Historical Aspects of Riparian in the Desert High Plains

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The Southern High Plains

The Southern High Plains cover all but the gently undulating southeastern third of the Texas Panhandle, where the Rolling Plains begin.

The upper tributaries of the Red River and the Canadian River drain the region.

The Canadian cuts across the High Plains to isolate the southern part, the Llano Estacado, which has little drainage.

Beneath the High Plains lies the enormous store of relict water held by the Ogallala Aquifer-unquestionably the region's most valuable resource

The High Plains and Rolling Plains of the Panhandle support wetlands predominantly in *playa lakes and saline lakes* (High Plains), and in water-table influenced basins and *riparian habitats* (Rolling Plains). *Riparian habitats* include vegetation along creeks, rivers and wet meadows,lakes and beaver pond habitats. Riparian habitats are characterized by Plains cottonwood, netleaf hackberry, buttonbush, native plum, western dogwood and persimmon. Exotic tamarisk and Russian olive have been introduced, changing riparian character and successional patterns (Brinson et al., 1981).

Photo by Leroy Gene Miller

Some argue that the Great Plains were dominated by grasslands and that riparian woodlands were rare. .

The US Fish and Wildlife Service (1981) drew upon 1905 conditions for insight and concluded that trees were "wholly absent" or consisted of scattered cottonwood and willow.

However, a more complete reading of historical records suggests that by the early 1900's, most riparian areas in the Great Plains had long been depleted of their natural woody vegetation.

Historical evidence from the 1800's supports a very different picture of Great Plains -- with large riparian forests along many streams and rivers of the area.

Great Plains riparian areas were significantly affected in the mid 1800's from the simultaneous and cumulative harvest pressure of Native Americans, gold seekers, soldiers, railroad crews, river commerce (wood fired steam engines) and settlers.

Natural resource restoration efforts that target pre-settlement conditions are advised to use pre 1843 scenarios to accurately depict natural riparian areas in the Great Plains. ("A Long, Long Time Ago … " by Elliott West and Greg Ruark printed in the Journal of Soil and Water Conservation, Volume 59, Number 5.)

EARLY HUMAN PRESENCE IN THE S. HIGH PLAINS

Human presence in the Desert High Plains dates from the time of Paleo-Indian hunters of Pleistocene animals, whose presence is verified by their Folsom and Clovis projectile points found in situ with datable materials.

An archeological complex, the Panhandle Aspect, occupied the Canadian River and nearby streams, cresting from roughly A.D. 1350 to 1450, but was gone by the time Indians were 1st documented in writing.

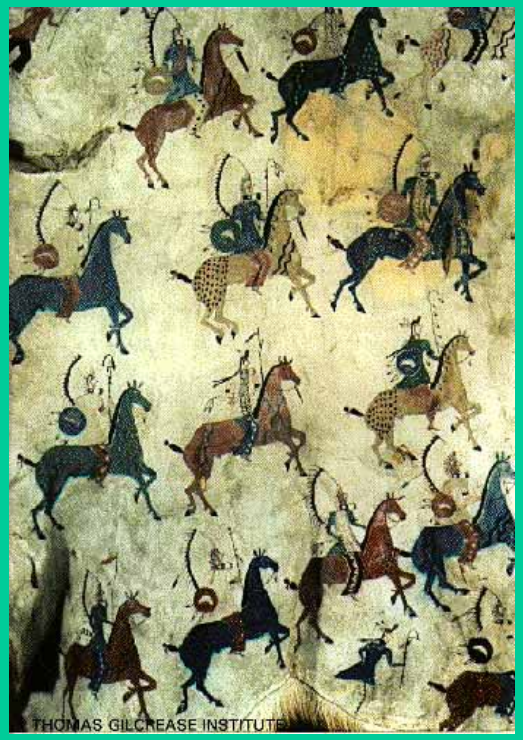
Coronado's entrada crossed the Llano Estacado in 1541 and found a culture of pedestrian, buffalo-hunting nomads whom the Spaniards called "Querechos," Athabaskan ancestors of the Apaches.

Apacheans evidently controlled the Panhandle and surrounding territory uncontested until after 1700, when Comanches, now mounted, appeared, challenged the Apaches, and eventually dispossessed them.

By 1800, Comanches, Kiowas and Kiowa-Apache allies dominated the Great Plains south of Arkansas River and held Comanchería 150 years.

Comanche encampment, Texas. Teepee frames were build of wood poles, often gathered from riparian areas.

According to West and Ruark (2004), the spread of horses out of the Southwest and the rise of the Plains horse culture led to increased use of river valleys by Native American populations, which in turn wore away at wood resources.



Indians set up encampments along rivers, where they could water and feed their horses and themselves, and inevitably used wood for firewood and building materials.

"All the land south of the Arkansas River belongs to the Kiowas and Comanches and I don't want to give away any of it." –Santanta, Kiowa Chief, 1871

Kiowa camp, ca. 1867-1874. Photograph courtesy of the Center for American History, Frank Caldwell Collection (#10187), The University of Texas at Austin.

In addition, periodic episodes of drought resulted in reduced availability of water and food, eventually leading to concentrations of Indian villages (pueblos) along major southwestern rivers such as the Rio Grande.

After early exploration, Spanish settled in the Southwest, often building villages near peaceful Indian villages, to enhance commerce.

An 18th century Spanish mission church at Pecos National Historic Park.

Exploration Phase

In 1821 the Mexican War of Independence[qv] opened Santa Fe to legal trade with U.S. citizens and Maj. Stephen H. Long[qv] explored the Canadian River valley, initiating the Anglo-American exploratory phase of Panhandle history.

Between 1821 and the 1853 the Pacific railroad survey of the thirty-fifth parallel, and expeditions led by the Army explored and described the Canadian valley, the Rolling Plains, and the upper tributaries of the Red River.

In 1849 Capt. Randolph B. marked the Fort Smith-Santa Fe Trail, allowing pioneers to spread west along this southern route, camping along rivers and using riparian wood resources for fuel and supplies..

1874 Red River view. Early immigrants make their way in an overcrowded boat down the swollen Texas river. Source: http://www.printsoldandrare.com/texas/

The starting line for the first Oklahoma Land Rush, April 22, 1889.

Like Plains Indians and pioneers, settlers were drawn to rivers and streams for similar reasons, but settlers occupied such sites year-round. As the settler population expanded, farmers occupied land around streams that ensured water resources and offered timber.

They made use of other resources to lessen their dependence on wood—sod houses, buffalo chips for fuel, and barbed wire fences are the best-known adaptations—but for some needs, such as winter firewood, cottonwoods and other riparian trees were inevitably used.

Collecting buffalo chips

Cottonwood Use by Early Settlers

Though the wood of the Plains Cottonwood is moderately weak, it was the only wood available to early settlers on the plains and was pressed into use as timber and firewood.

The vegas -- horizontal roof beams -- of the adobe dwellings characteristic of the southwest were often made of cottonwood. Examples are the vegas of the reconstructed Bent's Fort near La Junta on the Arkansas River.

For much of its 16-year history, Bent's Old Fort was the only major permanent white settlement on the Santa Fe Trail between Missouri and the Mexican settlements. The fort provided explorers, adventurers, and the U.S. Army a place to get needed supplies, wagon repairs, livestock, food, water and company, rest and protection.

Conflicts grew between settlers and the Comanche & Kiowa on the Texas frontier after U.S. troops left Texas during the Civil War years. Battles led to major loss of life and the establishment of reservations. Painting by Nola Davis, courtesy of Fort Richardson SHS, Texas Parks and Wildlife Department.

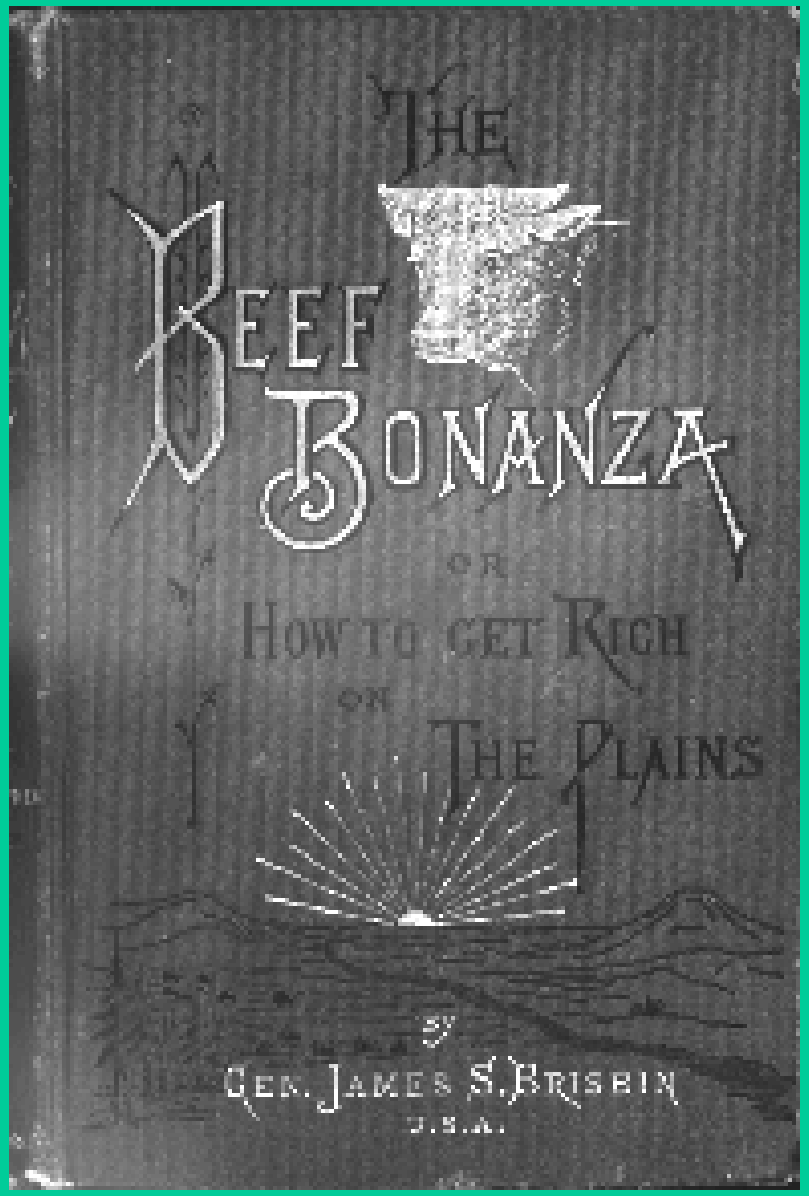
The High Plains lacked standard building materials such as wood or stone, but sod from thickly-rooted prairie grass was abundant.

Archival Photo, Tarrant County, Texas. 1898

Plowing sod

Cover of *The Beef Bonanza: How to Get Rich on the Plains*, by Gen. James. S. Brisbin, one of the books that helped fuel the cattle boom of the early 1880's.

(Courtesy Beinecke Rare Book and Manuscript Library, Yale University.)



The Ranching and Open Range Phase

Although sheep ranching initiated the grazing phase, its dominance quickly gave way to cattle, which first came in herds as few as 100 head.

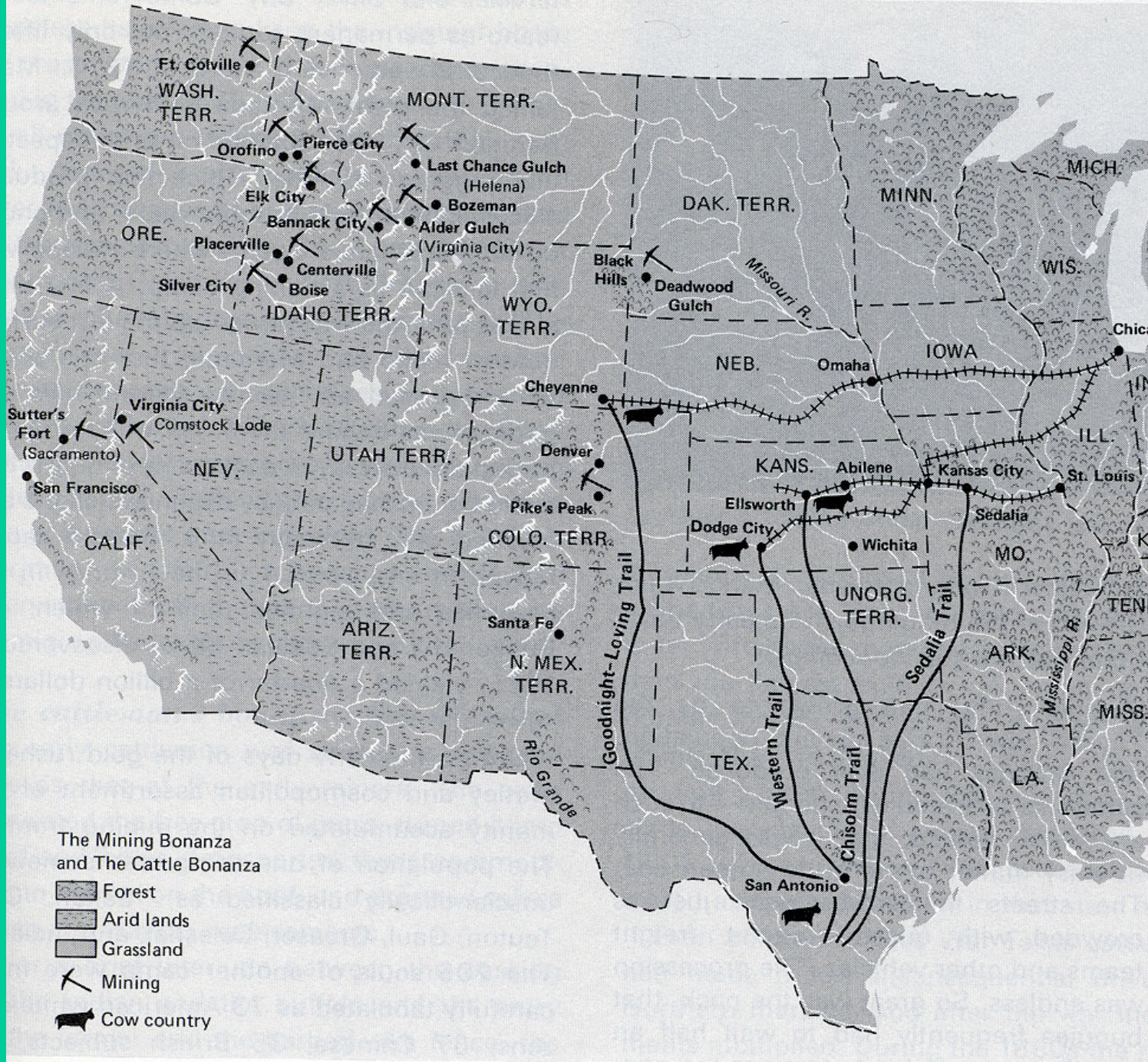
Individual enterprise gave way to corporate enterprise because the attraction of low-cost stocker cattle, low labor costs, the subsidy of free grass, and high market prices infused large amounts of capital from the east and Europe.

The 1st corporate giant was Prairie Cattle Company of Edinburgh, Scotland. Another, Capitol Freehold Land and Investment Company, Ltd, is best known as XIT Ranch.

Corporate financial resources brought barbed wire[qv] fencing, deep-drilled wells, and windmills, thus enabling more effective use of pasturage away from surface water, & encouraging less dependence on riparian resources.

Texas Cattle Trails

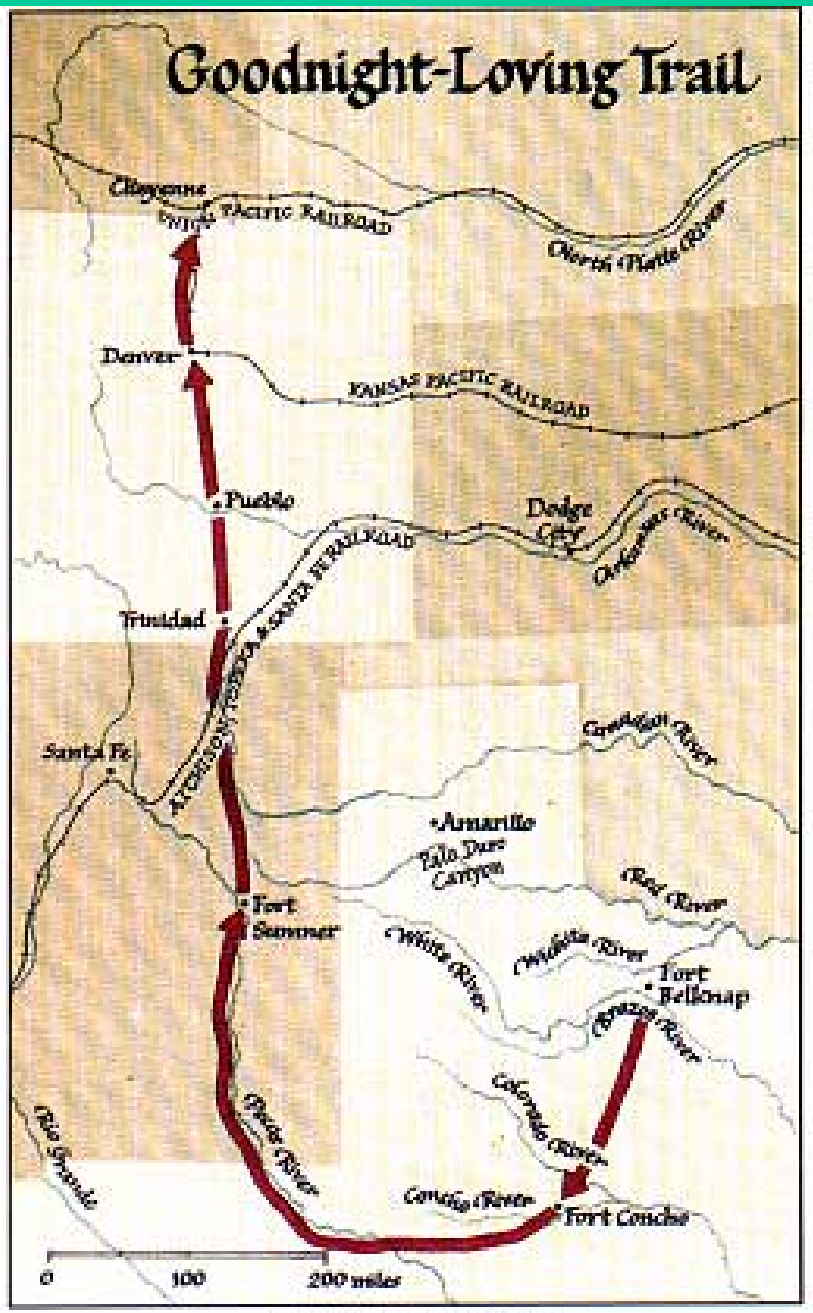
Before the Civil War, the Shawnee Trail (far right) led Texas cattlemen to markets in Kansas City and St. Louis. Following the war, increased settlement closed that route, and in 1866 Charles Goodnight and Oliver Loving blazed a trail west to the New Mexico and Colorado markets, called the Goodnight-Loving Trail (far left). Soon, however, railheads in Kansas led cowboys up the Chisholm Trail to Abilene, and up the Western Trail to Dodge City and points north.



Great Plains environment

GOODNIGHT-LOVING TRAIL

The Goodnight-Loving Trail
an from Young County, Texas,
southwest to Horsehead Crossing
on the Pecos River, up the Pecos
to Fort Sumner, New Mexico,
and on north to Colorado.



Map by Joan Pennington

A DROVE OF TEXAS CATTLE CROSSING A STREAM.—Sketched by A. R. Waud.—[See Page 668.]

Fenced in Ranch

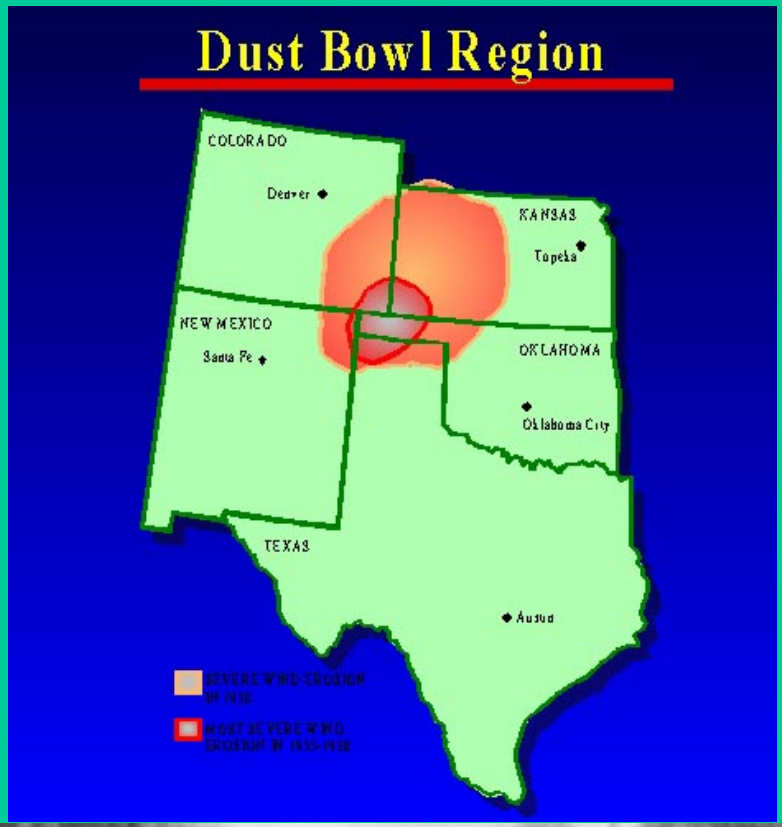
Railroads Improved Access

Every phase of regional development profited by completion of the Fort Worth and Denver Railway in 1888. In time, the Rock Island and Santa Fe joined the FW&D in providing a region-wide rail network. Railroads determined the location of townsites, ranchers got easier access to supplies and markets, and promoters, boosted the Panhandle as the

new garden for farmers.

The Dust Bowl Period

The Dust Bowl was an ecological calamity induced by land abuse, unsuitable farming methods, severe drought, and abnormally high winds. Many farmers, especially tenants, were driven from the land. Between 1935 and 1940 both the number of farms and property values declined sharply.



1937

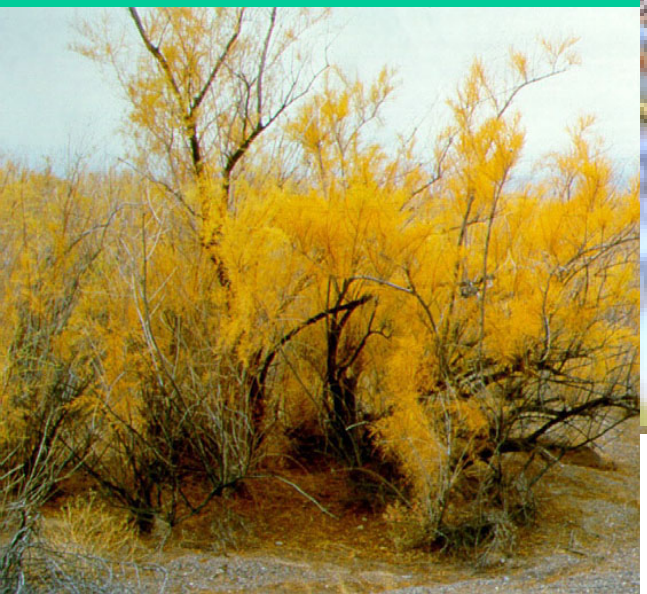
FDR's Shelterbelt Project begins.
The project called for large-scale planting of trees across the Great Plains, stretching in a 100-mile wide zone from Canada to northern Texas, to protect the land from wind erosion. Trees were planted along fence rows separating properties, and farmers were paid to to plant and cultivate them.

1938

The extensive work re-plowing the land into furrows, planting trees in shelterbelts, and other conservation methods resulted in a 65 percent reduction in the amount of soil blowing.

Introduction and Spread of Tamarix

Eight species of *Tamarix* were first brought to North America in the 1800s from s. Europe or the eastern Mediterranean region (DiTomaso 1998). *Tamarix* species escaped cultivation and are now widespread on floodplains throughout the western United States (Christensen 1962). There are few river systems in Texas, Oklahoma, New Mexico, Arizona, Utah, Nevada, and California where *Tamarix* is not present.



Tamarix ramosissima
Salt cedar

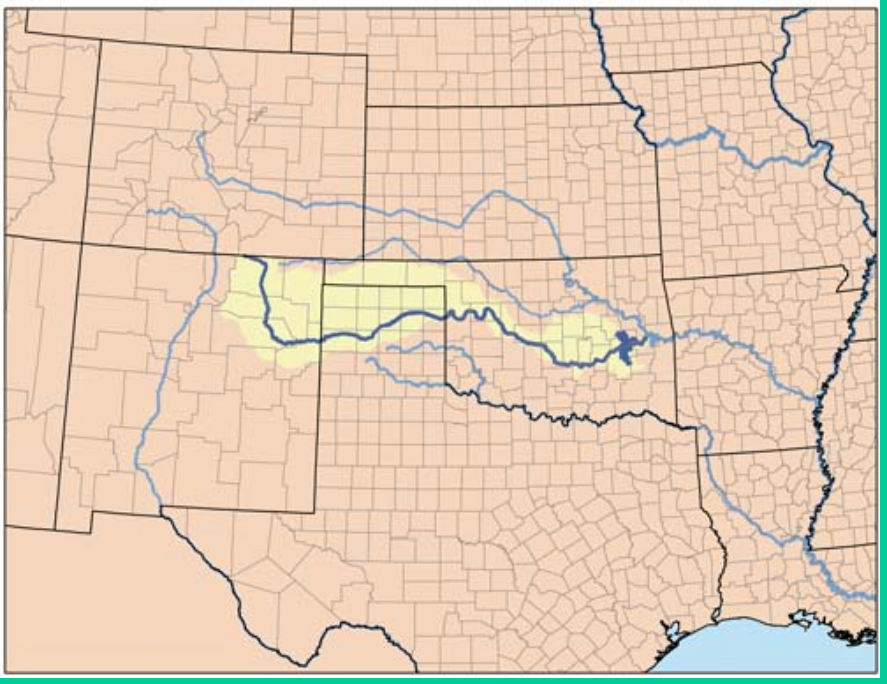
History of Canadian River

As early as 1926 Alson Asa Meredith made a life's work in promoting the harnessing of the Canadian River as a water supply for the Panhandle region.

The Canadian River Municipal Water Authority was formed in 1953 and Sanford Dam was constructed.

This project created the 821,000-acre feet water source Lake Meredith.

Damming and water regulation decreased water amount in the channel, allowing invasion of more xeric riparian species, particularly exotic tamarisk



The Canadian River near Bridgeport, Oklahoma

The Canadian River at Calvin, Oklahoma

Conchas Dam and Lake on the Canadian River in San Miguel County, New Mexico

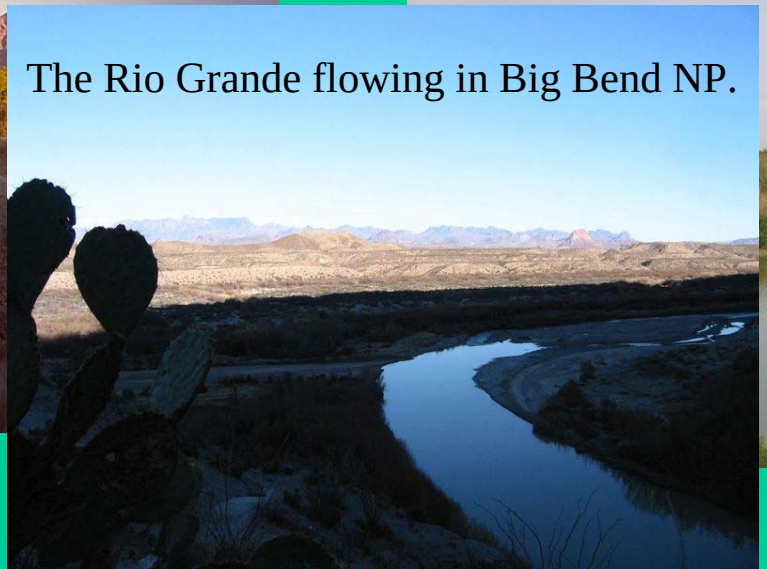
A chopper applies herbicide to kill salt cedar on the Canadian River near Lake Meredith

The Upper Rio Grande near Creede, C0

Rio Grande in Laredo, Tx

The Rio Grande at Bernalillo, NM

The Rio Grande in its lower course, between Matamoros and Brownsville



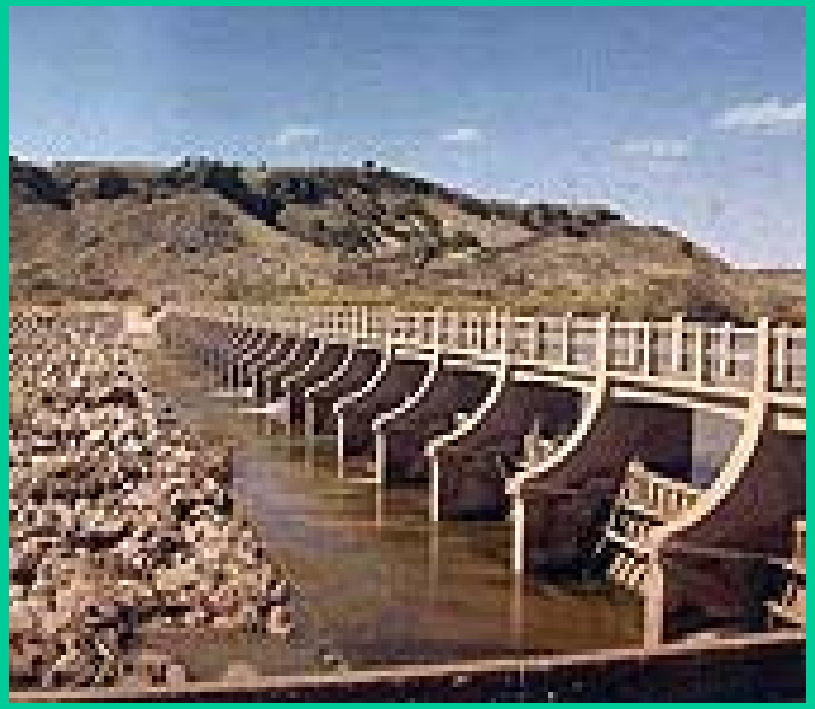
The Rio Grande flowing in Big Bend NP.

Dates in Rio Grande History

- 1600 Europeans intensify agriculture
- 1908-1936 Saltcedar proliferates
- 1915-1933 Russian olive proliferates
- 1920s Levee construction to confine floodway
- 1930-1936 Drainage canals lower water table
- 1953 Jetty Jack installation begins
- 1956 Initial Channelization completed
- 1975 Cochiti Dam completed
- 1990s Listings of Minnow, Flycatcher
- 2002 Albuquerque bosque fire

From Crawford et al. 1993

Existing cottonwoods were established in early 1940s before flow was well regulated



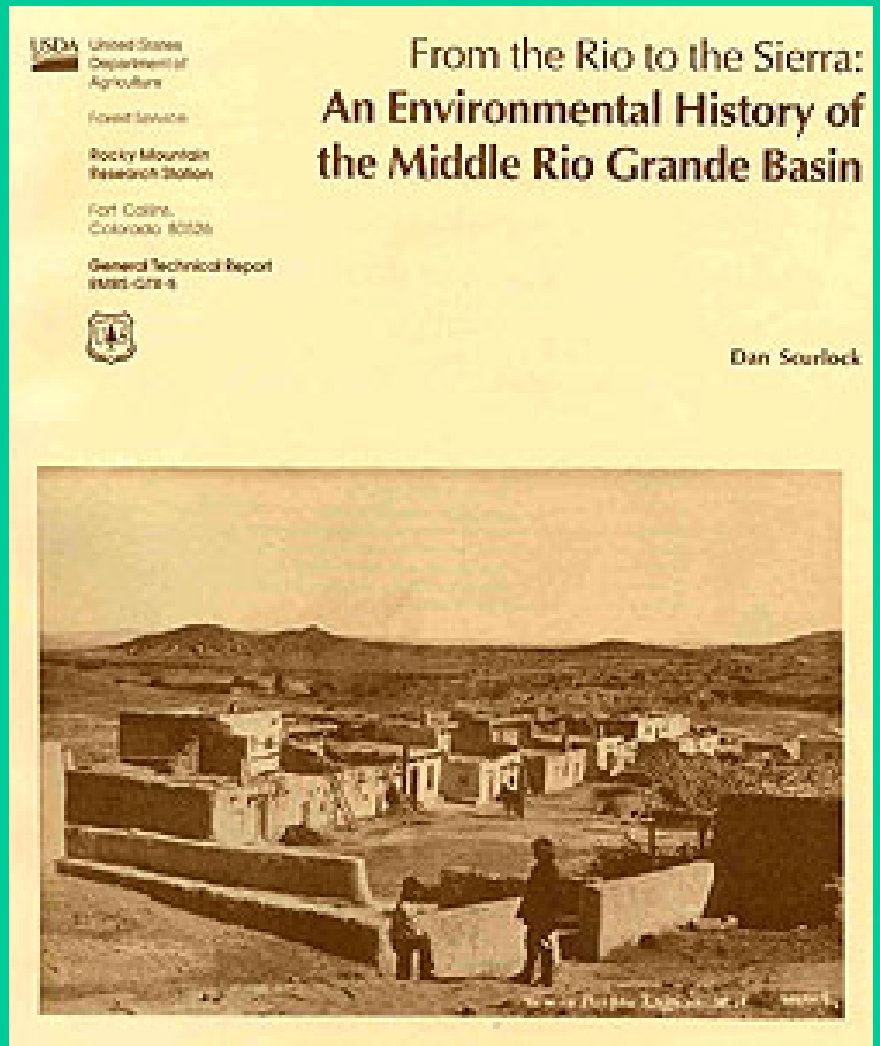
Jetty Jacks

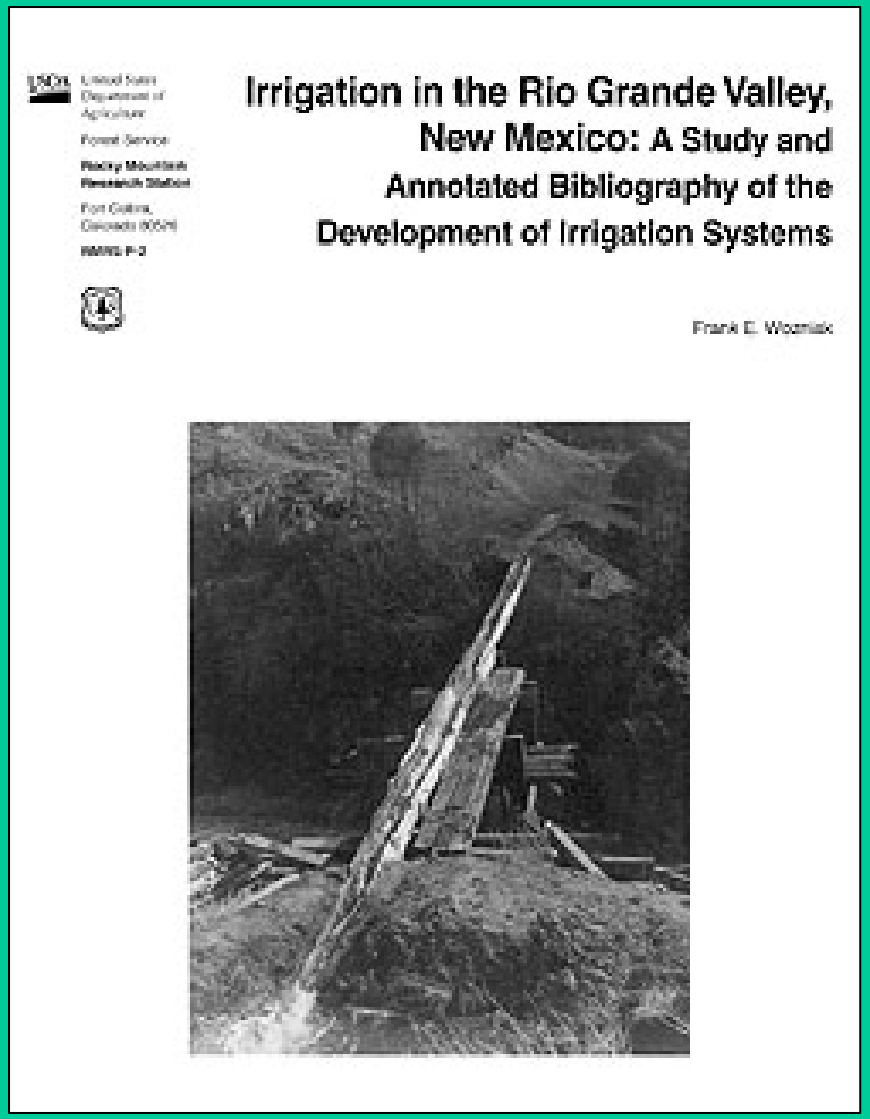
Fire is now a threat to many SW riparian woodlands as a result of water management, invasion of exotics, Drought, accumulating deadwood, & city proximity.

Albuquerque Bosque Fire, July 2003

Photos by Chief Bobby Halton, Albuquerque Fire Department

Cultural Heritage Assessments





Historical Use of Texas High Plains Playas

- Early settlers dug pits in playas to concentrate water and slow evaporation so that livestock would have a watering source during droughts.
- About 70% of playas >10 acres have had pits dug in them to concentrate water for row-water (or furrow) irrigation. Modern irrigation relying on groundwater does not use these pits.
- Approximately 10 percent of playas have roads constructed in their basins which have impacted playa condition.
- Playas in croplands experience severe sedimentation as a result of soil erosion in adjacent croplands. Playas affected by sedimentation are shallower with low capacity to hold water.
- Livestock historically trampled playa vegetation during range drives, and even now, remove many of the seed producing plants that are preferred by waterfowl and other birds.

Approximately 19,300 playas are found in the Texas High Plains, giving it the highest density of playas in North America. The lake shown to the left is within cropland.

Establishing native prairie buffers around the perimeter of playa basins can help to restore playas, depicted below. Grassland buffers slow or halt sedimentation.

Fencing allow ranchers to limit livestock access to playas during the growing season, improving growth and establishment of plants beneficial to wildlife. Removing sediments and filling pits also holds promise.

"From the upper branches of the cottonwood trees overhead -- whose shimmering, tremulous leaves are hardly ever quiet, but if the wind stirs at all, rustle and quiver and sigh all day long -- comes now and then the soft melancholy cooing of the mourning dove, whose voice always seems far away." **Theodore Roosevelt, *Ranch Life and the Hunting Trail***

Ralph Myers
"River Landscape. 1939

Sheldon Parsons
"Fall Cottonwoods",
1930s