

Tribal experiences and lessons learned in riparian ecosystem restoration

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Abstract.-Riparian ecosystems have been part of the culture of land use of native peoples in the Southwest United States for thousands of years. The experiences of tribal riparian initiatives to incorporate modern elements of environment and development with cultural needs are relatively few. This paper describes tribal case examples and approaches in riparian management which may advance discussions of cultural values in resource management for rural and developing communities such as those on tribal lands in the United States.

INTRODUCTION

“Mastamho drove a willow stick into the ground and drew out the water that became the Colorado River and with it came the fish and ducks. He gave the people the river and everything along the river. Whatever grew there was theirs, as he said, and they were the Aha Macave, the Mojave, the people who live along the river.”

So states the Mojave’s creation story. The story provides background and valuable insight into the significance of a particular river to tribal custom and culture. This relationship between the Mojave people and the Colorado River is further explained on a brass plaque on the Fort Mojave Reservation where the present day states of Nevada, Arizona, and California meet:

“For the Aha Macave the river was the center of existence. They practiced a dry farming method, relying on the regular overflow of the Colorado River to irrigate crops planted along the banks. They supplemented this with wild seeds and roots, especially mesquite beans, and game and fish taken from the river with traps and nets.”

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For many tribes in the arid Southwest, rivers, streams, and springs were, and continue to be, the “center of existence.” Neither the people, nor the unique cultures that developed, could survive without the “lifeblood of the desert”: The Southwest’s rivers and streams.

CENTERS OF EXISTENCE

Most Southwest tribes still live along the river courses and depend on them for a wide variety of uses. Sharing the Colorado River with the Mojaves are almost a dozen other tribes. Upstream are the Navajo, the Havasupai, and the Hualapai. Downstream are the Chemehuevi, the Colorado River Indian Tribes (consisting of four tribal groups), the Quechan at Fort Yuma, and the Cocopah.

Major tributaries of the Colorado River also play host to many tribes in Arizona. The White Mountain and San Carlos Apache reservations are separated by the Black River, which as it flows westward becomes the Salt River. As this river continues downstream, it gives its name to a reservation whose southern boundary it forms: the Salt River Reservation, home to Pima and Maricopa people. Their reservation also plays host to the Verde River, a beautiful river that first serves as a centerpiece to the Fort McDowell

Indian Reservation. The Verde and the Salt become one on the Salt River Reservation and continues to flow westward to form the northern border of the Gila River Reservation. This reservation, as its name implies, is bisected by the flowing waters of the Gila. As the Gila flows out of the reservation and joins the Salt, it takes its name with it causing the Salt River to once again change its name. This western stretch of the river with its increased flow, in turn, travels through yet another reservation and once again gives the reservation its geographic namesake. The Gila Bend Reservation, a district actually of the Tohono O'odham Nation, is the last reservation the river passes through before continuing west to join the Colorado River's southern migration.

Even for Arizona tribes whose present location may not make the riparian connection obvious, there is almost always a cultural link. The Ak Chin reservation, south of Phoenix, currently lacks any flowing streams, in part because heavy ground water pumping has depleted much of the available water in the area. Historically, however, the Ak Chin were nomadic farmers who followed the water that made their land arable. Their tribal name, in fact, means "Mouth of the wash".

In New Mexico, a majority of the tribes center along the Rio Grande. The Tewa, Tiwa, Towa, and Keresan settled along the Rio Grande living in close knit communities that the Spanish later named the pueblos of Taos, San Juan, Santa Clara, San Ildefonso, Tesuque, Cochiti, Santo Domingo, San Felipe, Santa Ana, Sandia, and Isleta. Other Pueblos not directly on the Rio Grande, line tributaries of the Rio Grande such as the Jemez river which the Jemez, Zia, and Santa Ana reservations all share. Their Zuni cousins settled along the Zuni River in western New Mexico.

When tribal peoples of the Southwest discuss what scientists and land managers call riparian areas there is a definite duality in how these areas are defined. For tribes of the Southwest, the heritage of land use includes riparian areas and is an inherent component in many of these cultures. In deeper religious terms, riparian areas are extremely important icons of survival, continuance, and reverence for societies and people long passed away. But the esoteric religious knowledge and importance of riparian areas is also secret and private in its meaning and use. In these expres-

sions, riparian areas have values which are nonquantifiable.

In academic and economic standards, efficient productivity is a desirable goal and riparian areas are resources with quantifiable values to be preserved or perhaps shared for multiple uses. These values and how they are taken into consideration are at the center of planning riparian area management on Indian lands in the Southwest.

As tribes prepare for the twenty-first century, a reshaping of tribal capability has begun and new perspectives are coming to light on how riparian areas will contribute to the needs of tribal peoples and the dependent life forms on tribal and adjacent lands. There are needs which must be addressed before plans of action can be drawn, and there are issues which must be discussed and dealt with before planning can begin.

SEEKING A BALANCE

A visitor to Indian country will almost certainly be amazed at the ability of tribes to get things done with their complicated theocratic and democratic governing systems. But things do get done, albeit in a different sort of way. Tribes may have different languages, customs, and indigenous religions, but each shares a common thread of belief which assures continuance and sustainability of the people. It is within this weave of beliefs that a fabric evolved which allowed these tribes to live in the same areas for centuries before this great republic was created. As tribes seek a balance between maintaining cultural identity and accepting aspects of modern land management, there are strategies emerging which are uniquely their own design and strategies which are nearly complete templates of national standards. In some cases there are hybrids of both systems.

It is important for non-Indians to understand that each tribe has a certain way of doing things, much relating to the history and culture of the respective tribe. In the case of riparian lands, there is a whole spectrum of possibilities for protection or development, and far more choices than are available on state or federal lands. Case examples of different tribal approaches to riparian ecosystem restoration are described below.

FORT MOJAVE AND COLORADO RIVER INDIAN TRIBES

Tribal members on the Fort Mojave and Colorado River Indian Reservations still extensively use the Colorado River. It provides an ever present source of irrigation water for their extensive agricultural fields, a home for the many species of wildlife that utilize the river corridor, and a tourist magnet for water-based recreational activities.

The river also provides favorable mesic habitat for plant species having important significance both ecologically and culturally. Mesquite is especially valued as it supplies wood for cradleboards, beans for food, and is used in combination with arrowweed in funeral pyres for traditional Mojave cremations. Willows provide material for basket making. Historical documentation, oral tradition, and legends all point to the many cultural connections the tribe has with the river and those plant and animal species tied to the riparian ecosystem.

Two recent fires (Spring, 1995) which burned an estimated 90% of Fort Mojave's mesquite were devastating to the tribe. A fire rehabilitation team was mobilized to immediately prepare a plan to reestablish mesquite on the most suitable sites. The rehabilitation team's concerns covered the entire gamut of possible natural resource degradation resulting from the fire but, at least on tribal land, the overriding concern was the loss of mesquite because of its cultural importance. Restoration efforts will focus on reestablishing this important tree on tribal land.

In the meantime, on the Colorado River Indian Reservation, a comprehensive plan has just been completed to establish a 1,042 acre riparian wilderness preserve and recreation area. Plans for the area include widespread revegetation with native riparian plant species, control of exotics such as saltcedar, and maintenance and improvement of a backwater area for fish and wildlife habitat. Hiking trails, also planned for the area, include a nature trail to educate visitors about riparian ecosystems, and a cultural trail focusing on Mojave history and way of life. A cultural center and an elder's village are also planned.

ZUNI INDIAN RESERVATION

In the remote plateau and canyon country of west central New Mexico, the Zuni Tribe has created a unique program of watershed restoration and riparian conservation based on Zuni cultural values and assessments of geomorphic processes. The work began as a result of a law suit brought against the United States for improprieties related to trust responsibilities.

The case was eventually settled out of court in 1990 and a substantial trust fund was established from which interest would fund watershed restoration and sustainable development of Zuni resources in perpetuity.

In late 1991, the Zuni Tribe established the Zuni Conservation Project to lead a program of watershed restoration and resource development which includes riparian restoration. Based on interviews with religious leaders, farmers, livestock growers, and other land users, attention to the culture of Zuni land use became the scope and mission of Zuni's efforts in environmental restoration and land use planning.

By 1993, the Tribe had completed a plan of action for sustainable resource development in the format of the United Nations Agenda 21 document. The U.N. Agenda 21 serves a blueprint for sustainable resource development and was as negotiated for several years among over 140 nations. Zuni's version of Agenda 21 was created using a participatory approach among Zuni land users. In the course of the law suit against the United States, Zuni elders and religious leaders gave depositions and interviews on behalf of the Tribe detailing an image of Zuni lands hundreds and even thousands of years ago. Zuni riparian areas were described as being more extensive, abundant with species diversity. Consequently, enthusiasm to restore Zuni riparian areas grew. The challenge for the Conservation Project has thus become two fold. As a culturally based project, riparian areas and species diversity are foremost concerns for Zuni religion and consultations and planning with religious leaders directly reflect this. As a restoration project, creating a program to achieve riparian area diversity required planning on a watershed scale.

The Zuni Conservation Project enlisted the knowledge of elders and use of traditional water

control features, as well as a sophisticated array of geomorphic study stations and geographic information systems. Before implementing a broad reservation-wide program, a pilot area was chosen where relationships among disciplines involved in the project could be evaluated and relationships with land users examined. As the project progressed, low impact techniques using hand labor and natural materials have become standard for watershed and riparian work. In a few cases, beavers have been transplanted to sites with diminished water levels where they have constructed dams, raising water levels considerably.

Establishing riparian vegetation has been successful as well, and efforts are underway to create a local plant materials center to propagate plants for transplanting into riparian areas and damaged watersheds.

The work to conserve riparian areas naturally requires participation from the land users and compromises have had to be developed to provide alternative watering sources for livestock and in some cases wildlife. In this respect, riparian projects in Zuni are not discrete projects, but rather involve broad participation of land users and managers. The Zuni example is a fortunate one in that cultural values contribute to the preservation and conservation of riparian areas as inherent necessities for Zuni continuance and spiritual well being. Several keys to developing riparian projects have been learned at Zuni through experience and observations of other projects with similar cultural based agendas. Principally, there are seven key areas:

- Legislation to support efforts
- Human resource development and capacity building
- Appropriate technologies
- Communications in local languages
- Financing for sustained project life
- Legal instruments to support the work (codes and regulatory laws)
- Cultural significance

The process of participatory development for riparian lands in Zuni is always evolving. In the first year of the project the issues and needs were broadly defined. By the second and third years, plans of action were implemented, monitoring

parameters defined, and financing for long term continuance of the project set in place.

RIO GRANDE PUEBLOS

To understand the current Rio Grande ecosystem, it is important to understand some of its history. The pueblos along the Rio Grande were already several hundreds of years old when the Spanish conquistadors arrived in 1540. As in the Southwest as a whole, the native people depended on the river and its tributaries for all aspects of life. With this dependence and use came changes. Trees were cut to provide house timbers and fuel. This continuous removal of wood often left areas completely devoid of fuelwood and building materials for many miles around a pueblo, and may explain why some pueblo settlements were deserted after fifty to one hundred years of habitation. The destructive effect was lessened because populations were relatively low, and in pre-Spanish times, carriage of logs had to be on human shoulders. There was, however, considerable erosion in the uplands, and the removal of small stands of timber in the cottonwood bosques often led to local flooding.

The Spaniards too, were heavy users of wood, and they introduced large herds of domestic sheep. These animals, by their close cropping of vegetation in the semiarid Southwest, contributed to rapid runoff and soil erosion, especially along some tributary streams.

By the twentieth century, major water control systems were in place, a huge increase in human and stock-animal populations evolved, and an insatiable urban demand for water began to fundamentally modify the Rio Grande region.

Currently, the Rio Grande pueblos are taking measures to restore their riparian areas and to improve the quality of water. These changes have come about with help from some farsighted individuals at the pueblos of Tesuque, Nambe, Santa Clara, San Ildefonso, San Juan, Picuris, and Taos. Examples of riparian restoration taking place in three of these pueblos is briefly discussed below.

Pueblo of Tesuque

The Pueblo of Tesuque is monitoring their cottonwood-willow bosques along the Rio Tesuque and associated perennial streams to

determine the effects of disturbance on this biological system from changes in species diversity, ecosystem stability, and biomass. Habitat management decisions for wildlife are frequently made by considering a limited set of species, e.g., common game species or endangered species. Some groups, such as bird species, respond quickly to changes in habitat structure because of their mobility. Tesuque's study has already collected data on these aspects and may confirm bird responses to the overall value of mitigating riparian losses solely by changes in vegetative cover. It may indicate that restoration of disturbed riparian faunas might require reintroduction of bird species, in addition to changes in vegetative complexity and to replicate full community structure and richness. It will also aid the tribe in making habitat decisions and monitoring environmental effects from off-reservation actions which affect avian populations necessary in cultural activities of the tribe.

Pueblo of Nambe

The Pueblo of Nambe derives income from the recreation area it has developed over the years along the Rio Nambe and Pojoaque Creek. This important resource, known as the Nambe Falls and Recreation Area, serves the Santa Fe and Espanola communities year round. Increasingly, the tribe is striving to manage the recreation area for multiple types of recreation and other resources. Multiple resource concerns center around fish and wildlife habitat, water quality, water conservation, aesthetics, cultural aspects, erosion control, and water conveyance. To help meet this broader focus, the tribe, assisted by the Bureau of Indian Affairs and the U.S. Forest Service, conducted a riparian evaluation based on the recreation area's goals and objectives. Following the evaluation's recommendations, approximately twenty acres along the Rio Nambe have been interplanted with native plant species such as mountain mahogany, Gamble oak, sumac, chokecherry, and willow. Narrowleaf cottonwoods were also planted along the shores of Nambe Lake at twenty picnic table sites. Many other revegetation projects are planned for the future. The overall survival rate for these projects has been about 85% for all species planted due in part to a watering program implemented by the recreation area staff.

Pueblo of San Juan

The Pueblo of San Juan is one of a few tribes in New Mexico to have a Forest Stewardship Plan. This program is a combined federal and state program which provides cost-share funds to implement forest conservation practices. As program cooperators, the Pueblo is managing its landbase to maintain cultural ties for the benefit of current and future generations. Channelization of the Rio Grande was and still is threatening the riparian vegetation. The tribe wished to restore these areas without destroying existing residential areas or farmlands. The riparian areas are to be developed to provide for recreation and wildlife habitat, as well as to provide wood for future economic development and maintenance of the culture.

Approximately 200 acres on the reservation were identified as riparian. Goals for these areas include elimination of exotic vegetation such as Russian olive and saltcedar, planting of native peach leaf, coyote, and Gooding willows and Rio Grande cottonwood, interplanting of grain crops with willow and cottonwoods strips to enhance wildlife food and cover, and establishment of water table monitoring devices. The willows are important to reestablish the riparian ecosystem and to provide material for culturally important activities. "Shinny sticks" for a tribal stick game similar to golf, willow furniture, and baskets are all made from willows. Thus far, in its first year, the tribe has implemented the planting of Rio Grande cottonwoods on ten acres.

FERTILE OPPORTUNITIES

Tribal experiences and lessons learned in riparian ecosystem restoration offer resource managers a broad array of information. This discussion described how some tribes employ old, time-proven traditional technologies, modern high technologies, or both. There are many different objectives as well. No matter what the differences may be, innovation and adaptability are common and planning has been shaped around widely-discussed and accepted goals of tribal communities. Though some efforts may be embryonic, and mistakes have been made, many tribes have become a regional influence and leaders in combining the "cultures of land use" with progressive management strategies.