River Flowing From The Sunrise

Aton, James M

Published by Utah State University Press

Aton, James M.
River Flowing From The Sunrise: An Environmental History of the Lower San Juan.
Project MUSE. muse.jhu.edu/book/9418.

For additional information about this book
https://muse.jhu.edu/book/9418

For content related to this chapter
https://muse.jhu.edu/related_content?type=book&id=204146
THE FEDERAL GOVERNMENT: Dams, Tamarisk, and Pikeminnows

The federal presence on the San Juan appears in the khaki-and-green uniforms of the Bureau of Land Management (BLM), the National Park Service (NPS), the Fish and Wildlife Service, and other public-land agencies that have jurisdiction over parts of the river. Of all public-land issues, water development has loomed like the four-thousand-pound gorilla and had the greatest impact on the San Juan landscape in at least two fundamental ways. No single human activity along the river has wrought so much change in ecological processes as Navajo and Glen Canyon Dams. Moreover, concern about water was the first manifestation of the turn-of-the-century conservation movement and eventually led to the post–World War II environmental movement, which ironically gained its voice, strength, and momentum by defeating a major Colorado Basin dam at Echo Park in Dinosaur National Monument. A flood of environmental laws in the 1960s and ’70s followed in the wake of the Echo Park victory. That, in turn, encouraged scientific study and a deeper understanding of the river’s ecology. Water’s story particularly is the subject of scores of books, monographs, and articles. To understand federal water development on the San Juan, however, a bit of background on the Colorado Basin is necessary.

Many western historians regard the Reclamation or Newlands Act of 1902 as the most far-reaching piece of legislation enacted by Congress regarding the West. The law was the culmination of decades of debate over ways to facilitate irrigation and encourage settlement. Some see the Reclamation Act as the climax of nineteenth-century Manifest Destiny and the creation of a hydraulic empire, controlled by the “iron triangle” of the modern federal state: science (the Bureau of Reclamation, Corps of Engineers, and U. S. Geological Survey Water Resources division), the state, and capital. Other scholars think the act represents the West’s failure to formulate a unified water policy, causing individual states to gain considerable influence at the expense of federal control. Whether one believes that the federal government or local politicians are wagging the western water tail, clearly national laws and agencies have built, funded, and maintained these projects during the twentieth century and will continue for the foreseeable future. The San Juan River, as part of the Colorado Basin, exemplifies everything that happened in the big dam-building era; it has a large dam, Navajo, near its headwaters, and the Glen Canyon Dam sits below its confluence with the Colorado. Before examining the effects of these two dams on the San Juan’s riparian and social life, let’s look at the way they came about and how they are managed today.

The Reclamation Service (changed to the Bureau of Reclamation in 1907) set out to construct dams to aid small farmers in living the Jeffersonian agrarian dream. But the bureau had trouble from the beginning making reclamation pay for itself, which the law required. Few farmers could afford water at the bureau’s costs. Moreover, the agency failed to develop a social program to teach farmers how to work arid land. Engineers know how to build big dams but have no clue about creating reclamation societies. Always in debt and often under attack, Reclamation began to see its way out of
the red in the 1920s, when hydroelectric power came along as a cash cow that would help finance projects.

Considerable debate arose during the first two decades of the twentieth century about hydropower development in the West. For a number of reasons, discussion focused on the Colorado River Basin. First, California was the fastest-growing and most-powerful western state, and the Colorado River was its closest source of water and power. Second, Bureau of Reclamation Director Arthur P. Davis had an absolute fascination, perhaps obsession, with building a giant dam in one of the Colorado’s canyons. Exactly how those dams would be built and who would regulate them were eventually worked out in the Federal Water Power Act of 1920, a compromise between total federal control and private monopoly. The law created a Federal Power Commission with authority to determine who could build hydroelectric dams on public lands like the San Juan. It also allowed, as discussed in chapter 3, private utilities such as Southern California Edison to help fund government surveys like the Trimble Expedition in 1921 to look for dam sites in the San Juan canyons.3

The real disagreement over water and power, however, did not concern public or private control. The crucial issue revolved around which states would get what out of the Colorado and its tributaries. Seven states—Wyoming, Colorado, Utah, New Mexico, Nevada, Arizona, and California—were contesting for water and power. In 1922 all but Arizona signed the Colorado River Compact, which divided the waters into an upper basin—Wyoming, Utah, Colorado, and New Mexico—and a lower one—California, Nevada, and Arizona. The dividing point was Lees Ferry, Arizona.4 California received the first benefits because it had the political clout, means, and perceived need for all the river could provide. The result was a series of small dams on the lower Colorado, followed by Hoover Dam in 1936, just outside Las Vegas.

In the late teens and throughout the twenties, USGS water geologists had combed the canyons of the Colorado looking for dam sites for a massive storage unit. E. C. LaRue, a cigar-chomping, outspoken hydrologist, had made a number of trips through Glen Canyon and on the Lower San Juan; he lobbied strongly for a big dam just four miles above Lees Ferry.5 There were two problems with the Glen Canyon site: upper-basin states were not ready to buy its power, and California would derive little benefit from it. Some believe that LaRue argued so strongly for the Glen Canyon site that he lost his job.6 The Boulder Canyon Act was signed into law in 1928, and construction of what was then one of the greatest building projects in world history began.7 Hoover Dam ushered in an era of unprecedented dam building in the West that utterly changed the waterways of the Colorado and tributaries like the San Juan.

During the construction of Hoover Dam (New Deal Democrats like Franklin Roosevelt preferred to call it Boulder Dam, even though it sat in Black rather than Boulder Canyon), a potentially significant lawsuit arose. United States v. Utah (1931) threatened federal water development in Utah and perhaps elsewhere in the basin. Known as the Colorado River Bed Case, the court proceedings had to decide whether the Green, Colorado, and San Juan Rivers were navigable at the time Utah became a state in 1896. Navigability meant that Utah owned the rivers; otherwise, all the rights of ownership rested with the federal government. At issue were oil-drilling permits and fees as well as power sites and mineral leases.8 After thousands of pages of testimony before Special Master Charles Warren, the Supreme Court decided that most of the rivers were navigable and hence Utah’s. The San Juan below Chinle Wash and hence through the canyons, however, was deemed nonnavigable. In 1960 the United States brought suit again in United States v. Utah (1960) to obtain title to the San Juan between Four Corners and Chinle Wash. Utah lost the case as well as control of mineral leases.9

These cases actually had a negligible bearing on the San Juan’s environmental history. They are monumentally important, however, for the wealth of historical information they provide about the use of these rivers. For the San Juan in particular, everyone from old gold miners like W. E. Mendenhall to Mormon pioneers like Kumen Jones and old river hands like Bert Loper testified. While attorneys for both sides tried to focus the testimonies on navigability, all sorts of other information crept out. For example, it became clear that the Mormons changed
the course of the San Juan at Bluff, cut down many of the cottonwoods and, unknowingly, hastened erosion along the river. They were aided by their counterparts upstream in New Mexico and Colorado. Reams of information about land use along the San Juan lie in the testimony of the case, offering a wealth of understanding for river historians.

With the court case settled, water development in the upper basin had to wait for World War II to end, but in 1946 the Bureau of Reclamation was ready with a thick, lavishly illustrated, almost-hyperbolic report, The Colorado River: “A Natural Menace Becomes a National Resource.” This report, which ultimately became the Colorado River Storage Project (CRSP), proposed nothing less than utilizing Colorado Basin water “to the very last drop” and was significant in a number of respects. First, in planning to use every ounce of upper-basin water, it outlined scores of dams, big and small, on all the rivers. Four sites were considered for the San Juan—the Great Bend, Slickhorn, the Goosenecks, and Chinle Wash (sometimes called the Bluff Dam). Second, the report’s language was full of unbridled optimism and hubris. It depicted the Colorado River in language close to the propaganda used to describe the “Nazi hordes” the Allied powers had recently defeated in Europe: “a natural menace,” “tore through deserts,” “ravaged villages,” “man was on the defensive,” “He sat helplessly . . . in vain to halt its destruction,” and so on. Further, the report concluded that controlling the river’s “terrifying energy” would build “beautiful homes for servicemen” and “bulwarks for peace.” In short, the bureau’s grand proposal emphasized empire, wealth, and absolute control of the whole basin. It projected images of clean, orderly houses; plentiful fields of crops, prosperous cities, healthy livestock, new dams, and happy recreationists and painted a glowing picture of America’s future, to be delivered by the “total use” of the Colorado River.

On environmental, even aesthetic, concerns, the report was strangely silent. It described the spectacular beauty of the many canyons the bureau hoped to dam, but in the next breath discussed the way that beauty would be somehow enhanced and made more accessible to the public by dams and reservoirs. It mentioned fish and wildlife, but only to the extent that reservoirs would increase sport fishing and hunting. In all The Colorado River was an extraordinary blueprint that outlined another kind of conquest for a nation flushed with victory after World War II but also wary of threats from communist Russia and China. What the bureau proposed, and largely accomplished, was what water historian Marc Reisner calls “the most fateful transformation that has ever been visited on any landscape, anywhere.”

That transformation did not happen immediately. First, the upper-basin states had to agree on water allocations. The Upper Colorado River Basin Compact was signed in 1948 and ratified by Congress the next year. The Bureau of Reclamation began issuing planning reports the same year, but the Korean War put CRSP on hold again. By 1953 the first CRSP bill finally arrived in Congress, and hearings began the next year. Two House and two Senate subcommittee hearings on irrigation and reclamation convened in 1954 and 1955. After thousands of pages of testimony and a major renegotiation in Denver by upper-basin congressmen, CRSP passed both houses in 1956, and President Eisenhower signed it into law. Two dams that affected the San Juan—Glen Canyon downstream and Navajo on the upper river—formed part of the original CRSP law. The way these dams made it into the final legislation has been the story of many recent publications, but here is a brief summary.

Glen Canyon Dam had always been a high priority for the bureau, going back to 1916, when E. C. LaRue first proposed the site. As the CRSP legislation proceeded, however, the act ran into opposition from conservation groups over its other top recommendation, a dam at Echo Park in Dinosaur National Monument. Conservationists like David Brower of the Sierra Club, Howard Zahniser of the Wilderness Society, and others effectively blocked the construction of a dam there, which moved Glen Canyon to the sole number-one spot. This does not say, as many environmentalists have over the years, that the conservation groups traded Echo Park for Glen Canyon. It would have been built anyway. Conservationists opposed Echo Park because it violated the integrity of a national park. The Glen Canyon Dam site, however, sat in no such park.

Dams, Tamarisk, and Pikeminnows 131
Moreover, Brower and the Sierra Club did not want to appear opposed to all “progress.” Although Brower later regretted not opposing the whole CRSP project, defeating a dam in a national park was probably the best conservationists could do at the time. A few faint-voiced souls, however, did argue strongly against Glen Canyon. Calling themselves “the Utah and National Committee for a Glen Canyon National Park in Opposition to the Proposed Glen Canyon Dam,” they managed to have their petition read into the record of the 1954 Senate and 1955 House hearings on CRSP. But their statements had no more impact than a small gust of wind on an ocean. No senator or congressman even acknowledged them.

What is interesting about the opposition to both Glen Canyon and Echo Park Dams is the nature of the arguments. Both the major conservation groups and this small group of river runners cited aesthetic and spiritual values to oppose the dams. Again and again, running through the testimonies of Howard Zahniser, Joe Penfold of the Izaak Walton League, and Sigurd Olson and Fred Packard of the National Parks Association are statements like this one from writer Olson: “We also believe that these areas are for the education and spiritual rejuvenation of all people... unspoiled nature has a greater significance than any other and... any change in these areas which depreciates the spiritual values is wrong.” Surprisingly enough, little discussion centered on environmental values—wildlife, riparian ecology, and so on. The closest any conservationist came was in statements by Richard Pough of the American Museum of Natural History and George Fell of the Nature Conservancy. Both argued for preserving Echo Park for scientific study, saying that biologists needed “untouched areas” where they could set up outdoor laboratories to study “undisturbed communities of wild plants and animals.” Pough and Fell justified these nature labs because they might yield new antibiotics, medicines, and other “new uses for obscure organisms.”

To contemporary ears, already full of talk about endangered species, habitat conservation, and ecosystems, these arguments may sound quaint and inadequate. To the western senators and congressmen, however, they were ridiculous and certainly not mainline arguments against dams. Although conservation groups formulated other arguments against Echo Park, such as pointing out math errors by the bureau and advocating “alternative” energy from coal and atomic power, they primarily stuck to the same arguments that Muir and the Sierra Club had used unsuccessfully earlier in the century to fight Hetch-Hetchy. Times had changed more than the terminology.

Glen Canyon, then, sailed through the CRSP hearings unscathed, but the law included a provision to protect Rainbow Bridge National Monument from the encroaching waters of Lake Powell. The bridge sits below the confluence of the San Juan and Colorado. After passage of CRSP and their victory at Echo Park, conservationists pressed the bureau and Congress to abide by the provision to protect the spectacular 278-foot sandstone span. It soon became apparent, however, that saving it required construction of at least one dam downstream from the arch to prevent Lake Powell from lapping at its base. Another dam upstream would divert water around the bridge. Congress decided in 1960 that this was too expensive and construction would mar the area more than doing nothing. They continued to refuse funding through 1971. Conservationists, who successfully posed the precedent argument at Echo Park (one incursion into a national park would open the floodgates for more), suddenly found themselves on the defensive. They pressed their case through the courts in the 1960s and ’70s, contending that Congress must uphold the law. The environmental groups won in federal court, but the U.S. Court of Appeals overturned the decision. In 1974 the Supreme Court declined to review the appellate decision, effectively ending the bid to protect Rainbow Bridge National Monument.

Now, given easy access via Lake Powell, as many as one thousand tourists arrive daily during the summer to view the sandstone span. Recently, however, the Park Service, responding to Navajo, Paiute, Ute, and Hopi claims that the bridge is sacred, have posted signs asking tourists to refrain from walking on or under the bridge. The idea of safeguarding the bridge has evolved, and many federal agencies and jurisdictions have been part of the story. The
controversy over the meaning and application of protection measures has obviously not ended.

Navajo Dam did not generate any of the controversy that surrounded Rainbow Bridge or Echo Park. And unlike Glen Canyon, it was authorized through the efforts of New Mexico Senator Clinton P. Anderson and a chorus of constituents, including members of the state delegation, Navajo tribal leaders, the commissioner of Indian Affairs, and local politicians and water-board officials. Navajo Dam, in fact, had not even been part of the original bureau proposal in 1946. By the time CRSP appeared before Congress in 1953, however, a number of smaller dams in northern New Mexico had coalesced into this one big project.22

New Mexico’s only real chance at Colorado River water allocation rested in the San Juan. Fortunately or unfortunately, depending on one’s opinion of the dam, the state had a very able and influential advocate in Anderson. At one point in the 1954 hearings, he responded to a question from Utah Senator Arthur Watkins by saying, “If the Navaho [sic] Dam is not included, I will say to my distinguished friend from Utah that the bill [CRSP] will pass over my dead body.”23 Actually Watkins had asked Anderson a different question. Anderson’s blurted, misdirected response clearly indicated the fervor he felt for Navajo Dam. He ultimately engineered the agreement to drop Echo Park, which left room for one or more major projects to be included. Anderson saw to it that “his dam” was one of them.

Construction began on the earthen structure shortly after CRSP’s passage. The government dedicated the dam, the first major
accomplishment of CRSP, in September 1962.\textsuperscript{24} Although the bureau originally estimated the dam would cost thirty-six million dollars, the final bill rose to forty-two million. Unlike Glen Canyon and other “cash registers” spilling out hydroelectric dollars, the cost of Navajo Dam is completely nonreimbursable. It is, as one political scientist has written, “a charge completely on the federal treasury.”\textsuperscript{25} In the 1970s the bureau proposed adding a power station at Navajo, but the Navajo Tribe filed suit, claiming all money from the sale of power should go to them. That effectively shut down the bureau’s project. Later in the 1980s, Farmington, New Mexico, settled with the tribe for millions of dollars and constructed a power facility at the dam, which came on-line in 1987. Farmington maintains the plant and derives all benefits from it.\textsuperscript{26}

Power generation or not, the inclusion of Navajo Dam in CRSP indicates that dams need friends, preferably ones in high places with lots of connections. Dams proposed for the Lower San Juan, especially the so-called Bluff Dam, had no such friends, but its story sheds light on the way water politics work.\textsuperscript{27} The first plan for a dam just below Chinle Wash came in 1914. Bureau of Reclamation surveyors had suggested the site, and E. C. LaRue pushed it in his 1916 report, saying, “Unquestionably the Bluff reservoir site . . . will prove of value in connection with the control of the Colorado River.”

The dam, he noted, would submerge the village of Bluff, but it was needed for irrigation, flood control, and silt retention.\textsuperscript{28} LaRue continued to push this site through the 1920s, while also advocating Glen Canyon Dam. It is not known exactly what Bluff residents thought of losing their town, their houses, and their cemetery, but the Montezuma Journal, reporting from a safe distance in Cortez, Colorado, observed that it would cost the government a lot of money to compensate the citizens of Bluff for their loss. The paper quickly added, “The benefits derived will more than offset the vast initial expenditure.”\textsuperscript{29}

The Bluff Dam, as well as the Slickhorn, Goosenecks, and Great Bend ones, continued to be discussed when the bureau published The Colorado River in 1946. The report indicated that the Bluff Dam was “urgently needed to prevent floods and retain silt” but later admitted that the other dams would adversely affect “scenic values on this impressive section of the San Juan and . . . would flood a number of sites of archeological importance.” The bureau estimated the costs for the San Juan dams as Bluff ($30.5 million), Goosenecks ($8.3 million), Slickhorn ($10.1 million), and Great Bend ($16 million) for a total of $65 million.\textsuperscript{30}

The Bluff project stayed in the plans through the signing of the Upper Colorado River Basin Compact in 1948. It appeared in the
bureau’s planning report in 1949 but had mysteriously disappeared by 1950.\textsuperscript{31} By the time CRSP legislation appeared in Congress in 1953, the Bluff Dam proposal was nowhere to be seen. Ironically, it was resurrected by a conservationist: General U. S. Grant, III.\textsuperscript{32} A former Corps of Engineer staff member knowledgeable about dams, Grant then served as president of the American Planning and Civic Association, a conservation organization opposing Echo Park. The grandson of the former president had carefully studied the bureau reports, looking at cost-benefit ratios as well as technical aspects of proposed dams. At the opening House hearings in January 1954, he urged the subcommittee to reinstate the Bluff Dam in the bill, contending that it could retain silt and store water. Grant also suggested other sites upstream on the Colorado and Green Rivers that, as a package, could substitute for Echo Park. Grant made the same argument later that summer before the Senate. Senator Arthur Watkins tried to trip Grant up by questioning his figures. Anderson and New Mexico also did not like Grant’s proposal because it threatened Navajo Dam. In the end Grant’s idea went nowhere, and the Bluff Dam proposal finally died in Congress, where it met stony silence from both the House and Senate.\textsuperscript{33}

In the 1960s the bureau proposed a dam one mile downstream from Mexican Hat, which would have flooded up to Cottonwood Wash at Bluff and cost fifty-one million dollars, but it remained a dream.\textsuperscript{34} Only Navajo Dam and Glen Canyon Dam became realities for the San Juan. The former changed stream flows and riparian life along Utah’s section of the San Juan. The latter drowned the lower part of the river, effectively killing riparian life.

Ultimately what saved Utah’s San Juan from all dams was its inaccessibility. Relatively few people who could advocate for a dam lived around the river. Utah’s politicians were clearly preoccupied with Echo Park and the Central Utah Project, both of which promised water and power for the populous Wasatch Front. Tiny Bluff didn’t amount to much in the political long run, so a good stretch of San Juan canyons was saved from the dam-builders’ concrete. Only one leg of the iron triangle of western water development, Reclamation, stood for the Bluff Dam. The other two, Congress and capital, walked away.

The story of Glen Canyon Dam’s construction is well told in Russell Martin’s \textit{A Story That Stands Like a Dam}. No such story exists, however, for the noncontroversial Navajo Dam. Nevertheless, both dams came on-line within a year of each other, Navajo in 1962 and Glen Canyon in 1963. Flows on the San Juan were immediately affected since Navajo Dam cut major floods by half. The waters behind Glen Canyon Dam slowly backed up into the San Juan arm of Lake Powell, all the way to the foot of Slickhorn Canyon by 1980. In the process, Lake Powell drowned the Lower San Juan between the confluence and Paiute Farms and the last twenty miles of the Middle San Juan between Mexican Hat and Paiute Farms. Both these dams had a major impact on plants and animals in the river corridor.

Another dam which threatens to have a major impact on San Juan River ecology is the Animas–La Plata Project (A-LP), proposed on a major tributary, the Animas River, below Durango, Colorado. First authorized by Congress in 1968, A-LP has seen many modifications as proponents have refashioned it to adjust to the shifting realities of San Juan basin politics. A major change in 1988 involved agreeing to include the Ute Mountain and Southern Utes in the complicated water-delivery scheme. This would satisfy the tribes’ water claims as granted by the 1908 Supreme Court decision known as the Winters Doctrine. Opponents, however, now estimate the dam’s cost at close to one billion dollars. They cite fiscal irresponsibility and major environmental impact to native fish and the San Juan River corridor as reasons to kill a project which has survived decades beyond the bureau’s big dam-building era. Unlike the Bluff Dam, this project has many powerful backers: the southwestern Colorado ranching and farming communities, nearly all the Colorado politicians, and the local Indian tribes. But opponents are well organized and armed with various environmental laws. Although A-LP seems to keep rising from the dead, it appears less and less likely that Congress will ultimately fund it.\textsuperscript{35} Either way, congressionally mandated environmental studies of the river’s ecology have had a major influence on the project.

The first of these riparian studies was conducted by Angus Woodbury. The increased
federal presence in the Colorado Basin and the San Juan area has intensified scientific study and netted a wealth of understanding about river systems.

In his trail-breaking survey of Glen Canyon-San Juan flora and fauna, Woodbury identified, described, and catalogued three plant zones: streamside, terrace, and hillside. He noted that once the canyons were flooded, all streamside habitats would be completely wiped out. Depending on their location in the canyon, terrace and even hillside vegetation might also be covered by water. What concerned Woodbury the most, however, was the loss of streamside vegetation. Because that lush, narrow strip of plants growing along the river was the direct source of food for many mammals and indirectly involved with nearly all others, Woodbury predicted that its loss would drastically affect populations. “Beavers,” he believed, “are doomed.” And he went on to predict “that the mammalian fauna will become drastically reduced both in kinds and number.” He concluded that the banks of the filled reservoir would “in no way provide the number and types of ecological niches which presently exist in the canyon. These banks will possibly become even more sterile because of fluctuations of the water level.” Clearly the few banks left on the San Juan arm of Lake Powell are sterile compared to the lush variety of the old riparian habitat. Studies of the environment around the lake since inundation have largely borne out Woodbury’s predictions, although the news is not entirely bad for the fauna, as the Lake Powell Research Project (LPRP) has shown.

Begun in the mid 1960s, the LPRP in many ways picked up where the Glen Canyon surveys had ended. Multidiscipline in nature, the project ranged far and wide, looking at everything from the concentration of heavy metals in game fish to the social consequences of boomtowns (like Page, Arizona); from the shoreline ecology of the lake to the prehistoric and historic trails in the Lake Powell area. The LPRP found, for example, that habitats for birds generally decreased as a result of flooding. Their range is now restricted mainly to the flowing part of the San Juan above Paiute Farms. But the lake has increased the number of waterfowl, shorebirds, peregrine falcons, and bald eagles. The peregrine population at Lake Powell has grown to be one of the largest in the United States. It appears that the falcons have shifted their diets from the swifts and swallows that used to nest along canyon walls to the waterfowl and shorebirds that have taken up residence at the lake.

As for the beaver whose doom Woodbury predicted, the LPRP said, “Little is known about the fate of this animal.” Although it has been seen burrowing into the banks of the lake, it appears to be largely gone from the San Juan arm. Nor has the lake been especially kind to native fish, of which more will be said later. In summary, some native and nonnative fauna have flourished with flooding, but most have not. The riverbank flora basically were wiped out in the flooded section of the San Juan, with the exception of native willows and nonnative tamarisks, which have flourished in the postdam environment.

A number of interesting changes have occurred as the result of the shoreline ecology that has developed around the lake. Dominant species like Indian ricegrass, broomgrass, Mormon tea, goldenweed, and sand sagebrush have markedly increased on sandy slopes. Fluctuating shorelines have caused a significant surge in the exotic species, Russian thistle. Accidentally brought into South Dakota in 1886, this aggressive pioneer, commonly called tumbleweed, colonizes sandy, disturbed soils. Its rapid seed development, quickly growing taproot, and resistance to periodic flooding make it a highly successful invader; only tamarisk has adapted better. Near Paiute Farms, Russian thistle has grown as large as Volkswagens.

Conversely, decomposition of snakeweed and other plant debris accounts for increased mercury levels in the lake. Carp, introduced into western streams and lakes in 1875 as a source of protein for local people, register the highest levels because they feed on the bottom where plant debris accumulates. Other game fish like walleye, bass, and trout also have higher concentrations of mercury per kilogram as they grow larger. Besides an increase in mercury, other heavy metals have concentrated in the lake because of discharge from the coal-fired Navajo Generating Station near Page.

Perhaps the major effect of both dams on the shoreline and the riverbank ecology of the
San Juan is a proliferation of tamarisks and, to a lesser extent, Russian olives. Gallons of ink have been spilled in trying to tell the story of tamarisk. From the tamarisk’s point of view, the narrative would surpass even the old stories of frontier conquest in its triumphs and completeness. But from the opposite standpoint, the narrative would look like a B-grade, space-invaders movie. This exotic species excites high emotions.

Tamarisk, or salt cedar, as it is commonly called, is an Old World plant from the Middle East. Its history goes back to biblical times. Although some attribute its introduction into the Americas to the Spanish, this appears to be due to mistranslating the Spanish taray as “tamarisk.” Probably a more accurate translation is “willow,” which is a native riparian species. The first mention of tamarisk was in an 1823 Old American Nursery catalogue from New York City. The catalogue offered it for sale, and then several East Coast nurseries followed suit in the 1820s and 1830s, advertising it as an ornamental and describing it as “hardy,” “beautiful,” and “much admired.” The first record of tamarisk in the West was in 1856, when A. P. Smith listed it in the Pomological Garden and Nursery catalog in Sacramento. Botanists assume that tamarisk escaped from cultivation; its first naturalized occurrence was on Galveston Island, Texas, in 1877. It was noted in the 1880s in St. George, Utah.

Between 1890 and 1920, tamarisk spread slowly at a rate of about twelve miles per year from the lower to the upper Colorado Basin, yet it largely escaped the notice of most sportsmen, ranchers, and farmers until the 1920s. The Roaring Twenties was a period of relative dryness for the Southwest, which hastened its multiplication. Using historic photos, botanists have pinpointed 1922 as the probable time tamarisks arrived at the mouth of the San Juan River. A 1921 photo by Hugh D. Miser of the Trimble Expedition shows no tamarisk at the confluence of the San Juan and Colorado. Herbert E. Gregory’s 1923 photo at the same place shows tamarisk. Presumably it migrated upstream thereafter.39

Contrary to contemporary appearances, however, tamarisk did not immediately dominate willows, cottonwoods, and other riparian species. As late as 1958, Angus Woodbury, Stephen Durrant, and Saville Flowers calculated that willow (Salix exigua) covered roughly three acres of streamside beach for every one acre of tamarisk (Tamarix pentandra).40 In most places along the San Juan now, the opposite ratio exists. What, then, facilitated tamarisk’s eventual dominance of Southwest waterways? The answer, as already suggested, is dams.

Prior to dams, rivers like the San Juan and Colorado had very high-volume spring and early summer floods, which scoured banks and deposited large beaches of sediment in their wake. Floodplains remained wide, and willows and, later, tamarisks were unable to colonize the unstable sands. One reason salt cedar flourished in the 1920s is that relatively low spring runoffs allowed it to invade and colonize previously unstable beaches. It was in the right place at the right time, a factor that became even more pronounced on the San Juan when Navajo Dam began controlling spring floods coming out of the San Juan Mountains in southwestern Colorado. Prior to Navajo Dam, floods of thirty thousand cubic feet per second were common on the San Juan, and ones of near or more than a hundred thousand cubic feet per second, like in 1884 and 1911, came swooping down periodically.41 Since Navajo Dam’s completion in 1962, the largest flow at Bluff registered fifty-two thousand cubic feet per second.42 Clearly the river channel has narrowed considerably, and tamarisk moved in to colonize the beaches that had previously been flooded yearly.

To appreciate its success, one must understand a bit about the way salt cedar reproduces. A large, mature tamarisk tree sheds 250 million seeds per year. An individual plant may live up to a century. It is highly tolerant to varying amounts of moisture. Once established, it can withstand the fiercest drought the arid Southwest throws at it as well as prolonged flooding. Some tamarisks along the Colorado River below Glen Canyon Dam survived five hundred days of inundation by cold reservoir water. Part of tamarisk’s ability to endure such extremes rests in its taproot, which may reach down more than 100 feet, with lateral roots spreading out 150 feet. The roots grow quickly, well ahead of drying surface sands. Tamarisk is also tolerant of high levels of salinity, and southwestern rivers have become saltier because of irrigation.43
In 1924 the San Juan near Aneth was wide and braided. Note the man standing in river. A 1995 rephotograph shows constricted river bottoms and nonnative Russian olive trees in the foreground. (C. H. Dane photo, #160, U.S. Geological Survey; 1995 photo by Lin Alder, Ecosystems Research)
Tamarisks have spread along the shorelines of the San Juan arm of Lake Powell for the same reasons: sand banks are covered with water when the reservoir fills in late spring and early summer and left dry when the lake lowers in mid-to-late summer. Tamarisk’s long seed viability allows it to flourish under such conditions where willows and cottonwoods cannot. It has proven to be a biological superplant. Like many species that evolved in the Mideast, it found a perfect opportunity to colonize and dominate when Americans dammed rivers in the Colorado Basin.

One thing that ecologists have studied since the advent of tamarisk along western waterways is its effect on wildlife, especially bird populations. In some places like the Grand Canyon, where vegetation was traditionally sparse, tamarisk growth has led to an overall increase in lizards, small mammals, some new species of birds, like Bell’s vireos, summer tanagers, hooded orioles, great-tailed grackles, and native birds like yellow warblers and ash-throated flycatchers. At the same time, cliff swallows have been largely extirpated. At other places like the lower Virgin River, where studies were conducted and vegetation was relatively dense, tamarisks provided poor wildlife habitat, and bird densities were substantially lower than with native riparian plants.

Although no studies have been made of the free-flowing sections of the San Juan, based on these two studies, a Grand Canyon-like scenario appears most likely. Historic photos of the river from Four Corners to the Colorado show wide, sandy bottoms with sparse vegetation except for cottonwoods. Tamarisk has now invaded the entire corridor, and increased wildlife habitat seems logical. The thick, mature tamarisk stands at places like the mouth of John’s Canyon, for example, must inevitably have increased habitat for lizards, small mammals, and some bird species. It is interesting to note that beavers gnaw on small branches, deer and bighorn sheep occasionally browse on tamarisk, and honey-producing bees use it as a source of nectar.

Wildlife biologists, then, face the perplexing situation of managing a naturalized ecosystem—a blend of the old and the new, a mixture of native and introduced organisms and natural and artificial processes.” Federal land agencies, however, have been slow to shift their thinking about dam-changed, tamarisk-dominated river corridors.

Many have damned tamarisks (and Russian olives) as the “ scourges of the West.” River runners hate tamarisks (or “tammies”) because they are not native, and they choke off camping beaches, make hiking a skin-tearing, eye-poking bushwhack, and often harbor billions of bloodsucking mosquitos. Farmers, ranchers, land managers, and dam operators also loathe tamarisks because they consume extraordinary amounts of water. LPRP ecologists estimate conservatively that the West has one million acres of tamarisks, which consume twice as much water as California’s major cities. For this reason and others, scientists and land managers have tried to control or eradicate the plant. Some have used flood and fire with no success. Tamarisk comes back even stronger. Others have combined plowing it up with applying herbicides like garlon.

One researcher, Jack DeLoach of the Department of Agriculture, has found what he believes are effective biological controls—a Chinese leaf beetle and a Dead Sea mealybug, which only attack tamarisk. DeLoach was set to introduce his insects in 1995, when the U.S. Fish and Wildlife Service halted his project. They feared reducing tamarisks would harm a recently listed endangered species, the Southwest willow flycatcher. This has set off yet another round of debates about tamarisk. Some ecologists, however, have questioned whether these programs are economically feasible or ecologically desirable. They say that a sick, static river system and irrigated saline soils are the problems. Thus far, no tamarisk eradication programs have been attempted on the San Juan. Part of what the tamarisk debate has done, however, is begin public discussion about what western rivers should look like and ways to manage them.

Recent events in San Juan country point to an additional, completely unexpected consequence of dams and tamarisk thickets. On 29 May 1998, three men from the Cortez-Dolores, Colorado, area—Alan Pilon, Jason McVean, and Robert Mason—killed a Cortez police officer. They apparently fled first to the Hovenweep area in June, then moved down to the tamarisk-Russian olive bottoms near Montezuma Creek.
large police force from the San Juan County Sheriff’s Office, the Navajo Tribe, and the FBI converged on the area in July 1998, searched the thickets, then tried to burn the fugitives out. They failed in their efforts, even though they found numerous clues that two of the men had hid out in the bottoms; Mason apparently committed suicide shortly thereafter. On 31 October 1999, Navajo deer hunters found McVean’s body in Squaw Canyon near Hovenweep National Monument, another apparent suicide. Pilon is still at large, though police expect to find his body in the same condition. The cost for the river operation totaled nearly two million dollars. Before Navajo Dam and tamarisks, criminals trying to hide along the San Juan near Montezuma Creek would have been as exposed as slickrock.51 These kinds of social and economic costs were never factored into the Bureau of Reclamation’s projections.

Besides questioning the ecological and economic value of tamarisk control, some scientists and land managers are beginning to see the plant in a new light. They are even espousing a new tamarisk aesthetic and ethic. Instead of viewing it as an alien species that must be driven out because it is “not natural,” a few ecologists have suggested that tamarisks and Russian olives are nature’s way of coping with the different water regime since the advent of dams. Weeds like tamarisks, after all, are colonizers, the “Red Cross” that rushes in to stabilize soil when something has disturbed the natural order. Rather than being an aggressive exploiter, the plant can be seen as a first line of defense against soil erosion. Because tamarisk has only been around the upper Colorado Basin for seventy years, one needs to take a longer view, they argue, and see how these new, naturalized areas evolve. Some anecdotal evidence even suggests that once

In 1914 the San Juan at the confluence with Chinle Wash (right) was a wide, cross-bedded stream. In the post–Navajo Dam era, the river is confined to a relatively narrow, tamarisk-choked course (facing page). (Herbert E. Gregory photo, #243, U.S. Geological Survey; later photo by Lin Alder, Ecosystems Research)
tamarisks invade and successfully stabilize an area over a few decades, native plants like hackberry, cottonwoods, and redbuds will begin to reestablish themselves. Ultimately, if the amount of flow remains stable for a century or so (a mere wink of time), southwestern rivers may even see at least a limited return of the native streamside vegetation that ecologists like Angus Woodbury described along the Lower San Juan in 1958.

Some “tamarisk philosophers” like Eben Rose have even pointed out that Euro-Americans and tamarisks share a special kinship. Both are “introduced species vying for a place in what will become the new balance of biota” in changed Southwest riparian ecosystems. Since Anglos have played the major role in that change—building dams and introducing tamarisk—no amount of “tamicide,” he argues, “will halt these forces of change and evolution’s relentless effort to reach a balance.” The wisest position right now, Rose believes, is just to sit back, watch closely, and learn.

The same period that ushered in phenomenal expenditures of public money on dam building in the West also saw the emergence of a newly invigorated environmental movement and subsequent passage of a slew of regulatory laws. The post–World War II era clearly marked the transition between the old and new environmental values. Those values reflected social changes in America in the postwar period. The explosion of nature writing as a literary genre, which will be discussed in the next chapter, exemplified that shift. Where the conservationists of the first half of the century had stressed efficient resource development, the environmental movement stressed the quality of life and human experience. While conservation ideas and actions rolled down to society from government and scientific leaders, the popular environmental movement spread from the middle of
society outward, continually forcing reluctant leaders to respond.\textsuperscript{54} The recent movement sprang from many places in society and has produced thousands of laws, policies, and consequences for the American landscape.

The Lower San Juan River especially, since it is administered by at least three government agencies—the BLM, the Bureau of Indian Affairs (BIA, the Navajo Tribe), and the NPS (Glen Canyon National Recreation Area)—serves as an excellent case study for working out the debates, laws, and policies of the environmental era.\textsuperscript{55} The Navajo Tribe governs both sides of the river from Four Corners to just east of Bluff. From there, the BLM administers the north side to the Honaker Trail; the Glen Canyon National Recreation Area (GCNRA) picks up from there to the old confluence. The Navajo Tribe continues its jurisdiction along the south side of the river, more or less to the old confluence. All of these federal entities, however, operate under the same set of environmental laws passed by Congress during the 1960s and 1970s.\textsuperscript{56}

The first major environmental law of the era, and the one that Congress spent the most time on, was the Wilderness Act of 1964. First conceived and proposed by Wilderness Society President Howard Zahniser, the act went through nine separate hearings, six thousand pages of testimony, and sixty-six rewrites between 1957 and 1964, when President Lyndon B. Johnson signed it into law. Originally a big, bold proposal by Zahniser, the act which passed made wilderness designation a long, cumbersome process of federal-agency reviews and separate acts of Congress for each state’s system. More than thirty years after the fact, Utah has two separate wilderness bills before Congress, and the process has divided state and local communities as few issues before.\textsuperscript{57} Environmental groups want almost five times as much acreage as the BLM has recommended or the Utah congressional delegation has proposed. In San Juan County, commissioners have stated they want no wilderness at all.

Along the San Juan, most of the Grand Gulch plateau and Cedar Mesa area have been proposed as wilderness, as has the north side of the river in GCNRA. The Utah Wilderness Coalition, however, wants almost twice as much land in the San Juan area as the BLM and Utah delegation (400,000 versus 200,000 acres).\textsuperscript{58} Moreover, it wants both Comb Ridge and Lime Ridge, north of the San Juan, designated as wilderness, while neither the BLM nor the Utah delegation has included them. No Navajo land, to the south or in the upper stretch, figures into any wilderness proposals. At this point, it appears that a good part of the Grand Gulch complex of drainages into the San Juan, as well as the GCNRA sections, will become wilderness if a bill ever passes. Sections of Cedar Mesa remain questionable.

Whatever happens about wilderness along the San Juan River, the debate has been extremely contentious, even though most wilderness study areas (WSAs) along the river have not generated as much controversy as other areas of San Juan County. Most of the San Juan has been a de facto wilderness for Anglos since the Spanish and fur trappers nipped around its edges. Generally the region has fewer mineral or agricultural resources than other parts of the Colorado Plateau and so has proven less of an issue for wilderness advocates and opponents.

Consequent with the Wilderness Act was the Wild and Scenic [River] Act, signed into law in 1968, again by President Johnson. Like the Wilderness Act, wild and scenic designation involves a slow, cumbersome review and legislative process which is even more difficult. Aiming specifically to protect river ecosystems from inundation by dams and safeguard other ecological, historic, and recreational values along riparian systems, the wild and scenic system has languished because it is so difficult to get competing users of waterways to agree. Moreover, major environmental organizations look upon rivers as secondary concerns.\textsuperscript{59} The San Juan has been considered by the BLM in its Resource Management Plan (RMP) as a wild and scenic river. From Bluff to Clay Hills, all but two miles around Mexican Hat have been judged “wild,” with those other two categorized as “recreational.” A National River Inventory judged the San Juan as “having outstandingly remarkable science, recreational and geologic values.”\textsuperscript{60} The RMP also declared that a formal study of the San Juan for wild and scenic designation should be conducted within five years. That was in 1991. As of 2000, however, all studies have been suspended indefinitely. Until
a study can be conducted, however, the San Juan is being managed as a wild and scenic river.61 This temporary designation means that no dams or other construction can be built along the San Juan. The river will remain as it is, but that does not indicate an absence of management. Boating on the San Juan has been popular since the early days of commercial river running in the late 1930s with Norman Nevills.62 As will be discussed in the next chapter, Nevills and subsequent commercial outfitters popularized the San Juan as a kind of “river for Everyman.” The big boom began, however, in the mid 1960s, when the national campaigns against the Echo Park and Glen Canyon Dams publicized the wonders of canyon river running. By the end of the 1970s, both the BLM and NPS, the two agencies administering the north side of the river, realized that a permit system was needed to limit the huge numbers of people running the San Juan. Along with the limit, there should also be safety inspections and waste and garbage-disposal requirements. The San Juan, in short, was getting trashed. In 1974 approximately two thousand people floated the San Juan. By 1995 that number had risen to more than thirteen thousand, where it remains today, fixed by BLM rules.63

In 1979 the NPS and BLM signed an agreement that allowed the bureau to issue permits, collect fees, enforce rules, and patrol the river. The agreement also called for developing a river-management plan, which BLM recreation planner Jerry Ballard drew up that spring. That plan,
after some tinkering, has formed the foundation for managing the thousands of people who use the river every year. It controls garbage and waste, educates the public about cultural and natural resources, and protects camps along the river. The Navajo Tribe, which owns the land south of the San Juan and the south half of the river itself, has recently begun requiring an additional permit to camp on their land. Although the presence of thirteen thousand people has undoubtedly had an effect on such popular places as River House Ruin, the Kachina Panel, the Honaker Trail, and Slickhorn, river runners, following BLM guidelines, have been responsible recreators. In fact, an independent study of the beaches and campsites along the river revealed “little biophysical damage.” Still, the BLM would like to do much more patrolling the river, educating river runners, and minimizing human impact on the ecosystem. The problem has been, and continues to be, funding.

A law which has had a profound effect on the San Juan and federal land administration is the National Environmental Policy Act of 1969 (commonly known as NEPA). Pushed through Congress by Senator Henry “Scoop” Jackson of Washington with remarkably little debate, NEPA fundamentally changed the way the nation did business when it came to land, water, and air. It required environmental impact statements for projects that might potentially harm natural resources. NEPA recognized environmental quality as part of American life. Together with its cousin act, the Federal Land Policy and Management Act of 1976 (FLPMA), NEPA has completely changed the way federal agencies like the BLM, BIA, and NPS administer the San Juan River and its drainages. For example, the BLM’s recent RMP was mandated by FLPMA. Moreover, the agency had to employ NEPA’s principles and consider environmental issues. The same ideas were inherent in the BLM’s original wilderness inventory, or draft environmental impact statement, in 1980. NEPA and FLPMA obligate the BLM and other federal agencies administering lands along the San Juan to study environmental impact before any project moves forward. This could mean a permit to graze cattle, drill oil wells, or build a new road. No longer may federal agencies make
decisions about land, water, and air based solely on economic principles. Ecological principles have entered the discussion.

Another law with an equally important effect on the San Juan—perhaps even greater than NEPA and FLPMA—is the Endangered Species Act (ESA) of 1966, 1969, and 1973. The ESA of 1973 not only sought to identify species that were endangered or threatened by extinction but also proposed plans to reestablish “critical habitat” for species designated by the U.S. Fish and Wildlife Service. Along the San Juan, the Southwest willow flycatcher and peregrine falcon have been on that list. The falcon, whose eggs were decimated by the petrochemical DDT, has recovered so well on the San Juan and throughout the West that it soon may be delisted.

The Fish and Wildlife Service has mostly concentrated its efforts, however, on two native fish: the Colorado pikeminnow (Ptychocheilus lucius) and the razorback sucker (Xyrauchen texanus). The resulting seven-year study (1991 to 1997), known as the San Juan River Basin Recovery Implementation Program (SJRIP), was the most thorough analysis of the river ever undertaken.65 The SJRIP looked not only at endangered native fish but also examined the entire fish community, which included an intensive look at geomorphology, hydrology, and habitat.

The pikeminnow, whose ancestors have swum in the Colorado Basin for at least six million years, is the Moby Dick of the area’s fish. Commonly called a Colorado salmon because of its migratory behavior, this minnow family member reached lengths of up to five or six feet and weighed eighty pounds. It was found throughout the basin, from the brackish estuary in Mexico to the mountains of Colorado. Remains have turned up in Anasazi ruins, while pioneer accounts and photos depict a popular fish with anglers, for both sport and food. The abundance of the pikeminnow was indicated by its use as fertilizer. The razorback sucker, nearly gone from the San Juan today, was also desired for food and supported commercial fisheries in the Colorado Basin. The razorback can grow three feet long and weigh thirteen pounds. Under normal conditions, an adult can live thirty or forty years.68 Conditions along the San Juan and in the Colorado Basin, however, have been anything but normal during the past forty years. Only a small reproducing population of pikeminnows currently live in the San Juan. Razorback suckers are even rarer.

There have been many assaults on these native fish. Navajo and Glen Canyon Dams have been a major factor. Together with diversion dams in New Mexico, Navajo has altered stream flows, interrupting breeding habits. Glen Canyon has prevented migration upstream and down. Competition from introduced fish has also been a problem for pikeminnows and razorbacks. Moreover, pikeminnows lost a major prey, the bonytail chub (Gila elegans), when that native fish disappeared from the San Juan. If these factors were not enough, pikeminnows and razorbacks declined because of various pollutants introduced directly and indirectly by people. Another crucial factor was poisoning. In 1961 the Fish and Wildlife Service, the same agency that is spending millions of dollars today to restore native fish, treated western waterways with rotenone. The chemical eradicated trash fish like carp and improved habitat for the popular sport fish, rainbow trout. Rotenone, however, dealt a crippling blow to all native fish.69

Finally, native fish have suffered from petrochemical pollution. The San Juan(5,5),(995,991) basin supports major oil-producing areas in Farmington and in Aneth. One kind of oil pollutant, polycyclic aromatic hydrocarbons (PAHs), are, according to a recent Fish and Wildlife Service study, “among the most potent carcinogens known to exist.”70 San Juan River fish are exposed to high levels of at least three PAH compounds. Fish absorb pollutants at an extremely high rate anyway, but the pikeminnow, a top-level predator, may be exposed to contaminants both directly in the water and indirectly through contaminated prey. PAHs enter the river from unlined waste pits next to pumping oil wells, as well as coal-fired plants, refineries, vehicular and heating emissions, motorized boats, and industrial sewage. These pollutants may be the most dire threat to pikeminnows and razorbacks. The Fish and Wildlife Service, however, has recently taken steps to reverse these trends.

The pikeminnow originally made the endangered species list in 1967. The first recovery plan, now largely scrapped, started in 1978. The razorback sucker joined the threatened list.
in 1978 and the endangered one in 1991. Habitat recovery plans were based on cooperation among at least eleven federal and state agencies: BLM, NPS, the Bureau of Reclamation, the BIA, Utah Division of Wildlife Resources, New Mexico Department of Fish and Game, Arizona Department of Fish and Game, Colorado Division of Wildlife, Nevada Department of Wildlife, California Department of Fish and Game, and the U.S. Fish and Wildlife Service, the lead agency. These plans designated the San Juan as “critical habitat,” according to ESA requirements. Thus, managers at Navajo Dam have adjusted water releases to mimic historic flows. For example, high late-spring and summer levels offered native fish calm backwater nurseries for their spawn, while very-low winter water stabilized habitat for growing fish and mature adults.71

The other principal action involves controlling PAHs and other petrochemical pollutants. Currently federal agencies, partly because of Navajo protests, are checking all wells in the San Juan basin for unlined waste pits. They clean out these pits and line them so that petrochemical pollutants do not wash down gullies and into the river nor seep into aquifers. The Fish and Wildlife Service is also monitoring native fish for other industrial and agricultural pollutants. Finally, using a fifteen-year budget of fifty-three million dollars for the whole basin, the service is employing radiotelemetry to monitor and analyze migration patterns of pikeminnows and razorbacks along the San Juan. It is considering augmenting existing populations (fifty to sixty reproducing pikeminnows and many fewer razorbacks) by stocking. The goal is to have self-sustaining populations of
these fish by 2006. Cooperating agencies hope they can achieve the same success with native fish as they have with the peregrine falcon. The obstacles seem even more numerous and formidable.

An endangered species whose recovery faces many more challenges is the California condor (Gymnogyps californicus), which made headlines during 1996 in San Juan County. Nearly exterminated, it has been the focus of a twenty-five-million-dollar recovery operation in California since 1987. The recovery team has planted this most-endangered species on BLM land in the Vermillion Cliffs, near the
Utah-Arizona border. The cliffs sit north of Grand Canyon National Park and west of GCNRA and the San Juan River. Federal officials expect the condor to take to the area and then migrate to other parts of canyon country to reestablish its range for the last 1.5 million years, including the Lower San Juan River. But San Juan County filed suit to stop reintroduction of this endangered species because of perceived threats to the area’s ranching economy. This legal challenge failed.

One animal that never attained endangered status but has topped the list of government restoration efforts in the San Juan region is the desert bighorn sheep (Ovis canadensis nelsoni). Wildlife biologists estimate that the pre–Anglo-American agricultural West had numbers ranging from 1,500,000 to 2,000,000 bighorn sheep. Estimates now reckon the population at 40,000 to 50,000. The enemy is we. One biologist who has studied the south San Juan herd in the Red Canyon area near Glen Canyon says that bighorn sheep cannot tolerate mining, overhunting, domestic sheep, and cattle. Perhaps the greatest factor in their demise has been diseases from nonnative sheep, notably pneumonia and sinusitis.

Historic, anecdotal evidence indicates many sightings of bighorn sheep in the San Juan canyons. As late as 1921, Trimble Expedition boatman Bert Loper recorded in his journal that the explorers saw “a bunch of mountain sheep” in the thirty-mile stretch between the Honaker Trail and Oljeto Wash. Other twentieth-century travelers verified this. Today, however, all that remains of a once-thriving herd in the canyons is a small group at the Raplee Anticline between Chinle Wash and Mexican Hat, south of the river. This herd is managed by the Navajo Tribe and probably numbers around sixty animals. Fortunately for the herd, no Navajos run sheep in the area, and tribal wildlife biologists continue to work and talk with locals, not only to keep out domestics but also to learn about bighorn behavior and movement. At Eight Foot Rapid, a number of popular river-running camps have been closed because bighorns use that canyon for river access.

While a few bighorns have been seen around the Goosenecks and the San Juan arm of Lake Powell, distinct herds no longer exist in this former range. The BLM, the Utah Department of Wildlife Resources, and the NPS, which manage bighorn herds in the Red Canyon area and Canyonlands National Park, have been cooperating to transplant, reestablish, monitor, and protect bighorn herds in San Juan County and elsewhere in Utah. One goal is to restore a herd north of the San Juan River, west of Mexican Hat. Wildlife biologists, however, are puzzled about why the south San Juan herd has not moved into its former range around Wilson Mesa, near the former confluence of the San Juan and Colorado. Nonetheless, the transplant program, begun in 1975, has fared well.

Interestingly, one of the ways that different state and federal agencies fund their expensive relocation programs is to auction off usually one hunting permit per herd at the annual Foundation for North American Wild Sheep banquet. The permits, which currently bring in fifty-to-sixty-thousand dollars apiece, allow the winner to hunt a mature ram. This money has been a good source of revenue for the different agencies and has also given biologists an opportunity to dissect dead animals and study them. Although cautious at this point, wildlife biologists believe that the future bodes well for bighorn sheep along the canyons of the San Juan.

The federal presence on the San Juan has produced positive and negative effects on the river’s environmental health. On the one hand, federally constructed dams and approved industrial, agricultural, and mineral development have profoundly damaged plants, animals, soil, water, and air along the San Juan. It is hard to overestimate just how deleterious dams have been. On the other hand, environmental laws have directed federal agencies to bring the lands they administer into compliance with recognized principles. Laws reflect national sentiment, and poll after poll suggests that Americans want environmental protection. Some residents of San Juan County and those who live along the river have often opposed environmental regulations.

Nevertheless, federal presence along the San Juan will continue to be omnipresent. It is not unreasonable to predict that within the next decade or two, the public will demand that the
San Juan be studied with the same scope and depth as the recent and massive Glen Canyon Environmental Studies (GCES), which commenced in 1982. Even though a final environmental impact statement was issued in 1995, individual scientific reports are still forthcoming. The GCES constitute the most extensive analysis of a river ecosystem in American history. The San Juan and other major western rivers could well receive the same attention in the not-too-distant future. The SJRIP was a step in that direction. Either way, however, the San Juan River is and will continue to be a “federal river” well into the future, with all the legal, ethical, environmental, and social complexities that implies.