

# 'Abakhav Tribal Preserve

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July 1990

# 'AHAKHAV TRIBAL PRESERVE

*FINAL DRAFT REPORT*

*JULY 1996*

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GLEN CANYON ENVIRONMENTAL  
STUDIES OFFICE

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**COLORADO RIVER INDIAN TRIBES**

**EDUCATION DEPARTMENT**

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## EXECUTIVE SUMMARY / INTRODUCTION

The 'Ahakhav Tribal Preserve on the Colorado River Indian Reservation is being restored through dredging operations and riparian (riverbank) revegetation activities. The preserve is along the eastern bank of the lower Colorado River and consists of 1042 acres in and around Deer Island (750.39 acres) and the 'Ahakhav Backwater (291.61 acres). The preserve includes 85.19 acres of open deep water and 249 acres of shallow water- wetlands vegetated primarily with cattails and bulrush. Nine species of amphibians, 19 species of fish, 23 species of reptiles, 32 species of mammals and over 250 species of birds are estimated to use the preserve. In addition, 29 endangered, threatened, or candidate species, including the Yuma clapper rail, southwest willow flycatcher, and razorback sucker, are estimated to benefit from habitat protection and enhancement in this area.

The history of this area has been described by the U.S. Bureau of Reclamation as the following: "The basic character of the river remained unchanged until 1935 when its natural regimen came to an abrupt end with the beginning of storage behind Hoover Dam."\* Since 1935, historically deep channels have become shallow and shallow areas have become sodden and dense with cattails, slowly becoming dry land. Thus, fewer wetlands are now available to river wildlife.

Fortunately, after the 1983 flood, the U.S. Bureau of Reclamation revised its damming/channelization mission and began selecting historic channels for dredging, to restore sport fishing areas in the backwaters. Through a series of percolation dikes, some backwaters are now being opened to the flow of the river. Native riparian trees and shrubs are being planted on dredge spoil piles, and natural fish habitat structures are being placed in selected backwaters. The 'Ahakhav Tribal Preserve has been designated a restoration dredging site, with operations scheduled to begin once matching funds have been secured and government procedural requirements met.

The 'Ahakhav Tribal Preserve seeks to replace wildlife habitat lost from the 1935-present damming, channelization and flood-caused siltation of the Colorado River below Headgate Rock Dam. The restoration of the tribal preserve to pre-1935 conditions will bring a resurgence of diverse river species, while preserving ecological history for a community whose history is inextricably bound to its environment.

### **'Ahakhav Dredge Plan**

- *Dredge and open historic backwater channels.*
- *Improve hydrology of backwater.*
- *Use spoil piles for revegetation without harming quality riparian habitat.*
- *Create and enhance fish and wildlife habitat in backwater.*
- *Develop monitoring programs to evaluate the success of dredging operations and provide information for future backwater management.*
- *Reduce future maintenance requirements.*

\* Draft Report - Comprehensive Plan, Lower Colorado River Channelization, Parker Division, printed by the Bureau of Reclamation under the U.S. Department of the Interior, Sept. 1965 (p.8).

Over the past century, riparian areas surrounding the backwaters have also been drastically altered. Fires and human consumption have decimated native stands of cottonwood, willow, and mesquite (honey and screwbean), while the non-native saltcedar has overrun the river area. The historic damming and channelization of the river have prevented seasonal flooding, and thus ended the natural process of soil desalinization. Where soil salt levels have increased, trees such as the cottonwood and willow, which cannot tolerate high soil salt levels, have been unable to regenerate. Thus, saltcedar - perfectly suited to high salt levels - thrives in the absence of serious competition from native plant species. Unfortunately, saltcedar, for various reasons, supports less indigenous wildlife than native vegetation. Since 1935, wildlife populations, especially migratory bird populations, have declined with the loss of suitable habitat. While simple replacement of salt cedar by native vegetation is problematic, the restoration of native vegetation through the use of dredge spoil piles to assure hospitable soil, along with extensive soil sampling at planting sites, bodes well for the return of native vegetation and wildlife.

'Ahakhav revegetation activities will continue for a ten year period on areas no larger than 70 acres per year. Extensive soil analyses will be conducted prior to planting, trees will be irrigated until well established, and revegetation sites will be monitored to ensure successful revegetation.

#### **'Ahakhav Revegetation Plan**

- *Establish stands of native vegetation, including cottonwood, willow and mesquite, in areas of low wildlife habitat value, primarily saltcedar stands.*
- *Stabilize dredge spoil piles and sensitive lowland sites adjacent to the backwater.*
- *Conduct bird censuses to monitor success of revegetation.*
- *Maximize successful establishment of native species and minimize amount of future maintenance required.*
- *Use native stands for environmental education, recreation and the arts.*
- *Design stands to minimize threat from wildfire.*
- *Maintain stands for the benefit of both wildlife and humans.*

The preserve will meet the community's need for low-impact outdoor recreation and environmental education activities. A Preserve Center will be constructed on a 4-acre portion of the 'Ahakhav Backwater. The center will include the Preserve Offices, the Cultural and Children's Centers, the Ceremonial Grounds, and a trail system. Classes in native arts, equipment rental, tribal gatherings, school field trips, day camps, an educational bookstore, and cultural and ecological exhibits will all be operated out of the Preserve Center facilities. Interpretive trails, outdoor learning laboratories, a native plant nursery, and a traditional garden will offer further educational opportunities. Shade ramadas, recycling toilets, and careful choice of building materials will allow the Preserve Center to meet the needs of visitors while minimizing the visual and environmental impact of the facilities.

#### **'Ahakhav Outdoor Recreation and Environmental Education Plan**

- *Provide low-impact outdoor recreation facilities for tribal members and the community.*
- *Provide an environmental and cultural education facility available to tribal members, school groups, and the community.*
- *Minimize the visual and environmental impact of Preserve facilities on surrounding habitat.*
- *Provide an environmental and cultural education package using the preserve as an outdoor reference and research laboratory.*
- *Provide job training and volunteer opportunities to tribal members and the community.*

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## ACKNOWLEDGEMENTS

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The Planning Team gratefully acknowledges the participation of the various members of the community who have shared their ideas, knowledge, and skills in support of this project. As it moves into the construction stage, we will continue to draw upon the knowledge you have shared, and look forward to continued work with all of you, as well as new additions to the network of supporters of this important project.

**1.0 A NATURAL HISTORY OF THE 'AHAKHAV TRIBAL PRESERVE  
AREA**



\*The Colorado River originates in the Rocky Mountains in Colorado and now travels some 1,700 miles before emptying into the Gulf of California in Mexico. The lower Colorado River, located below the Grand Canyon, flows through what used to be silt beds, marshes, and riparian forests.

Over the past three million years, the lower Colorado River Valley has been repeatedly submerged under the ocean. Essentially, at times, this was the northern Gulf of California. When gulf waters receded, the Colorado River cut through the volcanic landscapes north of the 'Ahakhav area down to the open, deserted, ocean bed. (Monument Peak/Needle Mountain is a volcanic spire.) With volcanos more widely dispersed, the river moved freely, cutting easily through ocean sediment left from the Gulf's last venture north. The ocean sediment in the 'Ahakhav area is currently about 1000 feet deep. At times, the river was 300 feet lower than it is now, and at other times it was 600 feet higher, explaining the existence of plateaus throughout the area.

To understand the type of vegetation that existed along the lower Colorado River, the natural events that shaped the floodplain need to be examined. There are two factors that affected floodplain formation (Ohmart et al. 1988). First, the Colorado River carried a large sediment load that contributed to the erosive action of the current. As the river meandered through the valley, the current eroded the outside bank of each meander (Figure 1.1) and deposited new soils on the inside bank. This resulted in the stream bank being continually created and destroyed. The second factor that affected floodplain formation involved the river's fluctuating water levels. Peak flooding, which occurred between mid May and the first of July, was largely determined by the size of the annual snowpack in the Rocky Mountains and how rapidly it melted. Flows on the Colorado River ranged from 4,000 to 100,000 cfs. (By comparison in 1994, the mean flow below Headgate Rock Dam ranged from 12,297 cfs in April to 4,819 cfs in November.\*\*)

The changing bank formation, combined with the variation in flood stages from year to year, created a series of terraced bottoms along the river. The lowest terrace was replenished and sometimes leveled annually by inundation. The second and higher terraces were inundated only intermittently, allowing a slower cycle of building and destruction.

A few plants are uniquely adapted to the floodplains of seasonally fluctuating streams. These riparian plants exist where their roots are in the capillary fringe of the water table and extend only as far from the channel as the stream exerts its influence through the water table. This strip of vegetation is often used to define the floodplain of the river.

The natural vegetation associated historically along the Colorado River consisted of belts of riparian vegetation. The dominant riparian forest species were cottonwood (please see Appendix A for scientific names of plants cited in this document) and willow. These occurred primarily on the lowermost, first terrace and on the braided channels. As an adaptation to a frequently flooded environment, these plants were fast-growing and short-lived. Their existence was ultimately

\* Text reprinted largely from the Vegetation Management Study, Lower Colorado River, Phase 1, U.S. Bureau of Reclamation, Lower Colorado Region, September 1992.

\*\*Based on Parker Dam and Headgate Rock Dam mean water flow records.

dependent on the cycle of annual floods that created new silt beds for seed germination. These plants cannot tolerate prolonged inundation. Where such long-term inundation persisted, such as in oxbow lakes, emergent marsh vegetation became established.

Along the drier sites next to willow and cottonwood, a shrub, arrowweed, often formed dense monotypic belts. Where the floodplain of the first bottom escaped inundation for several years, screwbean mesquite grew in association with willows.

A different type of riparian vegetation occurred on the higher, second terrace compared to alongside the river. The dominant species on the second terrace was honey mesquite (Figure 1.2). This tree formed sparse monotypic woodlands (Ohmart et al. 1988). In addition to honey mesquite, several shrubs grew locally in dense clumps on the second terrace. Saltbush was the most prevalent. Quailbush occurred as a narrow belt between the first and second terraces. Inkweed or pickleweed was found in areas with dense, saline, or alkaline soils.

Historically, cottonwood and willow riparian communities were a dominant feature along the lower Colorado River. Father Kino's expedition in 1699 reported that the junction of the Gila and Colorado Rivers was overgrown with dense groves approximately 3 miles wide. After the Mexican-American War, American soldiers and scientists began working in the area of the lower Colorado River and left records of cottonwood distribution, abundance, and size. A member of Lieutenant Emory's engineering party observed in 1846 that the land near the Colorado-Gila junction was overgrown with impenetrable thickets of willows, mesquites, and cottonwoods. John Bartlett, a commissioner of the boundary survey, also mentioned dense forests of willows, cottonwoods and mesquite that filled the river's bottomland in 1852.

While exploring potential routes to the U.S. interior, the soldiers and scientists also determined that the river was navigable. This awareness resulted in steamboat travel on the lower Colorado River. Steamboat use from 1855 to 1890, and the resulting need for fuel, caused widespread reduction of the cottonwood communities located along the lower terrace bottom of the river. Cottonwoods and willows were a primary fuel for powering the vessels and were readily accessible in the early years. Toward the end of the steamboat period, the trees had been reduced to the point that steamers planning long trips upriver had to take on wood from the delta to ensure an adequate fuel supply.

With the end of the steamboat era, cottonwood communities began returning. Floods in 1905 and 1907 (Figure 1.3) caused a temporary setback in the recovery of natural communities, but also provided the necessary habitat for cottonwood seed germination and for beginning the reforestation process.

"In 1905 the river broke through levees about four miles below the Mexican border and flooded lowlands for 16 months. The Imperial Valley was inundated, railroad tracks and highways were washed away, and homes and farms were destroyed. The Salton Sea, with an area of about 500 square miles, was formed."\*

\* Draft Report - Comprehensive Plan, Lower Colorado River Channelization, Parker Division, printed by the Bureau of Reclamation under the U.S. Department of the Interior, Sept. 1965 (p.15).

In the early 1900's, agricultural activities were also starting along the lower Colorado River (Figure 1.4). The same flooding events in 1905 and 1907, which provided for the return of the cottonwood-willow communities, devastated farming efforts. These floods caused public pressure to be placed on the Federal Government to control the river for human use. Water users wanted the Reclamation Service, established in 1902, to assume responsibility for developing the river for power generation, water storage, and flood control. All of these needs could be met by damming the Colorado River.

Laguna Dam, built in 1907, was the first water-management structure constructed on the Colorado River. When another large flood occurred in 1922, Colorado River users and their representatives pressured Washington decision makers into authorizing Hoover Dam. When Hoover Dam was completed in 1935, the stage was set for other river management activities. A number of lesser dams followed; Parker and Imperial Dams were operational by 1938 and Davis Dam by 1951. River management activities following construction of these dams began to control the once wild and unpredictable flows of the lower Colorado River. These structures permanently changed the character of the lower Colorado River by ending the cycle of annual flooding that had shaped the valley over geological time.

With floods controlled and irrigation water readily available, large stands of natural habitat in the floodplain areas of the lower Colorado River were rapidly converted to agricultural uses. Wide portions of the floodplain near Yuma, Blythe, Parker, and Needles were cleared during the 1940's and 1950's (Figure 1.5). Before conversion to agriculture, honey mesquite was the dominant vegetation throughout the second terrace in the valleys. The only large tracts of natural terrestrial vegetation remaining on the lower Colorado River are now on the five Indian reservations and the three national wildlife refuges (Ohmart et al. 1988).

Two major events and their consequences caused further decline of cottonwood and willow forests along the lower Colorado River (Ohmart et al. 1988). First, by 1936 Hoover Dam essentially stopped all threats of floods, except when heavy runoff from local rains brought floods from larger tributaries, such as the Bill Williams River. Farming of the rich alluvial soils increased with the cessation of flood threats. Without floods, new alluvial seedbeds were no longer formed and the life-cycle of the cottonwoods and willows was irreversibly changed. In addition, lakes behind Hoover Dam, and the other dams that followed, inundated thousands of acres of riparian habitat.

The second major event took place sometime around 1920, when an exotic woody species, saltcedar, spread into the lower Colorado River Valley from the Gila River. Saltcedar found optimal ecological conditions for its spread and eventual dominance. In 1894, Meams (1907) estimated that there were 400,000 to 450,000 acres of native riparian vegetation in the Colorado River Floodplain. As of 1986, total riparian vegetation was about 100,000 acres (Anderson and Ohmart 1984c). Roughly 40 percent of the remaining area in 1986 was covered in pure saltcedar stands, an additional 43 percent consisted of native plants mixed with saltcedar, and only 0.7 percent could be considered mature cottonwood or willow habitats.

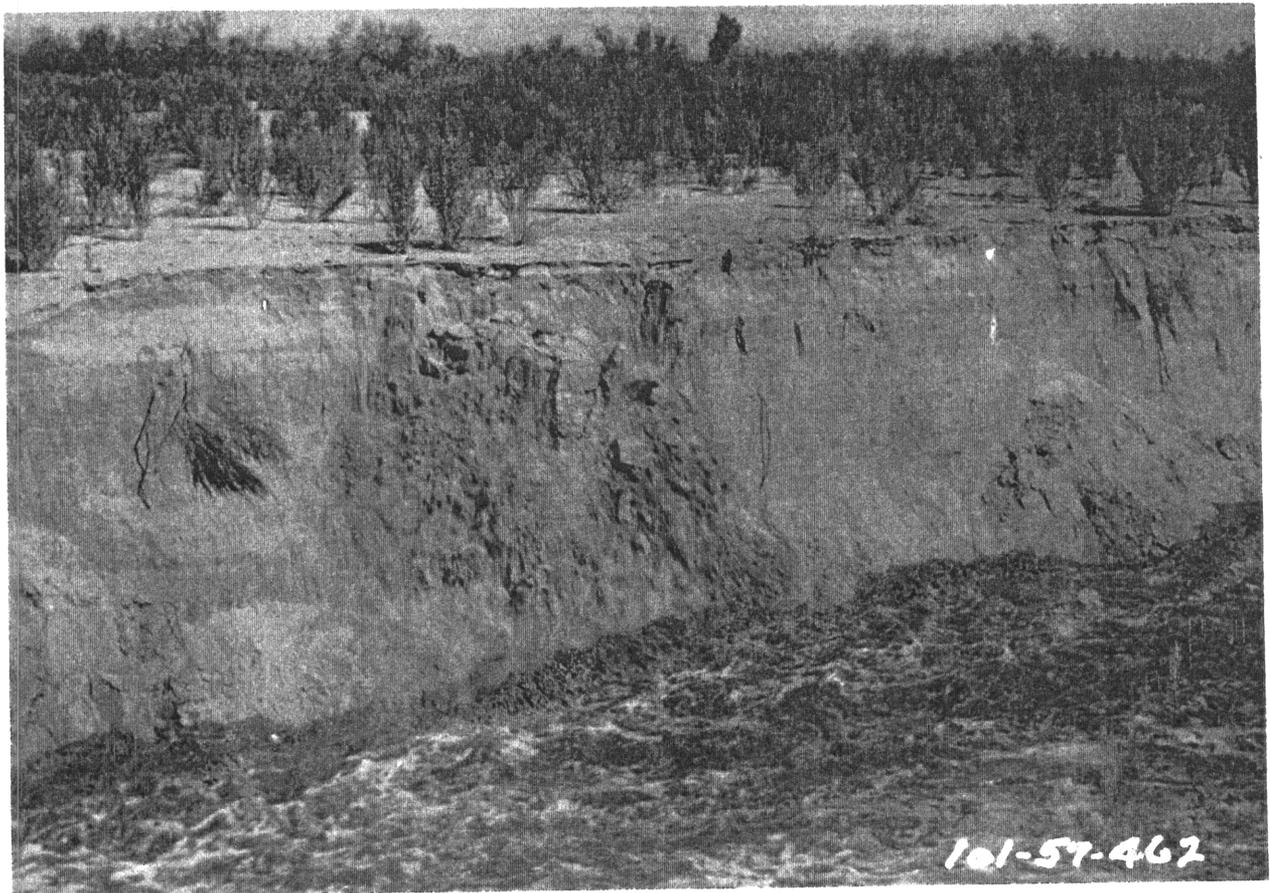


FIGURE 1.1 *Colorado River Bank Erosion:*

Without natural vegetation to hold soil within their roots, riverbanks rapidly eroded under the force of the River's current. As large trees, primarily cottonwood, were removed for steam boat fuel, the river's natural pattern of erosion was accelerated, as was the damage to agricultural fields and growing towns. (Photo courtesy of the U.S. Bureau of Indian Affairs)

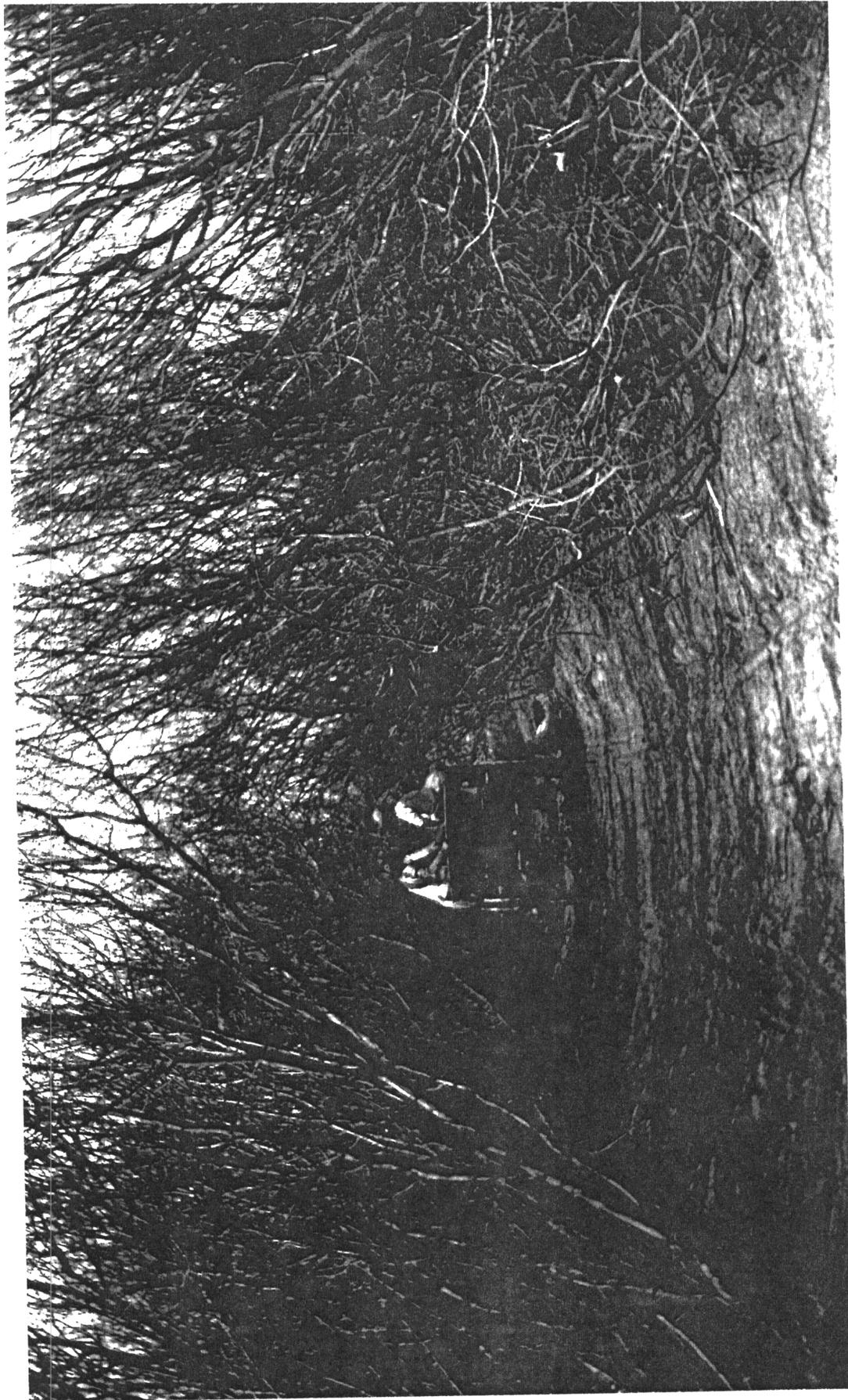


FIGURE 1.2 *Early 1900's Honey Mesquite Bosque:*  
The Colorado River Indian Reservation includes one of the few remaining honey mesquite bosques on the lower Colorado River. However, many more areas have been cleared of their mesquites than have been preserved. Mohave Road, between Parker and Poston, looked much like this in the early 1900's. (Photo courtesy of the Smithsonian Institution)



FIGURE 1.3 *Early 1900's Colorado River Flooding:*  
"In 1905 the river broke through levees about four miles below the Mexican border and flooded lowlands for 16 months. The Imperial Valley was inundated, railroad tracks and highways were washed away, and homes and farms were destroyed. The Salton Sea, with an area of about 500 square miles, was formed." (U.S. Bureau of Reclamation, 1965, photo courtesy of the Smithsonian Institution)

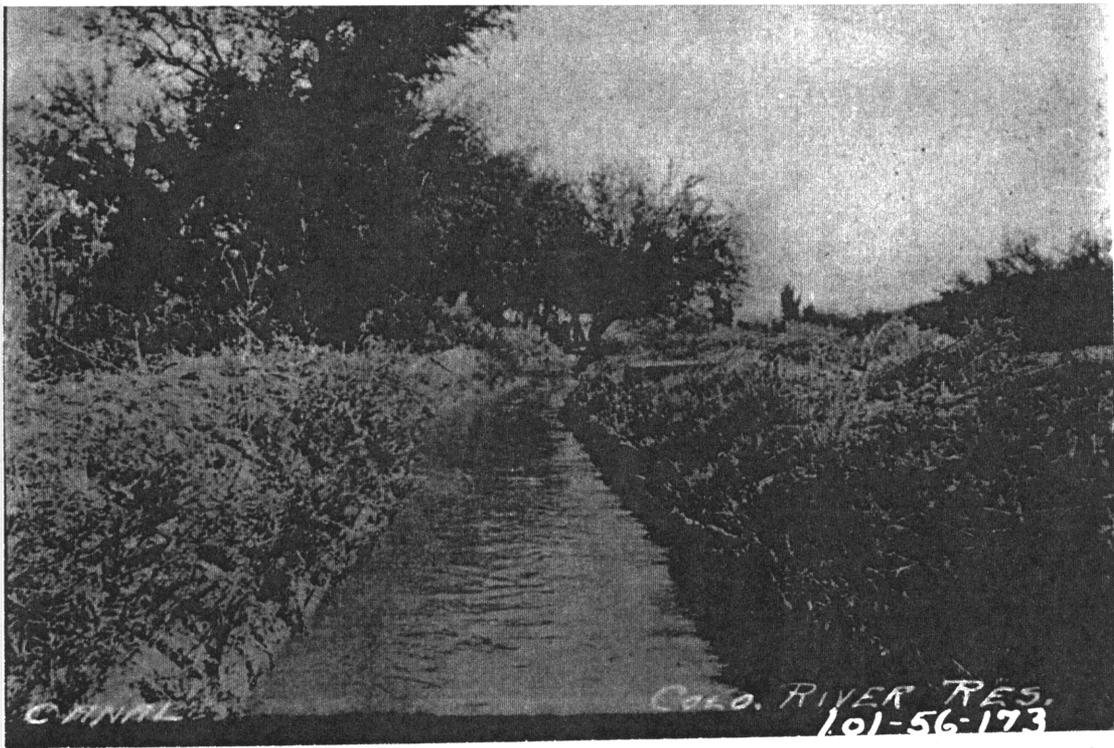


FIGURE 1.4 *Agricultural Irrigation Ditch:*

Agriculture became a dominant enterprise along the Lower Colorado River in the early 1900's. Irrigation water was plentiful via canals from the river. However, soon after agricultural activities began, flooding became a very serious threat to both crops and growing towns. (Photo courtesy of the U.S. Bureau of Indian Affairs)

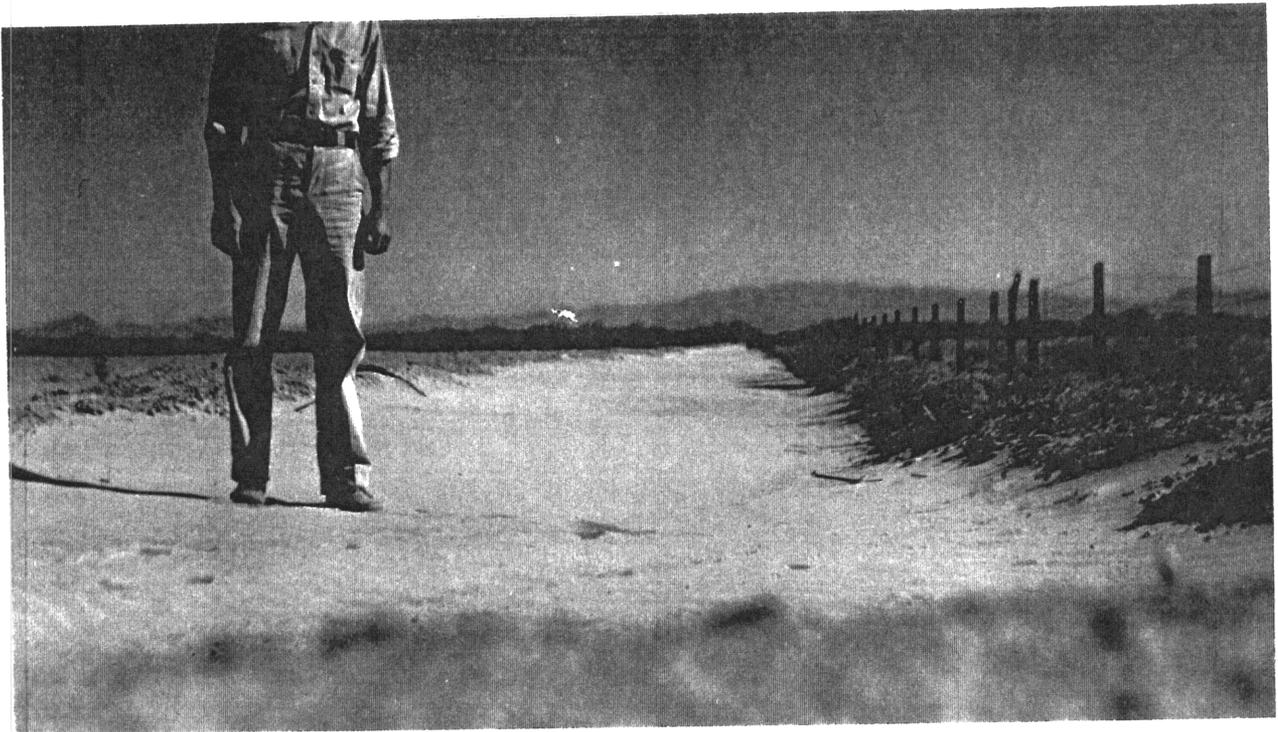
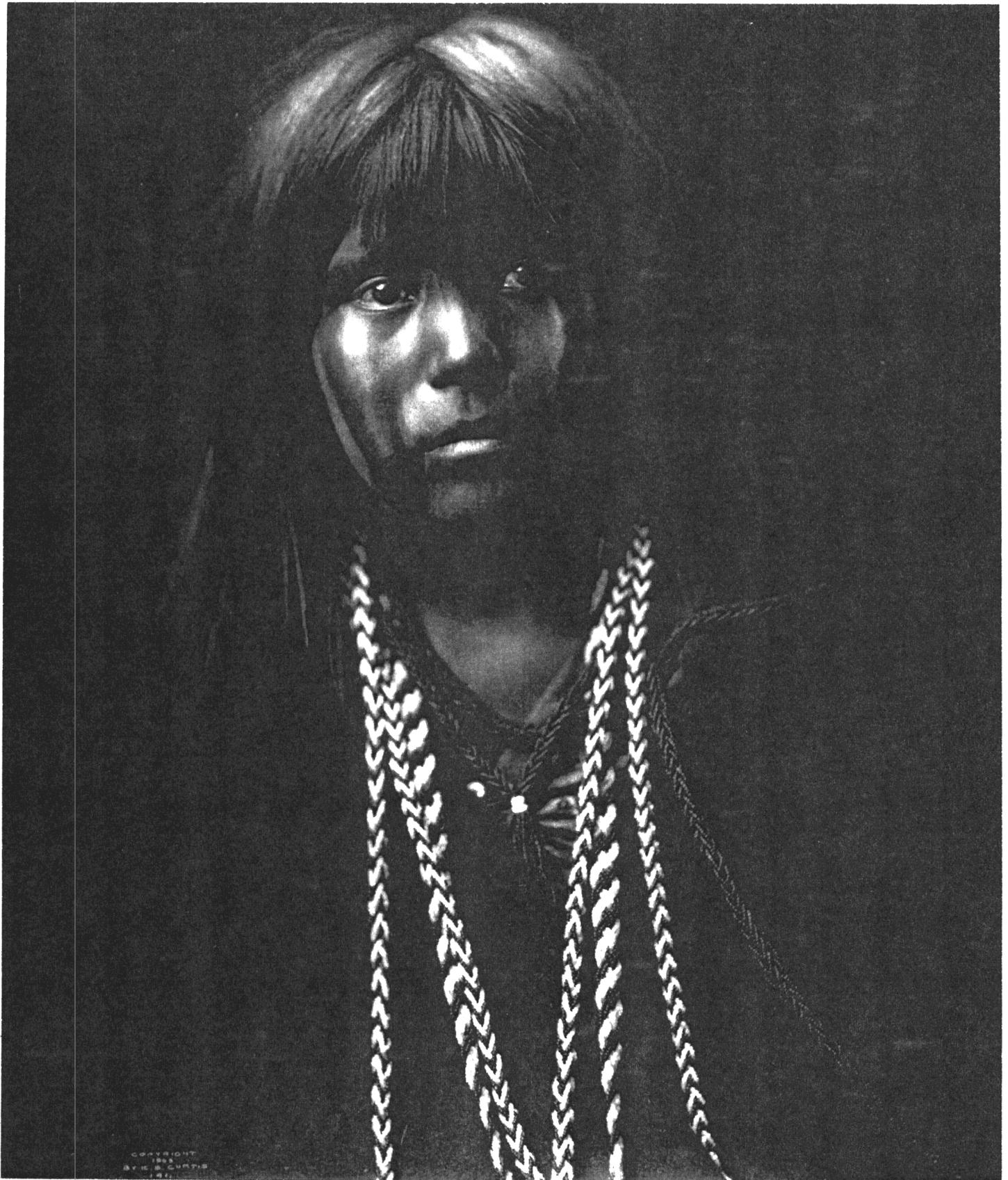


FIGURE 1.5 *Soil Erosion After Long-Term Agricultural Use:*

Soil erosion became problematic on agricultural lands after they were cleared of their native floodplain vegetation. The lightweight soil was easily blown off cleared fields without larger trees serving as windbreaks, and there were few roots to hold down the soil. Additionally, salinity levels of the soil surface increased rapidly without periodic flood events to leach salts from the soil. (Photo courtesy of the U.S. Bureau of Indian Affairs)

## 2.0 HISTORICAL HUMAN USE OF THE 'AHAKHAV AREA



## **2.1 THE PEOPLE ALONG THE WATER**

The Ahamacave, or using the English pronunciation - Mohave, are a nation of indigenous people living in the river valleys along the southern portion of the Colorado River in what is now Arizona, California, and Nevada. Currently, there are two communities of Mohaves in the United States. One group is located on the Fort Mojave Indian Reservation, established by the U.S. government in 1910, and the other is located on the Colorado River Indian Reservation, established in 1865. Both groups have maintained their political and legal sovereignty and currently share a "government to government" relationship with the United States. The descendants of the Ahamacave or "people along the water" live in the lush valleys fed by the waters of the great Colorado River.

The Ahamacave effectively used the resources in the rich and fertile river valleys to survive and flourish in the harsh desert environment for hundreds of years. Before it was dammed in the 1930's, the Colorado River carried tremendous amounts of minerals and other nutrients (silt) in the water. When the river flooded the valleys, silt was deposited on the land as the flood waters gradually receded. This rich deposit of topsoil, in combination with the heat, provided optimal conditions for the growing of crops such as corn, wheat, squash, beans, melons, and seed grasses within a very short time (60-90 days). This natural phenomenon is similar to that of the Nile River in Egypt.

In addition to cultivated food sources, a significant amount of uncultivated plant food was gathered by the Ahamacave women to diversify and supplement the diet. The primary and most prized of these plant foods was the mesquite bean. The pods of the honey and screwbean mesquite were gathered in late July through late September. Women used long hooked poles to pull the pods from the tree and carried them home in large, net-framed carrying baskets. The Ahamacave often stored the mesquite beans in large granaries near their homes for use throughout the year. The beans were prepared and ground into a meal to provide a nutritious source of carbohydrates and sugars. Other types of food gathered by the women included various tubers, roots, grass seeds, and greens to complement the cultivated foods.

Small game hunting and fishing were important activities for the men year-round. Most men hunted with a bow and arrow or a snare, and game consisted of deer, mountain sheep, rabbits, quail, and other small animals. Fishing was accomplished using lines, traps, scoops, and nets.

The successful adaptation to the extreme environment allowed the Ahamacave time to travel all over the country to visit and trade. For centuries, the Ahamacave were important middlemen in the trade of shell and shell products from the Pacific Ocean to the Rio Grande River. They also travelled as far north as Alaska and as far south as the Valley of Mexico.

The natural environment of the Colorado River was dramatically and permanently altered when the "wild" river was tamed with the completion of the building of Hoover Dam in 1935. The floods that had deposited silt in the valleys ceased to occur, changing both agricultural practices and the lives of the Mohave people. Many Mohave people in the Parker Valley began to grow cash crops such as alfalfa and cotton, and used irrigation water on a regular basis.

In addition to agricultural changes, the natural vegetation along the river was greatly reduced, as was the associated wildlife. Mohave women were unable to gather uncultivated foods as they had in the past, and the fish in the river declined in abundance. Mohave people began to develop a dramatically different diet of alternative food sources. New foods like potatoes, rice, canned meat, canned fruits and vegetables began to appear in the diet. Instead of eating simple carbohydrates, complex sugars, and low fat foods, they now consume complex carbohydrates, simple sugars, and high fat. Doctors believe that this shift in diet may be responsible for the tremendous outbreak of diabetes among the Mohave people in the last fifty years. Diabetes and its associated complications is one of the leading causes of death among the Mohave today.

The following excerpts are from A. Kroeber's Handbook of the Indians of California, originally published in 1925 (see references, Appendix N).

Some Mohave clan names (women's names):

Nyo'ilcha - sun, Hoalya - moon, Mat-hachva - wind, Hipa - coyote, Siulya - beaver, Motheha - screech owl, Halypota - frog, Tilya - mescal, Musa - screwbean mesquite

"The Mohave ...saying is that an untattooed person goes into a rat's hole at death instead of the proper place for spirits...Young women in particular hardly appear at a gathering or public occasion without striking red or yellow patterns across the cheeks. Forking lines are drawn downward from the eyes, or a band passes squarely across the cheeks...The hair is sometimes tied up in clay mixed with mesquite gum to stain it black and glossy..."

"When war parties went out, each man carried a gourd of water and a gourd of ground wheat which furnished his sole subsistence for 15 days. Travellers professed to journey four days without any food...The Mohave move across the country in a trot that carries them over long distances rapidly...Bits of *ihore* willow were often chewed to keep the mouth moist."

"The house has a frame of logs and poles, a thatch of arrowweed that serves so many Mohave needs, and a covering of sand."

"The rush raft of the Mohave was a crude affair of two bundles, with about three sticks skewered through, and some lashings of willows. The material was the flat tule...Loose tules might be laid on top. Four to six persons could be carried, those in the middle remaining dry. The men were all good swimmers. Children were sometimes pushed across the river in pots a yard in diameter."

"Shell currency seems to have been held only in small quantity. A horse was given for half a fathom of typical California disc beads-a very high valuation. Most old women wore at the throat a clam shell cut into frog shape and simply called *hanye*, frog. These also were valuable."

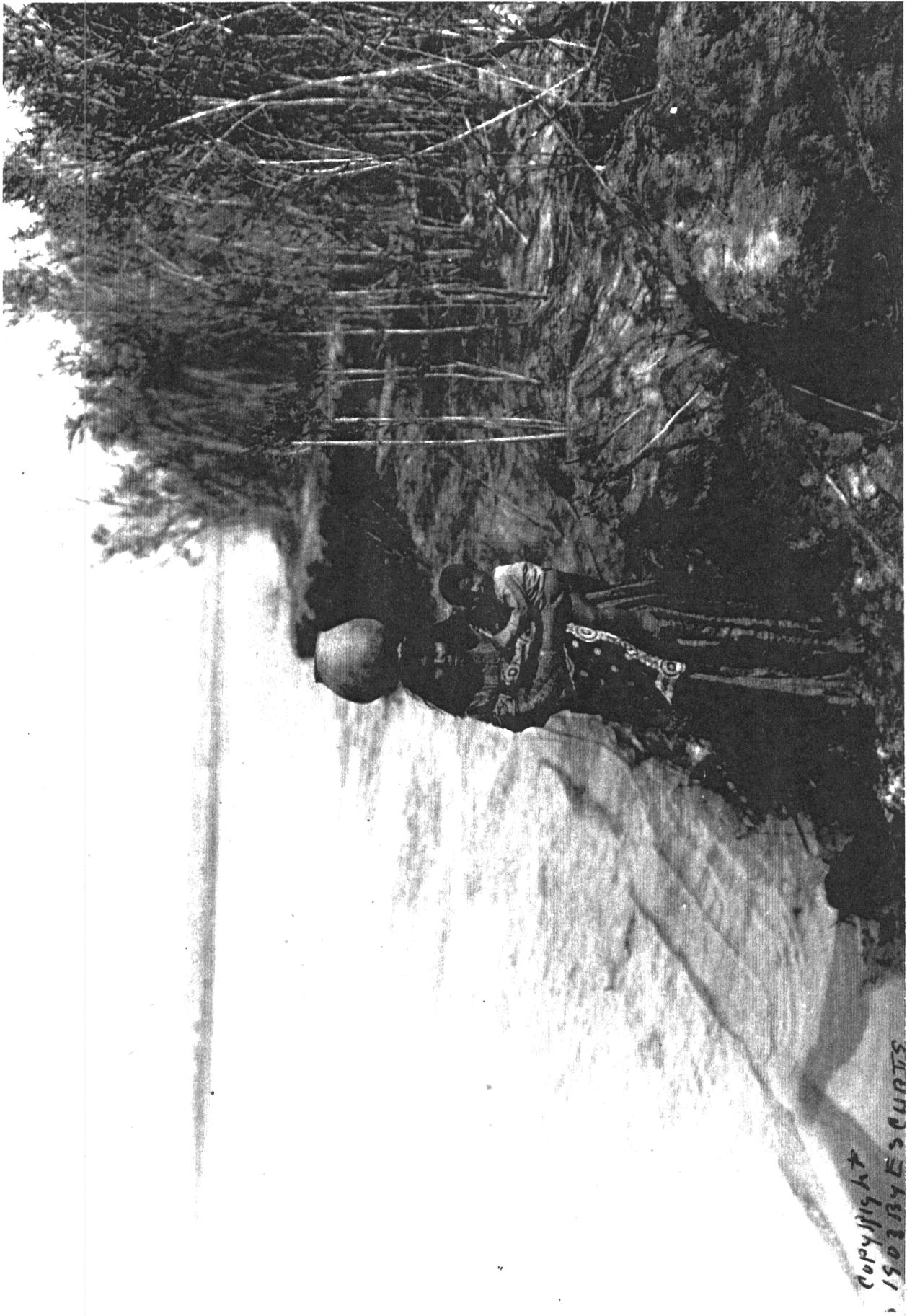


FIGURE 2.1 *Mohave Woman and Child on the Colorado River*  
(Photo by E. S. Curtis, 1903, courtesy of the Smithsonian Institution)



FIGURE 2.2 *Mohave Man in Rabbit Skin Robe* (Photo by E. S. Curtis, 1907, courtesy of the Smithsonian Institution)

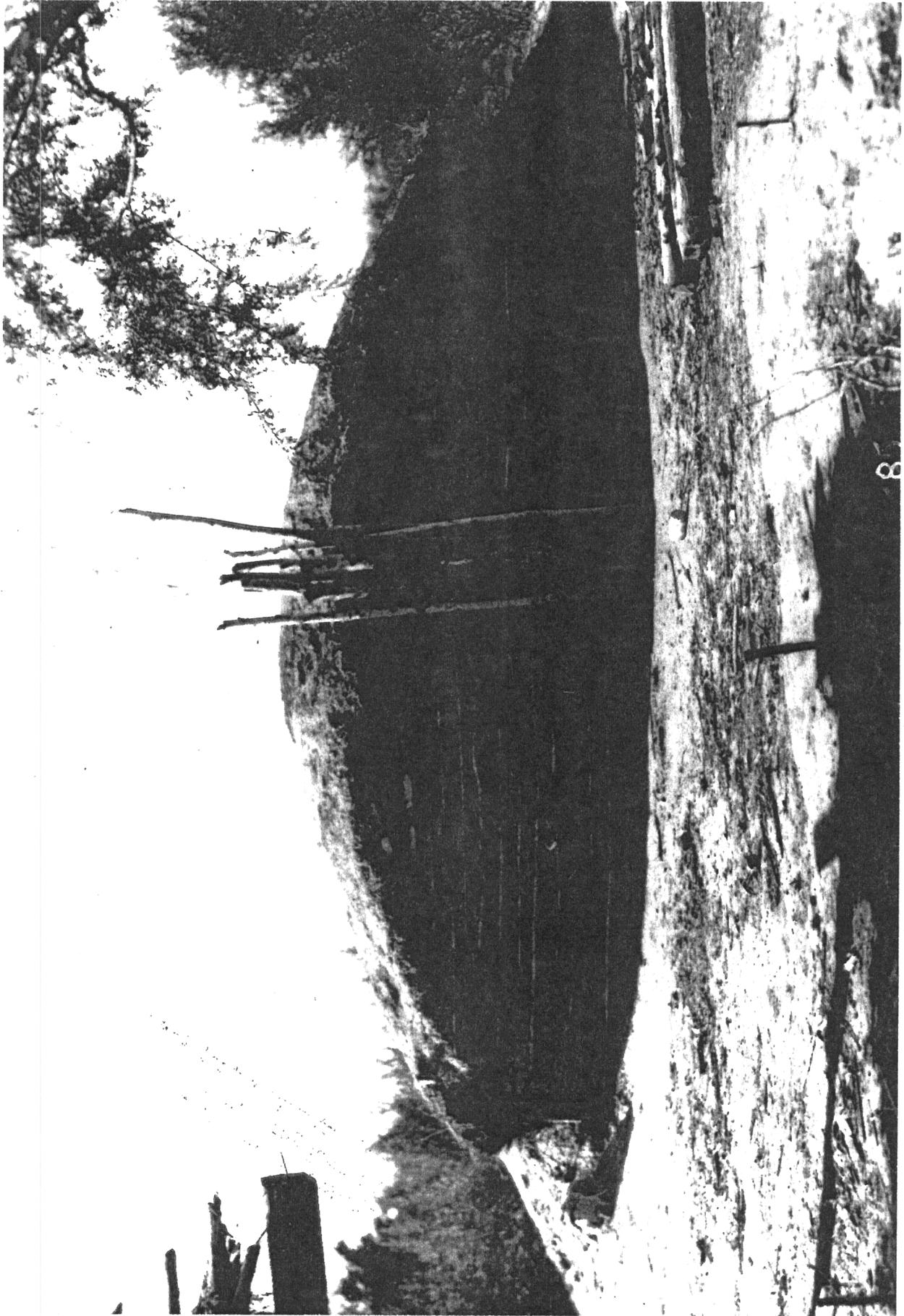


FIGURE 2.3 *Mohave Winter Mud House* (Photo by A. Hrdlicka, 1908, courtesy of the Smithsonian Institution)

## 2.2 ART, SONGS, STORIES

Mohave women gathered clay, granite, and sand from many sources along the river to make pottery. They made large jars to store and cool water, pots to cook food, vessels to parch seeds, bowls to mix and prepare food, spoons to scoop and eat food, jars to store food, and dolls and animals for the children. When the railroad came through Mohave territory in 1883, train passengers noticed the unique style of pottery and dolls that the Mohave women made and began to purchase them. The types and styles of pottery changed to accommodate the new market. Cups with handles, covered tea pots, dolls with elaborate dress, jars with many spouts and handles, frogs and turtles were made for sale to train passengers.

Before contact with Europeans, Mohave women used shells to make necklaces. When glass beads became readily available they switched to glass immediately. Mohave women became known for their elaborate bead collars, especially for their striking netting technique. The types of geometric patterns and light and dark contrasting colors used by Mohave women in making belts, purses, and necklaces has been described as distinctly Mohave.

Mohave people have a deep appreciation for music, especially songs. The Mohave have songs for healing the sick, telling history, and enjoying themselves at social events such as dances. Some of the great and powerful songs tell about the world and its creation by Matavilya (God) and how the Mohave people came into existence. The songs also describe the history and heroes of the Mohave, the place of the Mohave people in the world, and the natural phenomena they encounter. The most popular songs to dance to are the entertaining "Bird songs." Both men and women line dance using small steps to move their bodies backward and forward to the rhythm of the gourd rattle played by the men.

The following excerpts are from A. Kroeber's Handbook of the Indians of California, originally published in 1925 (see references, Appendix N).

"Designs on vessels are named spider, rain, rainbow, fish backbone, melon markings, turtle, cottonwood leaf, coyote tooth, yellow-hamer belly, tattoo, and *hotahpam*, a style of face paint that crosses under the eye."

"When the singer swings his stick, they step with their knees bent. All five of these dances might be going on at the same time. As soon as one song is finished, another is begun; they dance fast because the sun is nearly gone and the women sweat...So they did this time when the captives were brought in. As it began to be dusk, they stopped, and all went to the river and washed off their paint in order that the two captives might not cause them to be sick...So in two days they all assembled once more and danced again the whole day and the whole night. In the morning they continued singing while the *kohota* took the two slaves, one in each hand, and started toward the river...When he came near the river, he ran and leaped in with the two captives. Everyone plunged after him. This was to make the two Cocopa women Mohaves, so they would not bring sickness on the people." -- Mohave recounting event from childhood

"All the cycles have their songs strung on a thread of myth, of which the singer is conscious, although practically nothing of the story appears in the brief, stylistically chosen, and distorted words of the songs."  
"...although no two of the 100 or 200 songs of one series are identical, the Mohave need hear only a few bars of any song to recognize its kind..."

"Abreast with the singer is a kneeling line of elderly men facing east; behind him, two women selected for their loud voices, their faces painted red, their hair white; in front, looking toward the sun, sit three rows of younger men. They wear tufts of white heron or crane feathers on their heads, or strings of these feathers down their backs...The dance is continued till everyone is tired... Unison mass effect makes up to them for variety and meaning of movement."

*"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 Mohave, the people who live along the river."*  
-- Mohave creation story

"The myths are enormously long, and almost invariably relate the journey of either a single person, or a pair of brothers with or without a following, beginning with their coming into existence and ending with their transformation into an animal or landmark.... We are thus faced with a style of literature which is as frankly decorative as a patterned textile. The pattern is far from random; but it is its color and intricacy, its fineness or splendor that have meaning, not the action told by its figures..."

*"Nyohaiva, the insect called yanathakwa 'ataya, was a woman who grew out of the ground at Miakwa 'orva, near the northern end of Mohave Valley. She moved southward, went east from opposite Needles into the mountains, gave a bow and knife to Hamatholaviya that the Walapai might live by hunting, returned to the river, leaped far down, accepted a new name, Ath 'inkumedhi, from Nyahunemkwayava, but rejected several men who claimed her as sister. At Ahwaka-hava, somewhere in the old Halchidhoma country, she was offered food and plotted against by Kimkusuma, Ochouta, and their two brothers, who wished to eat her. She found her relatives' bones, beat the people of Ahwaka-hava in a contest for them, and defied them to war. She went downstream to Avi-haly 'a and Avenyava and prepared the people for war. They assembled, and she appointed three leaders besides herself. On the way up they met her brother, on whom horns were growing, and she sent him to the east to become a mountain sheep. As the party approached Ahwaka-hava, Nyohaiva put the foe to sleep with a magic ball, entered the house with her three companions, carried off the sleeping Ochouta, and decapitated him with her thumbnail. She took the head northward to Amata-ya 'ama, near Parker, still in old Halchidhoma territory, where four alyha men-women lived and made the scalp dance. Ochouta's skull she threw far south, where it became the rock Avimelyakyeta at Picacho near Yuma. Then she herself turned into a black rock near Amata-ya 'ama."*

"Shinny was played with a slender curved stick and small wooden ball by 'old', that is, middle aged, men, seven or eight to a side, between goal lines a third of a mile apart...The ball was put in a hole in the middle of the field, covered with soil and trod down. Half a dozen players struck at the pit until the billet flew out..."

#### Note

In accordance with C.R.I.T. archaeological and historic preservation procedures, an Archaeological Walk Through Evaluation was performed by the C.R.I.T. Museum and the Bureau of Indian Affairs (Colorado River Agency). Although much of the Colorado River Indian Reservation is rich in history and prehistory, no archaeological sites were found on the preserve (Appendix B). Considering Section 106 determination under the National Historic Preservation Act, the State Historic Preservation office found the Archaeological Walk Through Evaluation sufficient for "compliance with the identification provisions of 36 CFR 800" and adopted the recommendations of the Archaeological Walk Through Evaluation (Appendix C).

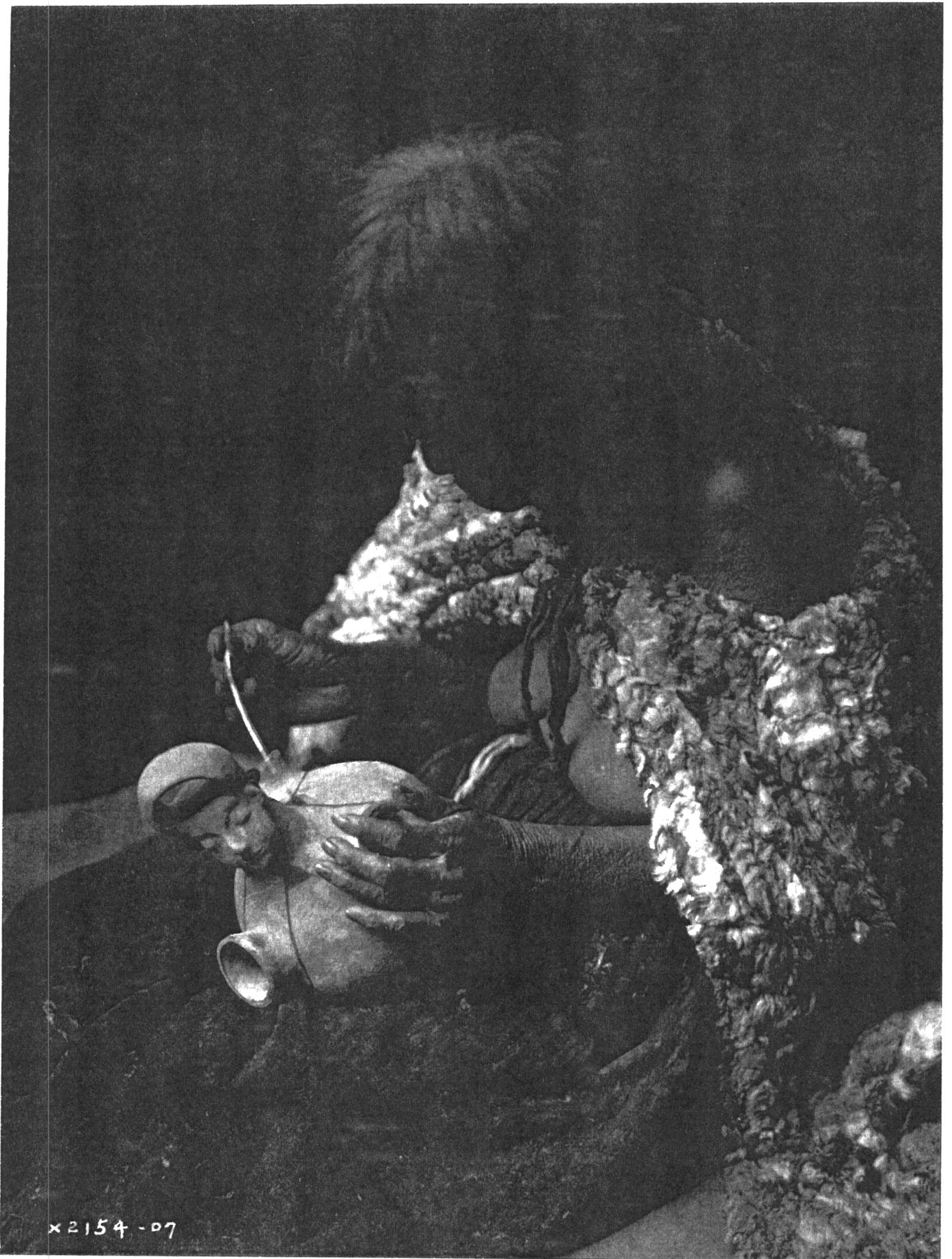


FIGURE 2.4 *Mohave Woman - Potter* (Photo by E. S. Curtis, 1907, courtesy of the Smithsonian Institution)

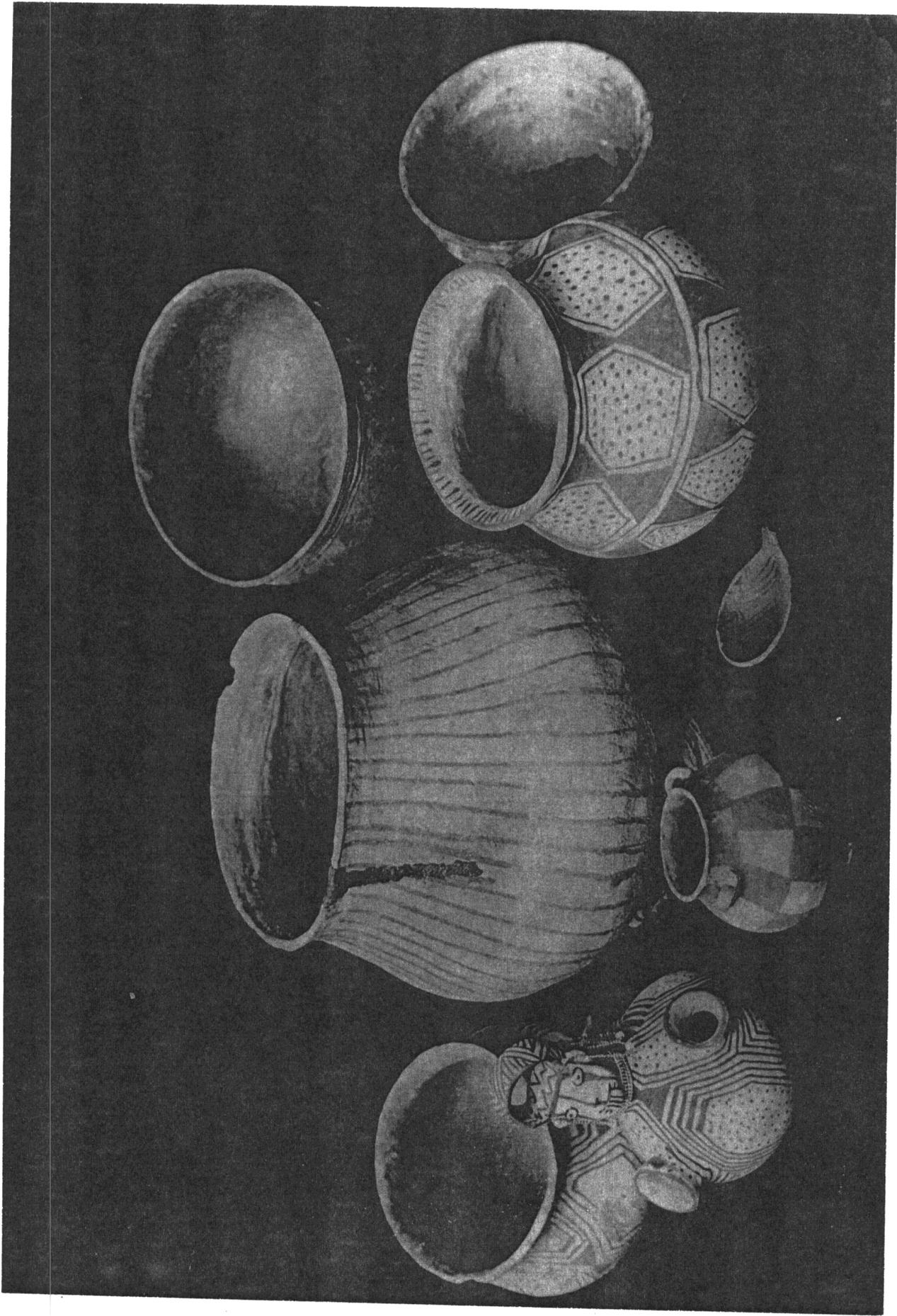


FIGURE 2.5 *Mohave Ceramic Collection* (Photo by E. S. Curtis, 1907, courtesy of the Smithsonian Institution)

**3.0 CONDITIONS ON THE 'AHAKHAV TRIBAL PRESERVE PRIOR TO RESTORATION**



### 3.1 LOCATION

The 'Ahakhav Tribal Preserve contains land in Sections 9,10,16,17, 19, and 20, T9N, R20W, G&SRB&M, between Rodeo Drive and the Colorado River, comprised of 1042 acres, more or less, of Tribal land (Figure 3.1). The preserve includes two backwater areas - Deer Island (750.39 acres) and 'Ahakhav (291.61 acres). The backwaters were created during the 1960's in order to provide flood control and wildlife habitat lost to the damming and channelization of the Colorado River.



### 3.2 TOPOGRAPHY:

Topography is important in planning revegetation sites, dredge spoil locations, drainage patterns, and the location of elements of the Preserve Center. A topographic map of the preserve, figure 3.2, indicates the main river channel, areas that are within the 100 year flood plain, and upland areas outside the 100 year flood plain.

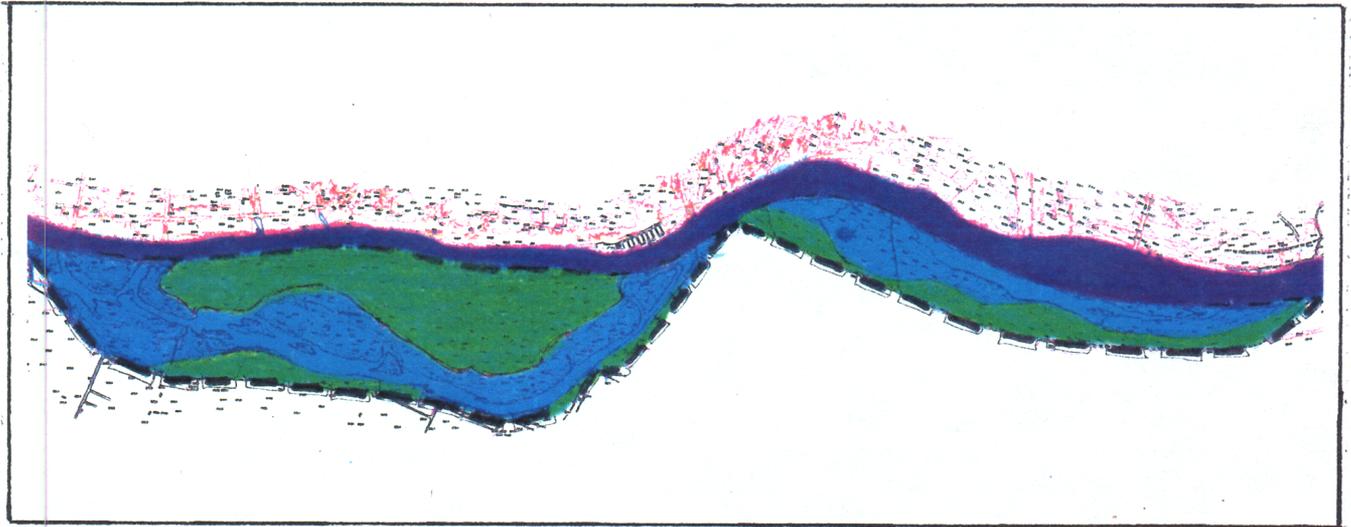
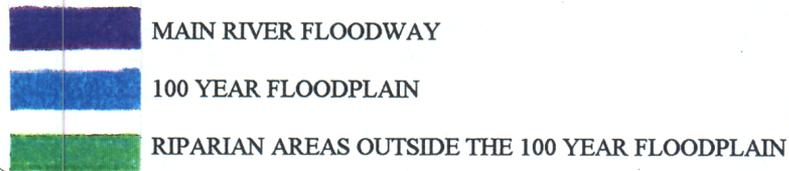


FIGURE 3.2 *Topographic Map of 'Ahakhav Tribal Preserve:*



### 3.3 SOILS:

A soil survey map of the preserve is given in figure 3.3. There are 5 soil types on the site, all of which have a very low available water capacity, slow runoff, slight hazard of water erosion, and very high hazard of soil erosion. They are also all subject to flooding and moderately suited to riparian vegetation (cottonwood, willow, mesquite, etc.). The 5 primary soil types are outlined in figure 3.3.

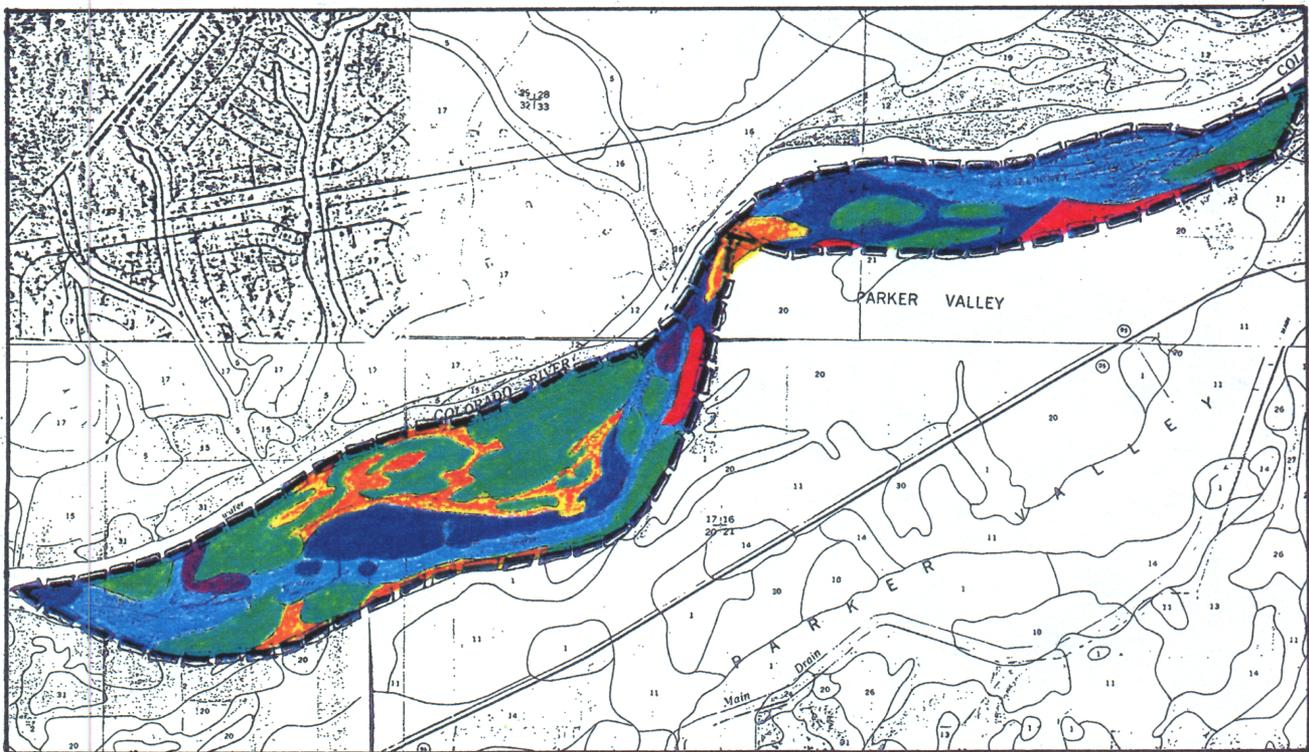


FIGURE 3.3 Soil Survey Map of Ahakhav Tribal Preserve:

- 2** --Agualt-Cibola; strongly saline, sandy loam, moderately slow permeability to a depth of 35 inches, salt tolerant vegetation with extremely deep taproots (up to 30 feet), and a natural plant community of saltcedar, mesquite, arrowweed, and saltbush.
- 21** --Lagunita; strongly saline, loamy sand, rapid permeability, vegetation similar to type 2 areas.
- 5** --Carrizo; gravelly coarse sand, rapid permeability, natural plant community of creosotebush, paloverde, ironwood, big galleta, and mesquite.
- 20** --Lagunita; loamy sand, used primarily for agriculture, however, not truly suitable for agriculture.
- 22** --Lagunita variant; moderately saline, loamy sand, rapid permeability, high soil erosion hazard in areas that are unponded, vegetative community of cattails, bulrush, mesquite, saltcedar, and arrowweed.
- Water

### 3.4 VEGETATION AND HABITATS\*

The preserve consists of riparian (707.58 acres), wetland (249.23 acres), and aquatic (85.19 acres) habitats. The distribution of the habitats throughout the preserve is found in figures 3.4 and 3.5.

#### Riparian

Areas of the site whose vegetation is dependent on a high water table from proximity to an aquatic ecosystem or to subsurface water are riparian areas (Figure 3.6). There are approximately 525.66 acres of riparian habitat at Deer Island, and 181.92 acres of riparian habitat at 'Ahakhav Backwater.

Native trees common to the site include the honey and screwbean mesquite, especially valuable for food and cover to a variety of wildlife species. Though the few native trees are usually separated by dense saltcedar, there are some areas with enough mature mesquite to shade out the saltcedar. The understory is dominated by native plants such as the arrowweed, quailbush, and four-wing saltbush, all of which provide habitat for a variety of native wildlife.

Riparian areas of the site are dominated by saltcedar (Figure 3.7), an exotic species introduced from Eurasia during the 19th century. Its name comes from its ability to absorb salt in soil and water and release it again near the soil surface. As irrigation practices in the Colorado River Basin have increased, soil and water salinity levels have risen. Native plants, with the exception of saltbush and quailbush, and to a degree mesquite, exhibit a low tolerance to saline soils. In contrast, saltcedar thrives under highly saline conditions.

Saltcedar is known as a "well-plant," having deep roots and high water use. It is widely naturalized in the southwest United States, and has proven difficult to eradicate because of its habit of both root sprouting and spreading by seed. Though saltcedar successfully competes with native plants for water and space, it has a lower wildlife habitat value than most native plants. At the beginning of restoration, saltcedar accounted for approximately 80 percent of the vegetative coverage on riparian portions of the preserve.

Initially saltcedar became established in areas where native vegetation had been cleared and the land left fallow (Ohmart et al. 1977). However, saltcedar has a high rate of seed production with as many as 600,000 seeds per plant produced from April through October. The long period of seed production allows saltcedar to germinate well into fall, when most native trees are no longer producing viable seeds. Thus, where channelization and river-flow management have resulted in very little native plant regeneration, stands of cottonwood or willow have been replaced by saltcedar.

\*Text largely reprinted from the Vegetation Management Study, Lower Colorado River, Phase 1, U.S. Bureau of Reclamation, Lower Colorado Region, September 1992.

In addition, saltcedar is deciduous and, without floods, large amounts of leaf litter accumulate. Therefore, the possibility of a stand igniting increases, especially during the dry summer months. After such fires, saltcedar and arrowweed quickly regenerate (Figure 3.8), whereas cottonwoods and quailbush usually fail to return. Thus in stands of mixed vegetation, saltcedar will be the first to regenerate, and through successive fires eventually displaces most native species.

As saltcedar displaced native riparian vegetation, wildlife experienced a changed habitat requiring adaptation or relocation. Since saltcedar is dense, produces little useful food, and harbors few insects, most wildlife found the new habitat to be sub-optimal. It has been observed that most species have been adversely affected by the change.

Monotypic stands of saltcedar support the lowest density and variety of bird species of any riparian habitat except arrowweed (Ohmart et al. 1988). Most saltcedar stands are of short stature (less than 15 feet tall) and are very dense. Bird species that occur in these habitats generally are permanent resident ground-foragers or small birds that eat insects. Birds that eat fruit are virtually absent in saltcedar habitats. Among the valley's summer residents, only six species do not seem to avoid pure saltcedar habitat. These habitats are largely devoid of birds in winter.

Several factors probably contribute to the scarcity of birds in saltcedar (Ohmart et al. 1988). Although insects are often abundant in saltcedar during summer, the trees produce a sticky and salty exudate that may inhibit birds from foraging efficiently in the dense foliage. Since many birds nest and feed in saltcedar in other river valleys farther east, their absence in saltcedar on the lower Colorado River may be more complex than the mere inability to cope with the sticky exudate. Summer temperatures become more severe from east to west across the southwestern deserts, and certain migratory mid-summer birds become more specialized in their use of multi-layered habitats such as cottonwood-willow. Perhaps for these birds, the shrubby saltcedar cannot mitigate against the extreme summer heat.

A comprehensive study of the relationship between wildlife species and vegetation types was conducted along the lower Colorado River by Anderson and Ohmart (1977). They recorded the occurrence and seasonal abundance of 385 species of birds in the various plant community types in riparian, open water, river, marsh, desert, agricultural land, and urban areas. The study used total number of species and density of birds present to compare habitat quality of various vegetation types.

Anderson and Ohmart concluded that vegetation height and distribution strongly affected wildlife community attributes. To attract the greatest number of birds, an area should have shrubs (preferably quailbush) and trees (preferably cottonwood-willow). Inkweed is important to some birds and honey mesquite with mistletoe is important for birds that feed on fruit.

Past studies have shown that in mature growth forms, stands of native plant species provide better habitat than saltcedar. Cottonwood and willow communities provide the best habitat because of

their vertical and horizontal structure. However mesquite and quailbush also support many bird, mammal, reptile, and insect species.

The **cottonwood-willow** association was characteristic of the Colorado River Valley before the early 1900's. Although this habitat is now significantly reduced in area, it remains vital to a key segment of the area's bird species.

In terms of bird abundance and variety, mature cottonwood-willow communities are among the richest habitats in North America (Ohmart et al. 1988). Most migratory birds that either breed or winter in the Colorado River Valley prefer the tall willow and cottonwoods over shorter or shrubby vegetation. These seasonal residents are largely responsible for the high diversity of birds in this habitat. Some summering birds are largely restricted to native cottonwood-willow stands, others achieve their highest densities in these habitats.

Outside of the breeding season, cottonwood-willow groves attract a changing variety of abundant bird species. In fall, common migrants move throughout the forest canopy consuming small insects. In late January, the cottonwood trees bloom and birds flock to these trees to feed on nectar and insects attracted to the flowers. A month later, the willow begins to bloom and the feeding flocks move to the willows. Small stands of tall, mature cottonwood are also important to roosting and nesting herons, egrets, and large raptors.

The Bill Williams' cottonwood-willow grove (Figure 3.9) is the only area continuing to attract all these bird species. Remaining tracts of willows or cottonwoods attract many of these species depending on the maturity of the trees, size of the grove, and amount of saltcedar and shrubs present. Even sparse and isolated willow patches are better than saltcedar or sparse, stunted mesquite stands.

One important feature that separates mature cottonwood-willow habitats from other riparian vegetation is their structural complexity. Cottonwoods and willows typically grow to be the tallest trees in the valley, often up to 70 to 80 feet, thus providing both vertical and horizontal foliage layers often absent in other riparian habitats (Figure 3.10). Foliage diversity has been shown repeatedly to be correlated with higher numbers of bird species. On the lower Colorado River such structural complexity also allows for additional cover from the extreme temperatures that may otherwise interfere with the nesting of many midsummer breeding species.

**Honey mesquite** (Figure 3.11) habitats along the Colorado River rank second to cottonwood-willow in terms of bird abundance and variety (Ohmart et al. 1988). Unlike the seasonal progression of bird species described above, the honey mesquite community is dominated for much of the year by permanently resident insectivores. Gambel's quail maintain their highest winter and spring breeding populations in honey mesquite habitats, where they feed on mesquite seeds.

Two botanical features found in honey mesquite stands attract seasonal residents and add greatly to the composition of the bird community. One feature is mistletoe, which parasitizes honey mesquite more than other tree species in the area. Mistletoe clumps produce large amounts of

berries that support a huge wintering avian population. The second important feature of honey mesquite habitats is the presence of several shrub species that form large patches in more open stands. Quailbush and saltbush are the most common, providing perennial foliage for small wintering birds. These shrubs also provide abundant food (insects and seeds) and cover.

Honey mesquite generally dominates on upper floodplain terraces (Ohmart et al. 1988). This plant is frequently the only riparian tree to form monotypic stands (Figure 3.12), in which saltcedar is not an important component.

On the lower Colorado River, all screwbean mesquite (Figure 3.13) stands are mixed with saltcedar (Ohmart et al. 1988). In contrast to honey mesquite, screwbean mesquite is rarely parasitized by mistletoe and grows so dense that few shrubs become established. Screwbean mesquites generally grow taller than honey mesquites, and because they occur closer to the river bank, screwbean mesquite groves often contain a few isolated cottonwoods and willows. For much of the year, the bird community in screwbean mesquite habitats is composed almost entirely of permanent resident species. The general lack of perennial foliage, fruit, or seeds makes these areas among the least attractive of riparian habitats for winter migrants. Some species are attracted during summer to the tall canopy and scattered cottonwoods. Perhaps the most conspicuous avian feature of mature screwbean mesquite-saltcedar communities is the tremendous density of nesting white-winged and mourning doves. In addition, during late summer and fall the seed pods of the screwbean mesquite ripen and fall, providing an abundant food source for many wildlife species.

Screwbean mesquite habitats have increased in area with the stabilization and channelization of the river. Since cottonwoods and willows are not naturally regenerating, screwbean mesquite, in association with saltcedar, is becoming more prevalent. Structurally well-developed stands of screwbean mesquite are continuously under threat of clearing, and as individual screwbean trees die they are replaced by saltcedar.

Although information on the water usage of native species is limited, some preliminary conclusions can be drawn. Most studies show that cottonwood and willow use almost as much water as saltcedar. Annual water use by mesquite, 4.0 to 5.0 acre-feet per acre for a dense stand, was lower than that expected for cottonwood and willow. A study of quailbush put its use at 3.0 to 4.0 acre-feet per acre. These results indicate that replacement of saltcedar with quailbush would provide the most water salvage potential, and replacement of saltcedar with cottonwood and willow would provide the least salvage potential. Because of limited information, ground-water depth relationships for native species could not be obtained.

### **Wetland**

Wetland areas of the preserve lie between the aquatic areas and the higher, riparian portions of the preserve. These areas are characterized by periodic flooding and plant species requiring a substantial amount of available water. There are approximately 158.73 acres of wetland at Deer Island, and 90.5 acres of wetland at 'Ahakhav Backwater.

Most of the shallow water area is dominated by cattails, with some areas of bulrush, (Figure 3.14). There are also patches of cane (or giant reed), another exotic species that is thriving in the backwater area. Unlike saltcedar, cane has not yet replaced native species, though it is spreading rapidly, and may prove problematic in the future. Thriving in abundant water, saltcedar is also present in the wetlands, often in very dense patches.

### Water

In addition to shallow, vegetated areas, there are 66 acres of open water aquatic habitat around Deer Island, and 19.19 acres in the 'Ahakhav area. Thus, water resources on the preserve, including wetlands, total 334.42 acres in surface area, with the Colorado River as the western boundary of the preserve.

The backwater is characterized by open water, with shallow, vegetated marsh areas (Figure 3.15). In the densely vegetated areas, little or no open water is visible, and cattails generally dominate (Figure 3.16). The water here flows slowly through the cattails, and, over time, these areas will fill with deposited sediment and become riparian (upland, river bank) areas. The less densely vegetated areas tend to be dissected by small channels of flowing water and have a higher diversity of both plants and wildlife.\*

The Colorado River is used extensively for recreation, primarily boating. The river is fast-flowing (3-4 mph), and the water level changes frequently due to dams both upstream and downstream. Based on 1994 water flow records from Parker Dam, the mean flow below Headgate Rock Dam ranged from a high of 12,297 cfs in April to a low of 4,819 cfs in November .

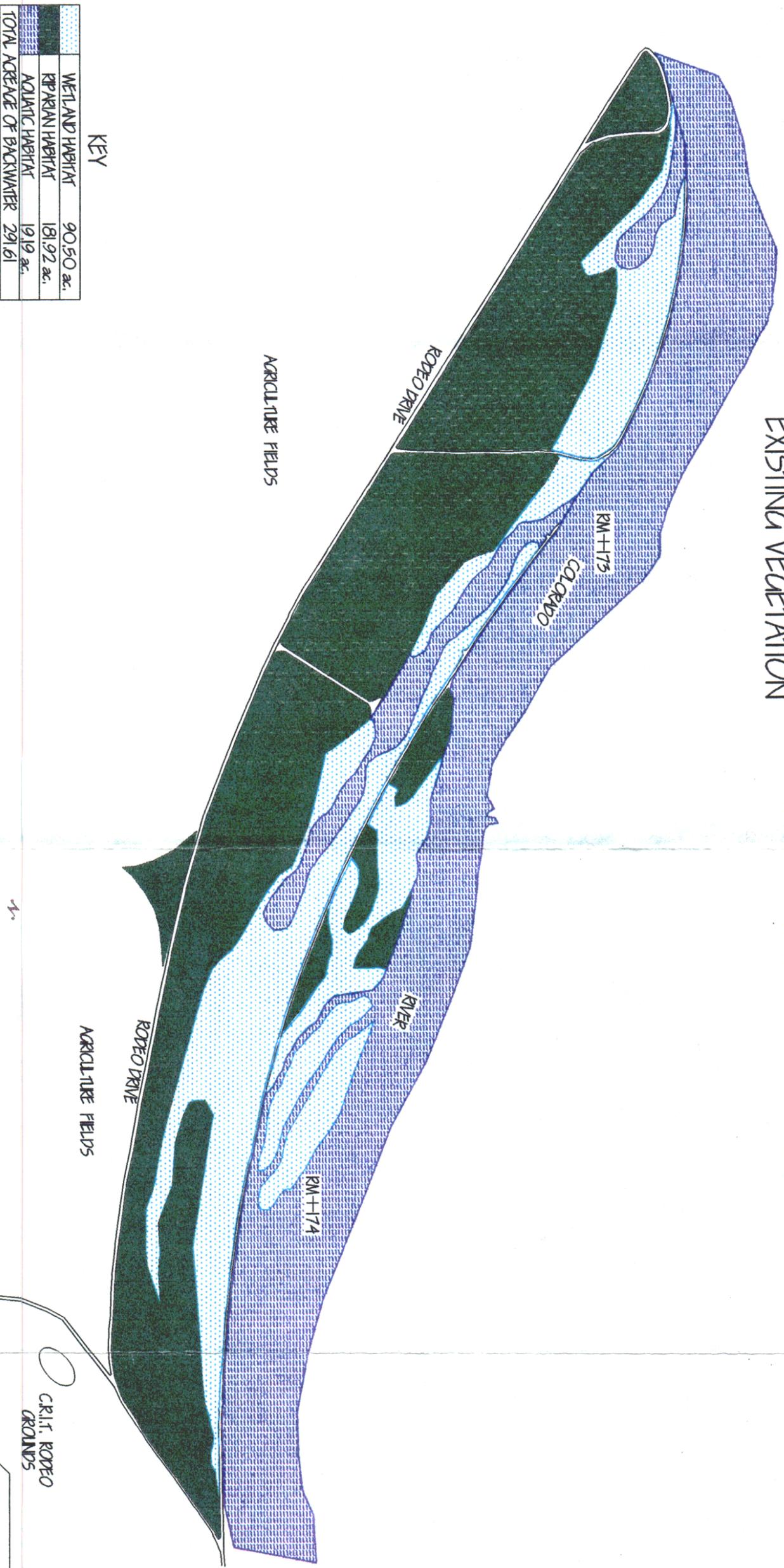
#### NOTE:

\*Cattails are known to be the most important habitat type for the endangered Yuma Clapper Rail, as well as the sensitive species California black rail. (Susan Henry)

FIGURE 3.4 Existing Habitat -- Ahakhav Backwater

# AHAKHAV BACKWATER

## EXISTING VEGETATION



KEY	
WETLAND HABITAT	90.50 ac.
RIPARIAN HABITAT	181.92 ac.
AQUATIC HABITAT	19.19 ac.
TOTAL AREA OF BACKWATER 291.61	

**NOTES**  
 1. ALL INFORMATION ON EXISTING CONDITIONS WAS OBTAINED FROM THE U.S.B.R., C.R.I.T. WATER RESOURCES, 1994 AERIAL PHOTOGRAPHS, AND ON-SITE EVALUATION (REFER TO TEXT).

SCALE 1" = 900'



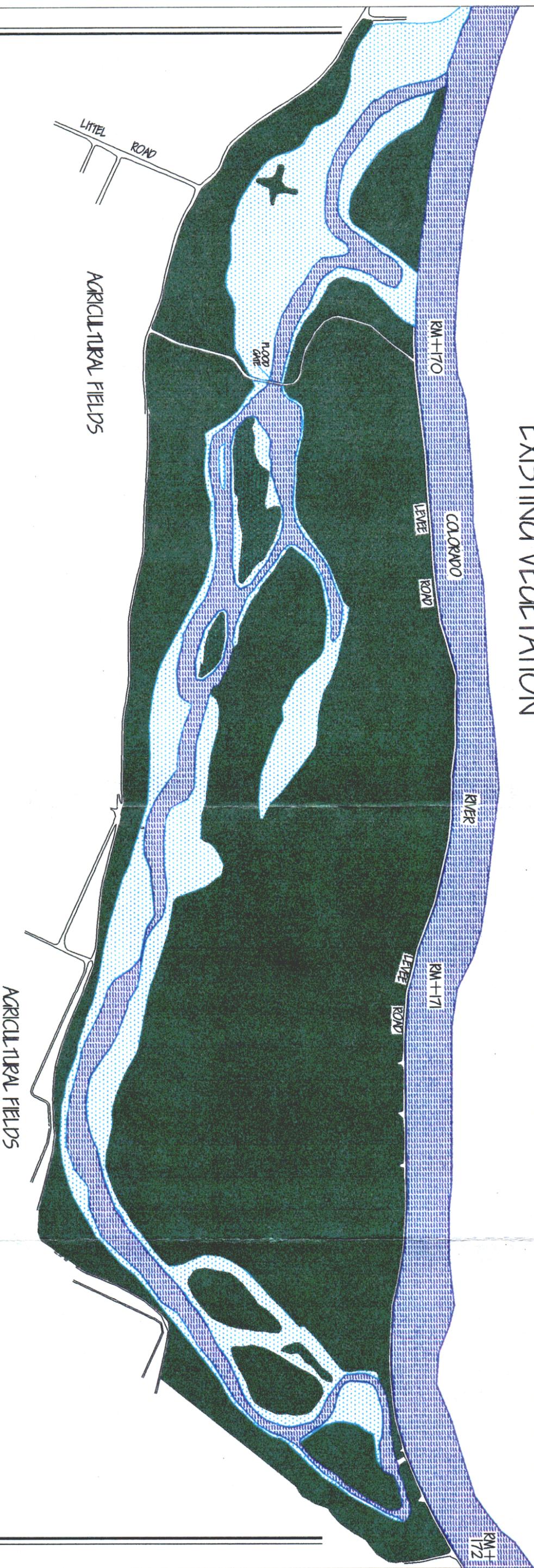
TO MOHAVE ROAD

CR.I.T. ROTEO DRUMS

Date: JUNE 18, 1996  
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FIGURE 3.5 Existing Habitat -- Deer Island Backwater

# DEER ISLAND BACKWATER EXISTING VEGETATION



KEY

	WETLAND HABITAT	158.75 ac.
	RIPIARIAN HABITAT	525.66 ac.
	AQUATIC HABITAT	66 ac.
TOTAL ACREAGE OF BACKWATER		750.39 ac.

NOTES

1. ALL INFORMATION ON EXISTING CONDITIONS WAS OBTAINED FROM THE USBR, C.R.I.T., WATER RESOURCES, AND ON-SITE EVALUATION (REFER TO TEXT).

SCALE 1" = 900'

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FIGURE 3.6 *Riparian Habitat:*

Riparian areas are periodically flooded and were at one time dominated by cottonwood and willow, such as this young stand (background), and mesquite. Today they are primarily dominated by saltcedar and arrowweed (foreground).



FIGURE 3.7 *Saltcedar:*

Saltcedar is an exotic species from Eurasia that thrives at the expense of native vegetation. It spreads easily, grows rapidly, and dominates all but the open water areas of the preserve.



FIGURE 3.8 *Saltcedar After Fire:*

Saltcedar both invades and resprouts rapidly after a fire. This saltcedar has resprouted from rootstock only weeks after a burn, already reaching a height of several feet. Firebreaks will be included in the plan in order to prevent revegetated areas from burning and allowing saltcedar a new foothold.



FIGURE 3.9 *Bill Williams Cottonwood / Willow Grove:*

Bill Williams National Wildlife Refuge, about 20 miles north of the Preserve, contains one of the few remaining natural riparian corridors on the Lower Colorado River. It is hoped that the Preserve will eventually contain another.

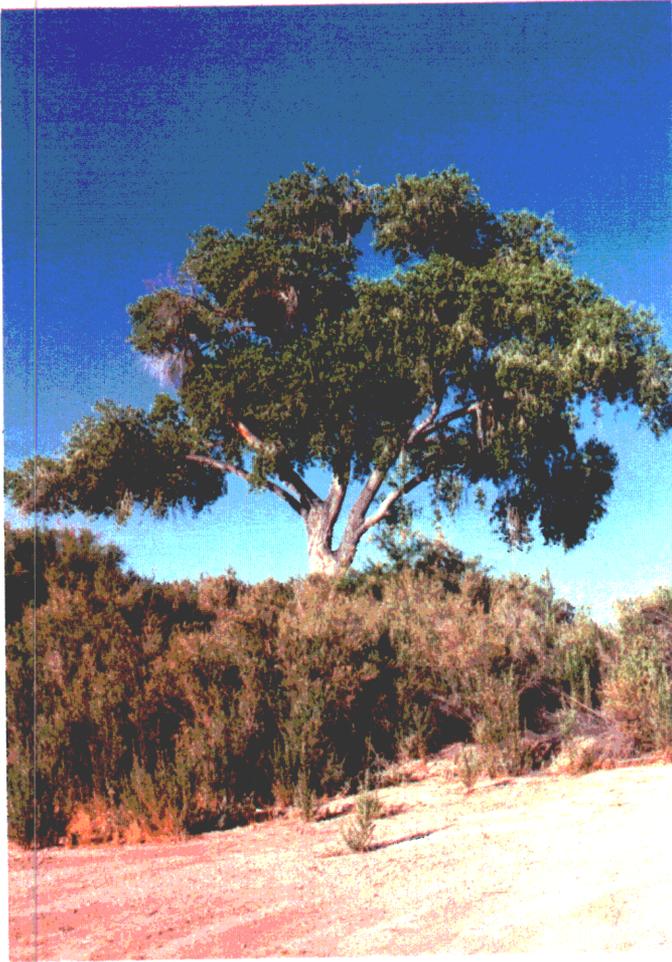


FIGURE 3.10 *Cottonwood*: Cottonwoods provide important habitat for birds requiring tall trees or cavities for nesting purposes. There are no large cottonwoods, such as this one, on the site, but there are still a few stands of young trees.



FIGURE 3.11 *Honey Mesquite*: This honey mesquite bosque, south of Poston, is an area relatively free of saltcedar. It is one of the few remaining bosques on the Colorado River Indian Reservation, and has qualities similar to the historic state of 'Ahakhav Tribal Preserve.



FIGURE 3.12 *Monotypic Honey Mesquite Bosque:*

The understory of a mesquite bosque is often void of other vegetation because of the deep shade created by the trees. Successful revegetation could produce such dense crown cover in 3-5 years, given the right growing conditions and a lack of competition with saltcedar.



FIGURE 3.13 *Screwbean Mesquite:*

Screwbean mesquite is the most common native tree on the preserve. Most of the existing trees are large and can compete successfully with saltcedar, even when growing as close together as these are.



FIGURE 3.14 *Wetland Area:*

Cattails and bulrush growing along the edge of the backwater provide important brood cover for nesting birds, as well as cover for smaller fish.



FIGURE 3.15 *Open Water Area With Shallow Marsh:*

Riparian areas with both open water and emergent vegetation are generally most useful to the greatest number of wildlife species. This historical backwater channel is, however, more shallow than it used to be, and has lost some wildlife value because of this. Deepening of the channel would be especially beneficial to fish, as well as for recreational and other purposes.



FIGURE 3.16 *Dense Cattails:*

The central portion of this photo was a historical channel that has been filled with sediment, and subsequently, cattails and even arrowweed. Areas such as this contain very shallow water that is usually stagnant. They are available only to the smallest of fish, and are not preferred by most birds..



FIGURE 3.17 *Cattails:*

Cattails are valuable as breeding habitat for a number of species, including the federally endangered Yuma clapper rail. They provide food and cover for numerous wildlife species, but become much less valuable when they grow so dense that water flow is greatly inhibited.



FIGURE 3.18 *Arrowweed:*

Arrowweed (foreground) has a low value to most wildlife species, and, unfortunately, often dominates the site in association with saltcedar. Revegetation efforts will only improve the area's usefulness to wildlife, despite localized disruption.



FIGURE 3.19 *Saltcedar In Standing Water:*

Saltcedar can often be found growing in shallow, standing water on the preserve. Water release schedules from upriver dams determine the length of time such areas are inundated, but saltcedar can thrive even after extended periods of high water levels.



FIGURE 3.20 *Cottonwoods:*  
Large cottonwoods such as these are becoming increasingly rare. Many wildlife species require these larger trees for breeding purposes. Natural cottonwood forests provide a diversity of foliage, and therefore, insects, that many animals require as food.

### 3.5 WILDLIFE\*

Backwaters of the lower Colorado River support at least 14 species of fish, and riparian woodlands provide habitat for over 250 bird species, 9 amphibian species, 23 reptile species, and 33 mammal species. A list of vertebrate species that are found in this part of the lower Colorado River valley is provided in Appendix D. For a complete list of birds that may be found in this area, see Rosenberg et al. (1991) and Ohmart et al. (1988).

#### Birds

Taller trees, such as honey and screwbean mesquite, attract birds to the site that would normally use only cottonwoods or willows for nesting. These adaptable species include the yellow-billed cuckoo (see Appendix K for scientific names of birds cited in the text), the Gila woodpecker, and the northern flicker. Songbirds such as yellow-headed blackbirds (Figure 3.21), Abert's towhees, Western kingbirds, and Crissal thrashers also use the preserve for nesting purposes, while belted kingfishers, American robins, and phainopepla migrate to the preserve in winter.

Though mourning doves, white-winged doves and some songbirds nest in mature saltcedar (over 17' tall). Screwbean mesquites support the highest density of nesting mourning doves and white-winged doves. High winter densities of Gambel's quail are supported only in honey mesquite communities, though they prefer screwbean mesquite communities in the summer and fall.

Harris hawks, red-tailed hawks, and American kestrels once nested in large numbers in mature cottonwood, willow, and mesquite trees along the river. However, today, the Harris hawk is a species of special concern, and the red-tailed hawk and American kestrel find few suitable nesting sites. Cooper's hawk, the northern harrier, and the endangered southern bald eagle continue to winter in the area, while the peregrine falcon and the osprey use the area during migration.

Birds that use the riparian portion of the site also generally inhabit the wetland areas. In addition to birds mentioned above, shorebirds such as black-crowned night-herons (Figure 3.22), American coots (Figure 3.23), black-necked stilts, killdeer, great egrets (Figure 3.24), and great blue herons nest in the wetland areas. Winter and transient visitors include northern pintails, sandhill cranes, Canada geese, the common snipe, mallards, teal, wigeon and the gadwall.

An interesting bird species now found in pure stands of honey mesquite or saltcedar is Bell's vireo, which historically was most highly associated with willow-dominated habitats. Although Bell's vireo is now rare on the lower Colorado River and does not occur in all honey mesquite-saltcedar stands, this vegetation type represents its most important habitat outside the willow stands of the Bill Williams' Delta. The vireo was once abundant along the lower Colorado River and was characteristic of the willow-cottonwood association. This species seems to require both a dense understory and at least a moderately tall canopy layer. The importance of vegetation structure in

\*Text largely reprinted from the Vegetation Management Study, Lower Colorado River, Phase 1, U.S. Bureau of Reclamation, Lower Colorado Region, September 1992.

determining habitat preference by certain bird species is illustrated by the adequacy of honey mesquite-saltcedar mix.

### *Listed Species and Species of Special Concern*

The federally endangered Southwest willow flycatcher historically nested in the lower Colorado River Valley. It is a cottonwood-willow obligate species that declined dramatically in the area, presumably due to a loss of breeding habitat. It has recently been sighted along the Colorado River.

Five other federally-listed bird species are found on the lower Colorado River. They are the bald eagle, peregrine falcon, brown pelican, least tern, and Yuma clapper rail. All five are open water or marsh species. Only one species, the Yuma clapper rail, is fairly common. Ironically none of these species are indigenous to cottonwood-willow habitats. Therefore preservation and restoration of these habitats to protect federally-listed bird species has not been a high priority.

The endangered Yuma clapper rail is considered a resident of the Colorado River Indian Reservation. It inhabits shallow, freshwater marshes, with low-density stands of cattails and bulrushes, and is found along the lower Colorado River from Arizona and California into Mexico, as well as around the Salton Sea in Imperial County, California. Crayfish, isopods, small fish, clams, insects, and seeds are its primary food sources. The rail is threatened by loss of habitat due to artificial river flooding, reclamation projects, and mosquito abatement activities.

Many bird species that utilize riparian vegetation are listed as endangered or of special concern by the states. California recognizes the elf owl, yellow-billed cuckoo, gilded northern flicker, Gila woodpecker, and Arizona Bell's vireo. In addition, twelve other riparian species are listed as species of special concern and special concern to be monitored. Arizona lists the great egret and the willow flycatcher as endangered and six other riparian species as threatened or of concern.

The number of listed species and those of concern in riparian habitats attest to the dramatic changes experienced on the lower Colorado River. Birds have suffered more dramatic declines than any other faunal group, except fish. Almost all of the bird species would benefit from improved riparian habitat, especially expanded cottonwood and willow stands.

### **Fish**

The slowly moving, nutrient-rich backwaters are essential for the survival of many wildlife species that would otherwise not be found in the arid Southwest. These aquatic areas provide important habitat for a number of fish species. Fish such as carp, bluegill, and largemouth bass are commonly found here. However, none of the fish that are found in any numbers in these areas are native species. Species such as the endangered bonytail chub and the endangered razorback sucker have been essentially eradicated.

#### **Note:**

A complete list of federally, tribally and state-listed endangered, threatened or candidate species occurring on the preserve is provided in Appendix E.

Thus, this portion of the lower Colorado River has been designated critical habitat for the federally endangered razorback sucker, found primarily in Lake Mohave and in small numbers on the preserve. All known wild populations, including those that inhabit the preserve, consist of large, old adults. There has been no known addition of young to the population for over twenty years. It is believed that the population decline of the razorback sucker was caused by the predation of young by non-native fish in the Colorado and other rivers. The species reproduces successfully and the young grow rapidly when isolated from these non-native predators. The U.S. Fish and Wildlife Service reviewed the first draft of this document, and in a Section 107 critical habitat consultation, concurred with a finding of no effect to the razorback sucker, or bonytail, and no destruction or adverse modification to designated critical habitat (Appendix F).

### Mammals

Many land mammals can be found in riparian vegetation. Open riparian habitats, such as stands of honey mesquite with shrubs, are dominated mostly by burrowing species. Riparian habitats closer to the river, such as cottonwood-willow, screwbean mesquite, dense honey mesquite, saltcedar, and saltcedar/honey mesquite mix, harbor a different set of mammals.

There are a number of riparian species that are dependent upon aquatic habitats. Both beaver (Figure 3.25) and muskrat occur in quiet backwaters and in unchannelized sections of the Colorado River bordered by extensive stands of riparian vegetation. Beavers are most common in and around large stands of young willows and can cause extensive damage to small stands of regenerating willows and to cottonwood-willow revegetation efforts. In the nineteenth century, trapping severely reduced both species. However, muskrats are now common in marshes and along canal systems, and beaver have recovered to some extent. The loss of riparian habitat to channelization, brush clearing, and concreting canals is still detrimental to beaver populations.

River otters occurred on the lower Colorado River until 1933. They were never common and disappeared from the Colorado River soon after the construction of Hoover Dam. This was probably due to loss of riparian habitat and the extirpation of native prey species. Other riparian mammals, which use aquatic and semi-aquatic habitats, are the bat species, raccoon, striped skunk, coyote, bobcat, Arizona and hispid cotton rats, and the mule deer.

Rodents are the largest group of mammals in riparian habitats. Rodent populations have been studied intensively in only a few riparian areas. Anderson and Ohmart (1977, 1984a) found that most of the rodent species identified showed some preference for certain vegetation types. None showed strong preferences and all were found in several vegetation types. Anderson and Ohmart (1984a) concluded that the best management system for all rodent species would be to create an area that is horizontally diverse.

A number of carnivores occupy the riparian habitats along the Colorado River. They range in size from the Yuma puma to the spotted skunk. In general, little is known of the biology of many of these species along the Colorado River. Dense vegetation and the expense of studying individual species have prevented extensive data collection. Cottonwood-willow habitats may be important for the Yuma puma as cover in the capture of deer and other large mammals. All habitats were

probably used as hunting areas and space to roam. The Yuma puma is on the list of Arizona threatened native wildlife and is a candidate for endangered species status.

Individual bobcats and coyotes and their tracks are frequently observed in riparian habitats. Bobcats are found in all vegetation types. Coyotes are most abundant in honey and screwbean mesquite habitats. The kit fox, gray fox, raccoon, and spotted skunk are all rarely seen, but they may be more abundant than records show. The badger is primarily found in honey mesquite or other sparsely vegetated habitat. The striped skunk is found in dense habitats near water.

Deer densities in riparian habitats probably have changed dramatically over the past 100 years (Ohmart et al. 1988). Continuing riparian habitat conversion combined with the disappearance of cottonwood-willow communities have affected deer populations by eliminating cover and forage availability. Deer use riparian areas from June to October. Does living in upland habitats move to the riparian habitats during summer. Tracking indicates that some does use dense riparian habitat or mesquite habitat, and others use saltcedar.

### *Endangered Species and Species of Special Concern*

There are no Federal or State listed endangered mammals on the lower Colorado River. However, there are several species of special concern monitored by both California and Arizona. They include the California leaf-nosed bat, the cave and Arizona myotis, the white-throated Woodrat, and the Arizona cotton rat. Extirpated from the river are the river otter, Yuma puma, and pronghorn.

Of special concern are the Arizona and cave myotis. Colonies of both have been severely reduced during the last few decades. These species feed in and over riparian vegetation. The Arizona myotis has its colonies located under bridges and in old cottonwoods. The cave myotis roosts in caves and mine shafts but forages over riparian habitats. Declines have been occurring due to human disturbance and heavy insecticide use. Both are of highest priority for designation as State listed endangered species. The Arizona myotis population on the lower Colorado River is the only known population in California and is separated by 200 miles from the next nearest colony.

### **Reptiles and Amphibians**

There are 36 species of reptiles that can be found in riparian habitats. Nine of these species are associated strictly with riparian vegetation. Of the nine species, all but one are semi-aquatic. The only land riparian species is the ornate tree lizard, which lives in large cottonwood, mesquite, and saltcedar trees.

The backwater area provides important habitat for amphibians known to exist on the Colorado River Indian Reservation. All are dependent on nearby water for both survival and reproduction. The most commonly encountered amphibians include the Great Plains toad, the red-spotted toad, the Woodhouse's toad, and the bullfrog.

Anderson and Ohmart (1982) monitored a 75-acre dredge spoil site that had been revegetated. One species of frog, three species of toads, eight species of lizard, and eight species of snakes were found using the revegetation site. Frogs and toads were associated mostly with standing irrigation water around trees. Most lizard and snake species were attracted to sandy soil covered with vegetation and used all vegetation types.

#### *Listed Species and Species of Special Concern*

There are no Federally-listed endangered or threatened reptiles or amphibians commonly occurring on the lower Colorado River. However, there are many State listed species and species of special concern within the river valley. Six riparian and aquatic species are now rare or have disappeared from the river.

All except one are only associated with riparian vegetation. These are the southwest toad, pacific treefrog, lowland leopard frog, mexican garter snake, and the checker garter snake. These species have suffered population declines and extirpations due to the destruction of riparian habitat.

#### **Insects**

Most of the information on the type and number of insects occurring in this area is from studies of riparian vegetation. The number of insects present is highest from April to August with peaks in April and May. Declines occur between August and September with the lowest number being found for all habitats in January and February. Cottonwood and willow habitat supports the highest number of insects across seasons. Saltcedar, arrowweed, and saltcedar-honey mesquite are all important for many species during the summer.

These insects are an important food source for a number of animals, including lizards, birds, and bats. One very important food item is the Apache cicada. The Apache cicada appears in riparian vegetation annually, around mid-June. Large numbers are found in cottonwood-willow, saltcedar-honey mesquite, and especially saltcedar habitats. The timing of cicada emergence coincides closely with the peak breeding period for many bird species in cottonwood-willow communities. Most breeding bird species in cottonwood-willow forage primarily for cicadas. Although cicadas are abundant in saltcedar habitats, most of the birds that feed on cicadas are rare or absent in saltcedar.

#### *Listed Species and Species of Special Concern*

MacNeill's sootywing is presently a candidate species for Federal listing on the lower Colorado River. This skipper is restricted to the lower Colorado River from southern Nevada south to Blythe, California. Quailbush is the sole host plant for the larvae. The status of the species appears stable at present. Known localities for this species include Bennett Wash, Parker Dam, Earp, Needles, Blythe, and the Colorado River Indian Reservation.



FIGURE 3.21 *Yellow-headed Blackbirds*



FIGURE 3.22 *Black-crowned Night-Herons*

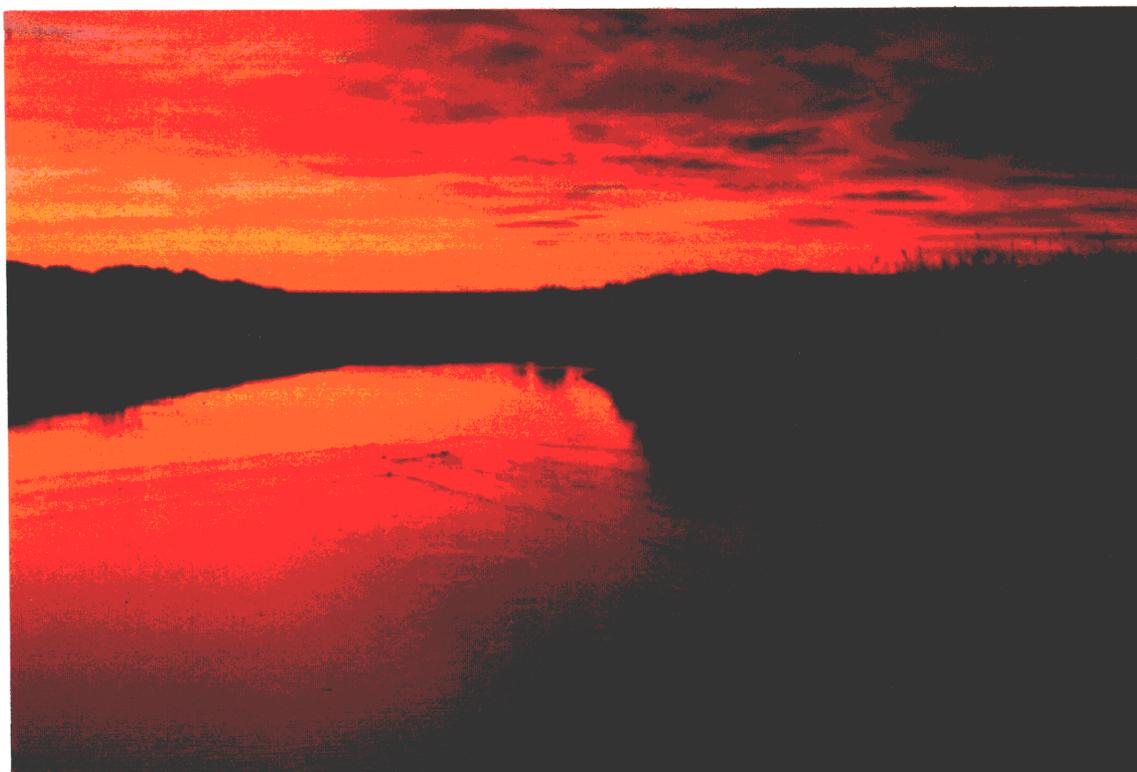


FIGURE 3.23 *American Coots in Sunset*



FIGURE 3.24 *Great Egrets*



FIGURE 3.25 *Beaver Lodge*

### 3.6 HUMAN USE

Hunting and fishing are common in the area. Cottontail rabbits, quail, and doves are the primary game animals. Bass, sunfish, carp, and catfish are among the fish commonly caught (Figure 3.26). Camping is allowed, with stone fire circles provided at some sites. A permit is required from the C.R.I.T. Fish and Game Department for camping, hunting or fishing. There are bag and possession limits on a number of fish and game species. The area is patrolled by the C.R.I.T. Fish and Game Department.



FIGURE 3.26 *Bass Fishing in the Backwaters*

### 3.7 POLLUTION

There are a number of areas on the site that have been used for illegal dumping (Figure 3.27). Automobiles (Figure 3.28), furniture, appliances, and trash have been found, usually near roads. Most of the dumping sites are small, under 50 square feet, though at least one is over a quarter acre. The public has begun to clean-up the dump sites in anticipation of the restoration of the tribal preserve (Figure 3.29).

There are no known toxic substances on the site. However, the water in the Colorado is known to be contaminated by agricultural fertilizer and pesticide run-off, recreational water vehicle waste and faulty or illegal sewage system dumping. Ironically, the backwaters actually serve to process water pollutants by allowing them to settle and become absorbed by aquatic vegetation.

Recent research has indicated that selenium levels in the lower Colorado River may be a serious concern. Concentrations of selenium have been detected that approach the threshold of reproductive failure in fish. Additionally, pesticide, herbicide, and heavy metal concentrations are being detected at very high levels in nearby areas, especially the lower Gila River. Ohmart et al. (1988) concluded "that there may be serious persistent problems associated with the influence of mining, fossil fuel combustion, and agricultural chemicals within the entire Colorado River watershed."



FIGURE 3.27 *Dump Site*



FIGURE 3.28 *Automobile Dump Site*

FIGURE 3.29 *Volunteer Dump Site Clean-Up:*

A trash clean-up day during the winter of 1995 used volunteer labor to clear debris from areas within the Preserve. These boys were part of the team responsible for loading this truck into the bed of another truck for removal. CRIT Landfill donated the dumpsters and trash pick-up for the day, and the Mohave Elders Group cooked fry bread tacos for the volunteers.



### 3.8 NOTES AND CONCLUSIONS\*

Historically the Colorado River Valley floodplain supported 450,000 acres of riparian vegetation composed mostly of cottonwoods, willows, and mesquite. Currently only 110,000 acres remain. Of the 110,000 acres still existing, 45,000 acres are saltcedar, 20,000 acres are mesquite and mesquite-saltcedar mix, and only 6,000 acres contain cottonwoods and willows. Of the 45,000 acres of saltcedar, 35,750 acres are located in 100 acre parcels or greater. The second largest acreage, 6,066 acres, is within the Colorado River Indian Reservation.

The reduction in riparian vegetation along the river was due to agricultural clearing and the construction of dams that stopped the natural cycle of flooding needed for cottonwood-willow growth. These actions created favorable conditions for the invasion of the non-native saltcedar. A review of past studies has shown that saltcedar uses more water than native species.

Studies on wildlife along the Colorado River have documented the dramatic decline in the amount and number of bird, mammal, reptile, and insect species found within the river valley. As saltcedar has displaced native habitat, wildlife has had to adapt or relocate. Since saltcedar is dense, produces little useful food, and harbors few insects, most wildlife has found the new habitat to be sub-optimal. Most species have been damaged by the change.

With the expanding development of the Colorado River for human use, the 'Ahakhav area is becoming increasingly vital to wildlife, though it has become less accomodating. Various species driven from spawning and nesting areas along the Colorado River use the 'Ahakhav area. It is important that the preserve be restored and maintained as a refuge to remind us of the natural heritage for which we are responsible. Such areas will be invaluable to future generations.

\*Text largely reprinted from the Vegetation Management Study, Lower Colorado River, Phase 1, U.S. Bureau of Reclamation, Lower Colorado Region, September 1992.

## 4.0 RESTORATION GOALS



The goals for the restoration of 'Ahakhav Tribal Preserve are as follows:

1. Restore open areas of the backwater.
2. Revegetate the preserve with native species.
3. Improve and expand habitat for the diverse wildlife species along the Lower Colorado River.
4. Maintain restoration of the preserve.
5. Strengthen public understanding and respect for the ecology and cultural history of the 'Ahakhav area.

## 5.0 RESTORATION OPERATIONS



## **5.1 BACKWATER DREDGING**

The backwater areas on the site provided fish and wildlife habitat that was lost by the damming and channelization of the Colorado River. These areas now require periodic dredging and other maintenance operations in order to encourage water flow and prevent sedimentation (Figure 5.1). Since the 1960's, the habitat has slowly deteriorated. In 1983, floods sedimented deeper channels, creating poor water circulation, thus reducing wildlife species diversity and productivity. Growing sandbars block inlets and outlets to the river (Figure 5.2). Historically deep channels are now shallow, and historically shallow areas are often filled in completely and covered with dense cattails. Dense cattails generally have a lower value to wildlife than medium to low density cattails, and a lack of deep water areas limits the diversity of fish to be found in the backwater.

### **Goals of the Dredge Plan**

1. Dredge and open historic backwater channels.
2. Improve the hydrology of the backwater.
3. Use dredge spoil piles for revegetation efforts.
4. Create and enhance backwater fish and wildlife habitats.
5. Develop monitoring programs to evaluate the success of dredging operations and provide information for future backwater management plans.
6. Reduce future maintenance requirements.

### **Hydrographic Mapping**

Glen Canyon Environmental Studies, under the U.S. Bureau of Reclamation, has provided their plan for hydrographic mapping to be completed before dredging operations begin. Once completed, these maps will be used to determine the locations of channels to be dredged. The channel bottom topography under 133 acres of open deep water will be mapped by combining real-time kinematic (RTK) global positioning systems (GPS) with acoustically sounded depths using the Hypack software package from Coastal Oceanographics, Inc. This software uses latitude and longitude signals from the GPS instrument to navigate the depth transducer along a pre-determined course (usually a grid pattern), and combines the transducer's horizontal position with a depth reading at the rate of two updates per second. This technique would be completed by simply driving a boat along the pre-determined grid (Figure 5.3). However, the survey boat needs at least two feet of water to function properly. Additionally, a few areas proposed for dredging operations are completely covered in cattails. These areas must have the cattails removed prior to mapping to allow unimpeded coverage by the hydrographic unit.

The 196 acres of dense cattails under shallow water, that have not been scheduled for dredging, will require less topographic accuracy than the proposed dredge channels. Glen Canyon Environmental Studies has suggested integrating existing topography from Bureau of Reclamation aerial mapping with the hydrographic data. This will be done by intersecting the marsh bottom with the toe of the dike by projecting the dike slope down to the elevation of the closest hydro-collected data point. This data point will be plotted against the open-water edge of a given patch. It will be assumed that the backwater floor elevation remains constant from this point to the toe of

the dike. For backwater restoration purposes, this is not an unreasonable assumption. This method will be fairly easy if the Bureau of Reclamation topography is provided to GCES in a digital format. Deliverables for the hydrographic mapping are as follows:

- +/-8 24" x 36" plan view map sheets of the existing backwater bottom in the specified open-water areas at a scale of 1:1200, including the horizontal alignments of proposed channels.
- +/-58 24" x 36" plan/profile map sheets of the proposed channel areas at a scale of 1:300, including design profiles for the proposed channels.
- An engineer's estimate of the proposed dredge quantities.
- All data will be mapped in Arizona State Plane coordinates or UTM's for ease of conversion into GIS software, which is a common platform used for long-term monitoring of environmental resources. This report will include a list of all permanent survey control used and/or established in the area for this survey, copies of raw and processed survey data points, and recommendations for optimizing and integrating future mapping efforts.

### **Ecological Evaluation**

Glen Canyon Environmental Studies has provided a plan for the on-site evaluation of physical and biological variables prior to dredging activities. This evaluation will include seasonal analysis of conditions and resources, and will incorporate previous analyses of existing databases and literature. Site-specific information will then be used to make recommendations regarding such issues as the quantity and residence time of diverted water, the use of artificial means of increasing dissolved oxygen, and related management information. The mainstream river will be used as a control for water quality variables and benthic invertebrates, although the restored backwater will provide a somewhat different environment for aquatic life. The pre-dredge evaluation is estimated to require 75 days of work by a qualified biologist.

### **Dredge Plan**

Dredging plans include deepening historic channels, opening backwater to the flow of the river through a series of percolation dikes, revegetating dredge spoil with native riparian trees and shrubs, and adding fish habitat structures in the backwaters.

The backwater area will be opened to water flow from the river through a series of percolation dikes (Figure 5.4), located as shown in Figures 5.5 and 5.6. Percolation dikes will be constructed by excavating sections of the existing dikes to a depth of at least 2 feet below the river bottom. The lower sections of the dikes will consist of large rocks to allow permeability. The upper gravel roads will be rebuilt for authorized vehicle access to the site. Construction of the dikes will occur during the winter when river levels are low.

According to Glen Canyon Environmental Studies, the Hypack software combined with RTK, used during the hydrographic mapping, can also be used for the dredge design. A "channel design" option can be used after the preliminary mapping by entering the geographic coordinates of the toe lines and centerlines with their corresponding depth and side slope information. Hypack can then be used to position the dredging equipment for accurate channel construction. Hypack also allows the original coordinate line files to be repeated over time. By repeating the same line files, an accurate quantity of dredged material can be quickly calculated.

Areas that are to be deepened will be dredged with a hydraulic dredge (Figure 5.7) supplied by the U.S. Bureau of Reclamation. Channels with an average width of 30 feet and an average depth of 12 feet at low river flow will be dredged as shown in Figures 5.5 and 5.6. These channels will be located in areas that have been fully sedimented, near the percolation dikes, and at the mouth of the backwater. At 'Ahakhav, 228,547.37 cubic yards of spoil will be removed from the backwater. At Deer Island, 428,296.20 cubic yards of spoil will be removed.

The location of dredge spoil piles was carefully considered, as there are areas of both high and low wildlife habitat value. Spoil piles will be placed first and foremost on upland areas with no vegetation or on old spoil piles. They will also be located on other upland areas with little vegetation and low value to wildlife (Figures 5.5 and 5.6). Wherever possible, spoil piles will be contained by a basin of excavated material formed with caterpillar tractors - a containment berm (Figure 5.8). These berms will prevent turbidity caused by spoil returning to the water. It will not be possible to construct containment berms where dozer access to spoil piles is limited by deep water or the risk of getting stuck in wet soil high in organic content.

When spoil piles are placed in the riparian area, they will be in the least valuable habitats, usually mucky areas with little or no vegetation (Figures 5.5 and 5.6). A shallow shelf with an average width of 25 feet will be left around riparian spoil piles in order to allow for the growth of emergent vegetation (Figure 5.8). Higher areas of these spoil piles will create islands in the backwater, and will be used for revegetation with cottonwood, willow, and other riparian vegetation. Spoil piles in riparian areas will not be higher than 6 to 8 feet above the water table in order to increase the probability of successful revegetation (Figure 5.9).

Spoil piles will be located in areas with low value to wildlife, such as saltcedar or arrowweed stands. When cottonwood, willow, or mesquite trees are located within a spoil pile site, individual trees will be avoided. Dredge spoil can be successfully revegetated if soil type, depth to groundwater, species used, and other factors are suitable (Figure 5.10). If areas of low value to wildlife are replaced with successful revegetation projects, their value to wildlife will be enhanced. Numbers and species used for revegetation will need to be decided after dredging operations have been completed so that soil and water factors may be analyzed to better ensure the success of the project. Whenever possible, cottonwood and willow will be planted on the lower areas and mesquite will be planted on higher areas.

The total area of spoil coverage will be 35.40 acres at 'Ahakhav, and 65.20 acres at Deer Island, with an average spoil pile depth of 4 feet. A floating plastic pipe will be used to transport spoil from the dredge to the disposal areas. A dredge platform will be graded and filled with gravel for storage of the dredger and other earth-moving equipment.

Fish habitat structures will be placed near access points and locations most likely to be used for fishing in both backwaters (Figure 5.12). Such placement is meant to encourage high concentrations of non-native fish species in these areas, leaving other areas of the backwaters available to native species. The habitat structures will consist of dead trees and brush (from dredging operations and revegetation projects) anchored to the bottom of the channels.

Figures 5.11 and 5.12 are cross-section drawings illustrating the historical, existing, dredged, and restored state of the backwaters. Such drawings are required by the U.S. Army Corps of Engineers during the permitting process in order to demonstrate that dredging operations will bring these areas closer to their historical status.

### **Monitoring**

Post-construction monitoring surveys and sedimentation analyses will be performed by Glen Canyon Environmental Studies. Deliverables for these surveys will include:

- +/- 24" x 36" plan view map sheets of the previously excavated channel areas at a scale of 1:1200, with a color-shaded overlay of channel aggradation and degradation.
- A final report describing the monitoring survey process, including observed aggradation/degradation trends in specific areas. This report will include copies of the raw and processed survey data points, and recommendations for critical re-dredge work.

GCES will also establish a cost-efficient aquatic monitoring program to determine whether, and to what extent, the action was successful and whether refinements are needed. This monitoring will be conducted on a regular (at least seasonal) basis to determine developmental trends, such as gradual changes in benthic invertebrate populations or fisheries development. Depending on the results of a pilot sampling effort, seasonal monitoring of aquatic algal cover, plankton density and composition, and aquatic invertebrate composition and standing mass will be conducted from three volume-calibrated phytoplankton/zooplankton samples using a tow net of 50-240 um mesh. Three area-calibrated benthic Hess or Ponar samples will be collected in each of four seasons at each of three stations in three backwaters and three mainstream stations. Seasonal fisheries monitoring will be conducted during a four hour, night-time electrofishing run in each of three backwaters and at three mainstream stations in each season. Electroshocking will be conducted with a Coffelt Mark 22 Constant Pulse System. Study site selection will be coordinated with CRIT, and tribal members will be trained in sampling and analytical techniques. This training will require approximately one year. Deliverables are as follows:

- A management recommendations report will be prepared to refine management actions, timing, costs, and related issues. Quarterly and annual reports will be submitted to CRIT and to cooperating agencies.
- A draft final report will be submitted for CRIT review and a final report will be submitted three months after receipt of comments on the draft final report.
- A manuscript will be prepared for publication in a peer-reviewed scientific journal, and popular articles may be prepared as well.

### **Regulations and Time Frame**

A regional general permit number 22 will be required from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act and Section 10 of the River and Harbor Act of 1899. This permit can usually be obtained in 30-60 days and is valid for three years from the date issued. Once the permit is issued, a timeline for dredging, construction, and revegetation will be developed.

## Water Budget Analysis\*

**Location** The 'Ahakhav Tribal Preserve is located in Sections 9,10,16,17, 19, and 20, T9N, R20W, G&SRB&M, between Rodeo Drive and the Colorado River, comprised of 1042 acres, more or less, of Tribal land (Figure 3.1). The preserve includes two backwater areas - Deer Island (750.39 acres) and 'Ahakhav (291.61 acres). The backwaters were created during the 1960's in order to provide flood control and wildlife habitat lost to the damming and channelization of the Colorado River.

**Background and Project Description** Deer Island Backwater originally consisted of approximately 290 surface acres of water, 355 acres of riparian habitat, and 105 acres of wetland. Flooding and succession have eliminated 78% of the water surface area in the lake and wetlands. The 'Ahakhav Backwater originally consisted of approximately 85 acres surface water, 167 acres of Riparian habitat, and 40 acres of wetland. Flooding and succession have eliminated 80% of the water surface area in the lake and wetlands. These areas now require periodic dredging and other maintenance operations in order to encourage water flow and prevent sedimentation (Figure 5.1). Since the 1960's, the habitat has slowly deteriorated. In 1983, floods sedimented deeper channels, creating poor water circulation, thus reducing wildlife species diversity and productivity. Growing sandbars block inlets and outlets to the river (Figure 5.2). Historically deep channels are now shallow, and historically shallow areas are often filled in completely and covered with dense cattails. Dense cattails generally have a lower value to wildlife than medium to low density cattails, and a lack of deep water areas limits the diversity of fish to be found in the backwater.

Dredging plans include deepening historic channels, opening the backwaters to the flow of the river through a series of 6 percolation dikes on the existing levee road, revegetating dredge spoil with native riparian trees and shrubs, and adding fish habitat structures in the backwaters.

The backwater area will be opened to water flow from the river through a series of 6 percolation dikes (Figure 5.4), located as shown in Figures 5.5 and 5.6. Percolation dikes will be constructed by excavating sections of the existing dikes to a depth of at least 2 feet below the river bottom. The lower sections of the dikes will consist of large rocks to allow permeability. The upper gravel roads will be rebuilt for authorized vehicle access to the site. Construction of the dikes will occur during the winter when river levels are low.

Areas that are to be deepened will be dredged with a hydraulic dredge (Figure 5.7) supplied by the U.S. Bureau of Reclamation. Channels with an average width of 30 feet and an average depth of 12 feet at low river flow will be dredged as shown in Figures 5.5 and 5.6. These channels will be located in areas that have been fully sedimented, near the percolation dikes, and at the mouth of the backwater. At 'Ahakhav, 228,547.37 cubic yards of spoil will be removed from the backwater. At Deer Island, 428,296.20 cubic yards of spoil will be dredged.

\*This section has been written for inclusion in permit applications, so duplication of some information should be expected.

The location of dredge spoil piles was carefully considered, as there are areas of both high and low wildlife habitat value. Spoil piles will be placed first and foremost on upland areas with no vegetation or on old spoil piles. They will also be located on other upland areas with little vegetation and low value to wildlife (Figures 5.5 and 5.6). Wherever possible, spoil piles will be contained by a basin of excavated material formed with caterpillar tractors - a containment berm (Figure 5.8). These berms will prevent turbidity caused by spoil returning to the water. It will not be possible to construct containment berms where dozer access to spoil piles is limited by deep water or the risk of getting stuck in wet soil high in organic content.

When spoil piles are placed in the riparian area, they will be in the least valuable habitats, usually mucky areas with little or no vegetation (Figures 5.5 and 5.6). A shallow shelf with an average width of 25 feet will be left around riparian spoil piles in order to allow for the growth of emergent vegetation (Figure 5.8). Higher areas of these spoil piles will create islands in the backwater, and will be used for revegetation with cottonwood, willow, and other riparian vegetation. Spoil piles in riparian areas will not be higher than 6 to 8 feet above the water table in order to increase the probability of successful revegetation (Figure 5.9).

Spoil piles will be located in areas with low value to wildlife, such as saltcedar or arrowweed stands. When cottonwood, willow, or mesquite trees are located within a spoil pile site, individual trees will be avoided. Dredge spoil can be successfully revegetated if soil type, depth to groundwater, species used, and other factors are suitable (Figure 5.10). If areas of low value to wildlife are replaced with successful revegetation projects, their value to wildlife will be enhanced. Numbers and species used for revegetation will need to be decided after dredging operations have been completed so that soil and water factors may be analyzed to better ensure the success of the project. Whenever possible, cottonwood and willow will be planted on the lower areas and mesquite will be planted on higher areas.

The total area of spoil coverage will be 35.40 acres at 'Ahakhav, and 67 acres at Deer Island, with an average depth of 4 feet. A floating plastic pipe will be used to transport spoil from the dredge to the disposal areas. A dredge platform will be graded and filled with gravel for storage of the dredger and other earth-moving equipment.

Fish habitat structures will be placed near access points and locations most likely to be used for fishing in both backwaters (Figure 5.12). Such placement is meant to encourage high concentrations of non-native fish species in these areas, leaving other areas of the backwaters available to native species. The habitat structures will consist of dead trees and brush (from dredging operations and revegetation projects) anchored to the bottom of the channels.

Figures 5.11 and 5.12 are cross-section drawings illustrating the historical, existing, dredged, and restored state of the backwaters.

### ***Water Budget***

***Evaporation*** - Evaporation rates of open water in Colorado River Backwaters and lakes is approximately 7.5 acre feet per year per surface acre. The original water surface area of Deer Island Backwater in the early 1960's was approximately 290 acres.  $290 \times 7.5$  equals 2175 acre feet net water loss per year. Under present conditions, Deer Island consists of approximately 66 surface acres with a loss of 495 acre feet of water per year. The original water surface area of the 'Ahakhav Backwater in the early 1960's was approximately 85 acres.  $85 \times 7.5$  equals 637.5 acre feet net water loss per year. Under present conditions, the 'Ahakhav Backwater consists of approximately 19.19 surface acres with a loss of 144 acre feet of water per year.

Surface area of wetlands adjacent to the river is dependent on river flow. It is estimated there were approximately 105 acres of wetlands at Deer Island Backwater and 40 acres of wetlands at the 'Ahakhav Backwater. Since wetland evaporation rates are a function of river flow, they would vary from month to month and year to year. The planned project would not increase wetland acreage, so there would be no increase in consumptive use.

***Transpiration***- Transpiration is defined as the loss of water from plants as vapor, and is dependent on temperature and the physiology of the plant. 100% of the original wetland habitat at Deer Island Backwater and 95% of the existing riparian habitat the 'Ahakhav Backwater has grown over with saltcedar and other undesirable exotic vegetation. Areas that are wet are overgrown with tules. An acre of saltcedar uses approximately 2.5 acre feet of water per year, so 105 acres of saltcedar at Deer Island would use approximately 250 acre feet of water per year and 38 acres of saltcedar at the 'Ahakhav Backwater would use approximately 95 acre feet of water per year.

***Conclusion*** Water loss by evaporation at the Deer Island Backwater and the 'Ahakhav Backwaters under present physical and biological conditions is considerably less than it was in the early 1960's, because there is less water surface area. However, restoring these backwaters to their 1960's physical size and similar biological condition will not cause a net increase in consumptive use of water according to the Supreme Court Decree in *Arizona v. California*.

### **Impact of Dredging Operations on the 'Ahakhav Environment**

***Hydrology and Water Quality***: Construction of percolation dikes and deepening of channels will improve water circulation through the backwaters, especially during low river flows, while still allowing the water level to fluctuate freely. The increased water flow will tend to prevent siltation at the openings of the backwaters. Water quality parameters such as salinity, dissolved oxygen, and temperature are expected to improve with increased circulation and depth. Turbidity is expected to increase in the immediate area of the dredge, but the sandy material will tend to settle out rapidly in the slow current. Turbidity caused by upland spoil piles will be prevented by earthen berms.

***Vegetation***: Spoil piles will be placed on areas of low habitat value and constructed to maximize successful revegetation potential. Spoil piles will avoid individual trees deemed valuable to wildlife (such as mesquite and cottonwood). Shallow ledges along spoil piles placed

in wetland areas will allow the successful establishment of emergent vegetation such as cattail and bulrush.

*Wildlife:* Disturbance of wildlife is expected in the immediate area of dredging operations and during the placement of spoil. However, wildlife habitat will ultimately be enhanced by replacing low value saltcedar stands with native riparian habitat. Revegetation efforts will be concentrated around the most disturbed areas in order to allow the wildlife habitat value to increase rapidly.

*Fisheries:* Fish habitat will be disturbed during dredging operations, but will ultimately be enhanced by the improved water quality and circulation. The fish habitat structures, variety of water depths, and improved access to and from the river are expected to increase fish species diversity.

*Human use:* Increased water flow and depth will improve backwater swimming and boating conditions for small, unmotorized craft. Dredging operations at 'Aha Quin indicate that the number and size of fish caught will most likely improve. Game hunting is expected to improve with the increased habitat available to ducks and other waterfowl.

### **Cost of Dredging**

Please refer to Table 7.1 (in section 7.0) for the costs of activities associated with dredging, including ecological assessments, mapping, monitoring, and dredge construction.

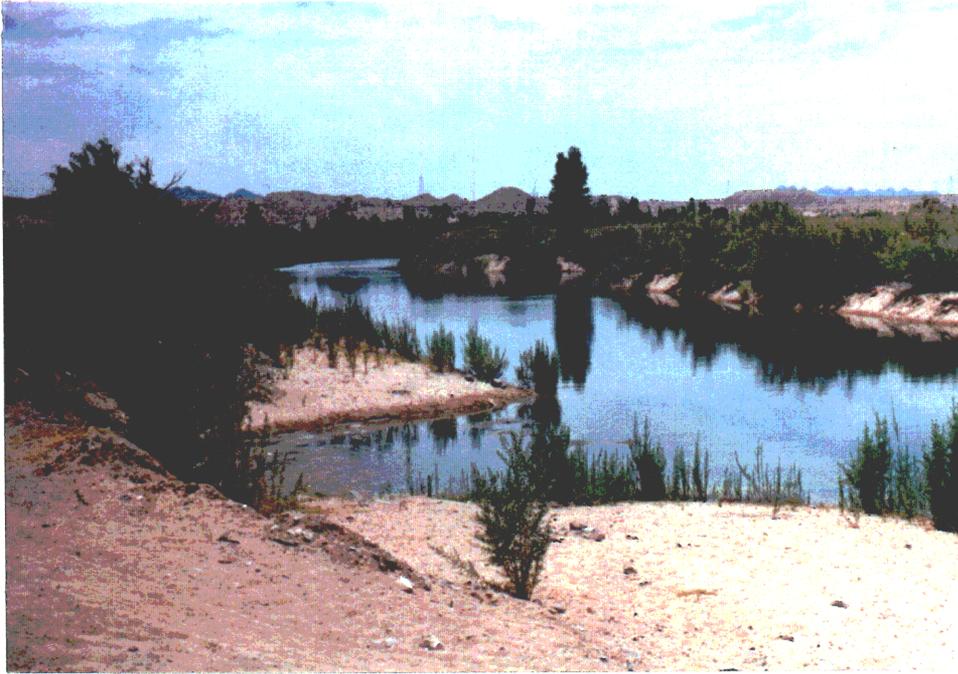


FIGURE 5.1 *Recent Dredge Work -- Goose Flats, CA:*  
Goose Flats, south of Blythe, CA, was recently dredged in cooperation with the U.S. Bureau of Reclamation. The site was in need of dredging, as well as revegetation efforts.

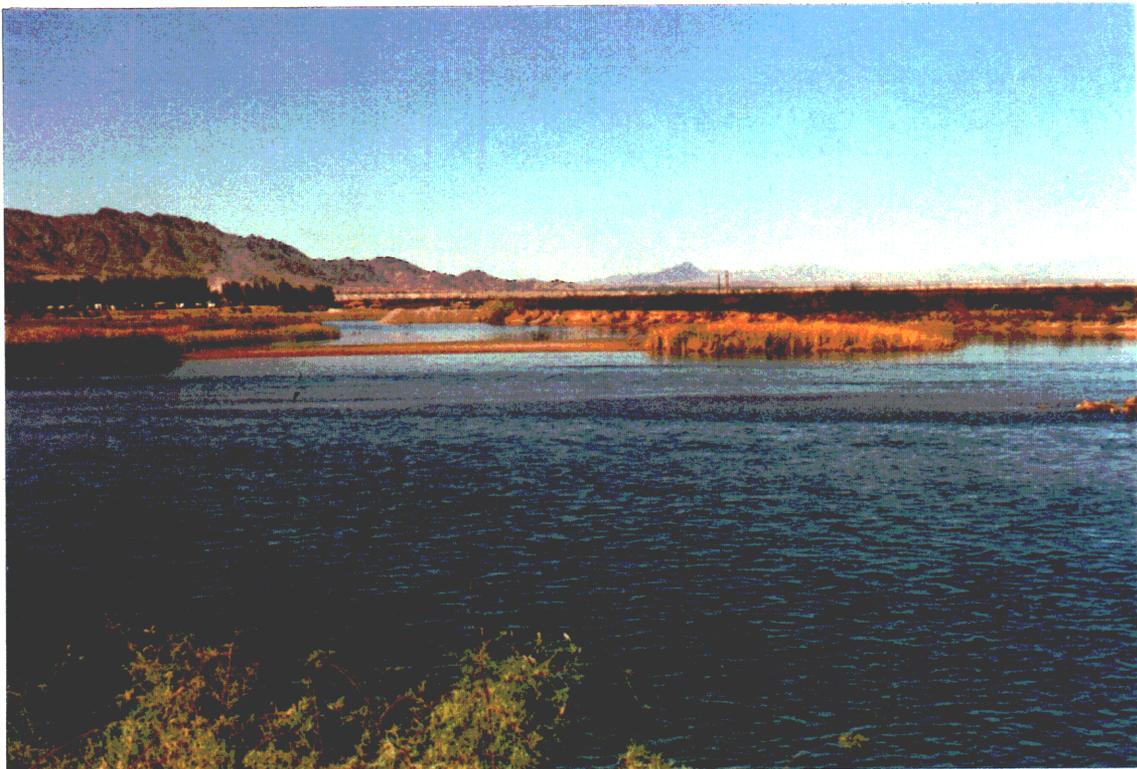


FIGURE 5.2 *Sandbar Blockage of River Flow:*  
Sedimentation of the backwaters, including their openings to the river, reduces water flow, and thus, quality in the backwaters. Such areas will be dredged, and percolation dikes will be constructed, in an effort to restore such areas to their condition at the time of their creation by the U.S. Bureau of Reclamation.



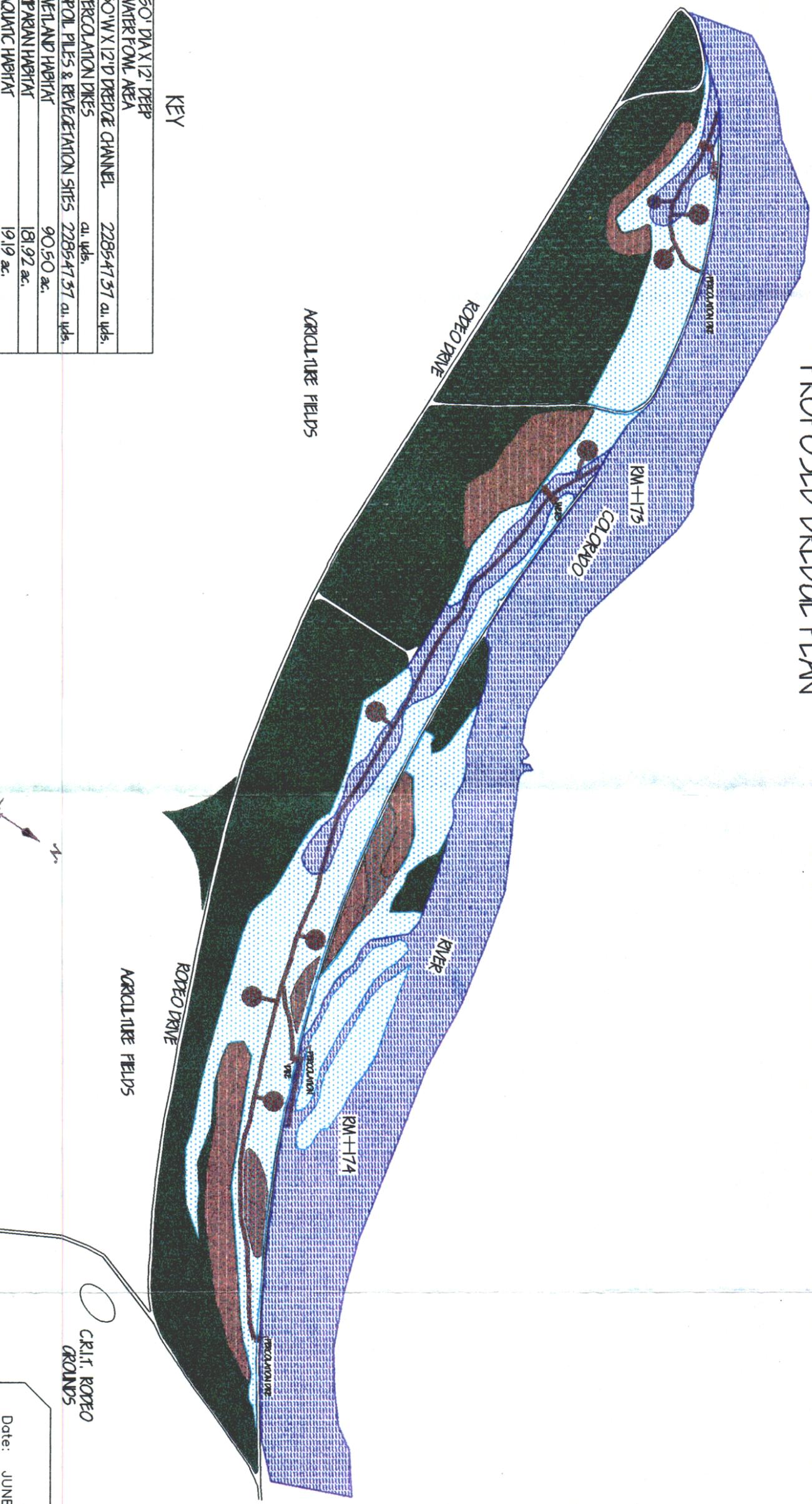
FIGURE 5.3 *Hydrographic Mapping Boat -- Glen Canyon Environmental Studies:* This boat, surveying a section of the Colorado River bottom in the Grand Canyon area, will be used for mapping the floor of the backwaters. This data will then be used in determining the final dredge canal placement.



FIGURE 5.4 *Percolation Dike:* Percolation dikes will be constructed to open the backwaters to the flow of the river. Existing material along the levee does not allow sufficient water flow to the backwaters, and the one existing percolation dike at Deer Island is clogged with sediment that has accumulated over time.

FIGURE 5.5 Dredge Plan -- Ahakhav Backwater

# AHAKHAV BACKWATER PROPOSED DREDGE PLAN



KEY

	150' DIA X 12' DEEP WATER FOWL AREA	
	30' W X 12' D DREDGE CHANNEL	2285+47.37 a.u. upds.
	PERCOLATION DIKES	a.u. upds.
	SPOIL PILES & REVEGETATION SITES	2285+47.37 a.u. upds.
	WETLAND HABITAT	90.50 ac.
	REPARAN HABITAT	181.92 ac.
	AQUATIC HABITAT	19.19 ac.

NOTE:  
 1. FINAL DREDGE DESIGN WILL BE DETERMINED UPON RESULTS OF HYDROGRAPHIC SURVEYING  
 2. WEIRS WILL KEEP MOTORIZED RIVER TRAFFIC OUT OF THE BACKWATERS. ACCESS FOR NON-MOTORIZED BOATING WILL BE PROVIDED ON THE ACTUAL BACKWATER SITE



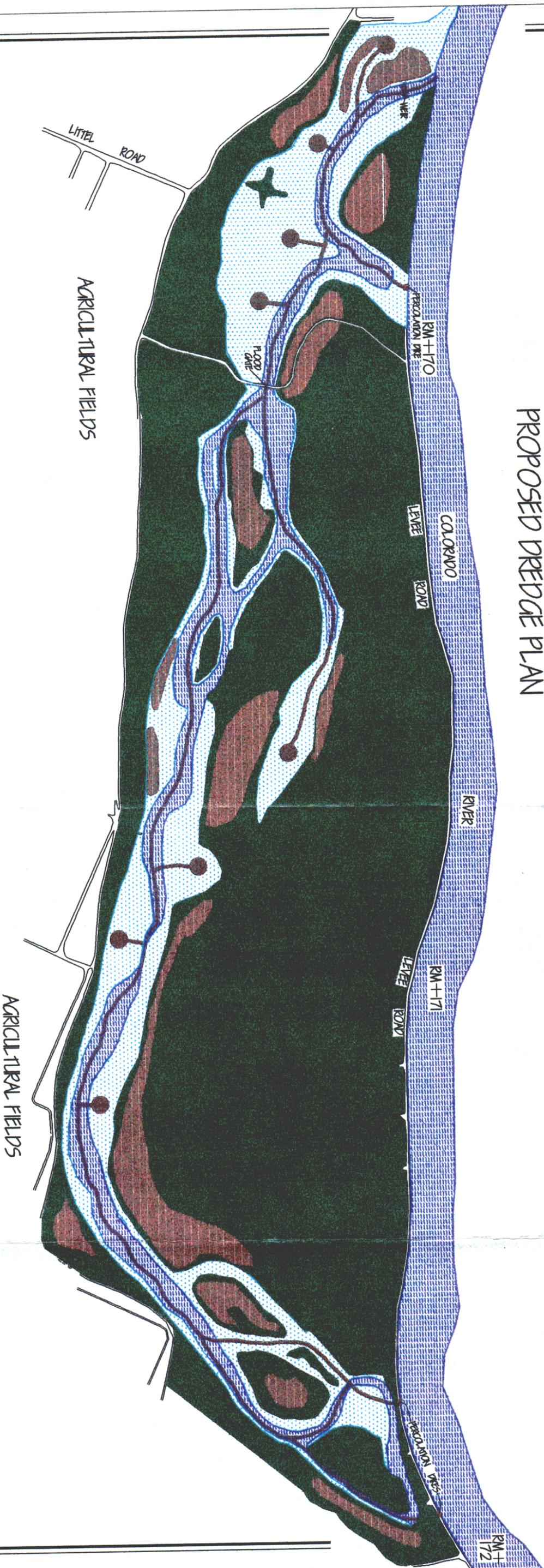
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TO MOHAVE ROAD  
 CRIT. ROPEO GROUNDS

Date: JUNE 18, 1996  
 Revisions: \_\_\_\_\_  
 Drawn: ACP  
 Checked: FOP  
 Project #: \_\_\_\_\_  
 Sheet \_\_\_\_\_ of \_\_\_\_\_

FIGURE 5.6 Dredge Plan -- Deer Island Backwater

# DEER ISLAND BACKWATER PROPOSED DREDGE PLAN



KEY

	150' dia. x 12' DEEP WATEROWL AREAS
	30' W X 12' D DREDGE CHANNEL
	PERCOLATION DKS 428296.20 ai. yds.
	SPILL PILES & REVEGETATION SITES 428296.20 ai. yds.
	WETLAND HABITAT 158.75 ac.
	RIPIARIAN HABITAT 525.66 ac.
	AQUATIC HABITAT 66 ac.

- NOTE:
1. FINAL DREDGE DESIGN WILL BE DETERMINED UPON RESULTS OF HYDROGRAPHIC SURVEYING.
  2. WEIRS WILL KEEP MOTORIZED RIVER TRAFFIC OUT OF THE BACKWATERS. ACCESS FOR NON MOTORIZED BOATING WILL BE PROVIDED ON THE ACTUAL BACKWATER SITE.

SCALE 1" = 900'

Date: JUNE 18, 1996  
 Revisions: \_\_\_\_\_  
 Drawn: ACP  
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 Project #: \_\_\_\_\_  
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FIGURE 5.7 *Hydraulic Dredge -- U.S. Bureau of Reclamation:*

There are three dredgers on the lower Colorado River, but federal government budget cut-backs have allowed for the hiring of only one team of operators. Despite a 4-year wait (at least) for the restoration of dying backwaters, the possibility of a second dredging team looks bleak without the support of the public, and federal, state, and tribal agencies.

FIGURE 5.8 Dredge Details:

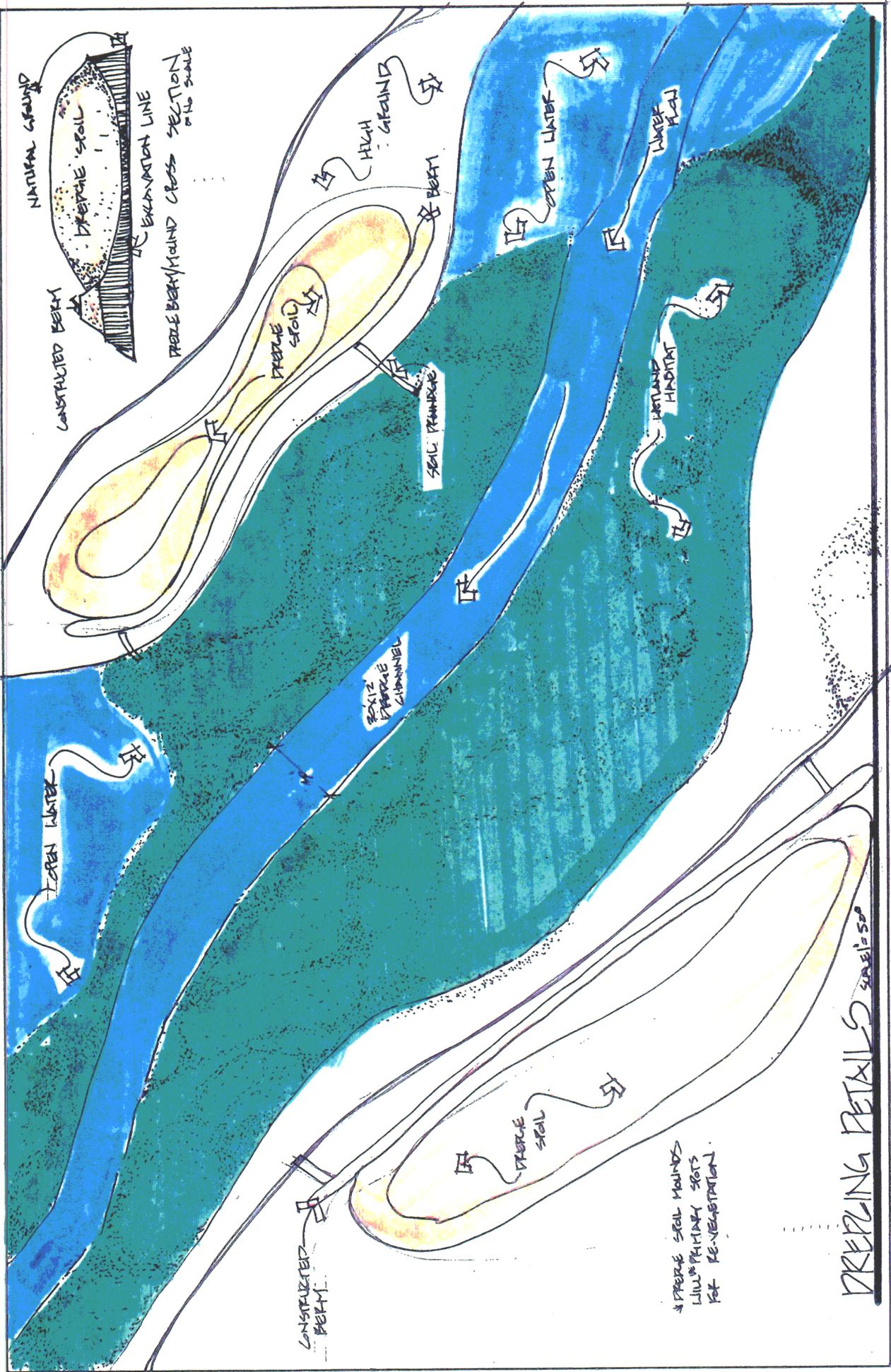




FIGURE 5.9 *Dredge Spoil Pile:*

This spoil pile from the Goose Flats site is slated for revegetation efforts. Properly placed spoil piles are often excellent for revegetation because the spoil generally contains less salt than most existing soils. Without revegetation efforts, arrowweed and salt cedar can be expected to dominate.



FIGURE 5.10 *Spoil Pile Revegetation -- Root Detail:*

The Revegetation & Wildlife Management Center augers holes for plantings in order to speed their root growth to the water table. Spoil piles often make exceptionally good revegetation sites because the salinity levels tend to be very low. (Photo courtesy of the Revegetation & Wildlife Management Center, Inc.)

FIGURE 5.11 Historical and Existing Backwater Cross-sections:

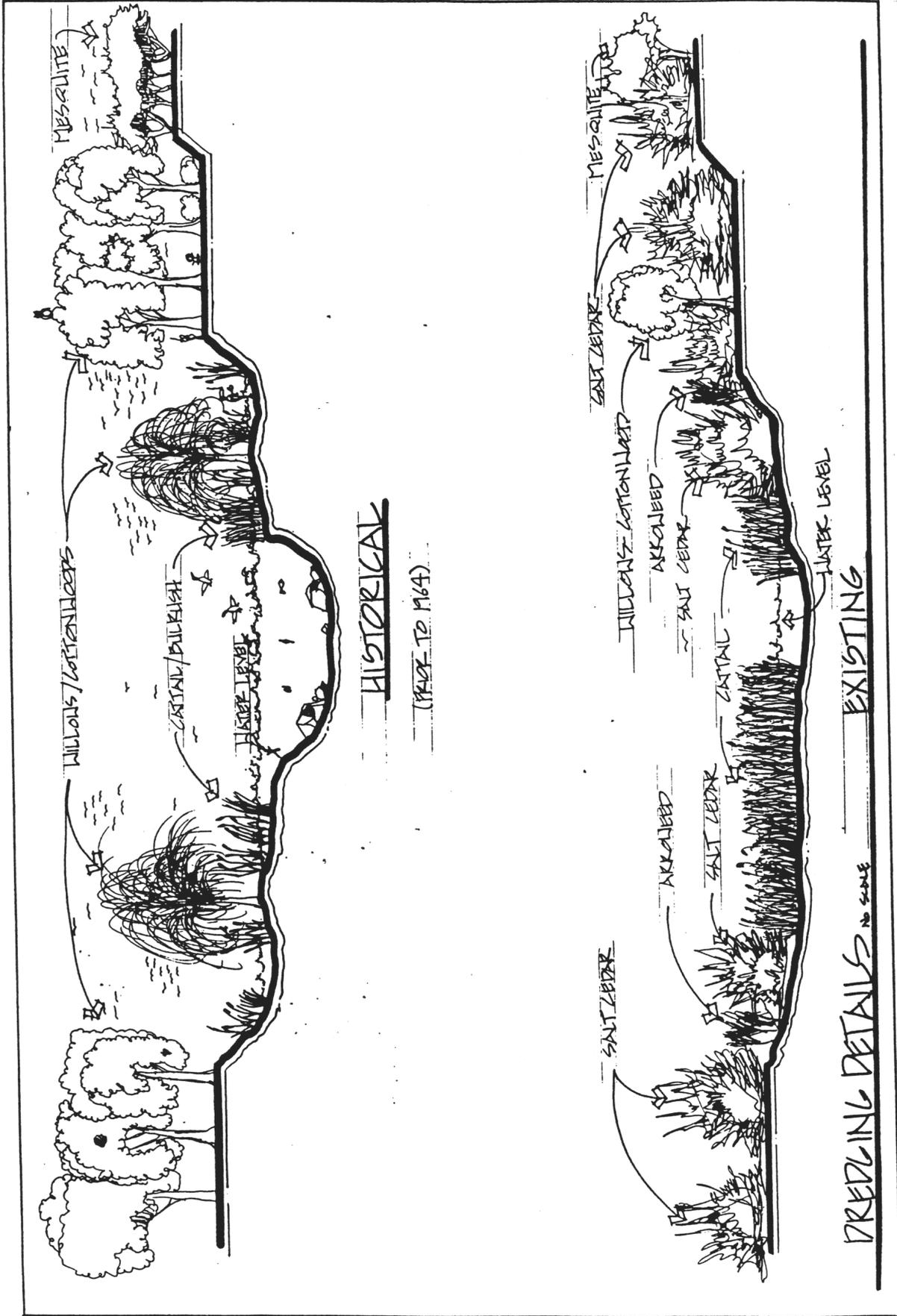
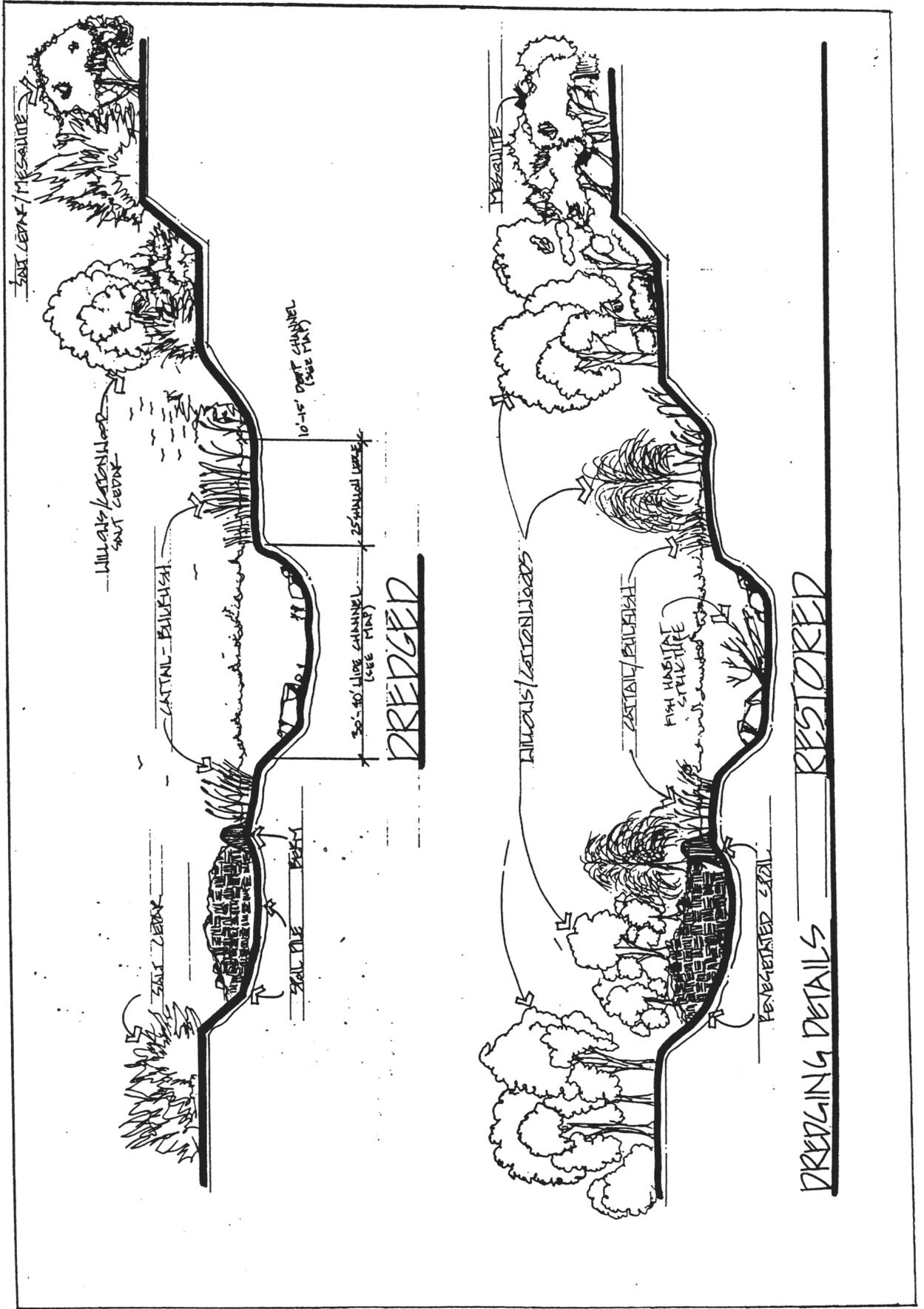


FIGURE 5.12 Dredged and Restored Backwater Cross-sections:



## 5.2 REVEGETATION

### Goals

1. Establish stands of native vegetation, including cottonwood, willow, and mesquite in areas with otherwise low wildlife habitat value, primarily saltcedar stands.
2. Stabilize dredge spoil piles and sensitive riparian sites adjacent to backwater areas.
3. Conduct bird censuses to monitor success of revegetation.
4. Maximize the successful establishment of native species and minimize the amount of future maintenance required.
5. Use native stands for environmental education and cultural programs.
6. Design native stands to minimize threat from wildfire.
7. Maintain native stands for the future benefit of both wildlife and humans.

### Revegetation Procedure

Below is the Nine Step Revegetation Method, developed by the Revegetation and Wildlife Management Center, Inc., to establish healthy and vigorous trees and shrubs. This Revegetation Method was developed to reestablish habitat with maximum wildlife value in the shortest time possible. This requires maximizing growth rates and minimizing mortality rates. While over 80 percent of other revegetation projects from western Arizona to the Pacific Ocean have failed, The Revegetation and Wildlife Management Center has had only a 5 percent failure rate with their revegetation projects.

1. **Preliminary Soil Analysis:** Two soil samples will be collected at one sample point per acre. The first sample will be taken near the surface and the other will be taken just above the water table, or 6-8 feet below the surface. For each sample the soil type, pH, electroconductivity, and surface-to-water-table depth are determined. Whenever possible, a water sample will be taken and its pH and electroconductivity determined. This analysis reveals the range of variation for each variable tested and allows an assessment of the success that might be expected for a planting on the site.
2. **Propagules:** Cuttings of local genetic stock will be taken, treated with *Rootone*, and started in one-gallon pots (Figure 5.13). Potting material will consist of equal portions of sandy soil from the revegetation area, and vermiculite and peat moss to encourage the growth of micorrhizal fungi. Micorrhizal fungi assist in the uptake of nutrients from the soil. Propagules will be watered daily and kept in a temporary greenhouse for 8-12 weeks before planting (Figure 5.14).
3. **Site Preparation:** The revegetation area will be cleared and leveled with a D-8 or D-7 Caterpillar dozer (or the equivalent). The clearing will be selective, saving any valuable trees already on the site (Figure 5.15).
4. **Intensive Soil Sampling:** Soil samples will be taken from 10 percent of all planting holes on 20 foot centers. Sample analysis allows mapping of the distribution of nutrients, salts, soil types, pH values, and depth to water table throughout the site. A planting design is formulated which places appropriate plants in areas where they can be expected to grow at or near their maximum rate. It is because of the need for this intensive sampling that a planting design cannot be produced until the site is nearly ready for planting.

5. **Tillage:** Holes at least 18 inches in diameter and 8 feet deep (or to the water table) will be augured where each propagule is to be planted. This vertical tillage allows for rapid root penetration to the water table.
6. **Irrigation System:** The irrigation system will consist of commercially available 1/2 inch black polyethylene drip tubing emanating from a 2 inch diameter black polyethylene main line. Each lateral drip tube will have a filter and ball shut-off valve at every 15-20 feet and 2 gallon pressure compensating emitters will be installed in the line. Water will be pumped from the backwater or from a 6-inch line leading off the Mohave Road water main. Details of the irrigation system will be drawn after intensive soil sampling is complete.
7. **Planting:** Larger trees, such as cottonwood, will be planted on 20 foot centers. Smaller trees, such as willow and mesquite, will be planted on 15 foot centers, and patches of shrubs, such as sandbar willow and mulefat, will be planted on 10 foot centers. Fertilizer will be added as needed, in a manner that does not contribute to weed competition. Trees planted on 20 foot centers will yield 100 percent ground cover in 3-4 years. Planting at higher densities promotes intraspecific competition and is wasteful. Propagules will be approximately 15-20 inches tall at the time of planting, and will be planted at the rate of approximately 300 per day. *Tubex*, a protective tubing, will protect propagules from browsing, slow competitor growth, and increase water use efficiency.
8. **Irrigation and Weeding:** Approximately 8 gallons of water per day per tree will be delivered through two-gallon per hour pressure compensating emitters for 5-7 days a week for 18 weeks. Cottonwood and willow will not be planted where the permanently available water source (water table, perched water table, or wet soil) is greater than 8 feet deep. Weeding will be done as needed during the irrigation period.
9. **Monitoring and Reports:** Monitoring will begin when trees are planted and will continue until irrigation is halted. Trees that will be monitored are those that were planted in the sample holes from the intensive soil analysis. Sample size of the trees monitored will be at least 30 individuals of each species. Each tree will be measured from the base of the trunk to the top of the tallest upstretched leaf throughout the first season. Ground cover (crown diameter) and foliage volume can be calculated from this measurement. Growth is analyzed in the context of differences in the variables measured during the intensive soil sampling. Less frequent monitoring will be conducted during the next ten years and reports will be submitted at the end of the first, fifth, and tenth year of the project. Average growth during the first season is expected to be 1/2 inch per day. At the end of the third season (Figure 5.16), a cumulative mortality of less than 5 percent can be expected, and this will likely be compensated for by natural germination of mesquite after high flows.

Prior to revegetation, 8-10 bird censuses will be conducted to establish pre-revegetation population levels. This data will be used in evaluating the success of the revegetation project. Birds will be the only animals censused because they respond quickly to environmental changes and are excellent indicators of environmental health. They are also the easiest vertebrates to monitor in the field.

Revegetation will occur on one site per year, each site consisting of not more than 70 acres. This plot size allows the trees and shrubs to be monitored, assuring that they are receiving the water and tillage they need. As mentioned earlier, since saltcedar can tolerate higher salt levels, some saltcedar groves may only be suitable for revegetation with mesquite or various brushes. It becomes vital, therefore, that the revegetation site be thoroughly tested before planting begins. Insufficient site analysis, especially measurements of the depth to the water table, salinity levels, and soil moisture levels, is the most common cause of revegetation failure. It is for this reason that it is not possible to accurately predict how many acres of the site are suitable for revegetation, nor what species may be successfully planted, until detailed soil analyses are

conducted. In any event, priority will be given to planting on dredge spoil piles in order to stabilize them. Dredge spoil, if sandy and low in salt content, is often one of the best soil mediums for revegetation projects. Priority will also be given to planting lowland sites adjacent to the backwater. There are 706 acres that may be revegetated, but only 500 acres are included in the budget plan. Existing stands of native trees and sites found unsuitable for revegetation will probably eliminate at least the other 206 acres from potential revegetation areas.

Figures 5.17 and 5.18 indicate potential revegetation areas of 'Ahakhav Backwater and Deer Island. These are preliminary drawings illustrating the possibilities for the area, and will not be used as a planting guide.

#### Success Requirements for Revegetation Species:

<i>Species</i>	<i>Growing Season</i>	<i>Survival</i>	<i>Mean Height</i>
Cottonwood	5 years	80-100%	200-300 inches
	10 years	60-90%	240-360 inches
Willow (Black, Red)	5 years	80-100%	200-265 inches
	10 years	60-75%	220-300 inches
Mesquite (Screwbean, Honey)	5 years	75-80%	135-265 inches
	10 years	60-80%	140-280 inches
Sandbar Willow	5 years	75-80%	135-265 inches
	10 years	60-80%	140-280 inches

While both black willow and sandbar willow will be planted, the sandbar willow will be especially important as a source of the willow branches used in basket weaving. It is becoming increasingly difficult to locate suitable stands of these willows, but branches from the revegetation site will be open for careful collection after the trees are established.

Saltcedar is generally the first plant to colonize a burned area, so revegetation sites must be protected from fires. Non-planted areas will be included in the final design to provide fuel breaks that will help to prevent the spread of devastating fires. These fuel breaks are also important as a place from which firefighters may battle any blazes that threaten the revegetation sites.

The first 25-acre revegetation plot is currently being planted, using funds supplied by a Bureau of Reclamation grant (\$25,000), Bureau of Indian Affairs grant (\$20,000) and a U.S. Fish and Wildlife grant (\$10,000). Soil and water table analyses have been performed, the irrigation system has been installed, and over 2000 trees have been planted.

#### Species Monitoring

Bird censusing will begin in the fall of the third season after revegetation. Three censuses will be conducted each month (October, November, December, January, February, March, April, May, and June), totaling 27 censuses. The same monitoring program will be conducted after the fifth season, totaling another 27 censuses. These censuses will be used in conjunction with the pre-

revegetation census data to determine whether, and to what extent, the revegetation was successful.

### **Impact of Revegetation on the 'Ahakhav Environment**

*Vegetation:* Selective clearing of the revegetation site will prevent the removal of species deemed valuable to wildlife, while allowing low value species (primarily saltcedar and arrowweed) to be removed quickly and efficiently.

*Wildlife:* Wildlife disturbance is expected in the revegetation area, especially during bulldozing, installation of the irrigation system, and planting operations. Until the end of the monitoring period, wildlife disturbance will consist of additional maintenance on the site and human presence during monitoring activities. Ultimately, however, wildlife habitat will be dramatically improved by the planting of native species and removal of low wildlife habitat value species.

*Water Usage:* Water consumption should not increase on the site as a result of revegetation efforts. Irrigating newly-planted trees will consume less water than was consumed when the area was covered in saltcedar. The natural water consumption of established trees will be comparable to, or even less than, the water used by the current vegetation (U.S. Bureau of Reclamation, 1995).

*Human use:* Native vegetation will provide habitat for many game species, and much-needed shaded areas for comfort during hiking and camping. The revegetated area will also provide an important visual aid for educational programs concerning native ecosystems, wetlands and wilderness preservation.

### **Costs of Revegetation**

Please refer to Tables 7.2 and 7.3 (in Section 7.0) for projected costs associated with the revegetation plan.



FIGURE 5.13 *Willow Propagule:*

Willows and cottonwoods are propagated from poles cut from local genetic stock. They are then genetically adapted to the climatic and soil conditions of the area, and have a better chance of thriving after planting. Mesquite seeds for planting are collected locally for the same reason.



FIGURE 5.14 *Propagule Greenhouse:*

Poles and seedlings are reared in a greenhouse before planting. A nursery for the propagation of plants has already been constructed at the Preserve to provide a continual supply of propagules for revegetation efforts.



FIGURE 5.15 *Site Preparation -- Bulldozer Clearing:*

A bulldozer has been used to clear existing saltcedar and arrowweed, while selectively avoiding valuable trees such as these small mesquite bosques. The bulldozer is one of the few methods successful in eliminating saltcedar

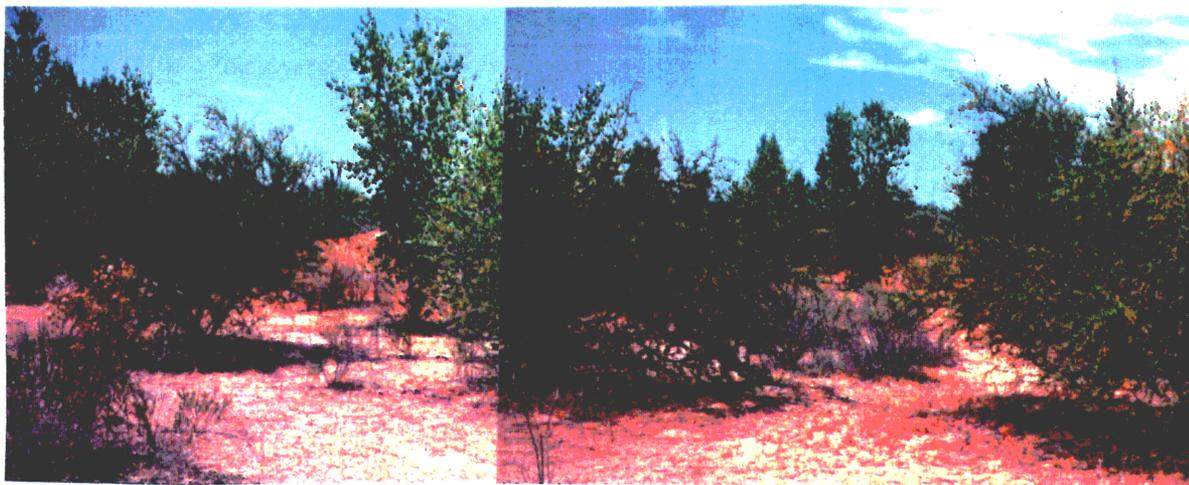
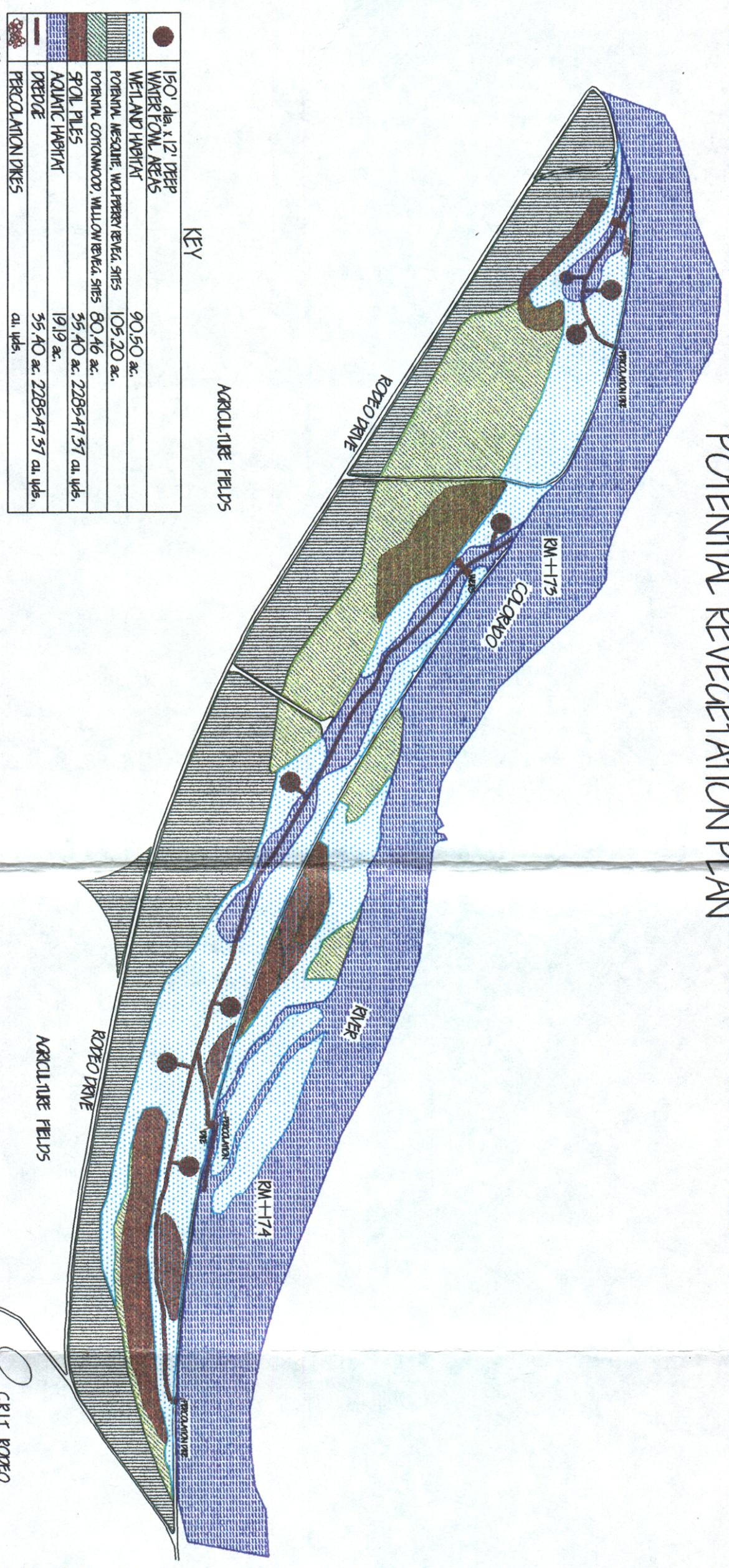


FIGURE 5.16 *Post-Revegetation -- Goose Flats, CA:*

Two years after trees are planted, the site will look much like this area at Goose Flats, south of Blythe, California. Revegetation & Wildlife Management Center's cottonwoods grow an average of 1/2 inch per day, sometimes reaching a height of over 40 feet in under 5 years. Such rapid growth is especially important in the revegetation of recently disturbed areas, such as dredge spoil piles.

FIGURE 5.17 Potential Revegetation Plan -- 'Ahakhav Backwater

# 'AHAKHAV BACKWATER POTENTIAL REVEGETATION PLAN



- NOTES**
1. ALL REVEGETATION SITES WILL HAVE TO BE RESEARCHED THOROUGHLY TO DETERMINE SUITABILITY FOR PLANTING (I.e. SOIL CONDITIONS, DEPTH TO WATER TABLE)
  2. ALL REVEGETATION DONE ON SITE WILL FOLLOW THE 9 STEP REVEGETATION METHOD (ANDERSON, ET AL.) AND SPECIFIC PLANTING SITES WILL BE CHOSEN WHEN ALL RELEVANT RESEARCH ON THE SITE IS COMPLETED, THEN, AND ONLY THEN, WILL FINAL PLANTING PLANS BE CREATED.



SCALE 1" = 900'

CRIT. RODEO  
GROUNDS

TO MOVE ROAD

Date: JUNE 18, 1996

Revisions: \_\_\_\_\_

Drawn: ACP

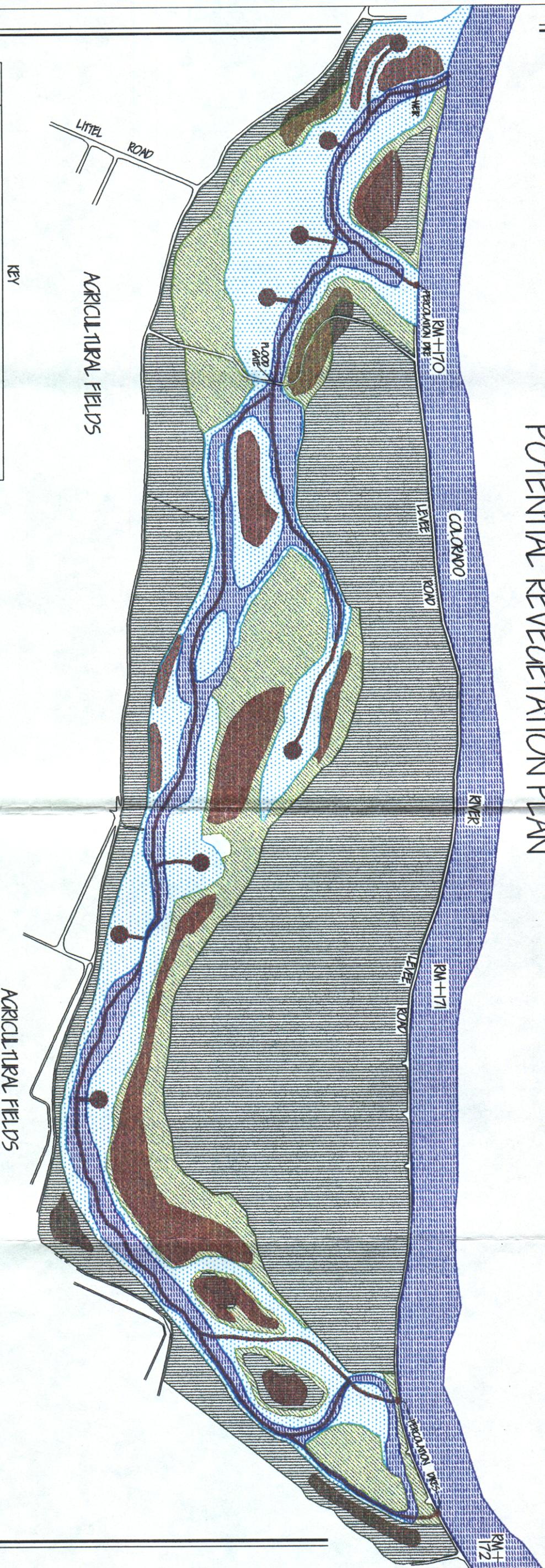
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FIGURE 5.18 Potential Revegetation Plan -- Deer Island Backwater

# DEER ISLAND BACKWATER POTENTIAL REVEGETATION PLAN



KEY

●	150' dia. x 12' DEEP WATERFOWL AREAS
▨	WETLAND HABITAT 158.75 ac.
▧	POTENTIAL MESQUITE, WOLFBERRY REVEG. SITES 385.97 ac.
▩	POTENTIAL COTONWOOD, WILLOW REVEG. SITES 141.85 ac.
▪	SPOIL PILES 65.2 ac. 428296.20 cu. yds.
▫	AQUATIC HABITAT 66 ac.
▬	DREDGE 65.2 ac. 428296.20 cu. yds.
▭	PERCOLATION DIKES cu. yds.

- NOTES:
1. ALL REVEGETATION SITES WILL HAVE TO BE RESEARCHED THOROUGHLY TO DETERMINE SUITABILITY FOR PLANTING (i.e. SOIL CONDITIONS, DEPTH TO WATER TABLE)
  2. ALL REVEGETATION DONE ON SITE WILL FOLLOW THE 9 STEP REVEGETATION METHOD (ANDERSON ET AL.) AND SPECIFIC PLANTING SITES WILL BE CHOSEN WHEN ALL RELEVANT RESEARCH ON THE SITE IS COMPLETED. THEN, AND ONLY THEN, WILL FINAL PLANTING PLANS BE CREATED.



SCALE 1" = 900'

Date: JUNE 18, 1996  
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### 5.3 RAPTOR PERCHES

In addition to providing natural habitat for wildlife, temporary measures will be taken to provide hunting perches for raptors (Figure 5.19). These hunting perches are necessary in order for many species to use the site for feeding purposes. Perches were, at one time, provided by the large cottonwood, willow, and mesquite. Until the newly planted trees mature, artificial perches will be placed on the site to attract owls, hawks, and eagles. These perches will be utilized year-round by migrating, wintering, and nesting birds. Forty perches will be made from telephone poles or fallen cottonwood snags (dead trees) at least 10m tall, planted 1m deep (Figure 5.20), and placed at a ratio of two per every hectare of the Tribal Preserve. The artificial perches will be removed as the trees mature and provide natural perches.

Impact on the 'Ahakhav environment will be minor. Perches will be placed in areas with little or no vegetation, including spoil piles after dredging operations. Wildlife will be disturbed only during the placement of the perches, during any maintenance work thereafter, and during removal.

Purchase and installation of the perches is estimated to cost approximately \$100 per perch, totaling \$4000 for 40 perches.



FIGURE 5.19 *Perching Raptor:*

Raptor perches will be installed to mimic the hunting perches formerly supplied by tall cottonwoods. Raptors such as owls, hawks, eagles, and falcons utilize the site at various times of the year, but are expected to find it more useful after perches are installed. Perches will be removed as planted trees reach a greater height and provide natural perches.

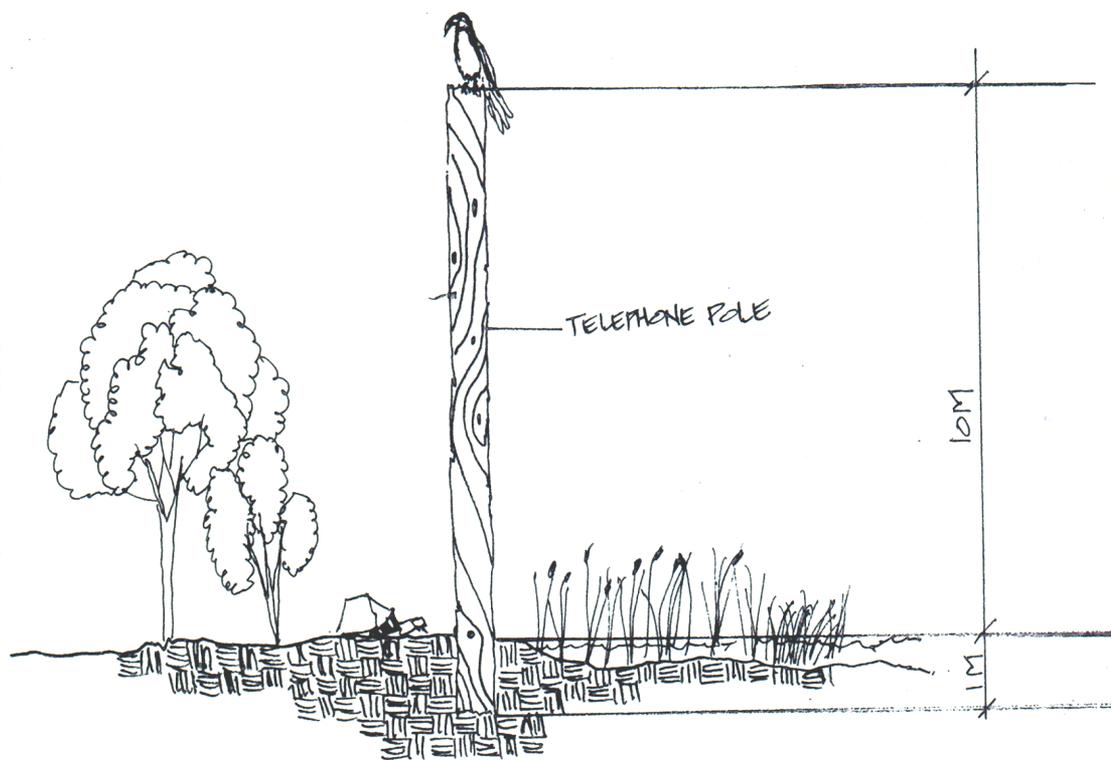


FIGURE 5.20 *Raptor Perch Detail:*

## **6.0 CULTURAL, EDUCATIONAL, AND LOW-IMPACT RECREATIONAL OPPORTUNITIES**



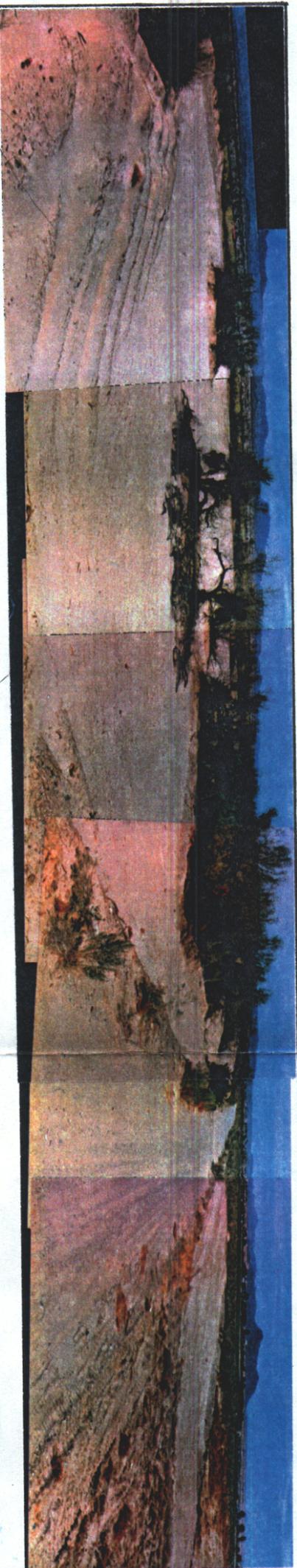
## 6.1 PRESERVE FACILITIES

The Preserve Center is a four acre site overlooking the backwater with views of Monument Peak/Needle Mountain. The site will contain the Cultural Center, Children's Center, Preserve Office, a Native Species Nursery and a gravel parking lot. The site (Figure 6.1) was chosen in an area of the 'Ahakhav Backwater which:

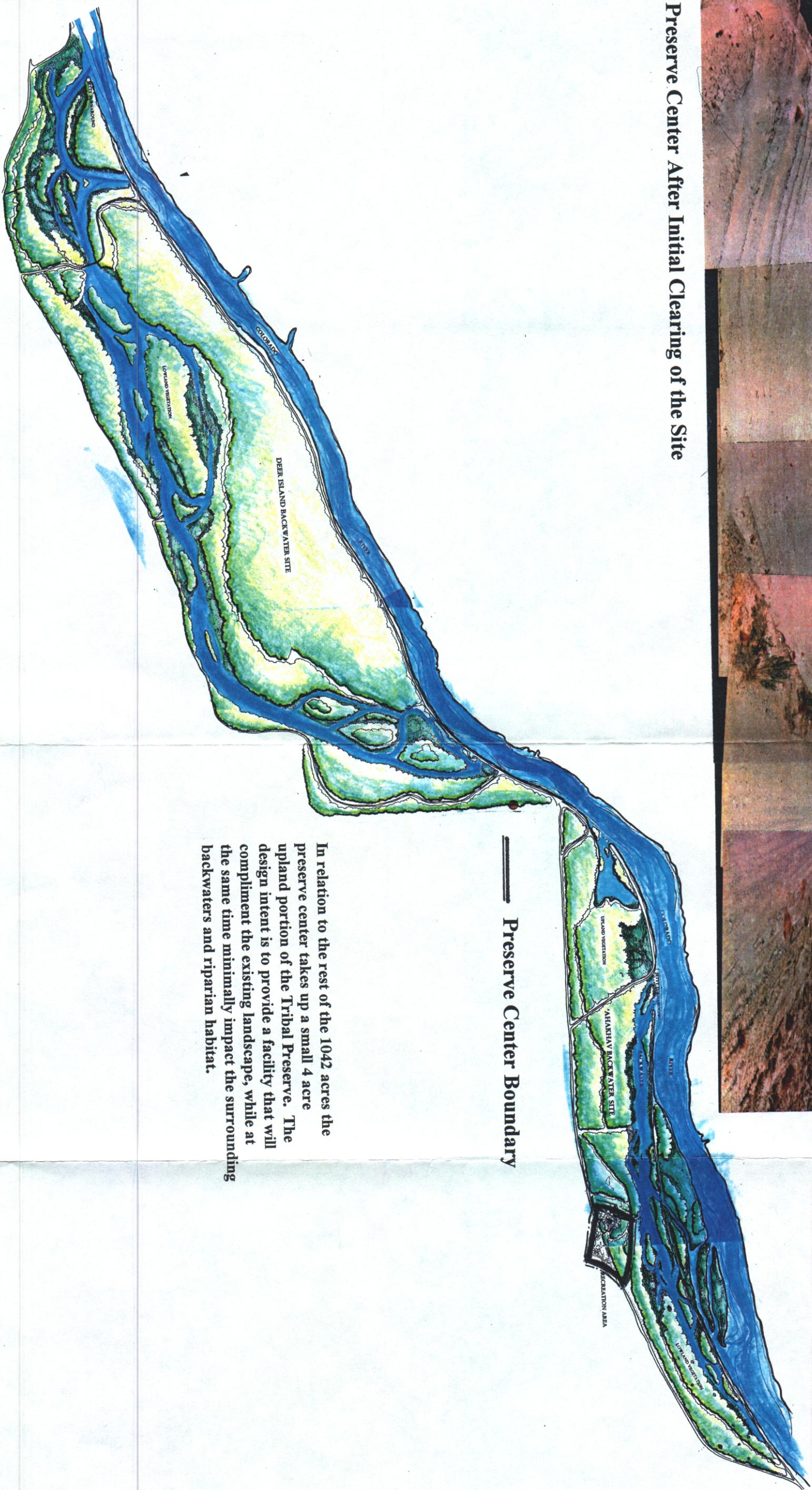
- is currently open, sandy upland, and thus, not vital riparian habitat,
- is near the Parker community, accessible by existant roads, yet secluded from busier roads and the overcrowded river,
- is accessible by road and open field to construction vehicles, reducing vehicle damage to the preserve,
- is easily accessible to parking and other high-intensity use areas outside the preserve.

The Cultural Center, Children's Center and Preserve Office will be connected by a large shaded terrace (Figure 6.2). An entrance station will be located at the entrance to the preserve (Figure 6.3) where a staff person will distribute preserve maps and schedules of upcoming events. Brochures and information about the preserve and its programs will be available at the Preserve Office. The Preserve Office will also house a first aid station and some maintenance equipment. All facilities will be open year-round and equipped with water, electricity and bathrooms. Public restrooms and a parking area will be located off the preserve on adjacent land. Maintenance sheds will be constructed on the preserve as needed. A canoe shed will be constructed near a natural beach which will be used for a canoe launch as well as for swimming. Environmentally sound construction materials will be chosen to blend with the natural surroundings. Composting toilets and gravels parking areas will be located along existing roads away from the Preserve Center. Fees collected from special services such as classes and equipment rental will be used to maintain the Preserve, as well as to provide for any future land acquisitions or additions to services provided.

Figure 6.4 is the master plan for the Preserve Center. The Center buildings will be surrounded by a series of terraced, grassy areas shaded by large cottonwood, willow, and mesquite trees. Other areas of the four acre Preserve Center will be vegetated with native desert wildflowers and shrubs. Thick mesquite bosques will be planted along entrance roads and surrounding land. These areas will bring back the essence of the bosques that once dominated the area. The bosques shade out most understory vegetation and are ideal for picnic and resting areas that lend a sense of isolation.



**Preserve Center After Initial Clearing of the Site**



— Preserve Center Boundary

In relation to the rest of the 1042 acres the preserve center takes up a small 4 acre upland portion of the Tribal Preserve. The design intent is to provide a facility that will compliment the existing landscape, while at the same time minimally impact the surrounding backwaters and riparian habitat.

**FIGURE 6.1** *Preserve Center Location Map (no scale):*

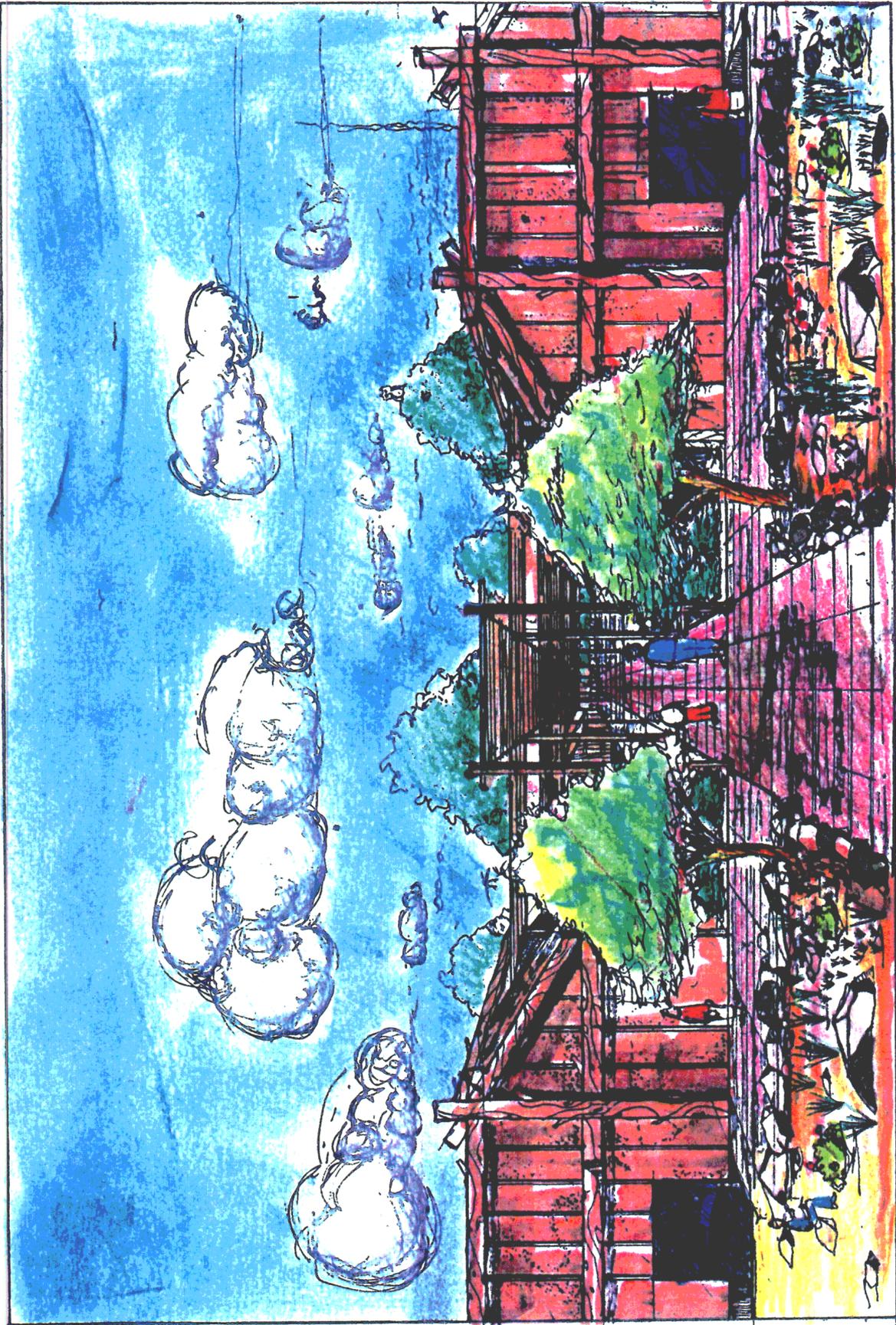


FIGURE 6.2. *Shaded Terrace Between Preserve Center Buildings:* Facilities within the 4-acre Preserve Center will include a Cultural Center, Children's Center, and Preserve Office. Additionally, shade ramadas, picnic tables, grills, and restrooms will also be provided.

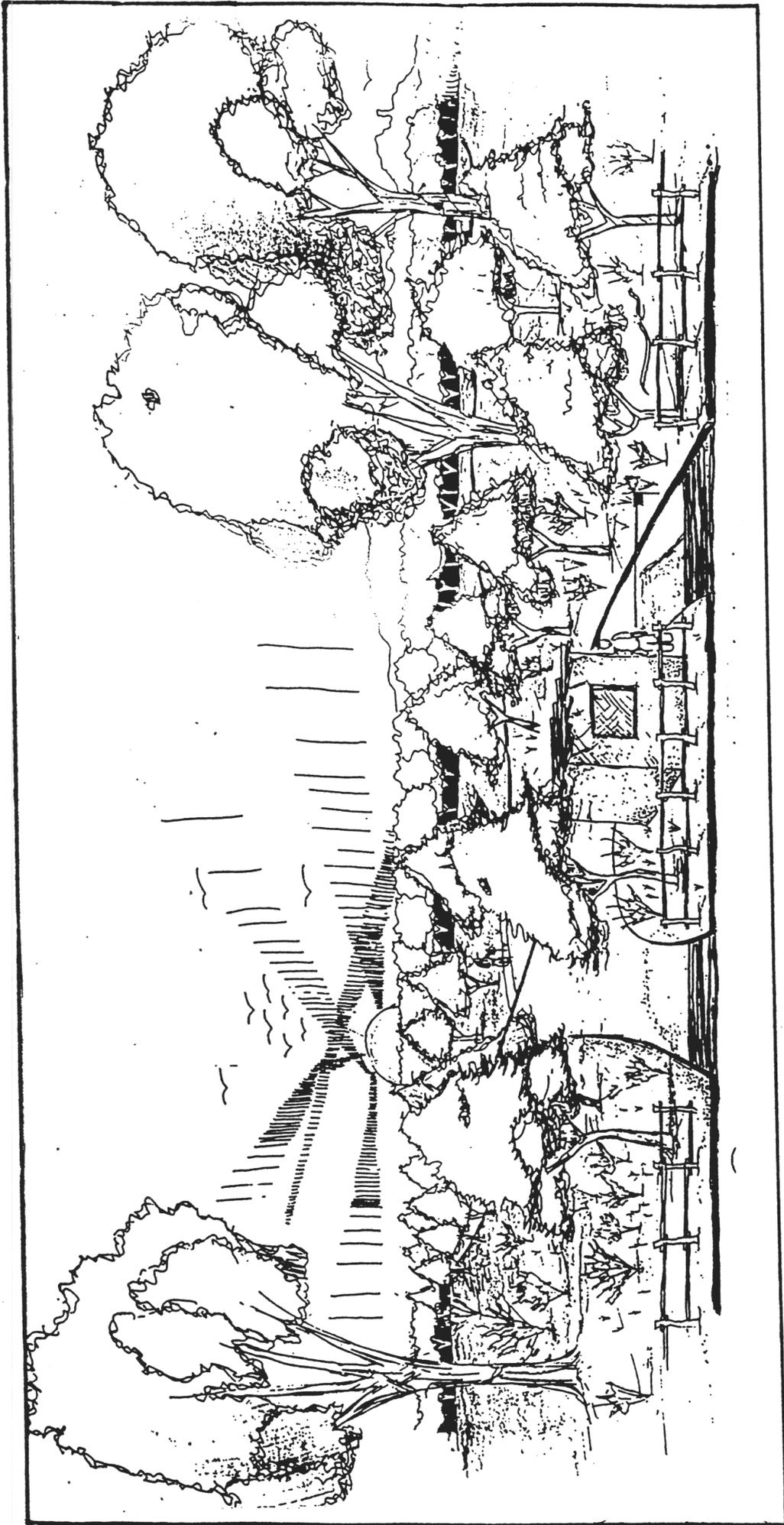


FIGURE 6.3 Entrance Station to 'Ahakhav Tribal Preserve:  
Maps and site information will be distributed to visitors as they enter the preserve. The  
gatekeeper will also collect fees from non-tribal members to enter the site.

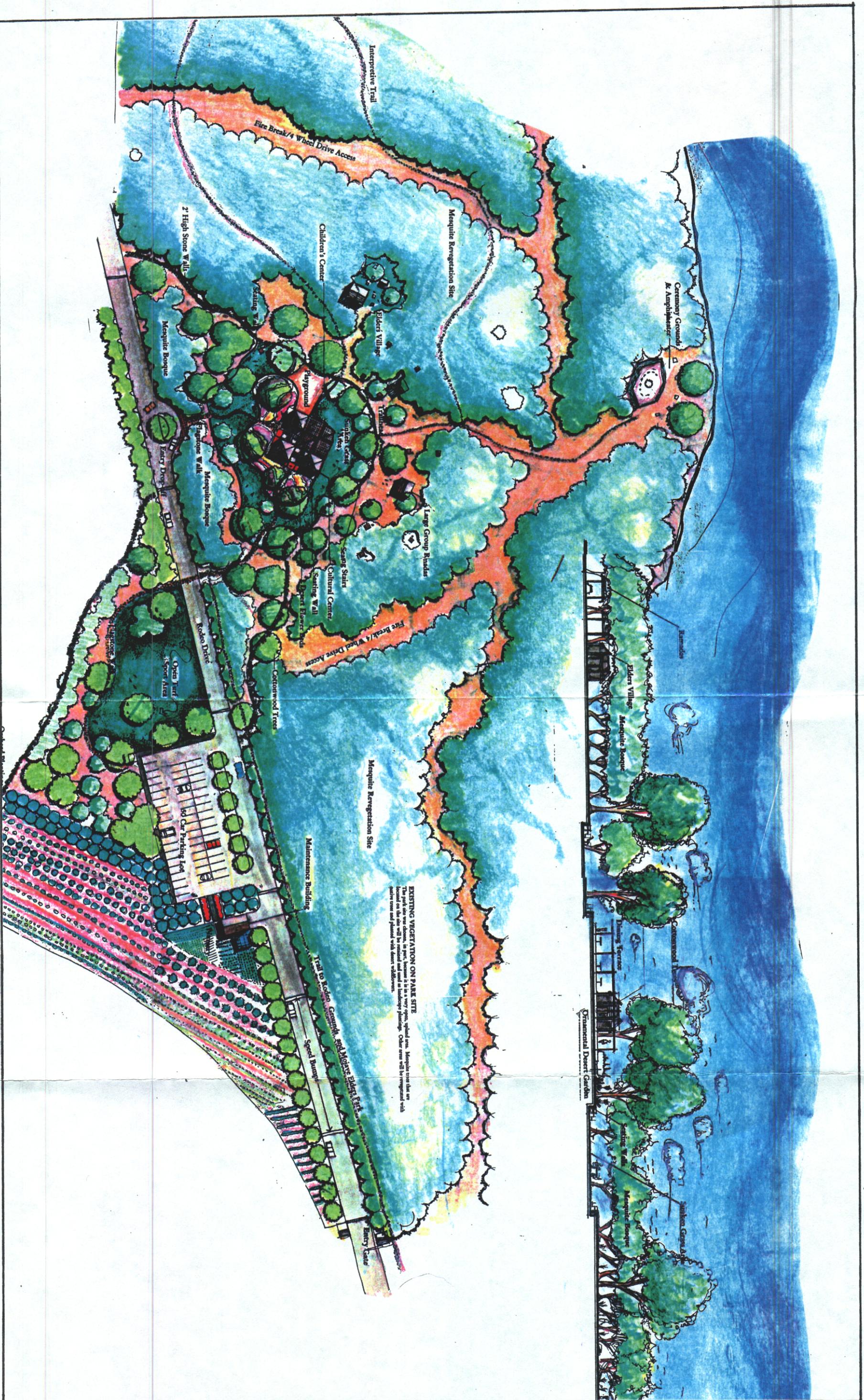


FIGURE 6.4 Preserve Center Master Plan.

## 6.2 CULTURAL OPPORTUNITIES

A Cultural Center will be located at the preserve center. The Cultural Center will offer classes in pottery, using local materials, and basket weaving, using willow branches from the revegetated areas. Ecological and cultural exhibits will be housed in the cultural center as well as a small library / bookstore of history and ecology books and educational materials. Materials will be available to the general public and teachers to encourage school field trips and student involvement in preserve activities. Lectures, performances, and meetings will also be held in the center.

A ceremonial ground (Figure 6.5) will include an earth and stone amphitheater with a view of Monument Peak/Needle Mountain (Figure 6.6), stone fire circles and shade ramadas. The ceremonial ground will be available for Mohave Days, Indian Days and tribal performances or gatherings.

Space and labor will be available for the construction of additional traditional structures such as shade ramadas, mud homes and fire pits, as requested by the tribal community. Construction has already begun on a shade ramada at the native plant nursery.



FIGURE 6.5 *Ceremonial Grounds:*  
The ceremonial ground amphitheater will be made of stone, earth, and other indigenous materials. It will be available for such things as Mohave Days, Indian Days, and other ceremonies and celebrations. Shade ramadas and fire rings will be provided near the amphitheater.



FIGURE 6.6 *View From Ceremonial Grounds (Monument Peak/Needle Mountain):* The ceremonial ground amphitheater directly faces a view of Monument Peak/Needle Mountain, with the 'Ahakhav Backwater just in front of the ceremonial grounds. This view to the mountains will be kept free of taller vegetation.

## **6.3 EDUCATIONAL OPPORTUNITIES**

### **Native Species Nursery**

A small, one acre nursery and greenhouse will be used to educate volunteers and local youth on cutting, growing and transplanting native plants during revegetation efforts (Figures 6.7 and 6.8). In addition to growing cottonwood, mesquite, willow and other native plants, traditional crops will be grown using organic and traditional methods. The nursery's activities will be coordinated with the Cultural Center to promote the traditional use and preparation of native species and traditional crops. The nursery will reduce the cost of revegetating the preserve by providing a continuous supply of propagules. It may also supply seedlings for fundraising sales benefitting the preserve.

### **Interpretive Trails**

An interpretive trail system is being constructed which will lead throughout the 'Ahakhav Backwater portion of the preserve. Detailed interpretive signs along the trails will present the cultural and ecological history of the area, highlighting the relationship between humans, wildlife and the native habitat. Native plant and animal species will be noted, with endangered species receiving special consideration. Important food and medicinal plants will be labeled and their uses described. Restoration rationale and operations will be described where appropriate. Figure 6.9 depicts a cross section of the trail, and an example of an interpretive sign is presented in Figure 6.10. Tribal members and local volunteers have already begun construction of the first trail (Figure 6.12).

A boardwalk will be constructed over a portion of the wetland area (Figure 6.11) to allow better viewing of wetland plants and wildlife. Roughhewn wooden benches and bird viewing pavilions will be placed along the trails and boardwalk.

### **Species Monitoring**

Volunteers and students will be recruited to assist in the monitoring of native plant and wildlife species. Quantities, overall health, and distribution of species will be monitored to assist in determining the direction of future restoration efforts. Species monitoring operations will be coordinated through the nursery and the preserve office. Cooperation with local schools and colleges will be pursued.

### **Wilderness Challenge**

A local outdoor program has been developed to provide individuals and groups with experiential learning opportunities. Through physical challenge, skill acquisition and group problem solving in wilderness settings, participants renew confidence in their own and others' capabilities - physically, mentally and socially. Currently, youth are targeted as participants, though eventually, other groups are expected to use the program as all people can benefit from experiencing the wilderness as a training ground. As soon as possible, training for trips will be conducted on the

preserve and organized out of the Cultural Center. Though some overnights will be held on the preserve, longer trips will usually involve travel to more remote areas (Figure 6.13).

### **Children's Center**

A Children's Center will be located next to the Cultural Center, to support education and low-impact recreation for youth under 13 years of age. Outdoor education programs, parties, group hikes, and classes oriented toward younger audiences will be operated out of this building. In addition, the center will be available to house vacation and summer day camps. An educational playground which will blend in with the surroundings will be located adjacent to the Children's Center.

### **Environmental Education Package**

Work has already begun on an environmental education package that will be prepared for local schools. The package will include outlines of several different field trips, varying by season of the year, ages of participants, and length of stay. Follow-up activities will allow teachers to return to the classroom and use what was learned at the Preserve as the basis for future lessons. Texts for both students and teachers will be developed to allow the Preserve to function as a long-term laboratory for students. Follow-up activities will include nature crafts, writing about lessons learned at the Preserve, using the Internet to find related information, using data from counting birds or plants in algebra and geometry lessons, using the cultural information from the preserve center in history lessons, and growing native plant species for science classes. Educators and volunteers from the Preserve will also visit schools and other facilities in the community. Presentations may include live animals found at the Preserve, and will emphasize the importance of wetland and riparian ecology in the arid Southwest. Educational programs at the Preserve will be outside and rather informal until the Preserve Center has been constructed. Once the facilities exist for classroom activities, the opportunities for both indoor and outdoor learning will improve.



FIGURE 6.7 *Screwbean Mesquite Propagules:*  
The native plant nursery will provide propagules, such as this screwbean mesquite, for future revegetation efforts, as well as for fundraising sales benefitting the Preserve.



FIGURE 6.8 *RWMC Cottonwood and Willow Nursery:*  
A nursery such as this one, operated by the Revegetation & Wildlife Management Center, Inc., has been constructed at the Preserve Center. A crew has already planted nearly 2000 propagules to be used in next year's revegetation efforts.

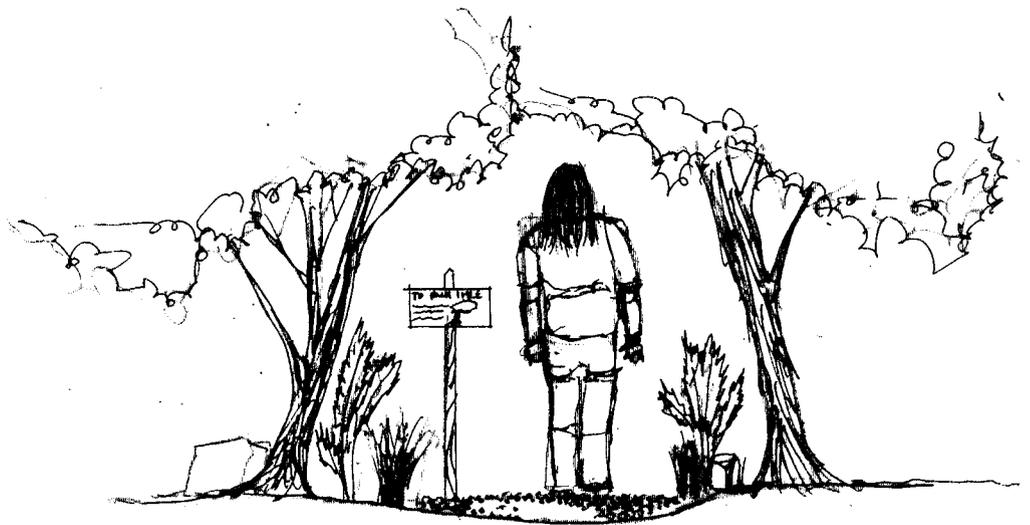
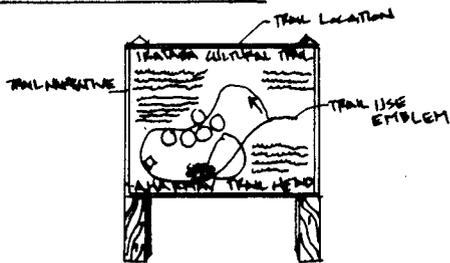


FIGURE 6.9 Trail Cross-Section

MAIN TRAIL HEAD SIGNS



SECONDARY SIGNS

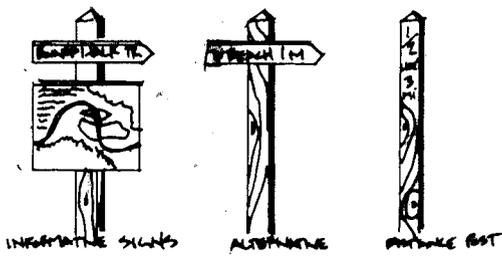


FIGURE 6.10 Interpretive Trail Sign Detail:

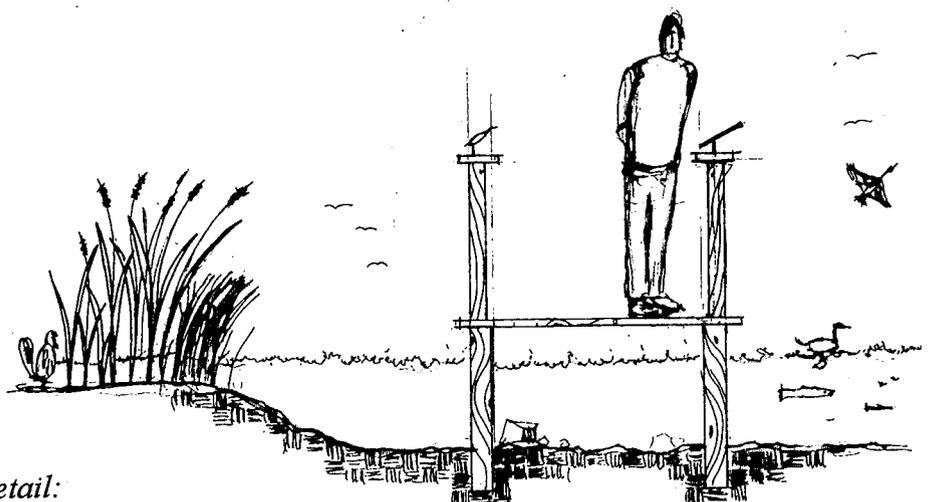


FIGURE 6.11 Boardwalk Trail Detail:



FIGURE 6.12 *Construction of First Trail:*

A bulldozer from CRIT Farms and an operator from CRIT Landfill cleared areas to be used as trails. Brush will be cleared and gravel will be installed for easier walking. Interpretive signs will also be installed to illustrate the wildlife, plants, and cultural importance of the Preserve.



FIGURE 6.13 *CRIT Education Trip -- Diamond Creek, Grand Canyon:*

An autumn trip to Diamond Creek was sponsored by the 'Ahakhav Tribal Preserve and CRIT Education. Members of the CRIT community donated personal gear for thirteen children to spend a weekend in the Canyon. Such trips will become a regular event for Wilderness Challenge, sponsored by the preserve, CRIT Education, and La Paz County Search and Rescue.

## 6.4 LOW-IMPACT RECREATIONAL OPPORTUNITIES

Low-impact recreation such as birdwatching\*, outdoor photography (Figure 6.14), hiking, camping, non-motorized boating (Figure 6.15), fishing and hunting will be allowed throughout the preserve, though permits will be required for camping, fishing and hunting. Permits and rental equipment such as canoes, tents and fishing poles will be available through the Preserve Office. Revenues from equipment rentals will help fund preserve programs and maintenance.

Hiking areas will be provided by trails constructed in the preserve. However, the trails will not be paved and will not disturb sensitive wetland habitats. Trails will be concentrated in the vicinity of the Preserve Center, though there will be a trail connecting the 'Ahakhav Backwater and Deer Island, and eventually a regional trail connecting the preserve with such places as the Rodeo Grounds, the Mohave Elders Village, and Blue Water park.

An existing sandy beach (Figure 6.16) will be used as a swimming area. This secluded swimming lagoon requires little alteration to be enjoyable. A 1/4 mile trail leads from a main road to the lagoon, while a 1/2 mile trail leads from the lagoon to the Preserve Center. Shade ramadas will also be constructed near the beach.

Fishing will continue to be an important form of recreation on the preserve, and permits will be available for purchase at the Preserve Office or the CRIT Fish and Game office. A small fishing dock will be provided on the backwater near the Preserve Center.

Hunting will be allowed in the preserve, but temporal and spatial zoning will be employed for the safety of the public. Deer Island may have hunting regulations much like the current ones. In order to protect visitors, there will be no hunting in the 'Ahakhav Backwater area of the preserve. Hunting permits will be available at the Preserve Office or the CRIT Fish and Game office.

\* Birds of the Lower Colorado River Valley, by K. Rosenberg, R. Ohmart, W. Hunter and B. Anderson, is a thorough, well written text including 244 pages of species accounts and a section with maps of the best birding spots along the lower Colorado River. See reference section.



FIGURE 6.14 *Outdoor Photography:*  
Sunsets over the backwaters and surrounding mountains are exceptional. Opportunities exist for all kinds of outdoor photographers, including those photographing wildlife, flowers, or even their child's first swimming lesson.



FIGURE 6.15 *Canoeing in Deer Island Backwater:*  
Canoe rentals from the preserve have already begun. Canoeing the backwater areas offers a view of the River and the reservation itself that is not often seen. Wildlife viewing, photography, and fishing are just some of the activities more easily enjoyed in the backwaters than on the jet-ski infested river.

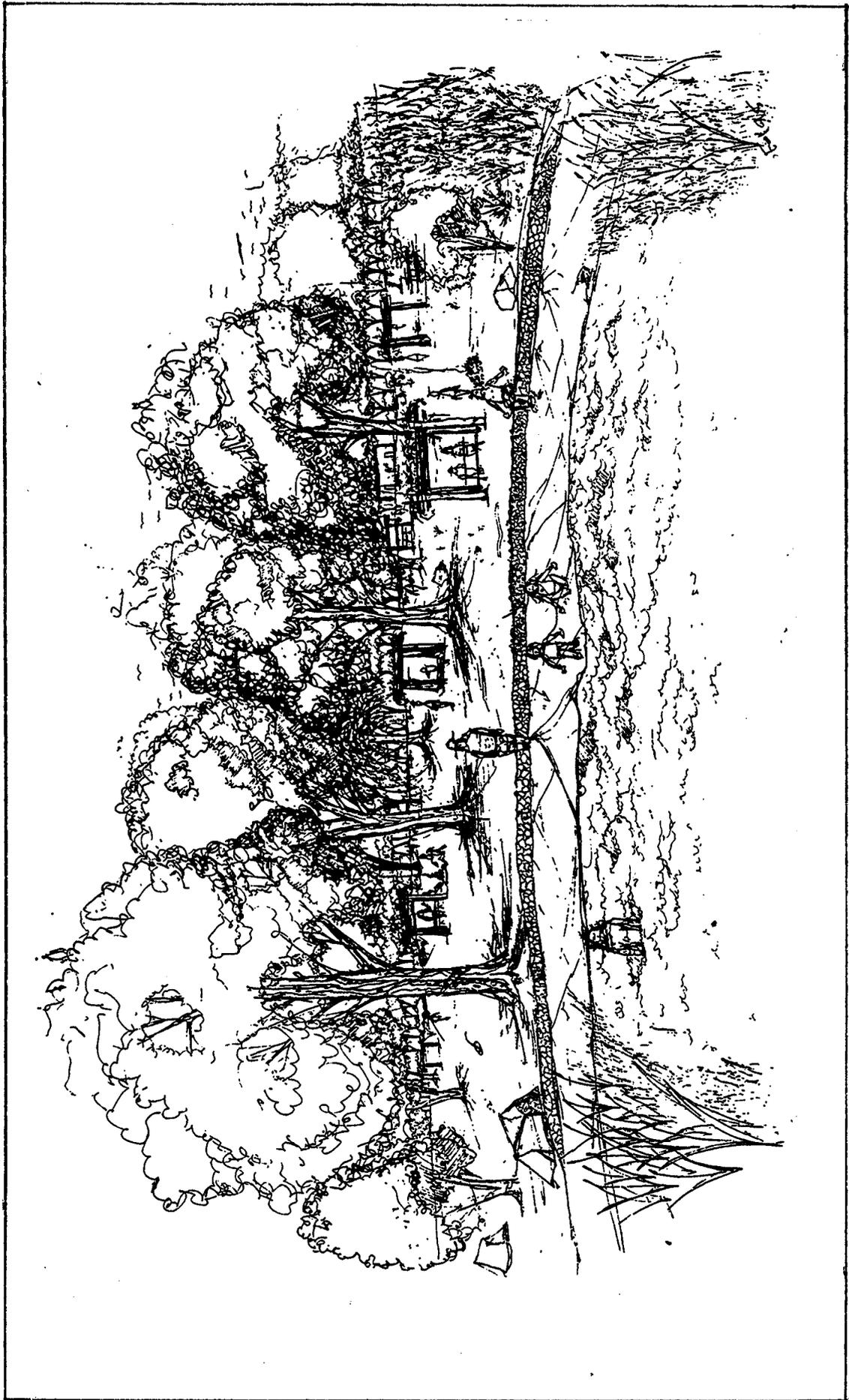


FIGURE 6.16 'Ahakhav Tribal Preserve Beach Area

## 6.5 IMPACT OF CULTURAL, EDUCATIONAL, AND RECREATIONAL ACTIVITIES ON THE ENVIRONMENT

*Water Quality and Usage:* Water quality will be only slightly impacted by a temporary increase in turbidity caused by construction. Bulldozers and other earth movers will be used only on the highest areas of the site, primarily in the vicinity of the buildings, parking areas, and entrance gate. Earth movers will not be used near wetland areas to prevent serious increases in turbidity. Regulations prohibiting motorized boats will prevent increased pollution caused by fuel spills, and swimming in the lagoon will cause negligible impact. Beach use and hiking may increase the amount of trash in the water, but volunteers and individuals meeting community service requirements will be recruited to clean-up the trash. Water consumption on the site will increase with irrigation of landscape plantings and human use through preserve facilities.

*Vegetation:* Most construction is occurring on upland sites with little vegetation, and building areas have been carefully selected to avoid valuable habitat. However, vegetation in the Preserve Center has been affected by ongoing construction. Native trees have been saved during clearing of the Preserve Center site. Trails are being constructed of local crushed stone and avoid existing trees that are to be retained. Recreational use of the preserve center may impact some vegetation as root exposure and erosion problems occur, though this will probably only be a problem in areas near the trails and preserve center.

*Wildlife:* Construction on the site will have the most damaging effect on wildlife. However, construction will be scheduled during non-breeding seasons for most species, and disturbances will be primarily in the four-acre Preserve Center. Recreational activities will disturb the more sensitive species, but this, too, will be localized.

### Costs

Please refer to Tables 7.4 and 7.5 (in Section 7.0) for costs associated with construction and maintenance of the Preserve Center.

## 7.0 RESTORATION BUDGETS, GRANT AWARDS AND TIMETABLES



**TABLE 7.1 Dredge Engineering, Construction, and Monitoring Costs.**

***PRE- DREDGE HYDROGRAPHIC MAPPING AND DREDGE DESIGN***

<b>ITEM</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL</b>
Control Research	Lump	\$3,376	\$3,376
Hydrographic Surveys of Backwaters	Lump	\$20,825	\$20,825
Dredge Channel Design	Lump	\$59,716	\$59,716
Equipment	Lump	\$3,240	\$3,240
Labor	Lump	\$6,418	\$6,418
Overhead	Lump	\$13,716	\$13,716
<b>Total Cost For Hydrographic Mapping and Dredge Design</b>			<b>\$107,291</b>

***PRE-DREDGE BIOLOGICAL ASSESSMENT***

<b>Pre-Action Assessment</b>			
<i>Compilation of Existing Literature, Hydrolab Parameters and Flow Data, Seasonal Inventory of Aquatic Algae and Invertebrates, and Seasonal Fisheries Inventory</i>			
	Lump	\$20,430	\$20,430
Monitoring of Hydrolab Parameters	Lump	\$4,540	\$4,540
Monitoring of Seasonal Benthos and Plankton	Lump	\$6,810	\$6,810
Monitoring of Seasonal Fisheries	Lump	\$6,810	\$6,810
Electrofishing Boat	Lump	\$6,000	\$6,000
Travel and Per Diem	Lump	\$3,292	\$3,292
Equipment	Lump	\$3,000	\$3,000
Administration Costs	Lump	\$10,176	\$10,176
<b>Total Cost For Pre-Dredge Biological Assessment</b>			<b>\$61,058</b>

***DREDGING OPERATIONS***

**'AHAKHAV BACKWATER**

Channel Dredge	1 cu. yd	\$3	\$594,223
Permeable Structure	Each	\$30,000	\$60,000
Flood Control Gate	Each	\$30,000	\$60,000

**DEER ISLAND BACKWATER**

Channel Dredge	1 cu. yd.	\$3	\$1,113,570
Permeable Structures	Each	\$30,000	\$60,000
Flood Control Gate	Each	\$30,000	\$30,000

Dredge Mobilization	Lump	\$40,000	\$40,000
Equipment Storage Platform (100' x 75')	Lump	\$7,500	\$7,500

<b>TOTAL DREDGE - 'AHAKHAV BACKWATER</b>			<b>\$714,223</b>
<b>TOTAL DREDGE - DEER ISLAND BACKWATER</b>			<b>\$1,203,570</b>
<b>TOTAL MOBILIZATION AND STORAGE</b>			<b>\$47,500</b>

<b>Total Dredging Cost For Preserve</b>			<b>\$1,965,293</b>
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**TABLE 7.1 (continued)**

***POST-DREDGE SEDIMENT MONITORING AND MAPPING***

<b>ITEM</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL</b>
Post Dredge Hydrographic Mapping	Lump	\$46,100	\$46,100
<b>Total For Post-Dredge Hydrographic Mapping</b>			<b>\$46,100</b>

***POST-DREDGE BIOLOGICAL ASSESSMENT AND MONITORING***

Monitoring of Hydrolab and Stage Flow Data	Lump	\$2,724	\$2,724
Monitoring of Seasonal Benthos and Plankton	Lump	\$6,810	\$6,810
Monitoring of Seasonal Fisheries	Lump	\$6,810	\$6,810
Electrofishing Boat	Lump	\$6,000	\$6,000
Travel and Per Diem	Lump	\$1,680	\$1,680
Equipment	Lump	\$2,000	\$2,000
Administration Costs	Lump	\$6,604	\$6,604
<b>Total For Post-Dredge Biological Assessment and Monitoring</b>			<b>\$32,628</b>

*Total Cost For Pre-Dredge Hydrographic Mapping and Dredge Design* **\$107,291**

*Total Cost For Pre-Dredge Biological Assessment* **\$61,058**

*Total Dredging Cost For Preserve* **\$1,965,293**

*Total For Post-Dredge Sediment Monitoring and Mapping* **\$46,100**

*Total For Post-Dredge Biological Assessment and Monitoring* **\$32,628**

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***TOTAL DREDGE ENGINEERING, CONSTRUCTION AND MONITORING COSTS*** **\$2,212,371**

\* All hydrographic mapping, dredge design, and post-dredge monitoring will be performed by Glen Canyon Environmental Studies of the U.S. Bureau of Reclamation.

\* All dredging operations will be performed by the U.S. Bureau of Reclamation, Yuma Office.

\* All construction and labor costs are included in cost estimate.

**TABLE 7.2 10-Year Revegetation and Bird Censusing  
Cost Estimate.**

<b>TIME FRAME</b>	<b>LOCATION</b>	<b>ITEM</b>	<b>UANTIT</b>	<b>UNIT</b>	<b>UNIT PRIC</b>	<b>TOTAL</b>
Year 1	Preserve	<i>Revegetation</i>	50	<i>Acre</i>	\$3,999	\$199,950
Year 2	Preserve	<i>Revegetation</i>	50	<i>Acre</i>	\$3,999	\$199,950
		<i>Bird Censusing</i>	21	1 Census	\$240	\$5,040
Year 3	Preserve	<i>Revegetation</i>	50	<i>Acre</i>	\$3,999	\$199,950
Year 4	Preserve	<i>Revegetation</i>	50	<i>Acre</i>	\$3,999	\$199,950
		<i>Bird Censusing</i>	21	1 Census	\$240	\$5,040
Year 5	Preserve	<i>Revegetation</i>	50	<i>Acre</i>	\$3,999	\$199,950
Year 6	Preserve	<i>Revegetation</i>	50	<i>Acre</i>	\$3,999	\$199,950
		<i>Bird Censusing</i>	21	1 Census	\$240	\$5,040
Year 7	Preserve	<i>Revegetation</i>	50	<i>Acre</i>	\$3,999	\$199,950
Year 8	Preserve	<i>Revegetation</i>	50	<i>Acre</i>	\$3,999	\$199,950
		<i>Bird Censusing</i>	21	1 Census	\$240	\$5,040
Year 9	Preserve	<i>Revegetation</i>	50	<i>Acre</i>	\$3,999	\$199,950
Year 10	Preserve	<i>Revegetation</i>	50	<i>Acre</i>	\$3,999	\$199,950
		<i>Bird Censusing</i>	21	1 Census	\$240	\$5,040
<b><i>Total Revegetation and Bird Censusing of Preserve in Ten Years</i></b>						<b>\$2,019,660</b>

\* See table 7.3 for detailed cost breakdown.

\* All revegetation plantings will be supplied by the 'Ahakhav Native Plant Nursery.

\*There are 500 acres of potential revegetation areas. Preliminary analysis will determine how many acres are actually suitable for revegetation.

**TABLE 7.3 Revegetation and Bird Censusing Cost Breakdown.**

**FIFTY-ACRE REVEGETATION COST BREAKDOWN:**

<b>Item</b>	<b>Cost</b>	<b>Contractor</b>	<b>CRIT</b>
Clearing, levelling, waterpipe installation			\$19,000
Preliminary analysis		\$11,880	
Auguring	6,250 Holes @ \$3/hole	\$13,750	\$5,000
Intensive Soil Analysis	500 samples @ \$50/sam	\$25,000	
Irrigation system installation	45 acres @ \$240/ac	\$2,000	\$10,000
Propagules	6,250 plants @ \$3/plant	\$2,000	\$16,750
Planting	6,250 plants @ \$1/plant	\$2,600	\$3,650
Irrigation	120 days @ \$100/day	\$10,000	\$2,000
Monitoring	18 times @ \$350/Week	\$6,300	
Report	100 hrs @ \$55/hr	\$5,500	
<b>Subtotal</b>		<b>\$79,030</b>	<b>\$56,400</b>
Overhead		\$31,612	\$8,460
Truck	125 days @ \$40/day	\$5,000	
Irrigation system and fertilizer	50 acres @ \$240/ac	\$12,000	
Follow-up monitoring and reports		\$3,200	
Follow-up maintenance (irrigation, replanting)			\$4,248
<b>Total Costs</b>		<b>\$130,842</b>	<b>\$69,108</b>
		(\$2,157/ac)	(\$1,843/ac)
<b>Total Cost for 50 Acre Revegetation Project</b>		<b>\$199,950</b>	
		(\$3,999/ac)	
<b>Total Cost for 10 Year Revegetation Plan</b>			<b>\$1,999,500</b>

**BIRD CENSUSING:**

**1 Year Bird Census for Entire 1042 Acre Preserve**

21 Censuses of Entire Preserve During 1 Year Period	21 censuses @ \$240/cen	\$5,040
<b>Total Cost for 1 Year, 1042 Acre Bird Census</b>		<b>\$5,040</b>
<b>Total Cost for 10 Years of Bird Censusing and Monitoring</b> (one census every two years)		<b>\$25,200</b>

**TABLE 7.4 Preserve Facilities Cost Estimate (Phase Cost Breakdown).**

***CIVIL BUDGET***

<b>ITEM</b>	<b>SIZE</b>	<b>QUANTITY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL</b>
Earthwork				Lump Sum	\$10,000
Electric Hook-up: Preserve Center				Lump Sum	\$10,000
Composting Toilets	1	3	each	\$8,000	\$24,000
Septic System	1		each	Lump Sum	\$10,000
Water Main (4" Line): Camping Facilities				Lump Sum	\$10,000
Water Main (6" Line): Preserve Center				Lump Sum	\$18,000
<b><i>Total Civil Work</i></b>					<b><i>\$82,000</i></b>

***HARDSCAPE MATERIALS***

Entry Gate Building	100 sq.ft.	1		\$40	\$4,000
Preserve Center Building	4500 sq.ft.	1		\$40	\$180,000
Access Roads	2 Miles			Lump Sum	\$10,000
Access Gates		3	each	\$800	\$2,400
Ceremonial Grounds				Lump Sum	\$20,000
Flagstone Path	6' Wide	3510	sq.ft.	\$15	\$52,650
Ramadas		40	each	\$500	\$20,000
Cast Iron Fire Pits		20	each	\$50	\$1,000
Seating Walls	18" Wall	675	lin.ft.	\$40	\$27,000
Fishing and Boat Dock		1	each	\$3,000	\$3,000
Boardwalk Trail		2500	sq.ft.	\$10	\$25,000
Stone Wall	2' High	1380	lin.ft.	\$10	\$13,800
Parking Lot	200' x 100'			Lump	\$10,400
Colored Concrete Patio		2200	sq.ft.	\$4	\$8,360
Colored Concrete Path		4000	sq.ft.	\$4	\$15,200
Wood Arbor	200' x 100'			Lump	\$10,400
Stairs	12"x 18"	175	lin.ft.	\$40	\$7,000
Specialized Paving	6' x 6'	1260	sq.ft.	\$10	\$12,600
Benches		20	each	\$200	\$4,000
Picnic Tables		40	each	\$200	\$8,000
Information Kiosk		1	each	\$2,000	\$2,000
Interpretive Trail	4' Wide	7080	sq.ft.	\$1	\$3,682
Trail Head Signs		4	each	\$150	\$600
Preserve Boundary Signs		150	each	\$50	\$7,500
Interpretive Trail Signs		15	each	\$600	\$9,000
Park Entry Sign		1	each	\$6,000	\$6,000
Trash Containers		20	each	\$100	\$2,000
Wildlife-Proof Food Containers		10	each	\$100	\$1,000
Canoes		20	each	Lump Sum	\$10,000
Native Vegetation Nursery		1		Lump Sum	\$10,000
<b><i>Total Hardscape Cost</i></b>					<b><i>\$472,592</i></b>

**TABLE 7.4 (continued)**

***LANDSCAPE MATERIALS***

Park Tree Planting	9	acre	\$3,500	\$31,500
Native Flowers and Shrubs	1	acre	Lump Sum	\$10,000
<b><i>Total Landscape Cost</i></b>				<b><i>\$41,500</i></b>

***TOTAL COST FOR PARK CONSTRUCTION*** ***\$596,092***

\*All construction and labor costs are included in cost estimate.

**TABLE 7.5 Preserve Management and Personnel Cost (One Year Budget).**

<b>ITEM</b>	<b>COST</b>
Project Planner / Manager Salary	\$36,000
Preserve Ranger	\$25,000
Wildlife Biologist	\$25,000
Maintenance Person	\$17,000
Maintenance Person	\$17,000
Secretary	\$16,000
Student Intern	\$5,000
Student Intern	\$5,000
Operating Costs	\$20,000
Computer	\$6,000
Equipment	\$25,000
Facilities Maintenance	\$15,000
<u>Consulting Fees</u>	<u>\$8,000</u>
<b><i>TOTAL OPERATING BUDGET</i></b>	<b><i>\$220,000</i></b>

**TABLE 7.6 Total 10 Year Construction Cost.**

<i>Total for Preserve Center and Facilities Construction</i>	\$596,092
<i>Total for Pre-Dredge Hydrographic Mapping</i>	\$107,291
<i>Total for Pre-Dredge Biological Assessment</i>	\$61,058
<i>Total for Dredge Construction</i>	\$1,965,293
<i>Total for Ten Year 500-Acre Revegetation</i>	\$1,999,500
<i>Total for 40 Raptor Perches</i>	\$4,000
<i>Total for 10 Year Bird Censusing</i>	\$25,200
<i>Total for Post-Dredge Hydrographic Mapping and Monitoring</i>	\$46,100
<i>Total for Post-Dredge Biological Assessment and Monitoring</i>	\$32,628
<b><i>Total 10 Year Construction Cost For the 'Ahakhav Tribal Preserve</i></b>	<b>\$4,837,163</b>

**TABLE 7.7 In-Kind and Cash Contributions (5/96).**

<b>Contributing Agency</b>	<b>Contribution</b>	<b>Amount Donated</b>	<b>Date</b>	<b>Total</b>	
Colorado River Indian Tribes (CRIT)	"Ahakhav Preserve Project Budget		FY 95		
	Project Planner/Manager Salary	\$27,000			
	Student Interns	\$6,000			
	Operating Costs	\$4,000			
	Travel	\$2,000		\$39,000	
	'Ahakhav Preserve Project Budget		FY 96		
	Project Planer / Manager Salary	\$31,907			
	Operating Costs	\$15,000			
	Student Interns	\$7,920			
	Travel	\$2,000			
CRIT Administration	20 Acre Topographic Survey of Preserve Center	\$4,000	FY 96	\$4,000	
	20 Canoes, 2 Trailers	\$11,000	FY 96	\$11,000	
	Tools, Equipment	\$2,000	FY 96	\$2,000	
	4 Wheel Drive Pickup	\$10,000	FY 96	\$10,000	
	4 Wheel Drive White Bronco	\$10,000	FY 96	\$10,000	
	Donated Dump Truck Use	\$12,000	FY 96	\$12,000	
	Administrative Time (50 hrs @ \$50/hr)	\$2,500	FY 95-96	\$2,500	
	CRIT Education	Student Summer Jobs, Additional Operating Costs	\$25,000	FY 96	\$25,000
	CRIT Farms	Selective Clearing of Salt Cedar (560 hrs d-9 dozer @ \$170/hr)	\$95,200	FY 95-96	\$95,200
		Grader and Water Truck (200 hrs tractor @ \$100/hr)	\$20,000	FY 95-96	\$20,000
	4 Wheel Drive Tractor (30 hrs @ \$100/hr)	\$3,000	FY 96	\$3,000	
CRIT Fish and Game	Project Design and Consulting	\$5,000	FY 95-96	\$5,000	
CRIT Landfill	Clean Up of Preserve Site				
	20 Dumpsters, Drop Off and Pick Up	\$1,000	FY 95-96	\$1,000	
CRIT Legal Department	Right of Way Preparation for Water Line Grant Contract Work (100 hrs @ \$150/hr)	\$15,000	FY 95-96	\$15,000	
CRIT Mohave Elders	Site Clean Up (15 elders @ 6 hrs/elder)	90 Hrs Work			
CRIT Museum	Archaeological Walk-Through	\$1,040	FY 95-96	\$1,040	
CRIT Utilities	6" Water Main to Re-Veg. Site	\$18,000	FY 95-96	\$18,000	
CRIT Water Resources	Project Design and Consulting	\$3,485	FY 95-96	\$3,485	
Cal State University	Trail Construction (40 students @ 12hrs/student)	480 Hrs Work			
Intertribal Youth Council	Site Clean-Up (10 youth @ 8 hrs/student)	80 Hrs Work			
La Pera High School	Site Clean-Up (50 students @ 8 hrs/student)	400 Hrs Work			
	Trail Construction (30 students @ 8hrs/student)	240 Hrs Work			
<b>Total Non-Grant Contributions To Date:</b>				<b>\$336,225</b>	

**TABLE 7.8 Grants Awarded to the Preserve (as of 5/96).**

<b>Grant Agency</b>	<b>Grant Action</b>	<b>Grant Award</b>	<b>Total Award</b>
U.S. Bureau of Indian Affairs (Woodlands Grant Program)	<i>Revegetation</i>	\$9,000	\$9,000
U.S. Bureau of Indian Affairs (Woodlands Grant Program)	<i>Revegetation / Native Plant Nursery</i>	\$22,000	\$22,000
U.S. Fish and Wildlife Service (Partners for Wildlife Grant)	<i>Revegetation</i>	\$10,000	\$10,000
AZ Department of Game and Fish	<i>Revegetation and Interpretive Trail</i>	\$37,000	\$37,000
U.S. Bureau of Reclamation (Wetland Construction Money)	<i>Revegetation</i>	\$25,000	\$25,000
U.S. Bureau of Reclamation (Environmental Education)	<i>Environmental Education</i>	\$10,000	\$10,000
U.S. Bureau of Reclamation (Central Utah Completion Act Funds)	<i>Revegetation</i>	\$45,000	\$45,000
<b><i>Total Preserve Grant Awards to Date</i></b>			<b><i>\$158,000</i></b>

**GRANTS AWARDED TO THE WILDERNESS CHALLENGE PROGRAM, WITH  
THE PRESERVE AND LA PAZ COUNTY SEARCH AND RESCUE AS TRUSTEES:**

Patagonia	<i>20 Anorak Jackets</i>	\$1,000	\$1,000
Slumber Jack	<i>9 Sleeping Bags</i>	\$675	\$675
ThermaRest	<i>21 Sleeping Pads</i>	\$210	\$210
U.S. Army	<i>Clothing and Equipment</i>	\$300	\$300
<b><i>Total Wilderness Challenge Grant Awards to Date</i></b>			<b><i>\$2,185</i></b>

**TABLE 7.9 Preserve Planning and Construction Timeline.**

<b>Job Task</b>	<b>Entities Involved</b>	<b>Proposed Completion</b>	<b>Task Status</b>
<b>Year One: August 1995 - August 1996</b>			
First Draft of 'Ahakhav' Tribal Preserve Plan	'Ahakhav' Tribal Preserve Planning Team (Colorado River Indian Tribes)	Aug-95	Complete
Plan Approval By Resolution	CRIT Tribal Council	Aug-95	Complete
Section 107 Critical Habitat Consultation	U.S. Fish and Wildlife Service	Sep-95	Complete
Section 106 State Historic Preservation Office Consultation	SHPO	Nov-95	Complete
National Environmental Protection Act (NEPA) Consultation	U.S. Department of the Interior, Bureau of Indian Affairs	Apr-96	Complete
U.S. Army Corps of Engineers Wetland Restoration Permit	U.S. Army Corps of Engineers	Jul-96	Being Reviewed
Public and Agency Comment / Review of Preserve Plan	USBR, USACOE, AZG&F, CRIT, CALF&G, USBLM, USFWS, USBIA, Tribal Members, and Parker Community	Aug 95 -Apr 96	Complete
Preparation of Final Draft of Preserve Plan	'Ahakhav' Tribal Preserve Planning Team	Jun-95	Complete
Right of Way Application for Utilities to Preserve Center	'Ahakhav' Tribal Preserve Planning Team	Nov-95	ROW Secured
Topographic Survey Of Preserve Center Site and Preserve Boundary	Glen Canyon Environmental Studies	May-96	Complete
Construction Drawing Package for Preserve Facilities	'Ahakhav' Tribal Preserve Planning Team	Aug-96	In Progress
Completion of All Construction Plans and Permits	'Ahakhav' Tribal Preserve Planning Team	Jul-96	Complete Except Wetland Restoration Permit
Initial Grant Proposal Applications for Preserve Funding	'Ahakhav' Tribal Preserve Planning Team	Aug 95-Jan 96	\$160,000 in Grants Awarded to Date
Construction of 6" Water Main to Preserve Center and 25 Acre Revegetation Site	CRIT	Feb-96	Complete
Revegetation of First 25 Acres	CRIT, Revegetation & Wildlife Management Center, Inc.	Jun-96	Complete
Construction of Native Plant Nursery	CRIT, Revegetation & Wildlife Management Center, Inc.	Jun-96	Complete
Clearing and Rough Grading of Preserve Center and 25 Acre Revegetation Sites	CRIT, Volunteers in Parker Community	Feb-96	Complete
Nature Trail Clearing and Construction	CRIT	Feb 96-Aug 96	In Progress
Revegetation of Second 25 Acre Revegetation Site	CRIT, Revegetation & Wildlife Management Center, Inc.	Jul 96-Dec 96	In Progress
Interpretive Signs for Nature Trail	'Ahakhav' Tribal Preserve Planning Team	Aug-96	In Progress

**TABLE 7.9 (continued).**

Boundary Signage Installation	CRIT	Aug-96	In Progress
Wilderness Challenge Program	CRIT, La Paz County Search and Rescue	Jan-96	In Progress
Environmental Education Plan For Preserve	'Abakhav Tribal Preserve Planning Team	Jul-96	In Progress
North American Wetlands Conservation Act Grant	'Abakhav Tribal Preserve Planning Team	Aug-96	In Progress
Proposal			
Arizona Water Protection Fund Grant Proposal	'Abakhav Tribal Preserve Planning Team	Aug-96	In Progress
Department of Transportation Grant Proposal	'Abakhav Tribal Preserve Planning Team	Aug-96	In Progress
Other Funding Proposals	'Abakhav Tribal Preserve Planning Team	Aug-96	In Progress

***Year Two: August 1996 - August 1997***

Announcement of Grant Awards	Funding Agencies	Aug 96-Nov 96	To Be Announced
Seasonal Bird Census of Preserve	CRIT	Oct-96	To Be Completed
Final Contract Bidding	CRIT / ADOIT	Dec 96-Jan 97	To Be Completed
Hydrographic Surveying and Channel Dredge Design	Glen Canyon Environmental Studies	Feb 97- Mar 97	To Be Completed
Pre-Dredge Biological Assessment	Glen Canyon Environmental Studies	Feb 97- Mar 97	To Be Completed
Seasonal Bird Census of Preserve	CRIT	Jan-97	To Be Completed
Clearing of 50 Acre Revegetation Site	CRIT	Feb-97	To Be Completed
Installation of 40 Raptor Perches	CRIT	Feb-97	To Be Completed
Construction of Weirs and Percolation Dikes at Backwaters	U.S. Bureau of Reclamation	Feb 97-Mar 97	To Be Completed
Construction of Preserve Center Facilities Begins	Contractor / CRIT	Mar-97	To Be Completed
Seasonal Bird Census of Preserve	CRIT	Apr-97	To Be Completed
50 Acre Revegetation	CRIT / Revegetation & Wildlife Management Center, Inc.	Jun-97	To Be Completed
Seasonal Bird Census of Preserve	CRIT	Jul-97	To Be Completed
Dredging Construction Begins	U.S. Bureau of Reclamation	Aug-97	To Be Completed
Construction of Preserve Center Complete	Contractor / CRIT	Aug-97	To Be Completed
50 Acre Revegetation Completed	CRIT	Aug-97	To Be Completed

TABLE 7.9 (continued).

**Year Three: August 1997 - August 1998**

Preserve Center Up and Running	CRIT	Sep-97	To Be Completed
Dredging Construction Continues	U.S. Bureau of Reclamation	Aug 97-Aug 98	To Be Completed
Clearing of 50 Acre Revegetation Site	CRIT	Feb-98	To Be Completed
50 Acre Revegetation	CRIT / Revegetation & Wildlife Management Center	Jun-98	To Be Completed
50 Acre Revegetation Complete	CRIT / Revegetation & Wildlife Management Center	Aug-98	To Be Completed
Dredging Construction Completed	U.S. Bureau of Reclamation	Aug-98	To Be Completed

**Year Four: August 1998 - August 1999**

Post Dredge Biological Assessment	Glen Canyon Environmental Studies	Oct-98	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Oct-98	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Jan-99	To Be Completed
Clearing of 50 Acre Revegetation Site	CRIT / Revegetation & Wildlife Management Center, Inc.	Feb-99	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Apr-99	To Be Completed
50 Acre Revegetation Planting	CRIT / Revegetation & Wildlife Management Center, Inc.	Jun-99	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Jul-99	To Be Completed
50 Acre Revegetation Complete	CRIT / Revegetation & Wildlife Management Center, Inc.	Aug-99	To Be Completed
Post Dredge Sediment Monitoring and Mapping	Glen Canyon Environmental Studies	Mar-99	To Be Completed

**Year Five: August 2000 - August 2001**

Clearing of 50 Acre Revegetation Site	CRIT / Revegetation & Wildlife Management Center, Inc.	Feb-01	To Be Completed
50 Acre Revegetation Planting	CRIT / Revegetation & Wildlife Management Center, Inc.	Jun-01	To Be Completed
50 Acre Revegetation Complete	CRIT / Revegetation & Wildlife Management Center, Inc.	Aug-01	To Be Completed

**TABLE 7.9 (continued).**

***Year Six: August 2001 - August 2002***

Seasonal Bird Censusing of Preserve	CRIT	Oct-01	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Jan-02	To Be Completed
Clearing of 50 Acre Revegetation Site	CRIT / Revegetation & Wildlife Management Center, Inc.	Feb-02	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Apr-02	To Be Completed
50 Acre Revegetation Planting	CRIT / Revegetation & Wildlife Management Center, Inc.	Jun-02	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Jul-02	To Be Completed
50 Acre Revegetation Complete	CRIT / Revegetation & Wildlife Management Center, Inc.	Aug-02	To Be Completed

***Year Seven: August 2002 - August 2003***

Post-Dredge Biological Assessment	Glen Canyon Environmental Studies	Oct-02	To Be Completed
Clearing of 50 Acre Revegetation Site	CRIT / Revegetation & Wildlife Management Center, Inc.	Feb-03	To Be Completed
50 Acre Revegetation Planting	CRIT / Revegetation & Wildlife Management Center, Inc.	Jun-03	To Be Completed
50 Acre Revegetation Complete	CRIT / Revegetation & Wildlife Management Center, Inc.	Aug-03	To Be Completed
Post Dredge Sediment Monitoring and Mapping	Glen Canyon Environmental Studies	Mar-03	To Be Completed

***Year Eight: August 2003 - August 2004***

Seasonal Bird Censusing of Preserve	CRIT	Oct-03	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Jan-04	To Be Completed
Clearing of 50 Acre Revegetation Site	CRIT / Revegetation & Wildlife Management Center, Inc.	Feb-04	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Apr-04	To Be Completed
50 Acre Revegetation Planting	CRIT / Revegetation & Wildlife Management Center, Inc.	Jun-04	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Jul-04	To Be Completed
50 Acre Revegetation Complete	CRIT / Revegetation & Wildlife Management Center, Inc.	Aug-04	To Be Completed

***Year Nine: August 2004 - August 2005***

Clearing of 50 Acre Revegetation Site	CRIT / Revegetation & Wildlife Management Center, Inc.	Feb-05	To Be Completed
50 Acre Revegetation Planting	CRIT / Revegetation & Wildlife Management Center, Inc.	Jun-05	To Be Completed
50 Acre Revegetation Complete	CRIT / Revegetation & Wildlife Management Center, Inc.	Aug-05	To Be Completed

TABLE 7.9 (continued).

*Year Ten: August 2005 - August 2006*

Post-Dredge Biological Assessment	Glen Canyon Environmental Studies	Oct-05	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Oct-05	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Jan-06	To Be Completed
Clearing of 50 Acre Revegetation Site	CRIT / Revegetation & Wildlife Management Center, Inc.	Feb-06	To Be Completed
Post-Dredge Sediment Monitoring and Mapping	Glen Canyon Environmental Studies	Mar-06	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Apr-06	To Be Completed
50 Acre Revegetation Planning	CRIT / Revegetation & Wildlife Management Center, Inc.	Jun-06	To Be Completed
Seasonal Bird Censusing of Preserve	CRIT	Jul-06	To Be Completed
50 Acre Revegetation Complete	CRIT / Revegetation & Wildlife Management Center, Inc.	Aug-06	To Be Completed

## 8.0 CURRENT WORK IN THE PRESERVE



Implementation of the preserve design began in the winter of 1995 with the installation by CRIT Farms of a 6 inch water main to the first revegetation site and preserve center (Figure 8.1). A 50-acre site has also been prepared for the first phase of revegetation efforts (Figure 8.2). Soil analysis was conducted by the Revegetation Wildlife Management Center, Inc., and the area was cleared of undesirable vegetation using heavy equipment and person-hours from CRIT Farms, CRIT Landfill, CRIT Fish and Game, and CRIT Education (Figure 8.3). Tree planting by the Revegetation & Wildlife Management Center, Inc., began on the first 25 acres in May, 1996 (Figure 8.4). Construction of the Native Plant Nursery (irrigation, fencing, and storage shed) was also begun in May (Figure 8.5), with completion expected in July, 1996. 2.5 miles of trail have been cleared in the 'Ahakhav Backwater, and gravel will be laid in the summer of 1996. A 2-acre grass area with irrigation will be installed during July and August. Seed collection for nursery plant propagation is underway, and will continue throughout the fall of 1996. Plants will then be available for a fundraising sale in Autumn, 1996 and revegetation efforts in Spring, 1997. Glen Canyon Environmental Studies completed the topography survey of the 25-acre revegetation area, including the future site of the Preserve Center.

Grant awards for the restoration of the 'Ahakhav Tribal Preserve have reached over \$160,000 (Table 7.8, section 7.0). Contributors include the Utah Bureau of Reclamation, Yuma Bureau of Reclamation, Bureau of Indian Affairs, U.S. Fish and Wildlife Service, Patagonia, Slumber Jack, the U.S. Army, and Arizona Game and Fish. Grants have been awarded for native species revegetation, the Native Plant Nursery, interpretive signs and trails, and environmental education programs. CRIT has donated a fleet of 20 canoes, Cascade Designs has donated 20 ThermaRest sleeping pads, the U.S. Army donated outdoor clothing and equipment, Slumber Jack donated 9 sleeping bags, and Patagonia donated 20 rain parkas for Preserve-sponsored programs. CRIT has contributed over \$300,000 in cash and in-kind donations (Table 7.7, Section 7.0).

The NEPA consultation (Appendix G), State Historic Preservation Office Section 106 consultation (Appendix C), and U.S. Fish and Wildlife Service Section 107 - Critical Habitat Consultation (Appendix F) have all been completed and restoration operations approved. Thus, all prerequisites have been met for the remaining U.S. Army Corps of Engineers Wetland Restoration permit.

The 'Ahakhav Tribal Preserve has been endorsed by the U.S. Fish and Wildlife Service Lower Colorado River Ecoregion Team, the U.S. Bureau of Reclamation -- Glen Canyon Environmental Studies, the Parker High School Science Department, the Parker Area Historical Society, the Revegetation and Wildlife Management Center, Inc., and CRIT Head Start Program (Appendix J). Requests for additional letters of support (for grant purposes) were sent out in early June. Approximately twenty more letters are expected by the end of the summer.

Public support for the Preserve has been strong, with over 60 people volunteering their efforts to clear trash at the site in December, 1995 (Figure 8.6). The Tribal Youth Council and other children filled over 15 dumpsters with garbage, and were then rewarded with canoe rides and fry bread tacos prepared by the Tribal Elders (Appendix H). Over 60 people also attended a public meeting with the Intermountain West Joint Venture and the U.S. Bureau of Reclamation about the Preserve (Appendix I). Additionally, 25 college exchange students sponsored by the Los

Angeles Rotary Club, the University of Arizona Extension Office, and CRIT Head Start joined local youth and adults in extending the first Preserve trail, clearing under existing mesquite groves, and weeding revegetation sites (Figure 8.7-8.10). In all, there have been over 1000 hours of volunteer work applied to the area.

Wilderness Challenge, a local outdoor youth program, began in the Spring of 1996, with the assistance of the Preserve project and the La Paz County Search and Rescue. Participants are learning tracking techniques, CPR, and wilderness first-aid. Grants and equipment are being pursued through the 'Ahakhav Tribal Preserve for both day and overnight trips.

Employment opportunities at the Preserve are increasing rapidly, with approximately 25 individuals now directly involved with construction, planning, planting, and monitoring of the site. Of these, approximately 16 positions are held by tribal members, primarily tribal youth. A crew of over 10 young men has been clearing brush under existing mesquite trees (Figure 8.11), planting seeds for the nursery, and will soon be planting grass and installing benches for the Preserve Center.

The environmental education package will begin with the completion of this document. The more technical portions will be removed or simplified, leaving the bulk of the proposal to serve as a guide to the Preserve. Suggested activities and study questions will be added at the end of each section in order to allow teachers to use the guide as a text book. Suggested activities will emphasize the use of the Preserve as both a regularly scheduled outdoor laboratory period, and for less frequent field trips. The first environmental education package is scheduled to be completed by August 1.



**FIGURE 8.1** *6-Inch Water Main Installation -- Winter, 1995:*

A 6-inch water main was installed from Mohave Road to the first revegetation site and the future site of the Preserve Center. CRIT Farms installed the main during the slower part of the winter of 1995.



**FIGURE 8.2** *Aerial View of 50-Acre Clearing -- Spring, 1996:*

This aerial photo was taken shortly after the Preserve Center site and first revegetation site were cleared of most existing vegetation. Larger mesquite bosques were spared and are now being cleared of their underbrush.



FIGURE 8.3 *Site Clearing -- Spring, 1996:*

A fifty-acre site was cleared of undesirable vegetation using person hours and equipment from CRIT Farms, CRIT Landfill, CRIT Fish and Game, and CRIT Education. Vincent Alcaida (above), of CRIT Landfill, operated the D-9 dozer.



FIGURE 8.4 *First 25-Acre Revegetation Site -- Spring, 1996:*

The first revegetation area was planted during the Spring of 1996. Wolfberry, saltbush, quailbush, honey mesquite, screwbean mesquite, Chilean mesquite, and cottonwood were planted along winding rows of irrigation line. Willow was not successfully propagated, but should be available in time for the next 25-acre site in the Spring of 1997.



FIGURE 8.5 *Native Plant Nursery -- Summer, 1996:*

The nursery was constructed during the Summer of 1996. A fence, shed, and irrigation lines will provide a head start for seedlings and poles before being used on site for future revegetation projects. Additionally, some plants may be sold in fundraising events for the Preserve.



FIGURE 8.6 *Trash Clean-Up Day -- Winter, 1996:*

Over 60 people participated in a trash clean-up day on the Preserve in December 1995. Over 15 dumpsters were filled with trash before everyone received canoe rides and fry-bread tacos prepared by the Mohave Elders.



FIGURE 8.7 *Trail Day -- Spring, 1996:*  
Students from California State, L.A., joined tribal members and other volunteers to clear trails and mesquite bosques during the Spring of 1996. The college students were sponsored by CRIT Head Start, the L.A. Rotary Club, and the University of Arizona Extension Office.



FIGURE 8.8 *Trail Day -- Spring, 1996*



FIGURE 8.9 *Trail Day -- Spring, 1996*

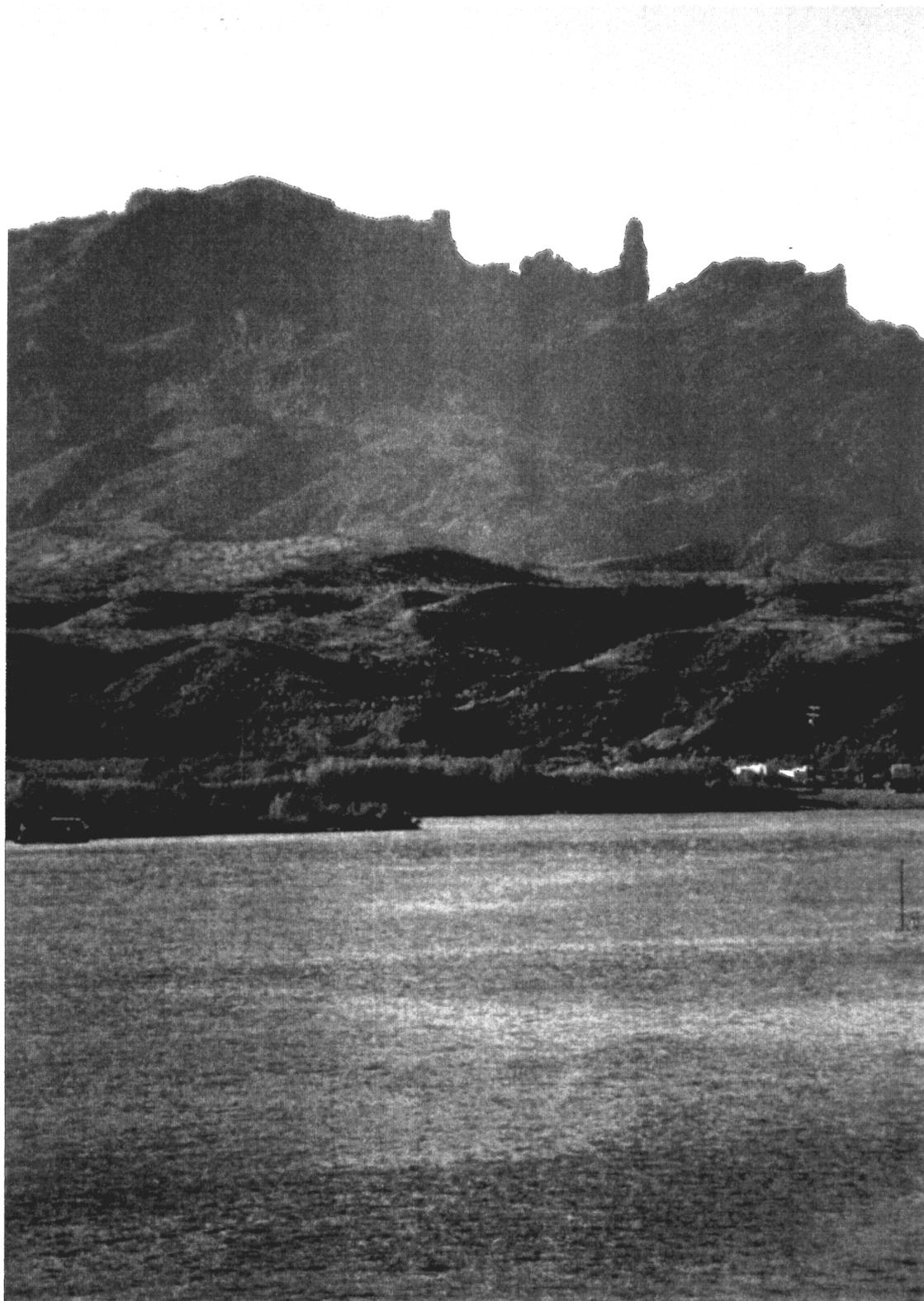


FIGURE 8.10 *Trail Day -- Spring, 1996*



FIGURE 8.11 *Brush Clearing Around Mesquite Bosques -- Spring and Summer, 1996*  
A crew of over 10 workers have cleared brush from under mesquite bosques at the Preserve Center site. These trees provide both shade and natural seating for enjoying the area. As newly-planted trees mature, they, too, will provide deep shade for preserve visitors.

**9.0 PROPOSALS FOR FUTURE USE AND EXPANSION OF THE  
PRESERVE**



## **High and Low Ropes Challenge Course**

A permanent high and low ropes challenge course has been proposed for the preserve. Telephone poles and steel cables connecting stations of the high ropes course (assuring secure belaying conditions), would be blended in with surrounding vegetation, minimizing visual impact on the preserve environment, while most materials on the low course would be made of wood or natural fibers. The low course, including an "all aboard platform", "fishing net", "wobbly walk", "long skis" and "porthole", would be portable, though set-up for long term use near the high ropes course.

A reputable, non-profit organization offering consultation services has been identified to assist in the planning and development of a ropes course, and based on the community's warm response to the Wilderness Challenge program, public support is expected to be strong.

Individuals with questions, information or labor are encouraged to contact:

Fred Phillips  
'Ahakhav Tribal Preserve Planning Office  
CRIT Education Dept.  
Rt.1 Box 23-B  
Parker, Az.85344  
(520) 669-8831

## **Canoe Rentals and Trips**

The 20 canoes purchased by CRIT will be used for Preserve-sponsored programs, including day camps, school field trips, and the Wilderness Challenge Program. In addition, canoes will be available for rental (Figure 9.1). This price includes one half hour of instruction, lifejackets, paddles, 17 foot aluminum canoe, and free drop-off and pick-up within the Colorado River Indian Reservation.

While insurance has been secured and canoe rentals have already begun, the program will be expanded as the Preserve facilities take shape. Eventually, the goal is to train tribal members as guides for fishing and birdwatching trips along the lower Colorado River. Canoes will be stored at the Preserve Center and all trips will leave from the Deer Island Backwater. Pick-up areas will be determined by canoers and priced according to distance from the Preserve. All funds received from the canoe rentals will be returned to the Preserve budget for expansion of programs and opportunities on the site.



FIGURE 9.1 *Backwater Canoeing*

## **APPENDIX A: Scientific Names of Plants Cited in the Text.**

Arrowweed (*Tessaria sericea*)  
Bulrush (*Scirpus spp.*)  
Cattails (*Typha spp.*)  
Devil's claw (*Proboscidea altheaefolia*)  
Fremont cottonwood (*Populus fremontii*)  
Giant reed / Cane (*Arundo donax*)  
Goodding willow (*Salix gooddingii*)  
Honey mesquite (*Prosopis glandulosa*)  
Mistletoe (*Phoradendron californicum*)  
Pickleweed / Inkweed (*Suaeda torreyana*)  
Quailbush (*Atriplex lentiformis*)  
Rushes (*Juncus spp.*)  
Saltbush (*Atriplex polycarpa and A. canescens*)  
Saltcedar (*Tamarix chinensis*)  
Screwbean mesquite (*Prosopis pubescens*)  
Sumac (*Rhus spp.*)  
Wild grape (*Vitis spp.*)  
Wolfberry (*Lycium spp.*)

### **ADDITIONAL SPECIES WHICH MAY OCCUR ON THE PRESERVE:**

Brittlebush (*Encelia farinosa*)  
Creosote bush (*Larrea Tridentata*)  
Tahoka Daisy (*Machaeranthera tanacetifolia*)  
Catclaw (*Acacia greggii*)  
Foothill / Yellow Palo Verde (*Cercidium microphyllum*)  
Blue Palo Verde (*Cercidium floridum*)  
Fluffgrass (*Erioneuron pulchellum*)  
Seepwillow (*Baccharis salicifolia*)  
Coyote willow (*Salix exigua*)  
Sedge (*Carex spp.*)  
Salt grass (*Distichlis spp.*)  
Bermuda grass (*Cynodon dactylon*)  
Smartweed (*Polygonum fusiforme*)  
Spearmint (*Mentha spicata*)  
Pennywort (*Hydrocotyle verticillata*)  
Water hyssop (*Bacopa monneri*)

**APPENDIX B: Archaeological Walk-Through Evaluation.**

# 95-10-4

RECEIVED: 10/3/95

COLORADO RIVER INDIAN TRIBES

REVIEW : 10/31/95

MUSEUM

PRE-APPLICATION EVALUATION FORM

PROPOSAL: Ahakhav Wilderness Preserve and Recreation Area. TWP. \_\_\_\_\_ R. \_\_\_\_\_ Sec. \_\_\_\_\_

LOCATION: Below PIRA Arena between the Levee Road and the Colorado River. \_\_\_\_\_ 1/4 of \_\_\_\_\_ 1/4

SUBMITTED BY: Weldon Johnson Sr., Cult. Res. Compliance Tech.

THROUGH: Betty Cornelius., Mus. Dir.

*BLC*

PREVIOUS DESIGNATIONS: A records search of the CRIT Museums Archaeologic files revealed no sites previously recorded at this location.

SITE DESCRIPTION: The area requested consists of Honey and Screwbean Mesquite, Salt Cedar, Willow, Tule, Sage, Wolfberry and seasonal flowers and grass vegetation. The soils consist of compacted sand and gravels along the River. All inroads and jeep trails in the area contain some form of illegal dumping in the form of farm or household trash.

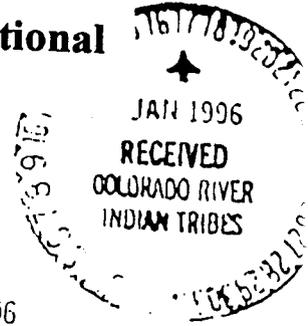
WALK-OVER RESULTS: The archaeological walk-over of the requested area revealed no artifactual material although "Cultural" the vegetation, river and animals are of significance and are the main object of preservation or interpretation for this project.

RECOMMENDATION/REMARKS: Due to the absence of artifactual material, no sites previously recorded and the current and continued involvement of this department on assisted cultural aspects of this project we recommend waiver of the Cultural Resource portion within the CRIT LUO 85-2 as ammended.

ATTACHMENTS:

received

APPENDIX C: Section 106 Determination Under the National  
Historic Preservation Act.



Environmental Quality Services  
Project No. 96-106  
File 4303.1CR  
(602) 379-6750

JAN 12 1996

Mr. James Garrison  
State Historic Preservation Officer  
Arizona State Parks  
1300 West Washington  
Phoenix, Arizona 85007

Attention: Carol Heathington, Compliance Specialist

Re: BIA-PAO/Historic Property Survey, Ahakhav Preserve,  
Colorado River Indian Reservation

Dear Mr. Garrison:

Pursuant to 36 CFR 800.4(b), as Agency Official, we have made a reasonable and good faith effort to identify historic properties that may be affected by the proposed undertaking, construction of the Ahakhav Education Nursery and Ahakhav Restoration and Interpretive Trail on the Colorado River Indian Reservation.

We find that no historic properties are present within the area of potential effect. Documentation of this finding is provided in the enclosed Colorado River Indian Tribes Museum Pre-Application Evaluation Form (W. Johnson).

If there are any questions, please contact the Area Archeologist at (602) 379-6750.

Sincerely,

Area Director

Enclosure

- cc: Superintendent, Colorado River Agency  
Attention: Environmental Coordinator
- Chairman, Colorado River Tribal Council  
Attention: Fred Phillips, Project Planner
- Attention: Museum Director

*Copy Sent:*

1  
2  
3  
4

*Copy to Project Manager,  
Museum*

**APPENDIX C (continued):**



Phoenix Area Director  
Environmental Quality Services

Section 106 Determination Under the National Historic Preservation Act (NHPA), Project No. 96-106, Ahakhav Preserve

Superintendent, Colorado River Agency  
Attention: Environmental Coordinator

As the certifying authority at Supplement 2, 30 BIAM 1.5B(1), we have determined that the Colorado River Indian Tribes Museum Pre-Application Evaluation Form (W. Johnson) is accurate in its findings of survey for purpose of compliance with the identification provisions of 36 CFR 800 and do herewith adopt its recommendations.

We find that the proposed undertaking contains no historic properties eligible for the National Register of Historic Places. For these purposes, approval may be granted for the proposed undertaking with the proviso that should cultural material be encountered in the course of construction, that work will cease at that location and the Indian land owner and the Area Archeologist be notified immediately.

This determination should be included as part of the National Environmental Policy Act (NEPA) documentation associated with the proposed actions to demonstrate compliance with Bureau responsibilities under Section 106 of NHPA, as amended.

If you have any questions, please contact the Area Archeologist at (602) 379-6750.

cc: Chairman, Colorado River Tribal Council  
✓ Attention: Fred Phillips, Project Planner  
Attention: Museum Director

## APPENDIX D: Vertebrate Species of the Lower Colorado River Valley. (See Rosenberg et al. 1991 for bird list.)

### FISH:

Bonytail chub (*Gila elegans*)  
Colorado River squawfish (*Ptychocheilus lucius*)  
Razorback sucker (*Xyrauchen texanus*)  
Threadfin shad (*Dorosoma petenense*)  
Carp (*Cyprinus carpio*)  
Red shiner (*Notropis lutrensis*)  
Flathead catfish (*Pilodictis olivaris*)  
Yellow bullhead (*Ictalurus natalis*)  
Mosquitofish (*Gambusia affinis*)  
Sailfin molly (*Poecilia latipinna*)  
Largemouth bass (*Micropterus salmoides*)  
Striped bass (*Morone saxatilis*)  
Warmouth (*Chaenobryttus gulosus*)  
Green sunfish (*Chaenobryttus cyanellus*)  
Bluegill (*Lepomis macrochirus*)  
Redear sunfish (*Lepomis microlophus*)  
Black crappie (*Pomoxis nigromaculatus*)  
Zill's tilapia (*Tilapia zilli*)  
Blue tilapia (*Tilapia aurea*)

### AMPHIBIANS:

Tiger salamander (*Ambystoma tigrinum*)  
Couch's spadefoot toad (*Scaphiopus couchii*)  
Sonoran Desert toad (*Bufo alvarius*)  
Great Plains toad (*Bufo cognatus*)  
Red-spotted toad (*Bufo punctatus*)  
Woodhouse's toad (*Bufo woodhousei*)  
Bullfrog (*Rana catesbeiana*)  
Lowland leopard frog (*Rana yavapaiensis*)  
Rio Grande leopard frog (*Rana berlandieri*)

### REPTILES:

Sonoran mud turtle (*Kinosternon sonoriense*)  
Spiny softshell turtle (*Trionyx spiniferus*)  
Western banded gecko (*Coleonyx variegatus*)  
Desert iguana (*Dipsosaurus dorsalis*)  
Zebra-tailed lizard (*Callisaurus draconoides*)  
Mohave fringe-toed lizard (*Uma scoparia*)  
Desert spiny lizard (*Sceloporus magister*)  
Side-blotched lizard (*Uta stansburiana*)  
Tree lizard (*Urosaurus ornatus*)  
Western whiptail (*Cnemidophorus tigris*)  
Western blind snake (*Leptotyphlops humilis*)  
Spotted leaf-nosed snake (*Phyllorhynchus decurtatus*)  
Coachwhip snake (*Masticophis flagellum*)

### REPTILES (continued):

Western patch-nosed snake (*Salvadora hexalepis*)  
Gopher snake (*Pituophis melanoleucus*)  
Common kingsnake (*Lampropeltis getulus*)  
Long-nosed snake (*Rhinocheilus lecontei*)  
Checkered garter snake (*Thamnophis marcianus*)  
Mexican garter snake (*Thamnophis eques*)  
Groundsnake (*Sonora episcopa*)  
Western diamondback rattlesnake (*Crotalus atrox*)  
Sidewinder (*Crotalus mitchelli*)  
Mohave rattlesnake (*Crotalus scutulatus*)

### MAMMALS:

California leaf-nosed bat (*Macrotus californicus*)  
Cave myotis (*Myotis velifer*)  
Yuma myotis (*Myotis yumanensis*)  
Western pipestrelle (*Pipistrellus hesperus*)  
Big brown bat (*Eptesicus fuscus*)  
Hoary bat (*Lasiurus cinereus*)  
Raccoon (*Procyon lotor*)  
Badger (*Taxidea taxus*)  
Striped skunk (*Mephitis mephitis*)  
Coyote (*Canis latrans*)  
Gray fox (*Urocyon cinerargenteus*)  
Bobcat (*Felis rufus*)  
Round-tailed ground squirrel (*Spermophilus tereticaudus*)  
Botta's pocket gopher (*Thomomys bottae*)  
Little pocket mouse (*Perognathus longimembris*)  
Desert pocket mouse (*Perognathus amplus*)  
Desert kangaroo rat (*Dipodomys deserti*)  
Merriam's kangaroo rat (*Dipodomys merriami*)  
Beaver (*Castor canadensis*)  
Western harvest mouse (*Reithrodontomys megalotis*)  
Cactus mouse (*Peromyscus eremicus*)  
Deer mouse (*Peromyscus maniculatus*)  
Southern grasshopper mouse (*Onychomys torridus*)  
White-throated woodrat (*Neotoma albigula*)  
Arizona cotton rat (*Sigmodon arizonae*)  
Hispid cotton rat (*Sigmodon hispidus*)  
Muskrat (*Ondatra zibethicus*)  
House mouse (*Mus musculus*)  
Porcupine (*Erithion dorsatum*)  
Black-tailed jackrabbit (*Lepus californicus*)  
Desert cottontail (*Sylvilagus audubonii*)  
Mule deer (*Odocoileus hemionus*)

## APPENDIX E: Federal, State, and Tribally Listed Species Which May Occur On the Site.

	<i>LISTING</i>		
	<u><i>Federal</i></u>	<u><i>State</i></u>	<u><i>CRIT</i></u>
Sonora tiger salamander ( <i>Ambystoma tigrinum stebbinsi</i> )	Proposed Endangered		
Lowland leopard frog ( <i>Rana yavapaiensis</i> )		Candidate	
Mexican garter snake ( <i>Thamnophis eques</i> )		Candidate	
Mohave fringe-toed lizard ( <i>Uma scoparia</i> )		Candidate	
Bonytail chub ( <i>Gila elegans</i> )	Endangered		Endangered
Humpback chub ( <i>Gila robusta</i> )	Endangered		Endangered
Colorado River squawfish ( <i>Ptychocheilus lucius</i> )	Endangered		Endangered
Razorback sucker ( <i>Xyrauchen texanus</i> )	Endangered	Endangered	Endangered
White-faced ibis ( <i>Plegadis chihi</i> )	Formerly Candidate		
Long-billed curlew ( <i>Numenius americanus</i> )	Formerly Candidate		
Yuma clapper rail ( <i>Rallus longirostris yumanensis</i> )	Endangered	Threatened	
California black rail ( <i>Laterallus jamaicensis</i> )	Formerly Candidate	Endangered	
Black-crowned night-heron ( <i>Nycticorax nycticorax hoactle</i> )		Threatened	
Least bittern ( <i>Ixobrychus exilis</i> )		Candidate	
Snowy egret ( <i>Egretta thula brewsteri</i> )		Threatened	
Great egret ( <i>Casmerodius albus egretta</i> )		Endangered	
American bittern ( <i>Botaurus lentiginosus</i> )		Candidate	
Mountain plover ( <i>Charadrius montanus</i> )	Formerly Candidate		

## APPENDIX E (continued).

### LISTING

	<i>Federal</i>	<i>State</i>	<i>CRIT</i>
Brown pelican ( <i>Pelecanus occidentalis</i> )	Endangered		
American peregrine falcon ( <i>Falco peregrinus anatum</i> )	Endangered	Endangered	Endangered
Osprey ( <i>Pandion haliaetus carolinensis</i> )		Threatened	Endangered
Zone-tailed hawk ( <i>Buteo albonotatus</i> )		Threatened	Endangered
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Endangered	Endangered	Endangered
Black-necked stilt ( <i>Himantopus mexicanus</i> )		Threatened	
Western yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	Formerly Candidate	Threatened	
Loggerhead shrike ( <i>Lanius ludovicianus</i> )	Formerly Endangered		
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	Endangered	Endangered	
California leaf-nosed bat ( <i>Macrotus californicus</i> )	Formerly Candidate	Candidate	
Cave myotis ( <i>Myotis velifer</i> )	Formerly Candidate		
Yuma myotis ( <i>Myotis yumanensis</i> )	Formerly Candidate		
Yuma cotton rat ( <i>Sigmodon arizonae</i> )	Formerly Candidate		

#### Definitions:

Endangered -- species threatened with extinction.

Threatened -- species threatened with endangerment if protective measures are not taken.

Candidate -- species being considered for listing as threatened or endangered.

**APPENDIX F: Section 107, Critical Habitat Consultation  
with the U.S. Fish and Wildlife Service.**



United States Department of the Interior  
Fish and Wildlife Service

Arizona Ecological Services Field Office

2321 W. Royal Palm Road, Suite 103

Phoenix, Arizona 85021-4951

(602) 640-2720 Fax (602) 640-2730



In Reply Refer To:

October 25, 1995

In Reply Refer To:  
AESO/SE

Mr. Fred Phillips  
Colorado River Indian Tribes  
Route 1, Box 23B  
Parker, Arizona 85344

Dear Mr. Phillips:

The Fish and Wildlife Service has reviewed the proposed 'Ahakhav Wilderness Plan developed by the Colorado River Indian Tribes and have the following comments for your consideration.

Overall, the Service believes the proposed restoration of the backwaters called for under the plan will benefit the natural resource values of the Colorado River. The project area is within designated critical habitat for the endangered razorback sucker (Xyrauchen texanus). Historically, backwaters along the lower Colorado may have provided important habitats for this endangered fish, thus the physical act of restoring backwaters is not a destruction or adverse modification of critical habitat. However, the improved habitat conditions available will also be utilized by non-native fish species present in the river. Declines in many native fish populations, including the razorback sucker and bonytail (Gila elegans), have been partially attributed to the introduction and spread of non-native fish species. The revisions to the project stated in your letter of October 20, 1995, dealing with placement of fish habitat structures only near access points and locations most likely to be used for fishing, address these concerns consistent with other such projects on the lower Colorado River. Concentrating the structures in these areas perhaps allows other portions of the backwaters to be less desirable to the non-native species.

Based on these factors, the Service concurs with a finding of no effect to the razorback sucker or bonytail and no destruction or adverse modification to designated critical habitat. If we can be of further assistance, please contact Ted Cordery or Lesley Fitzpatrick.

Sincerely,

Sam F. Spiller  
Field Supervisor

**APPENDIX G: NEPA Consultation with the U.S. Department of the Interior, Bureau of Indian Affairs.**

BUREAU OF INDIAN AFFAIRS  
 COLORADO RIVER AGENCY  
 ROUTE 1, BOX 9-C  
 PARKER, ARIZONA 85344

**CATEGORICAL EXCLUSION**

**EXCEPTION REVIEW CHECKLIST**

This checklist may be used in determining whether an individual proposed action which is within a categorical exclusion (516 DM 2, Appendix 1 and 516 DM 6, Appendix 4) nevertheless requires preparation of an Environmental Assessment.

1. Type of Action, document number, and brief description of proposed action: <sup>\*SEE ATTACHMENTS</sup>
  - A. Approval of Residential, Commercial, Recreational or Agricultural Lease to:  
 Lessee: \_\_\_\_\_ Description: \_\_\_\_\_
  - B. Lease No. \_\_\_\_\_ Term: \_\_\_\_\_
  - C. Final Environmental Assessment, Finding of No Significant Impact signed by Walter Mills, Superintendent, dated on April 14, 1982. For further reference see Department of Interior, Departmental Manual 516 D.M. 6 Appendix 4, Bureau of Indian Affairs, 4.4 Categorical Exclusions D. Administrative Actions and other activities relating to trust resources.
2. Answer the following questions "Yes" or "No":  
 Is the action one which may:

(a) Have significant adverse effect on public health and safety?	NO
(b) Adversely affect such unique geographic characteristics as historic or cultural resources, park, recreation, or refuge lands, wilderness areas, wild or scenic rivers, sole or principal drinking water aquifers, prime farmlands, wetlands, floodplains, or ecological significant or critical areas, including those listed on the Department's National Register of Natural Landmarks?	NO
(c) Have highly controversial environmental effects?	NO
(d) Have highly uncertain environmental effects or involve unique or unknown environmental risks?	NO
(e) Establish a precedent for future action or represent a decision in principle about a future consideration with significant environmental effects?	NO

**APPENDIX G (continued):**

(f) Be related to other actions with individually insignificant but cumulatively significant environmental effects?	NO
(g) Adversely affect properties listed or eligible for listing in the National Register of Historic Places?	NO
(h) Affect a species listed or proposed to be listed on the list of Endangered or Threatened Species? *SEE USFWS DOCUMENT	NO
(i) Threaten to violate a Federal, State, Local, or Tribal Law or requirement imposed for protection of the environment.	NO

A "Yes" to any of the above exceptions will require that an EA be prepared.

NEPA Action---CE X EA     

Prepared by:

FRED PHILLIPS                      [Signature]                      4/11/96  
 Name                                      Signature                                      Date  
PROJECT PLANNER, 'AHAKHAN TRIBAL PRESERVE  
 Title

Area Archeologist concurrence with Item G See PAO Memo dated 1/12/96, enclosed.

Concur: [Signature]                      4/29/96  
 Superintendent                                      Date

Concur: [Signature]                      4-19-96  
 Agency Environmental Coordinator                      Date

## APPENDIX H: *Parker Pioneer* Article, Trash Clean-Up Day.

THE PARKER PIONEER, JANUARY 10, 1996

# Wilderness cleanup effort big success

By SONJA MULLENIX

Special to the Pioneer

A trash cleanup and canoeing day at the proposed Ahakhav Wilderness Preserve and Recreation Area on Dec. 28 was a great success.

The event was organized by the Ahakhav Wilderness Preserve and Recreation Area planning team and sponsored by the CRIT Education Department. Members of the Intertribal Youth Council, CRIT Recreation Department, and individuals of all ages participated in the widespread clean-up of the area.

Vehicles provided by CRIT Auto and the CRIT Education Department were filled with children who then filled the trucks with trash. After hours of hard work collecting mattresses, paper, glass,

See CLEAN UP, page 14

## ■ CLEANUP

... from page 1

and even a rusted truck body, participants were rewarded with excellent fry bread tacos provided by the Mohave Elders.

Six canoes provided a relaxing and enjoyable outdoor experience for both children and adults, including those who had been to the area before but saw it with new eyes from the water. The CRIT Fish and Game Department also gave children rides in their boat.

The approximately 60 participants had such a great time, a similar event may be planned in the future.

APPENDIX I: Poster and *Parker Pioneer* Article, Public Meeting.

# Parker Pioneer

Volume 42, No. 13

Serving the people of Parker and La Paz County for 42 years

## Wetlands rehabilitation focus of Thursday public hearing

A proposed plan to restore 1,042 acres of wetlands and a riparian habitat on the Colorado River Indian Reservation will be discussed in a public hearing on Thursday, March 28, at 10 a.m. at the La Paz County Board of Supervisors Office in Parker.

The proposed plan, which has been developed by Dennis Patch of CRIT Education, Fred Phillips, project planner, the CRIT Fish and Game Department, and two students from Purdue University, includes the Deer Island (Deer Lake) and Ahakav Wilderness areas, just southwest of Parker along the Colorado River.

The planners hope the project will replace wildlife habitat lost from channelization and flood damage in the river below Headgate Dam. According to the projected plan, sandbars are blocking inlets and outlets to the river, and historically deep channels are now shallow, causing a "lower diversity" of fish and wildlife.

"It is important that these backwaters be rehabilitated in order to maximize their value to the fish and wildlife and people who wish to enjoy this exceptional area," according to the plan.

The plan calls for extensive dredging and open-

See WETLANDS... page 2

### WETLANDS... from page 1

ing of the backwater channels; and to re-vegetate the area with cottonwood, willow and mesquite trees, where saltcedar stands have taken over. Also included would be perches for raptors.

Total cost of the plan is \$6.8 million, and funding for the project will be discussed at the hearing. The plan has been endorsed by the CRIT Council and incorporated into the U.S. Fish and Wildlife Service "Ecoregion Plan."

The Deer Island and Ahakav Wilderness areas is home to 19 species of fish; nine species of amphibians; 23 species of reptiles; over 250 species of birds; and 32 species of mammals. Also, there's a possibility that 29 endangered, threatened or candidate species, including the Yuma clapper rail, southwest willow flycatcher and razor-back sucker "may benefit from habitat protection and enhancement in this area," according to the plan.

Already the revegetation of the first 19 acres has begun using \$55,000 in grant money. Project planners hope to develop support for other grant funding through the public meeting.

The proposal is available for public review at the La Paz County Community Development Department; the CRIT Administration Reception Desk; and the Parker Public Library. For more information, call Fred Phillips at 669-5325.

APPENDIX I (continued):

# **PUBLIC MEETING NOTICE**

## **'AHAKHAV TRIBAL PRESERVE**

PRESENTED BY

- ◆ **COLORADO RIVER INDIAN TRIBES**
- ◆ **INTERMOUNTAIN WEST JOINT VENTURE**
- ◆ **US BUREAU OF RECLAMATION**

### Agenda Items

#### **Overview of The Intermountain West Joint Venture**

*(North American Waterfowl Management Plan, NAWMP)*

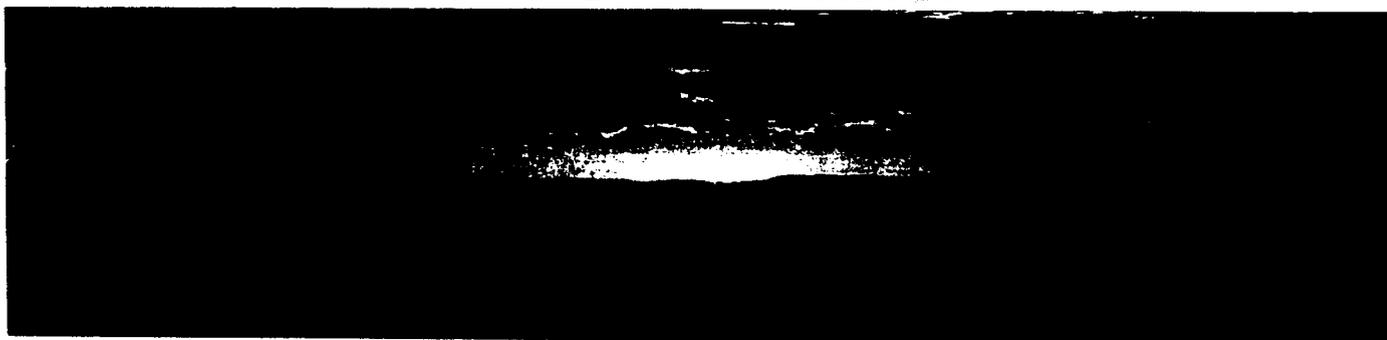
#### **Overview of The US Bureau of Reclamation's Objectives on The Lower Colorado River**

*(Ongoing and Planned Wildlife Habitat Mitigation Projects)*

#### **Presentation of the Colorado River Indian Tribes New 'Ahakhav Tribal Preserve**

*(Restoration of Wetland and Riparian Habitat at the Deer Island and A1 Backwaters and creation of Interpretive Trails, a Native Plant Nursery, and Environmental/Cultural Education Facilities.)*

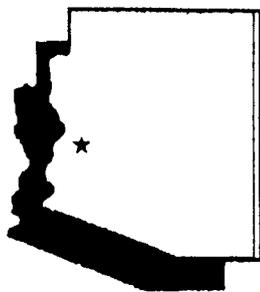
WE NEED YOUR TRIBAL AND PUBLIC SUPPORT FOR  
THIS IMPORTANT PROJECT!



**THURSDAY MARCH 28, 1996 10:00AM**  
**LA PAZ COUNTY BOARD OF SUPERVISORS MEETING ROOM**  
**FREE COFFEE AND DONUTS**

\*Copies of the 'Ahakhav Tribal Preserve Plan are located for public comment/review at the CRIT Administration Reception Desk, the Parker Public Library, and the La Paz County Community Development Office. Any comments or questions should be submitted to the 'Ahakhav Preserve Project Team, Rt1 Box 23B, Parker AZ 85344, (520) 669-5325.

## APPENDIX J: Endorsements.



### Parker Unified School District No. 27

1608 Laguna Avenue, Box 1089, Parker, Arizona 85344

District Office (520) 669-9244

Fax (520) 669-2515

Superintendent - Asst. Superintendent - Personnel Ext 1400  
Purchasing Ext 1401  
Accounts Payable Ext 1402  
Business Office Manager Ext 1414  
Payroll Ext 1416

November 7, 1995

#### Arizona Game & Fish:

This letter is written in support of the Environmental Education proposal submitted by Colorado River Indian Tribes.

Development and construction of the proposed site (native vegetation nursery) would greatly enhance our students' opportunities to learn about the native habitat of the Colorado River Valley. Students in science classes or in our Ecology Club would benefit from hands-on experiences while protecting, planting, and maintaining wildlife habitat.

A project such as this would have the support of Colorado River Indian Tribal members and agencies, Parker schools' students and personnel, and Parker area community members.

Specific benefits for our students at Parker High School include:

1. Curriculum particularly for our nontraditional learners, that could be integrated into field trips located in a natural setting.
2. Insight into the relationship between science, technology, and society using real laboratory techniques and equipment.
3. Exposure to a viable native vegetation nursery reflecting our decreasing desert riparian biots.
4. Appreciation of botany, the native riparian habitat, and wildlife.
5. Exploration of careers in Natural Resources.

In closing, this project would be invaluable for Parker High School students and communities of LaPaz County. Please feel free to contact me regarding this needed and worthwhile venture at 520-669-2202.

Sincerely,

Dan Schlecht  
Department Head of Science

Parker High School

(520) 669-2202

Ext. 1014

Blake School

(520) 669-8203

Ext. 1500

Le Pera School

(520) 662-4306

150

Wallace School

(520) 669-2141

Ext. 1365

**APPENDIX J (continued):**



*Colorado River Indian Tribes*

**PROJECT HEAD START**

Route 1, Box 39-X  
Parker, Arizona 85344  
Telephone 602-662-4311

November 15, 1995

Attention: Arizona Game and Fish  
Grants Program

The Colorado River Indian Tribes Head Start Program annually enrolls 183 three and four-year-old children of economically disadvantaged families. These children are primarily Native American children. All of the children reside on the Colorado River Indian Reservation.

The Program provides a comprehensive curriculum including such topics as self-help, science, geography, history, math, the environment, literacy. The teachers present these curriculum topics through a variety of teaching techniques. One of the most effective techniques are field trips where children are able to have hands-on-experiences as well as see real life objects.

Should the proposed environmental education project of the Colorado River Indian Tribes Education Department be funded, the children of the Head Start Program would benefit greatly by field trips to the project site, Ahakhav Wilderness Preserve. They would develop a greater appreciation for the native wildlife and plantlife by understanding better how native plantlife grows and how other animals depend on this plantlife.

All field trips require a number of parents to participate to ensure adequate supervision of the children. Therefore, parents will also benefit from the environmental education that they will receive.

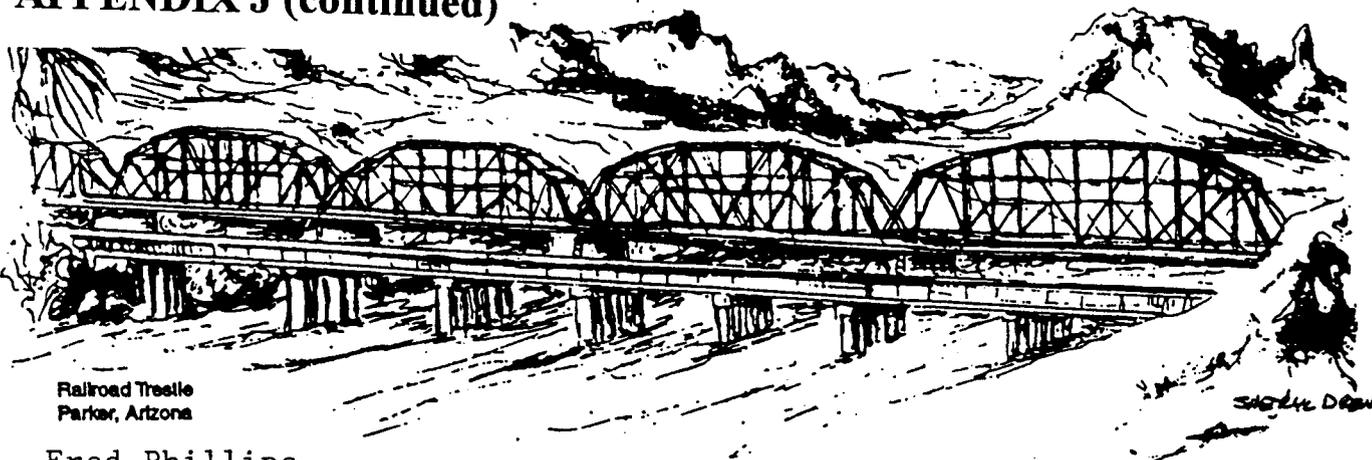
The Program would definitely utilize the proposed project and looks forward to its development.

Sincerely,

*Caroline Daniel*

Caroline Daniel  
Director

## APPENDIX J (continued)



Railroad Trestle  
Parker, Arizona

Fred Phillips  
Project Planner; 'Ahakhav' Preserve  
c/o Education Department  
Colorado River Indian Tribes  
Rt 1, Box 23-B  
Parker, AZ 85344

June 25, 1996

Dear Mr. Phillips:

We, as a local heritage society, do heartily support your current project; that of restoring the Ahakhav preserve to near native condition. To us this is truly an exciting and meaningful endeavor which should become a most valuable heritage, benefitting present and future generations of this reservation and surrounding area.

Sometimes historians and and/or heritage preservationists concentrate too heavily merely on buildings and 'man made' artifacts and while these are of great importance, they oftentimes overlook natural environment (native vegetation) which the indigenous peoples of the area once knew and to which they owed their subsistence; especially here along the Colorado River.

We fully endorse your project and your pursuit of grants to assist you in attaining those worthwhile goals which you enumerated in your most recent project report. The Arizona State Historic Preservation Office was surely a good place to start. Our best wishes to you as you apply for Arizona Water Protection and other funds.

Sincerely,

Robert S Drew; Pres. (for and in behalf of the Board of Directors )

**PARKER AREA HISTORICAL SOCIETY**

P. O. Box 1500  
Parker, Arizona 85344

520-669-2323  
520-669-2556

APPENDIX J (continued)

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REVEGETATION AND WILDLIFE MANAGEMENT CENTER, INC.  
201 SOUTH PALM DRIVE  
BLYTHE, CA 92225



BERTIN W. ANDERSON, PHD, PRES./TREAS.  
VICTOR R. VASQUEZ, SECRETARY  
JESSE S. VASQUEZ, VICE-PRESIDENT

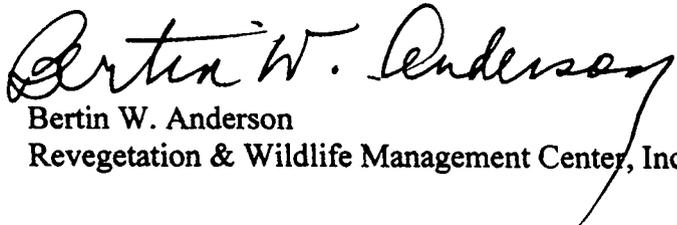
TAX ID# 33-0287434 EMAIL ADDRESS REVEG@TELIS.ORG PHONE/FAX 619-922-2541

---

'Ahakhav Tribal Preserve planning office,

Revegetation & Wildlife Management Center, Inc. strongly supports the restoration of the 'Ahakhav Tribal Preserve. We have done much work in revegetating riparian habitats and have data reflecting the benefits of this to wildlife and thus to humans. This project is an important step toward educating people about the environment through the creation of interpretive trails and identification of native flora and fauna.

We are proud to be a part of this project and will continue to support its growth.

  
Bertin W. Anderson  
Revegetation & Wildlife Management Center, Inc.

**APPENDIX J (continued):**



**United States Department of the Interior**

BUREAU OF RECLAMATION

Glen Canyon Environmental Studies  
 P.O. Box 22459  
 Flagstaff, Arizona 86002-2459



IN REPLY REFER TO:

June 7, 1996

`Ahakhav Tribal Preserve  
 Colorado River Indian Tribes  
 Colorado River Indian Reservation  
 Route 1, Box 22-B  
 Parker, AZ 85344

Dear `Ahakhav Tribal Preserve:

We have been involved in the protection and restoration of habitats for native fish and wildlife species in the Colorado River basin over the last thirteen years. We have been discussing the potential that exists to restore critical environmental needs for the native species in the lower Colorado River in the `Ahakhav Tribal Preserve. In our review we have found that with the proper guidance and cooperative approach the program proposed by the Colorado River Indian Tribes shows a very high potential for success.

We heartedly endorse the proposed work on the `Ahakhav Tribal Preserve and support the Colorado River Indian Tribes approach. Please count on us to assist the tribes in what ever level we can.

Sincerely,

*David L. Wegner*  
 David L. Wegner  
 Program Manager

Glen Canyon Environmental Studies ADMINISTRATION

NAME	ACTIVITY	DATE	INITIAL
	CHAIRMAN		
	VICE CHAIRMAN		
	SECRETARY		
	TREASURER		
	FORWARD	6/12/96	

APPENDIX J (continued):

REVEGETATION AND WILDLIFE MANAGEMENT CENTER, INC.  
201 South Palm Drive  
Blythe, Ca. 92225  
  
Bertin W. Anderson, PhD, Pres./Treas.  
Victor R. Vasquez, Secretary  
Jesse S. Vasquez, Vice-president  
TAX ID# 33-0287434  
PHONE/FAX 619-922-2541

MEMORANDUM TO: ECOREGION TEAM

SUBJECT: ECOSYSTEM PLAN

FROM: BERT ANDERSON

28 AUG 1995

I have three suggestions for revisions in the draft ecoregion plan:

1. The Colorado River Indian Tribes (CRIT) have approved plants to begin work immediately on developing the "Ahakhav Wilderness Preserve and Recreation Area", (F. Phillips, A. Perillo, and S. Mullenix, Aug. 1995) including some 1000 acres where wetland, including riparian, habitats will be enhanced/developed. This should be incorporated into the ecosystem plan--perhaps on pp. 32-34 as "action items" and "partnership opportunities".
2. In all pertinent places it must be made clear that we believe that riparian habitats are wetland habitats. To fail to do this would constitute an egregious error that will almost certainly haunt us in the future.
3. We must make it clear that we are opposed to the introduction of insects for the purpose of controlling salt cedar. If such an irresponsible and stupid act is actually carried out it must be clear that we in no way endorse the action. Even if the insects controlled salt cedar and did not attack any other species, it would be undesirable. The fact is that a majority of SW riparian zones are no longer suitable for native tree species. Salt cedar is currently a major wildlife habitat in the SW and we can't afford to lose it.

*Bertin W. Anderson*

**APPENDIX J (continued):**

**LOWER COLORADO RIVER ECOREGION PLAN**

Submitted to:  
Ms. Nancy Kaufman, Regional Director  
Region II,  
500 Gold Avenue SW.,  
Albuquerque, New Mexico 87103

**BY**

**U.S. FISH AND WILDLIFE SERVICE  
LOWER COLORADO RIVER ECOREGION TEAM**

**November, 1995**

## APPENDIX J (continued):

OBJECTIVE 5. Increase public awareness of native riparian habitats, their role in the ecosystem, and restoration initiatives by developing new and strengthening existing environmental education, interpretive and public outreach programs. (Eco COAL 8).

OBJECTIVE 6. Establish long-term native riparian habitat (Fremont cottonwood, Goodding willow, honey and screwbean mosquito) restoration and protection initiative (20+ years) in the LCRE.

Strategy 1: Develop partnerships to identify and implement native riparian habitat restoration activities on public, Tribal, State and private lands within the LCRE in the U.S. and Mexico. (Priority High)

Action Item 1: Convene an inter-organizational and cross-program team to identify and develop native riparian habitat restoration projects on other Federal lands, Tribal lands, State lands and private lands in the LCRE. 1-year project. Service Cost: \$10.0, 0.2 FTE. FWS lead: LCRNWRC, SSNWR, AESO, CAESO, NESO.

Action Item 2: Continue participation in Lower Colorado River Interagency Management Work Group and Vegetation Management Subcommittee. Annual operations. Service Cost: \$5.0, 0.2 FTE. FWS lead: LCRNWRC, AESO.

Action Item 3: Develop the 486 hectare Ahakhav Wilderness Preserve and Recreation Area on the Colorado River Reservation. Service Cost: \$50.0, .5 FTE

Strategy 2: Implement native riparian habitat restoration and protection activities on Service lands in the LCRE. (Priority High)

Action Item 1: Continue ongoing native habitat restoration activities on Lower Colorado River NWRs. 2-year project. Service Cost: \$160.0, 4.0 FTE. FWS lead: LCRNWRC.

Action Item 2: Restore riparian habitat on the Alamo and New Rivers within the Salton Sea NWR. 2-year project. Service Cost: \$30.0, 1.0 FTE. FWS lead: SSNWR.

Action Item 3: Plan and implement new native riparian habitat restoration projects on the Salton Sea, Havasu, Bill Williams River, Cibola and Imperial NWRs with an overall goal of restoring 2000 acres over the 20-year project. Service Cost: 3,000.0, 4.0 FTE. FWS lead: LCRNWRC.

## APPENDIX K: Scientific Names of Birds Cited In Text.

- Brown Pelican** (*Pelecanus occidentalis*)  
**Great Blue Heron** (*Ardea herodias*)  
**Great Egret** (*Casmerodius albus*)  
**Black-crowned Night-Heron** (*Nycticorax nycticorax*)  
**Canada Goose** (*Branta canadensis*)  
**Mallard** (*Anas platyrhynchos*)  
**Northern Pintail** (*Anas acuta*)  
**Teal** (*Anas discors*, *A. cyanoptera*, *A. crecca*)  
**Gadwall** (*Anas strepera*)  
**Wigeon** (*Anas penelope*, *A. americana*)  
**Osprey** (*Pandion haliaetus*)  
**Southern Bald Eagle** (*Haliaeetus leucocephalus*)  
**Northern Harrier** (*Circus cyaneus*)  
**Cooper's Hawk** (*Accipiter cooperii*)  
**Harris Hawk** (*Parabuteo unicinctus*)  
**Red-tailed Hawk** (*Buteo jamaicensis*)  
**American Kestrel** (*Falco sparverius*)  
**Peregrine Falcon** (*Falco peregrinus*)  
**Gambel's Quail** (*Callipepla gambelii*)  
**Yuma Clapper Rail** (*Rallus longirostris yumanensis*)  
**American Coot** (*Fulica americana*)
- Sandhill Crane** (*Grus canadensis*)  
**Killdeer** (*Charadrius vociferus*)  
**Black-necked Stilt** (*Himantopus mexicanus*)  
**Common Snipe** (*Gallinago gallinago*)  
**Least Tern** (*Sterna antillarum*)  
**White-winged Dove** (*Zenaida asiatica*)  
**Mourning Dove** (*Zenaida macroura*)  
**Yellow-billed Cuckoo** (*Coccyzus americanus*)  
**Elf Owl** (*Micrathene whitneyi*)  
**Belted Kingfisher** (*Ceryle alcyon*)  
**Gila Woodpecker** (*Melanerpes uropygialis*)  
**Northern Flicker** (*Colaptes auratus*)  
**Gilded Northern Flicker** (*Colaptes auratus mearnsi*)\*  
**Southwestern Willow Flycatcher** (*Empidonax trailii extimus*)  
**Western Kingbird** (*Tyrannus verticalis*)  
**American Robin** (*Turdus migratorius*)  
**Crissal Thrasher** (*Toxostoma crissale*)  
**Phainopepla** (*Phainopepla nitens*)  
**Bell's Vireo** (*Vireo bellii*)  
**Albert's Towhee** (*Pipilo aberti*)  
**Yellow-headed Blackbird** (*Xanthocephalus xanthocephalus*)

\* Often considered a separate species, it is only this subspecies of the Northern Flicker that is listed as State Endangered by the California Department of Fish and Game.

## APPENDIX L: *Parker Pioneer* Article.

6 — PARKER PIONEER, WEDNESDAY, JUNE 12, 1996

# Revegetation work continues at preserve

Work at the Ahakhav Tribal Preserve just south of Parker on the Colorado River Indian Reservation is continuing at a rapid pace. According to Fred Phillips, project planner, over 2,000 irrigated cottonwood, willow and mesquite trees have been planted, and seven tribal members have been hired to build the Native Species Nursery.

The U.S. Bureau of Reclamation has awarded \$5,000 to the program. Trainees from the CRIT Joint Training Partnership Act are working on the project, to assist with the nursery and to collect seeds to propagate in the nursery for the next mass planting, scheduled for late September.

Thirty trees have been donated to the Elders Village and were planted June 6. Grant proposals have also been submitted to the Arizona Water Protection Fund and the North American Wetlands Conservation Act Fund. If awarded, the grant funds will be used to re-vegetate more of the preserve with native plant species and dredge historic river channels in the backwater areas.

Several special education activities are planned at the site, throughout the summer, including the 'Ahakhav Natural Resources Summer Programs. Sponsored by the 'Ahakhav Tribal Preserve and CRIT Fish and Game, the activities are for those 12 years and up.

On June 19, at 8 a.m., Ray Aspa and a guest speaker will discuss fish stocking, wildlife

protection and other aspects of work with CRIT Fish and Game and other wildlife agencies. Canoeing will follow. Participants should bring a lunch.

On June 24, Fred Phillips and Ron Miller will discuss native species tree propagation, planting and care. Canoeing will follow the discussions, which begin at 8 a.m. Participants should bring a lunch.

On Aug. 21, Tribal elders will discuss traditional uses and significance of various plants on the Preserve. Canoeing will again follow, and participants should bring lunch.

The CRIT Summer Day Camp will also have several days of canoeing, on June 13, June 27, July 11 and July 18. For more information, contact Orlando at 669-9211 ext. 350, or the 'Ahakhav planning office at 669-8831.

All Tribal members who are interested in canoeing should contact the planning office regarding legal papers to assure proper risk notification to canoe users. Non-tribal members may canoe, at a cost of \$30 per day or \$50 per weekend. Liability release forms are available from the CRIT Legal department, and all proceeds will assist in the 'Ahakhav programs.

A special "Wilderness Challenge" program is scheduled for this Sunday, June 16. La Paz County Search and Rescue will present a water safety program. Canoes will be provided by CRIT. Participants should meet at the CRIT Education building at 9 a.m.

# APPENDIX M: Tribal Resolutions and Memorandums.

Resolution No. 168-95

## RESOLUTION

### COLORADO RIVER TRIBAL COUNCIL

A Resolution to APPROVE 'AHAKHAY WILDERNESS PRESERVE AND RECREATION  
AREA PLAN

Be it resolved by the Tribal Council of the Colorado River Indian Tribes, in ~~regular~~ meeting assembled on AUGUST 11, 1995 special

WHEREAS, historically, the Colorado River has been the center of life for the people who live along its banks, providing food for the Tribes, including fish and wildlife and plants in the riparian areas, and made agricultural possible, providing willow trees along the banks that were used in basketmaking and the straight stems of arrowweedn that were used to make arrows; and

WHEREAS, the backwaters along the Colorado River were created to provide wildlife habitat that was lost to the damming and channelization of the river, which these areas support an array of plant and wildlife species. Some residents, staying year-round, others are migratory, staying for a season or two, still others pass through, only to utilize the rich valley of the Colorado River as they travel across the arid Southwest; and

WHEREAS, the diversity of life forms are a reflection of the myriad of ways in which plants and animals are capable of meeting the challenges of their environment; and

WHEREAS, recently, even the backwaters have been placed in jeopardy. Within the last century, most native stands and haques of mesquite, willow, and cottonwood have been cleared, burned, or replaced with exotic salt cedar; and

WHEREAS, many wildlife populations are dwindling due to habitat loss, as well as increasing disturbance caused by high impact recreation such as motor boating

The foregoing resolution was adopted by the Tribal Council of the Colorado River Indian Tribes, on August 11, 1995, by a vote of 6 for, 0 against and 0 abstaining, by the

Tribal Council of the Colorado River Indian Tribes, pursuant to authority vested in it by Section 16, Article VI of the Constitution and By laws of the Tribes, ratified by the Tribes on March 1, 1975 and approved by the Secretary of the Interior on May 29, 1975, pursuant to Section 16 of the Act of June 18, 1934, (48 Stat. 984). This resolution is effective as of the date of its adoption.

COLORADO RIVER TRIBAL COUNCIL

By

**APPENDIX M (continued):**

COLORADO RIVER INDIAN TRIBES

1 807 669 5075  
ID: 1-002 669-5075

HUG 21 1995 13:23 No. 002 P. 0

RESOLUTION NO. R-168-95  
PAGE 2

NOW, THEREFORE, BE IT RESOLVED that the Tribal Council hereby supports and approves the Ahakhav Wilderness Preserve and Recreation Area Plan, including the location of the Ahakhav Park;

BE IT FURTHER RESOLVED that the Project team is authorized to seek funding for the plan, including applying for grants and donations for architectural design, engineering and construction, subject to the approval of Tribal Council;

BE IT FURTHER RESOLVED that the Tribal Council Chairman and Secretary, or their designated representatives, are authorized to execute any and all documents necessary to implement this action.

APPENDIX M (continued):

Resolution No. 234-95

RESOLUTION

COLORADO RIVER TRIBAL COUNCIL

A Resolution to Approve a Grant Application to the Arizona Game and Fish Department for Habitat Restoration and Interpretative Trail Development  
Be it resolved by the Tribal Council of the Colorado River Indian Tribes, in ~~regular~~ meeting assembled on November 9, 1995 ~~special~~

WHEREAS, the Colorado River Indian Tribes (CRIT) is authorized to apply for grants; and

WHEREAS, CRIT is developing the Ahakhav Wilderness Area and has approved plans for said development; and

WHEREAS, CRIT seeks funding to develop an interpretive trail and to restore habitat within the Ahakhav Wilderness Area; and

WHEREAS, the Arizona Game and Fish Department administers the 1996 Heritage Grant Program, Urban Wildlife and Urban Wildlife Habitat Fund; and

WHEREAS, said application is for the development of an interpretive trail and habitat restoration:

NOW, THEREFORE, BE IT RESOLVED by the Tribal Council of the Colorado River Indian Tribes that a grant application for the 1996 Heritage Grant Program be approved for submittal; and

BE IT FINALLY RESOLVED that the Tribal Council Chairman and Tribal Secretary, or their designated representatives, are authorized to sign any and all documents necessary to implement this action.

The foregoing resolution was on November 9, 1995 duly approved by a vote of 6 for, 0 against and 0 abstaining, by the Tribal Council of the Colorado River Indian Tribes, pursuant to authority vested in it by Section 1.a. Article VI of the Constitution and By laws of the Tribes, ratified by the Tribes on March 1, 1975 and approved by the Secretary of the Interior on May 29, 1975, pursuant to Section 16 of the Act of June 18, 1934, (48 Stat. 984). This resolution is effective as of the date of its adoption.

COLORADO RIVER TRIBAL COUNCIL

By

[Signature] ACTING  
Chairman  
[Signature]  
Secretary

APPENDIX M (continued):

Resolution No. 37-96

RESOLUTION  
COLORADO RIVER TRIBAL COUNCIL

A Resolution to To Grant a Right-of-Way for the Construction and Maintenance of the Water Main to the Ahakhav Wilderness Preserve and Recreation Area

Be it resolved by the Tribal Council of the Colorado River Indian Tribes, in ~~an~~ <sup>Special</sup> meeting assembled on February 26, 1996

WHEREAS, the Colorado River Indian Tribes has filed application for right-of-way for the purpose of constructing and maintaining a 6' Water Main for the delivery of water to the Ahakhav Wilderness Preserve and Recreation Area; and

WHEREAS, the proposed line will commence from an existing line in Tract No. 3819 and end at the Tract No. 3799A and will encompass approximately 15.90 acres more or less; and

WHEREAS, the Director of Building and Safety has reviewed the proposal for compliance with Article 6 of the Land Code and has found that said proposal is in compliance with Article 6 of the Land Code; and

WHEREAS, the Museum Director has found that there will be no potential adverse impacts on the archaeological and cultural resources of the Tribes, should said proposal be accepted:

NOW, THEREFORE, BE IT RESOLVED that the Tribal Council hereby grants a right-of-way for an indefinite term, commencing upon approval for the

The foregoing resolution was on February 26, 1996 duly approved by a vote of 7 for, 0 against and 0 abstaining, by the Tribal Council of the Colorado River Indian Tribes, pursuant to authority vested in it by Section 1 c e & r. Article VI of the Constitution and By laws of the Tribes, ratified by the Tribes on March 1, 1975 and approved by the Secretary of the Interior on May 29, 1975, pursuant to Section 16 of the Act of June 18, 1934, (48 Stat. 984). This resolution is effective as of the date of its adoption.

COLORADO RIVER TRIBAL COUNCIL

By

[Signature]  
Chairman  
[Signature] ACTING  
Secretary

**APPENDIX M (continued):**

**RESOLUTION NO. R-37-96**

**FEBRUARY 26, 1996**

**PAGE 2**

construction and maintenance of the Water Main to the Ahakhav Wilderness Preserve and Recreation Area on lands located within Tract Nos. 3819, 3818A, 1818, 3817A, 3816A, 3811A, 3810A, 3804A, 3804B, 3803A, 3802, 3801, in Section 16, and Tract Nos. 3800, 3799, 3799A within Section 10, all Tracts are in Township 9 North, Range 20 West, Gila and Salt River Base and Meridian, Colorado River Indian Reservation, containing 15.9 acres more or less; and

BE IT FURTHER RESOLVED that a survey will be provided of the described premises and will be made a part hereof;

BE IT FINALLY RESOLVED that the Tribal Council Chairman and Secretary, or their designated representatives, are hereby authorized to execute any and all documents necessary to implement this action.

APPENDIX M (continued):

**Office Memorandum** OF THE COLORADO RIVER INDIAN TRIBES

TO: Carolyn McBryde, Controller

DATE: January 4, 1996

FROM:  ACTING  
Daniel Eddy, Jr., Tribal Chairman

SUBJECT: Allocation of \$50,000 for Ahakhav Wilderness Project

At its special meeting of January 3, 1996, the Tribal Council took action to allocate a total of \$50,000 in the Council's budget to fund start-up costs for the proposed Ahakhav Wilderness Project.

Make the necessary budget modification as approved by Council.

By copy of this memorandum, Education Director Dennis Patch and Consultant Fred Phillips are apprised of the Council's action.

xc: Daniel Eddy, Jr., Chairman  
Russell Welsh, Vice-Chairman  
LaWanda Laffoon, Secretary  
Eldred Enas, Treasurer  
Rayford Patch, Council Member  
Conner Byestewa, Jr., Council Member  
Sylvia Homer, Council Member  
Fernando Flores, Sr., Council Member  
Herman Laffoon, Jr., Council Member  
Dennis Patch, Education Director  
✓ Fred Phillips, Consultant, Education Department

APPENDIX M (continued):

*Office Memorandum* OF THE COLORADO RIVER INDIAN TRIBES

TO: Dennis Patch, Education Director

DATE: February 13, 1996

FROM: Daniel Eddy, Jr., Tribal Chairman

SUBJECT: Right-of-Way for Wilderness Park

At its regular meeting of February 10, 1996, the Tribal Council approved your request for a Right-of-Way for a water line extension to the Ahakhav Wilderness Preserve and Recreation Area and your request for funds for the 6" water main and fire hydrants. The approximate cost of \$13,000.00, for installation and materials, shall be paid out of the Tribal Contingency Account.

Further, the Utility Department and CRIT Farms, and any other participating Tribal entity, shall cooperate and coordinate their resources with this project. By a copy of this memorandum, all appropriate departments and enterprises are notified of this action.

As a follow-up to this approval, please coordinate with the Legal Department in preparing a draft resolution for the granting of the Right-of-Way for Tribal Council adoption at its next scheduled meeting.

xc: Tribal Council  
Carolyn McBryde, Controller  
Greg Sprawls, Farm Manager  
Stewart Eddy, Director, Water Department  
Monica Michelizzi, Attorney General

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