

Center for Environmental Research at Hornsby Bend

MISSION

Urban Ecology and Sustainability

- Community
- Education
- Research

PARTNERS

- Austin Water Utility
- University of Texas
- Texas A&M University

RESEARCH AREAS

- Soil Ecology, Sewage Recycling and Reuse
- Hydrogeology of the Alluvial Aquifer
- Riparian Ecology and Restoration
- Avian Ecology



50 YEARS OF BIRDING



AUSTIN TEXAS
Hornsby Bend
1959 2009

City of Austin



Austin Water Utility



Center for Environmental Research at Hornsby Bend

AWU-CER Lunchtime Lectures January – April 2011

Each talk begins AT NOON Waller Center [625 East 10th Street – between I-35 and Red River] Room 104

The 1st Wednesday of the Month! Free and Open to the Public – bring a lunch and learn

Austin and the Colorado River Corridor

We begin 2011 by exploring the ecology and geography of the Colorado River Corridor. The first four Lunchtime Lectures focus on different aspects of the Colorado River – ecological, cultural, historical, and biological.

Wednesday, January 5

The Forgotten Habitat: the Biogeography of the Colorado River Bottomlands

Wednesday, February 2

Changes in the Land: The Cultural Landscape of the Colorado River Corridor

Wednesday, March 2

Discovering the Colorado: The Austin-Bastrop River Corridor Partnership 2003-2011

Wednesday, April 6

The Nature of the River: The Flora and Fauna of the Colorado River Corridor

Geography (from Greek γεωγραφία - *geografia*)

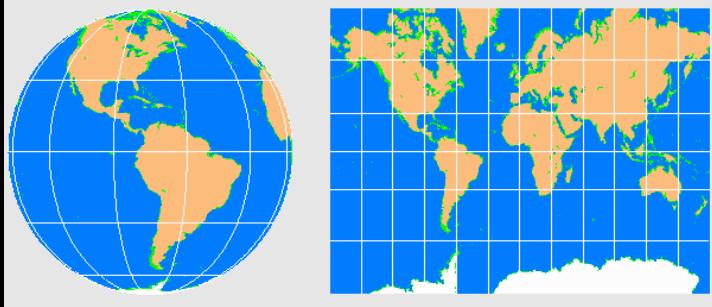
A literal translation would be "to describe or write about the Earth".

The first person to use the word "geography" was Eratosthenes (276-194 B.C.).

Alexander von Humboldt 1769-1859

Four historical traditions in geographical research are

- the spatial analysis of natural and human phenomena (geography as a study of distribution)
- area studies (places and regions)
- study of human-land relationship
- research in earth sciences



Vermeer's "Geographer"

As "the bridge between the human and physical sciences,"

Geography is divided into two main branches - human geography and physical geography.

Human geography is a branch of geography that focuses on the study of patterns and processes that shape human interaction with the environment, with particular reference to the causes and consequences of the spatial distribution of human activity on the Earth's surface. [Quantitative and Qualitative methods]

Cultural geography – **Carl Sauer** (1889 – 1975) was an American geographer.

Sauer was a professor of geography at the University of California, Berkeley from 1923 until becoming professor emeritus in 1957.

One of his most well known works was *Agricultural Origins and Dispersals* (1952).

In 1927, Carl Sauer wrote the article "Recent Developments in Cultural Geography," which considered how cultural landscapes are made up of "the forms superimposed on the physical landscape."

Sauer identified the landscape as the defining unit of geographic study.



Landscape – [late 16th century Dutch] a picture depicting natural scenery



Carl Sauer

Cultural Landscape and Cultural Geography

Carl Sauer saw that cultures and societies both developed out of their landscape, but also shaped them too.

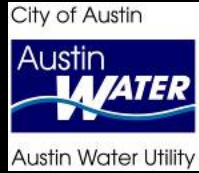
This interaction between the “natural” landscape and humans creates the “cultural” landscape.

Sauer summed up his idea of a cultural landscape this way –

“culture is the agent, the natural area is the medium, and the cultural landscape is the result.”

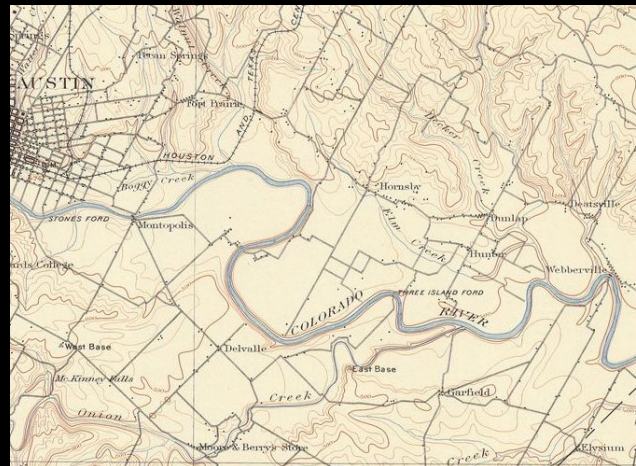
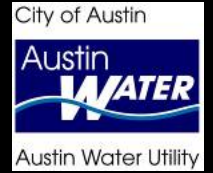


Changes in the Land: The Cultural Landscape of the Colorado River Corridor

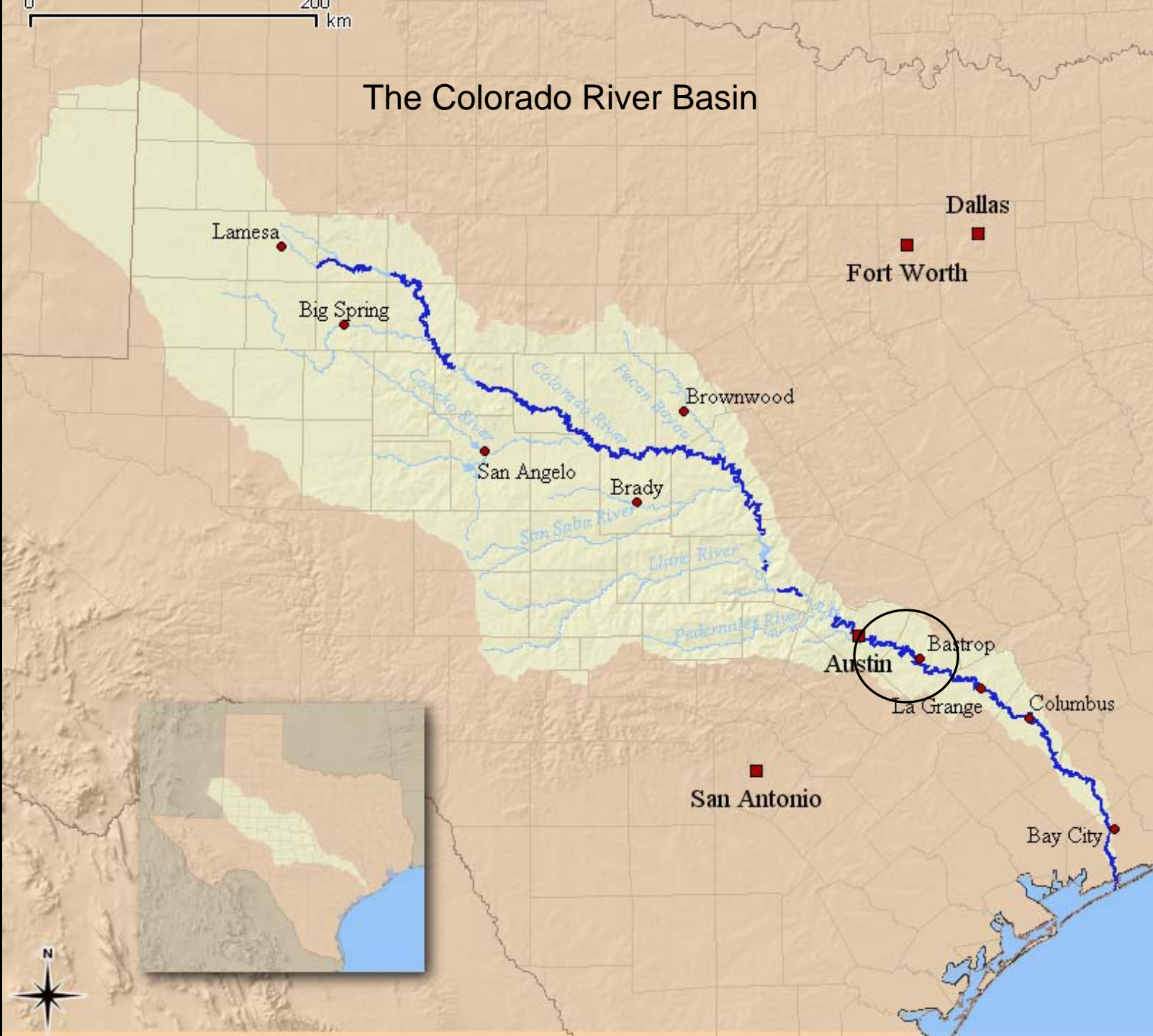


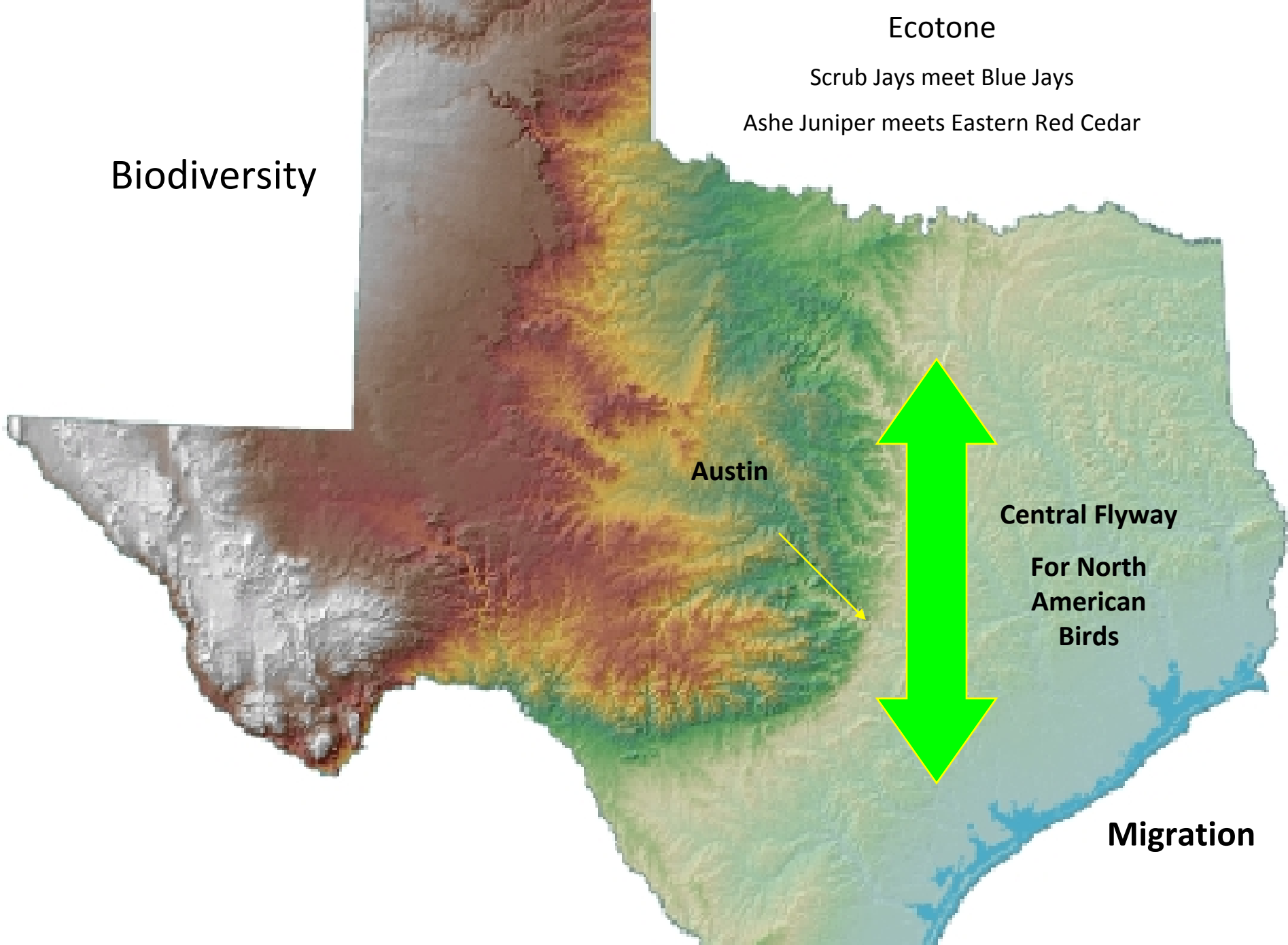
Kevin M. Anderson, Coordinator

Austin Water Utility - Center for Environmental Research



The Colorado River Basin





Ecotone

Scrub Jays meet Blue Jays

Ashe Juniper meets Eastern Red Cedar

Biodiversity

Austin

Central Flyway

For North
American
Birds

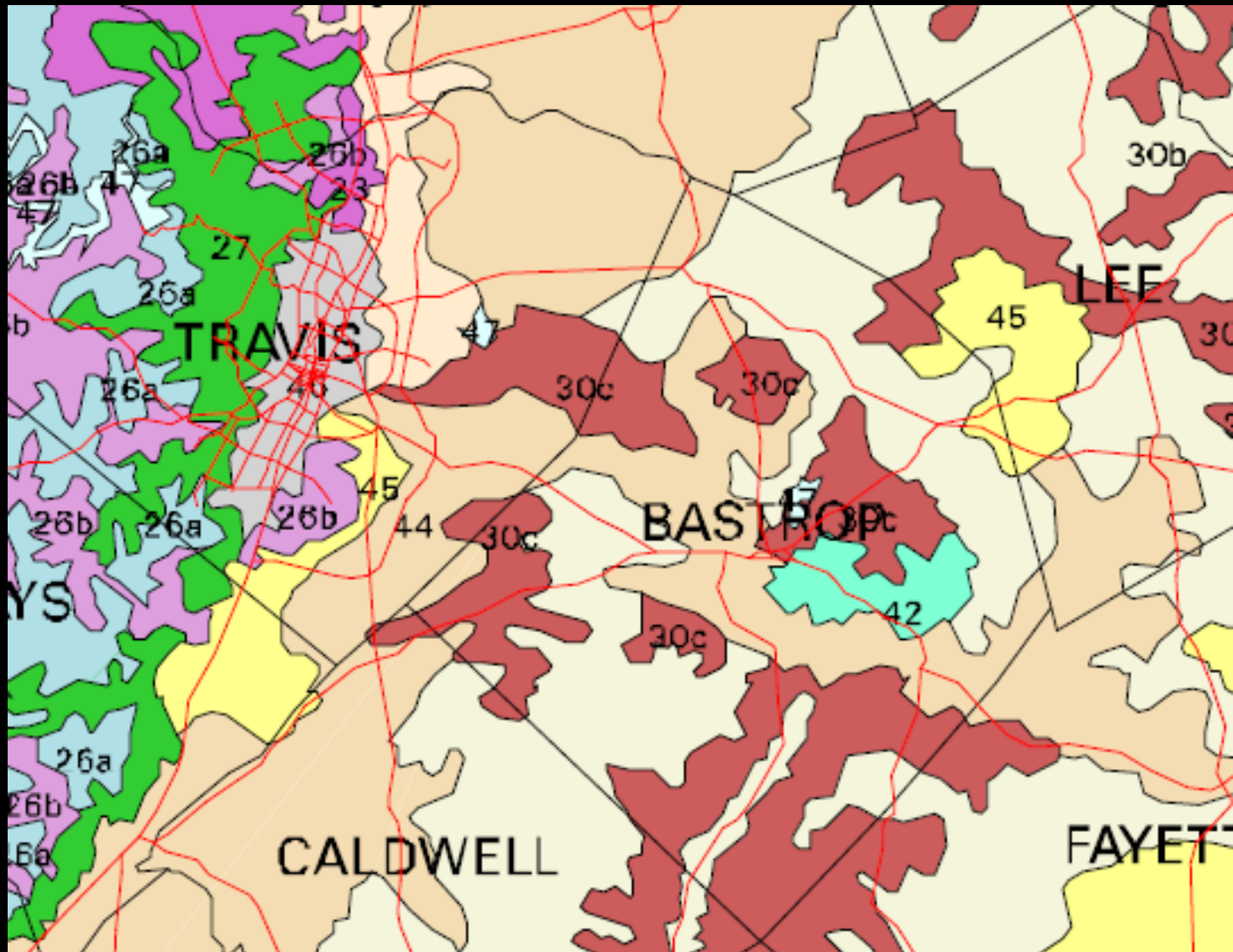
Migration



Bottomland Biodiversity

The Forgotten Bottomland Forest

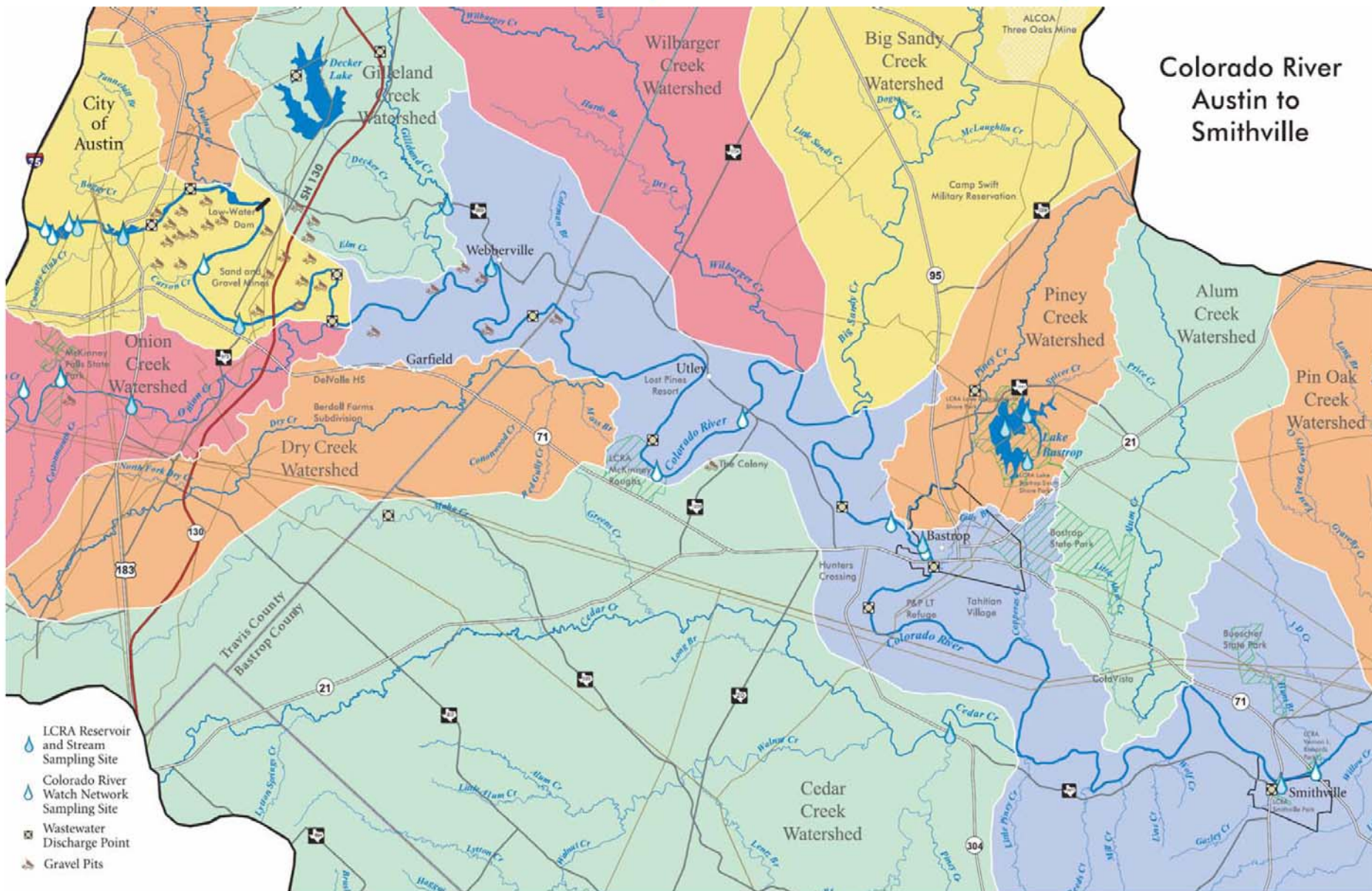




44 Crops

The Austin-Bastrop River Corridor Partnership

Colorado River
Austin to
Smithville

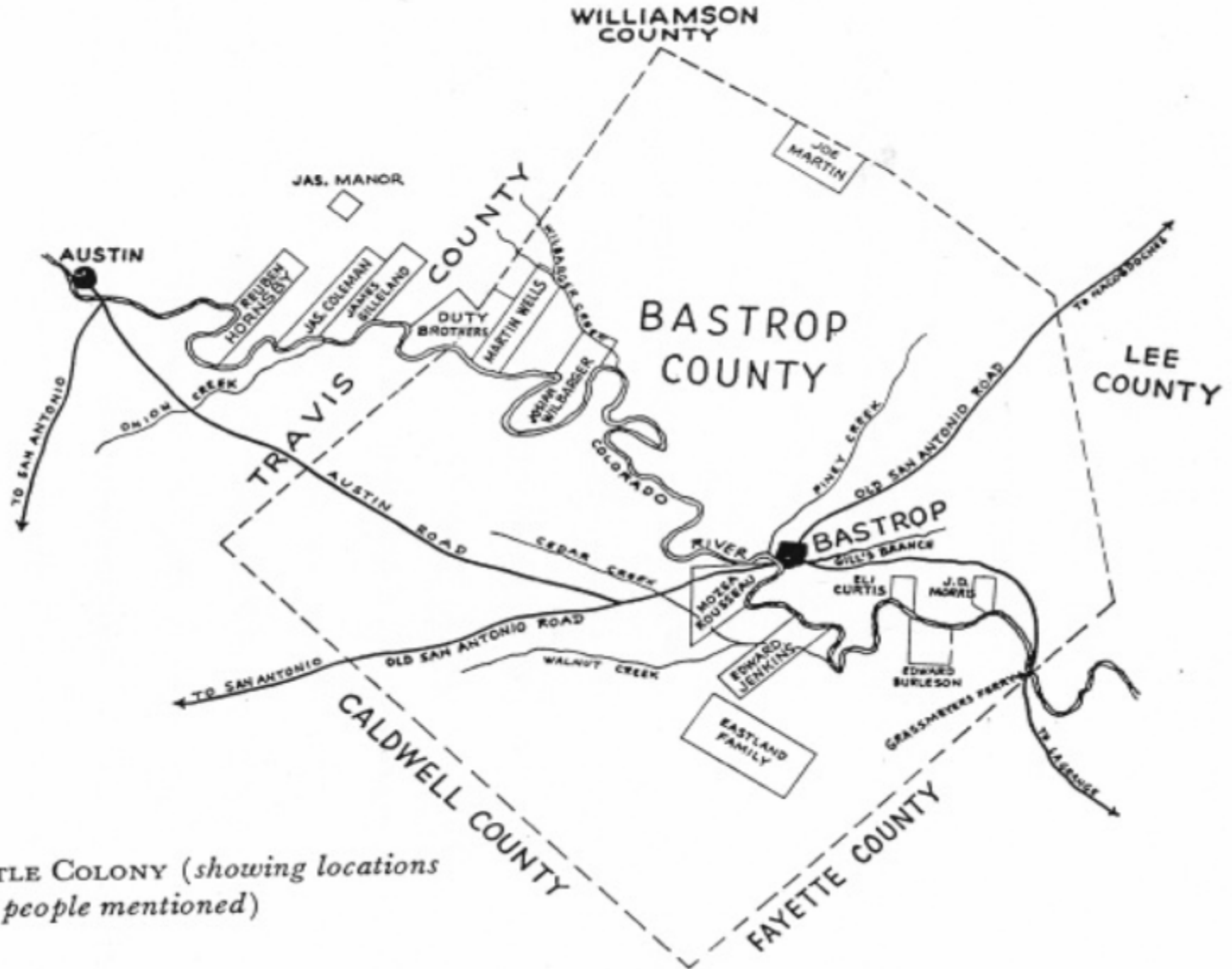


Early Settlement

How did the bottomland forest disappear?



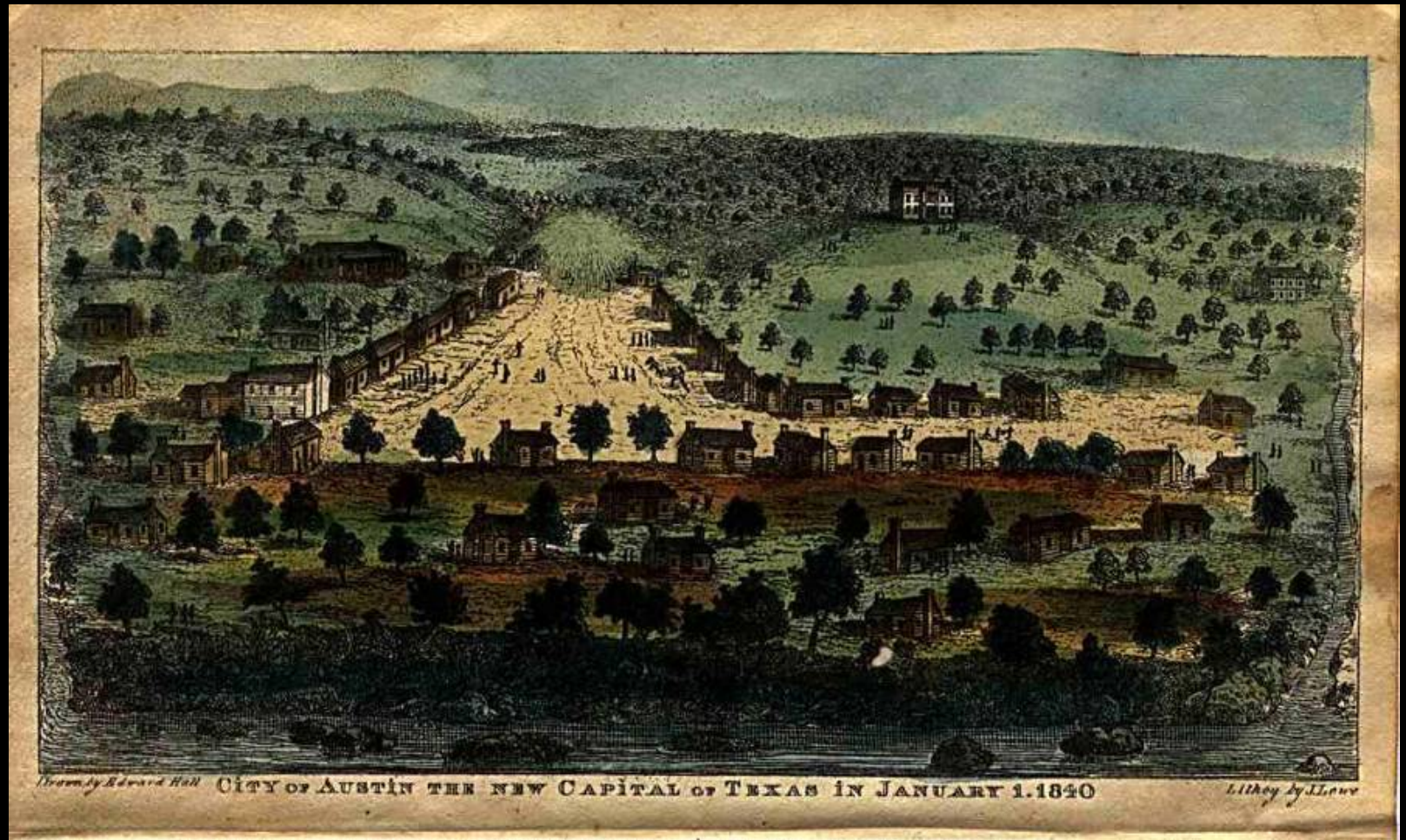
Settlement begins 1820's along river corridor

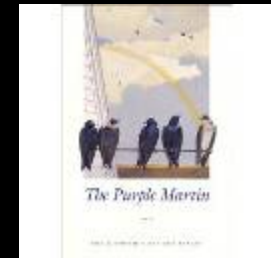
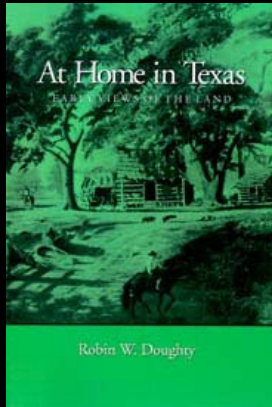


Austin's Little Colony (showing locations of homes of people mentioned)

Settlement in Central Texas

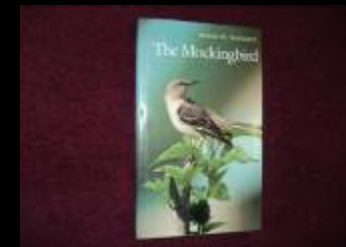
Transforms the landscape both real and imagined

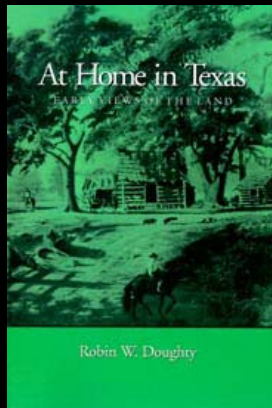




Robin Doughty is a professor of geography at the University of Texas at Austin, where he teaches and researches in the areas of cultural geography, historical ecology, biogeography, endangered species.

He has also been a prolific author about the Texas environment, writing such books as The Purple Martin, Return of the Whooping Crane, Endangered Wildlife in Texas, The Mockingbird, At Home in Texas: Early Views of the Land, The Amazing Armadillo: Geography of a Folk Critter, Wildlife and Man in Texas, and Feather Fashions and Bird Preservation.





From wilderness to garden – Central Texas as the “middle ground” of Texas – a Mediterranean parkland

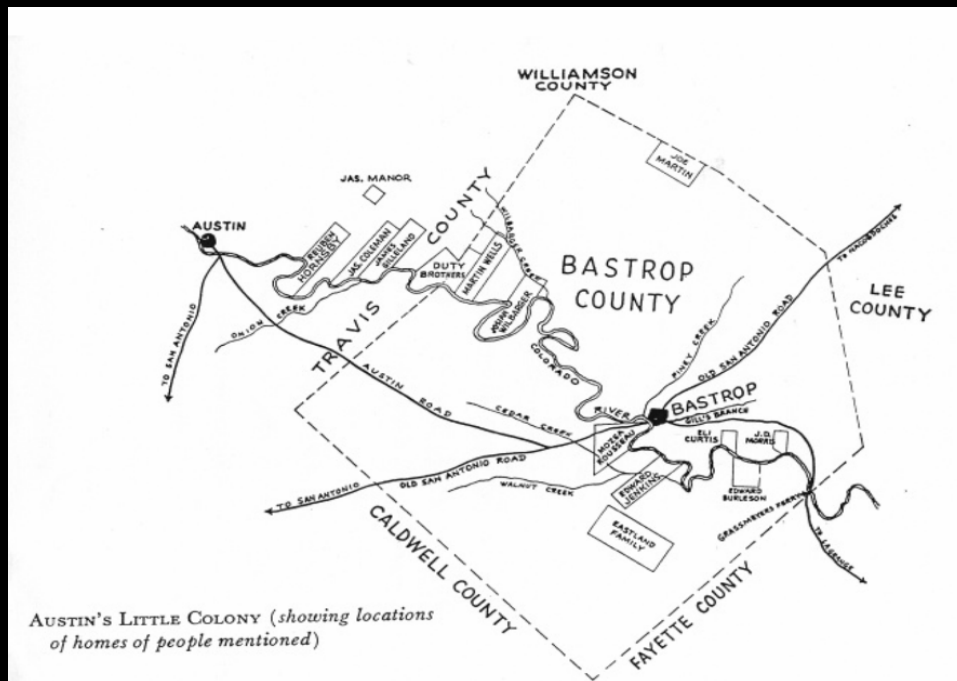
Robin Doughty, *At Home In Texas: Early Views of the Land*, Texas A&M Press, 1987.

Stephen F. Austin describing the Colorado River near Bastrop 1821

“Journal of Stephen F. Austin on His First Trip to Texas 1821” *Texas Historical Quarterly*, VII.

“Tuesday, August 7 [1821]. Came to the Colorado River – poor, gravelly ridges and near the river heavy pine timber, grapes in immense quantities on low vines, red, large, and well flavored, good for Red wine. The Colorado River is sometimes less than the Brazos, banks very high – generally clear of overflow – bottom and banks gravelly, water very clear and well tasted, current brisk, the river very much resembles Cumberland River, except that there are no rocks and it is some larger.

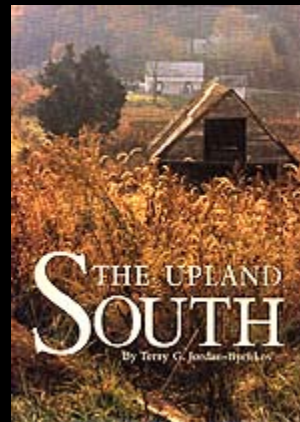
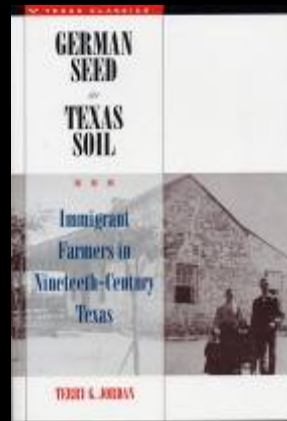
The bottomland where the road crosses is about five miles, mostly prairie, clear of overflow, land rich, timber Pecan, Ash, Oak, Cedar, abundance of fish.”



ANTECEDENTS OF THE LONG-LOT IN TEXAS*

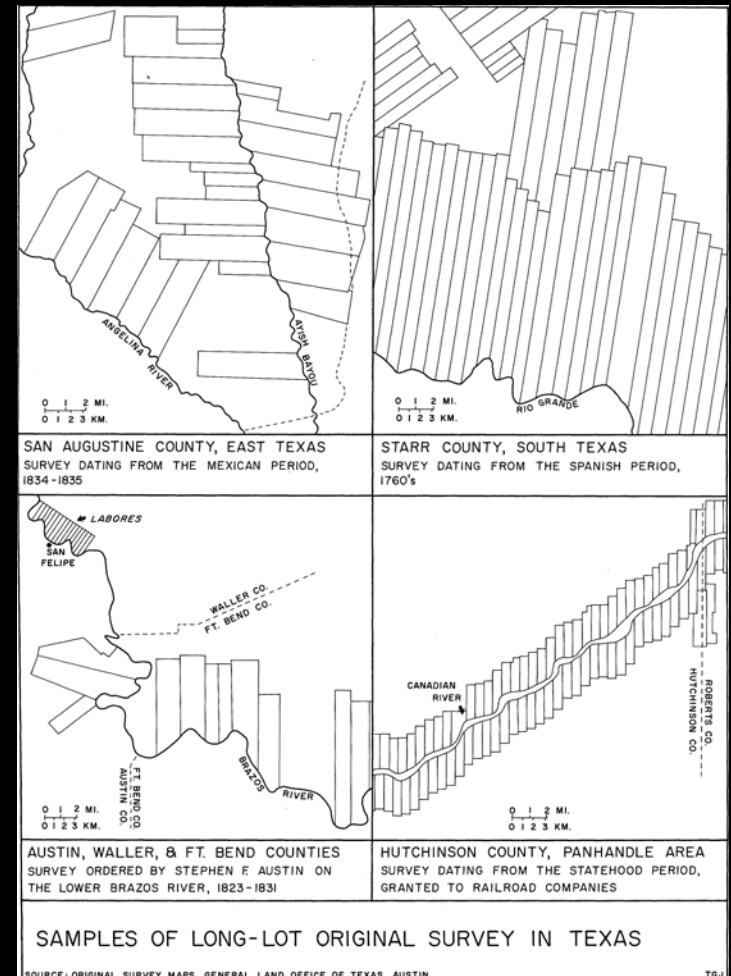
TERRY G. JORDAN

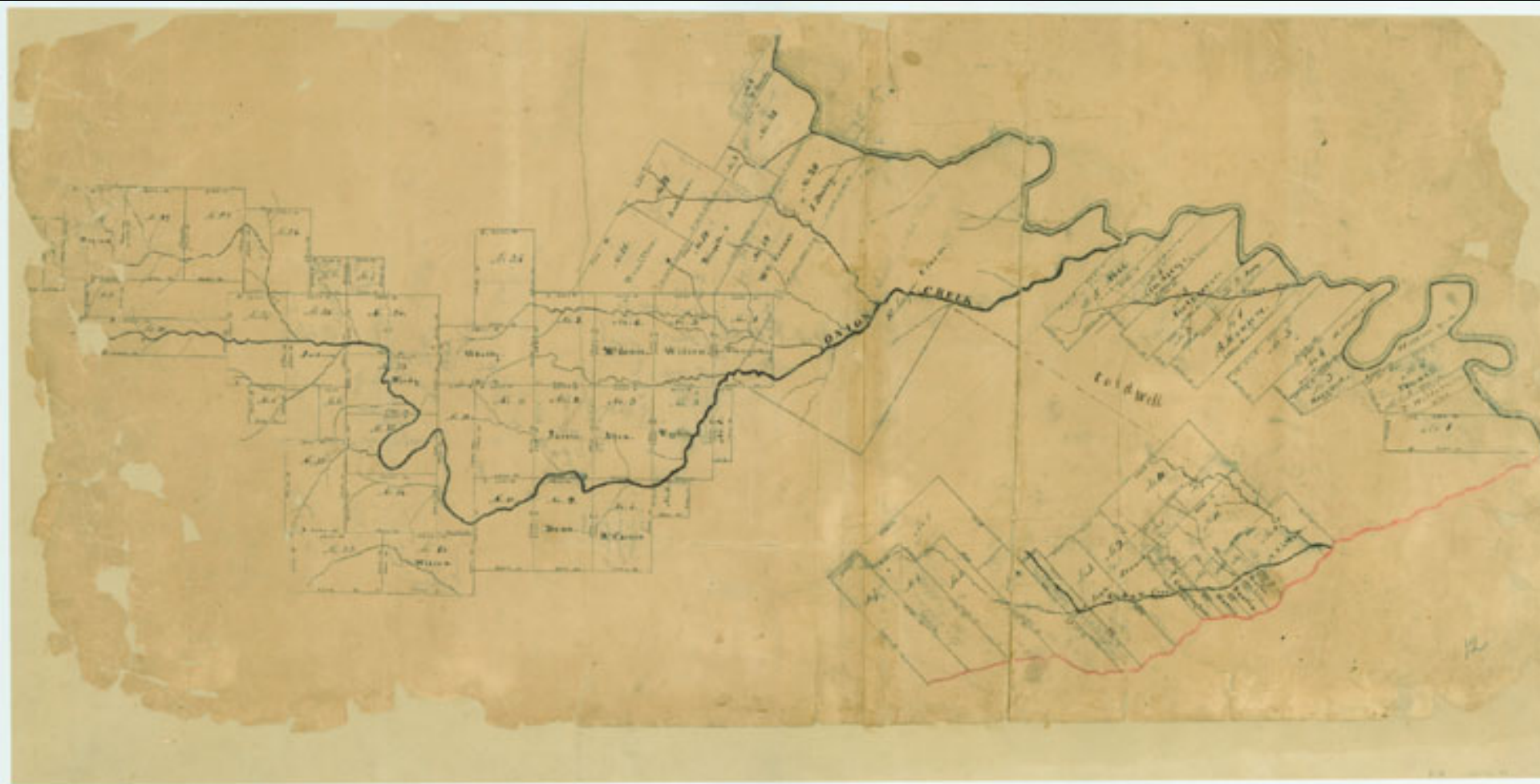
ABSTRACT. Riverine long-lot original surveys were employed in many parts of Texas for about 150 years, beginning in the Spanish period and extending well into the era of statehood. No precedent for the use of long-lots was found either in Spain or New Spain. The evidence suggests that long-lots were diffused to Texas from Central Europe, by way of northern France, Québec, and the French colonies in Missouri and Louisiana. Long-lot survey left an imprint in cadastral, road, and street patterns which is still observable. **KEY WORDS:** *Cultural landscape, Long-lots, Survey patterns, Texas.*



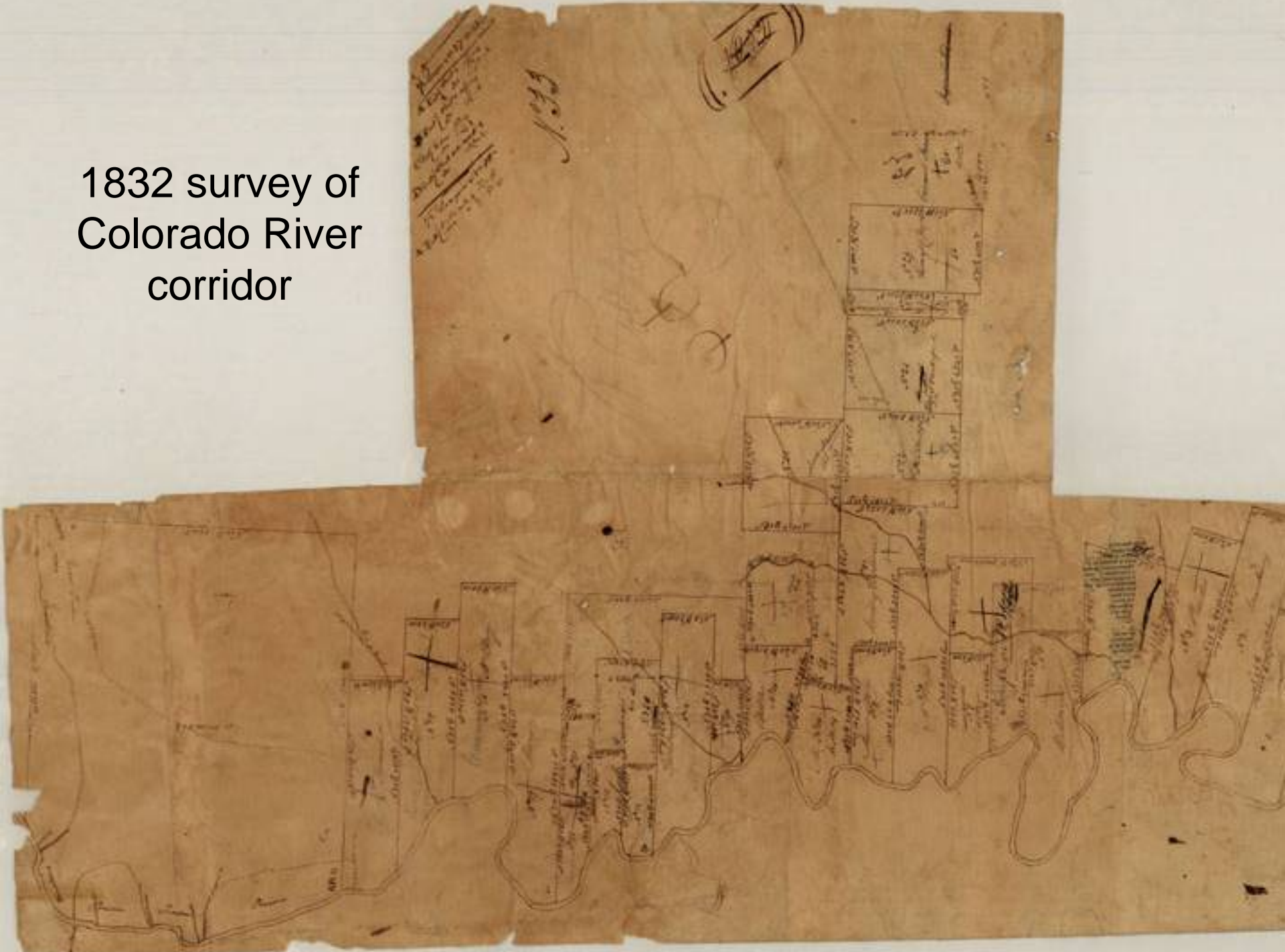
Terry G. Jordan 1938 – 2003

Terry G. Jordan held the Walter Prescott Webb Chair in History and Ideas in the geography department at The University of Texas at Austin.





1832 survey of
Colorado River
corridor





Bastrop

In 1804, the Spanish established a presidio or fort at this location named Puesta del Colorado. The purpose was to protect the Colorado River crossing of El Camino Real, the King's Highway, also known as the Old San Antonio Road.

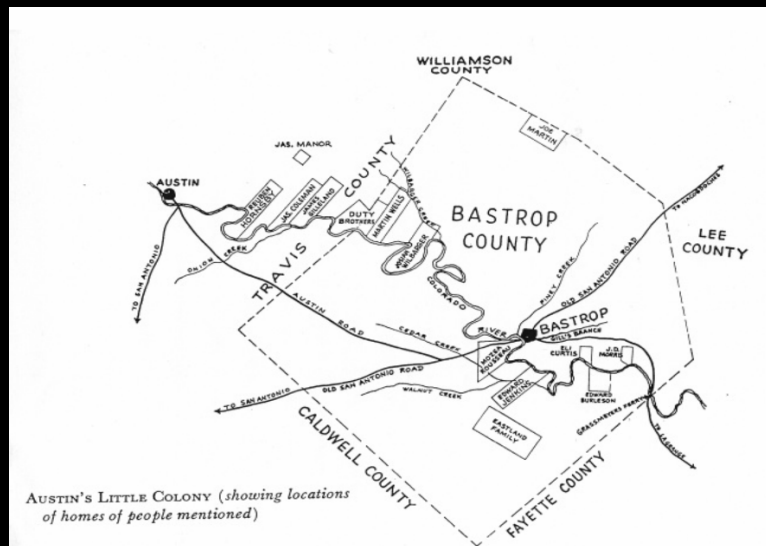


Anglo Settlement begins 1820s - Baron de Bastrop

The Baron de Bastrop obtained permission from the Spanish to found a German colony and selected the site in 1823, but subsequently failed to establish a settlement.

The town was named Bastrop by Stephen F. Austin in honor of the baron, a longtime friend and coworker. His real name was Philip Hendrick Nering Bogel and he was formerly a tax collector in Holland who had fled that country when charged with embezzlement.

Austin, interested in developing the upper reaches of his original colony, used this name after the German colonization attempt failed and he obtained permission in 1827 to locate a "Little Colony" of 100 families on the site. He had seen the future town site on his first journey to Texas, and had noted it favorably in his journal.



Bastrop – Mina – Bastrop

On June 8, 1832, land commissioner José Miguel de Arciniega officially platted the town along conventional Mexican lines, with a square in the center and blocks set aside for public buildings.

He also officially named the site Bastrop, but two years later the Coahuila and Texas legislature renamed it Mina in honor of Francisco Xavier Mina, a Mexican martyr and hero.

On January 1, 1835, Juan N. Almonte reported a population of 1,100 in the area, and at the outbreak of the Texas Revolution the town's population was approximately 400.



"[In the spring of 1832] Stephen F. Austin with some settlers set out from his Upper Colony, headquartered at Mina (now known as Bastrop) to survey a half dozen homesteads along the Colorado River. By late day, Josiah Wilbarger, John Walters, Joseph Duty, William Webber, and a man named Barker had chosen land for their farms.

Only Reuben Hornsby could find no land to suit him, and caused the party to ride on while he sought the extraordinary place where he would make a new home. At last they entered territory that intrigued Hornsby, land far out into the wilderness.

Up over a rolling hill went Austin's party to investigate; perhaps here would be something to satisfy their finicky companion. Below them, when they topped the hill, lay the most delectable valley anyone could remember seeing, luxuriant and emerald-green, where a horseshoe bend of the Colorado hooked into a lowland waving with a sea of wild buffalo rye grass. Laying down his gun, Hornsby turned to his friends.

"Boys, this suits me fine," he said. 'You can go on home if you like'."

Hornsby Bend

1832

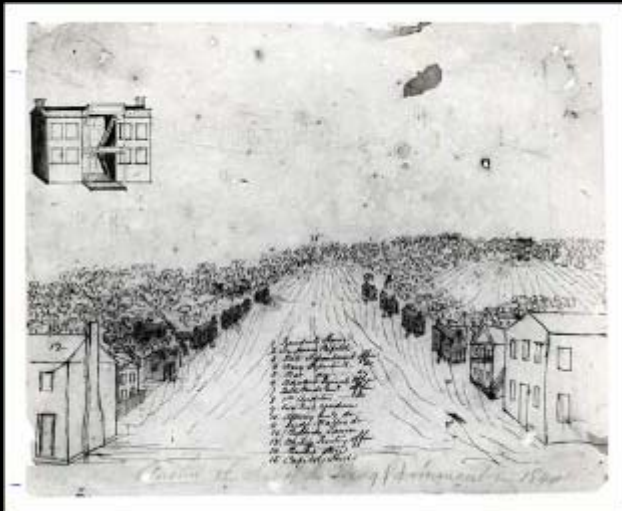
the oldest Anglo settlement
in Travis County



Waterloo and Montopolis

In 1835, Jacob Harrell and his family left one of these early settlements and set up a camp in a new location. It was near the present site of the Congress Avenue bridge. In 1837, after Texas had declared its independence from Mexico, William Barton moved from his property in Bastrop County to a new home on the Colorado River near the springs. Meanwhile, other families joined the Harrell's at their camp and named their settlement Waterloo.

In 1839, Jessie Tannehill and a few investors laid out plans for a town they christened Montopolis near a river crossing west of Hornsby's.



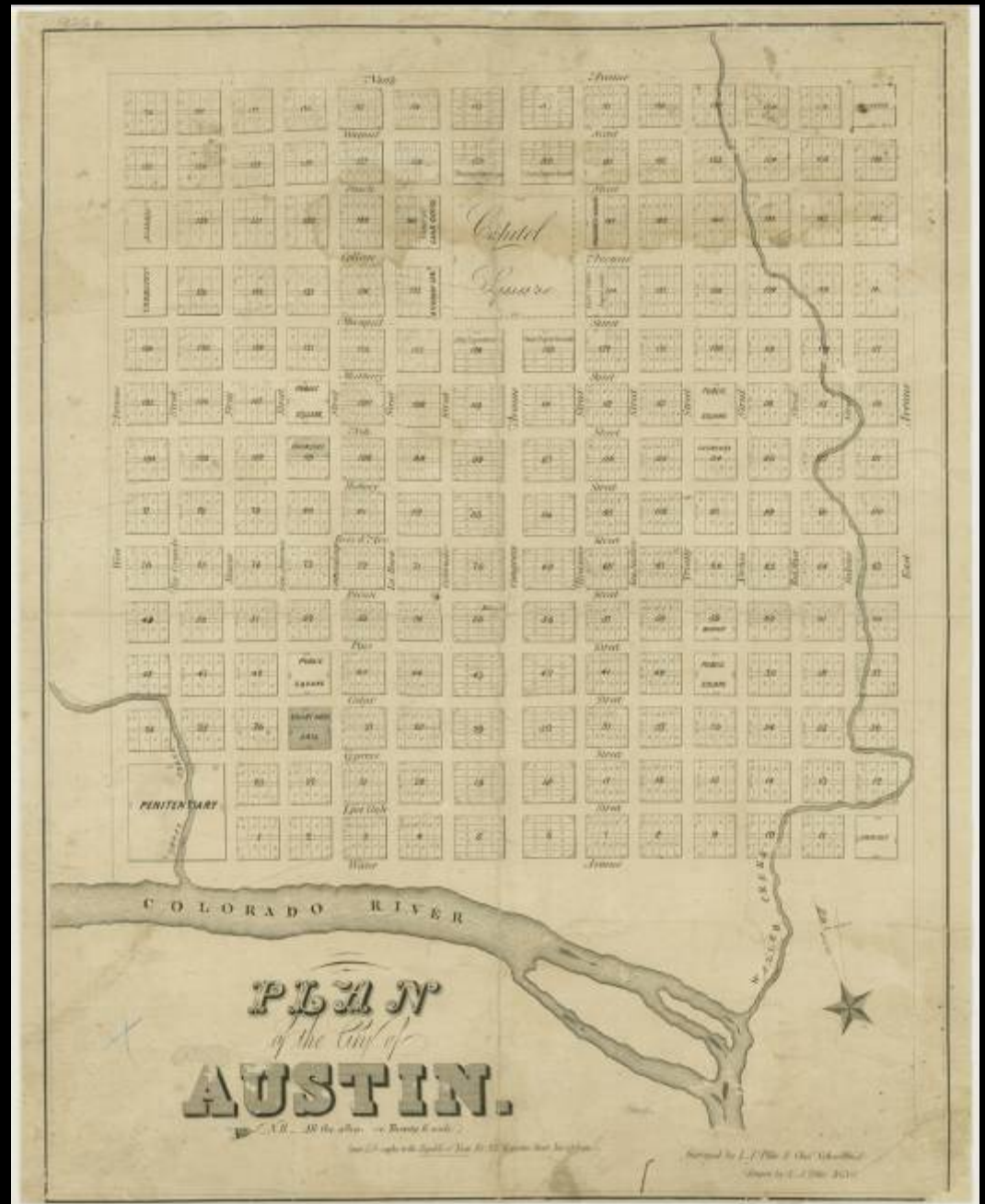
Austin 1839

The city was established by the three-year-old Republic of Texas in 1839 to serve as its permanent capital, and named in honor of the founder of Anglo-American Texas, Stephen F. Austin. A site-selection commission appointed by the Texas Congress in January 1839 chose a site on the western frontier, after viewing it at the instruction of President Mirabeau B. Lamar, a proponent of westward expansion who had visited the sparsely settled area in 1838. The commission purchased 7,735 acres along the Colorado River comprising the hamlet of Waterloo and adjacent lands.



Surveyors L. J. Pille and Charles Schoolfield laid out the new town, working under the direction of Edwin Waller, who was appointed by Lamar to plan and construct Austin. Out of the 7,735 acres they chose a 640-acre site fronting on the Colorado River and nestled between Waller Creek on the east and Shoal Creek on the west.

By 1840 Austin had 856 inhabitants, including 145 slaves as well as diplomatic representatives from France, England, and the United States.



Webberville

The post office, which was established in 1846.

Webberville was sometimes referred to as Smithwick's, for Noah Smithwick, who served as the first postmaster.



THE EVOLUTION OF A STATE OR RECOLLECTIONS OF OLD TEXAS DAYS

by Noah Smithwick

<http://www.oldcardboard.com/ljsj/olbooks/smithwic/otd.htm>



Native Americans and Anglo Settlers

The primary inhabitants settlers encountered were small, loosely organized groups of hunter-gatherers that were called the Tonkawa. More powerful tribes of Comanche, Kiowa, and Lipan Apache also were around. Many of these tribes accepted the newcomers but others held a different view. Most notably were the Comanche who saw the settlers as invaders.

Their attacks were common; the first recorded one being on a survey party that included the first settler in the Colony, Josiah Wilbarger. Wilbarger miraculously survived even after being scalped and left for dead.



Transformation

Agriculture – Cattle and Cotton





Agriculture and the River

Bedichek *Karankaway Country*

“As settlements of whites pushed up these rivers, particularly up the Colorado and its tributaries, slashing the timber out of the bottoms, tearing from the banks of streams the retarding vegetation Nature had placed there for a purpose, leaving in their greed for more land, only a turnrow between cultivated field and river brink – as these characteristic pioneer activities got well under way, an ancient and beneficent clogging of the river in its lower course, known as the ‘Colorado River Raft,’ became suddenly virulent.”

– “with the cultivation of the Colorado watershed and the slashing out of the bottoms along the river, this raft grew to enormous proportions, the head of it in 1929 extended forty-five miles from the mouth.” 233

Comer Clay, "The Colorado River Raft," *Southwestern Historical Quarterly* 52 (April 1949).



Cotton

Cotton became the principal field crop in the late 1880s and remained so for more than sixty years.

The 1890 census reported 65,000 acres—nearly 30 percent of the county's improved farmland—planted in cotton; by the turn of the century the amount of land devoted to cotton had increased to 113,300 acres, or 56 percent of the improved farmland.

However, as more marginal land was used and the soil became depleted, production levels fell; in 1930, 143,000 acres produced only 19,000 bales.

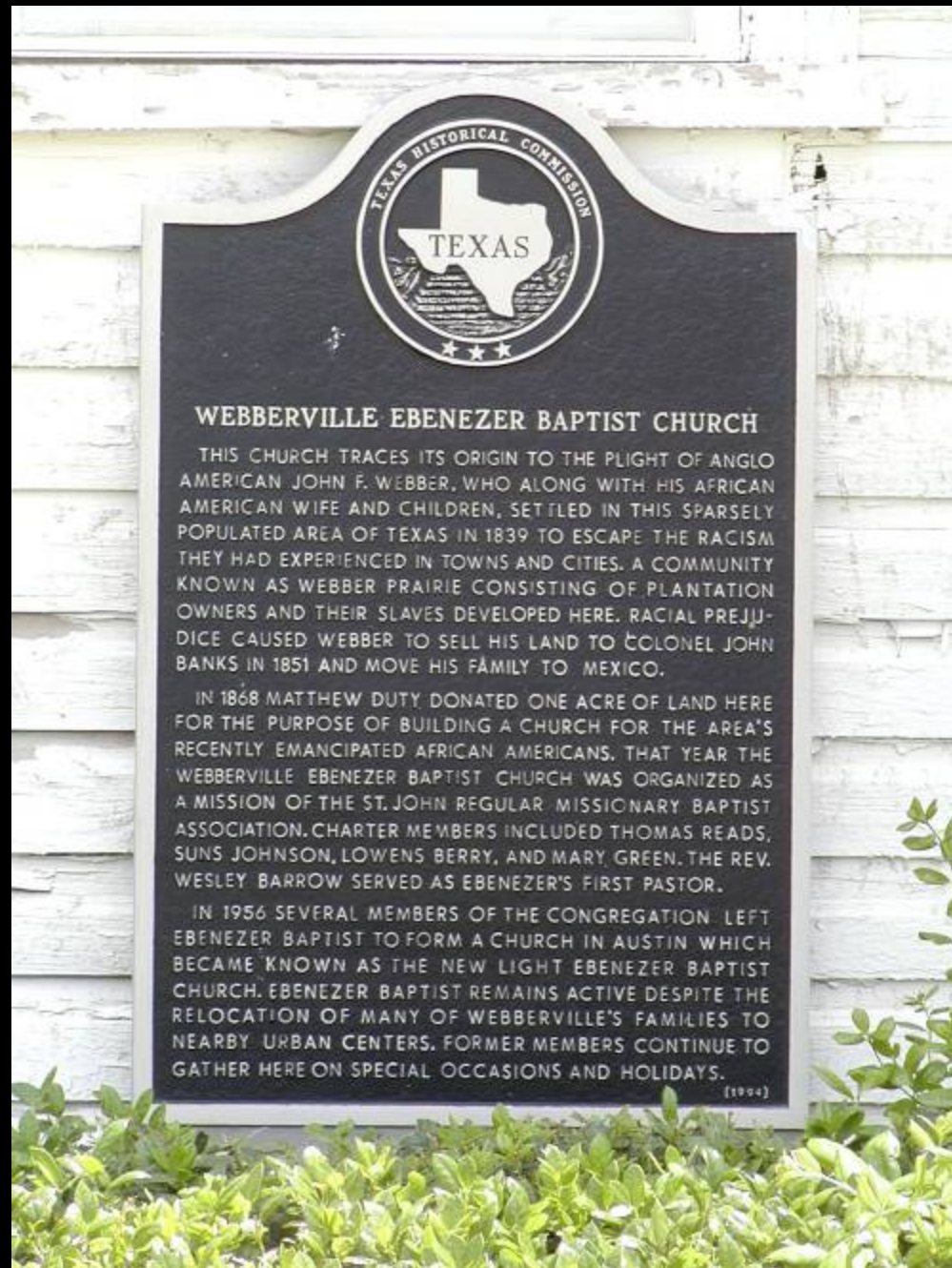
By the late 1950s cotton accounted for only 26 percent of the total cropland harvested, and by 1980 it had fallen to only 8 percent.



Agriculture – Cotton and Slavery

For the cultivation of cotton, plantations were established primarily using African slaves as labor. After the Civil War, the plantation system was replaced with tenant farms and sharecropping. Improvements in technology in both the plow and ginning increased production.





Legacy of early Black community

Agriculture 1890-1960 – from Cotton to Cattle

Farm tenancy had increased steadily since the 1890s and peaked in 1930, with tenants operating two-thirds of the 3,642 farms.

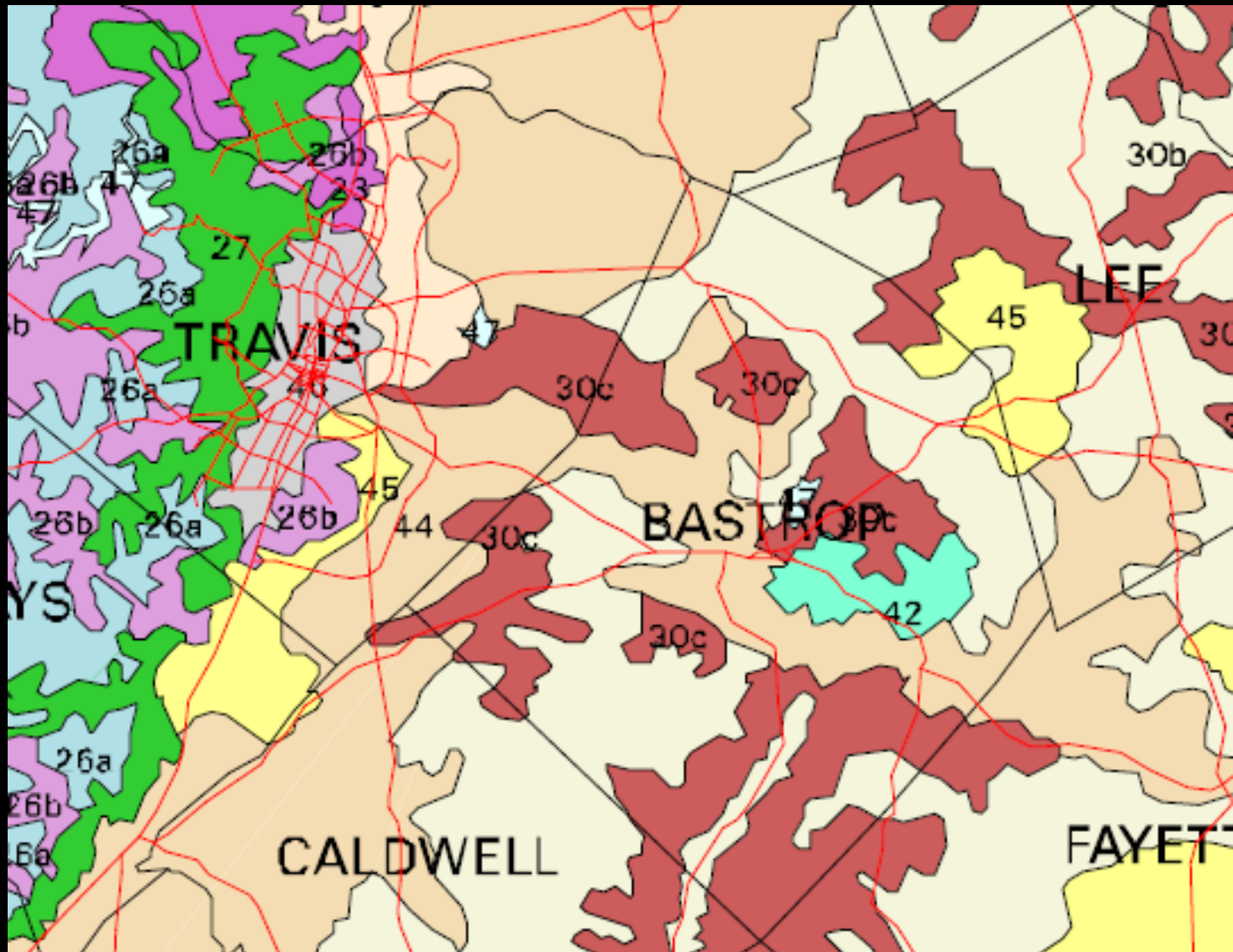
The number of farms fell by more than 1,000 in the 1930s, as many tenant farmers either move away or turned to other occupations.

Farmers who remained in the area began to devote more of their resources to crops other than cotton and to livestock.

The number of cattle increased from 32,000 in 1920 to 51,000 in 1950; the number of sheep and goats increased as well, boosting wool and mohair production from 23,600 and 4,292 pounds, respectively, in 1920 to 127,800 and 183,600 pounds in 1959.

By the late 1960s hay and sorghum combined to account for 60 percent of the cropland harvested.





44 Crops

**Flood Control and
River Management**

20th Century change



Harnessing the River – Floods, Flows, and Dams

The Lower Colorado River Authority

a multipurpose public agency instituted by the Texas legislature in 1934 as a conservation and reclamation district with a statutory authority covering ten counties through which the Texas Colorado River flows. These counties extend from San Saba in Central Texas to Matagorda on the Gulf Coast.

Walter E. Long, *Flood to Faucet* (Austin: Steck, 1956).



Floods - More than 80 flood events have been recorded in the lower Colorado River basin since the 1800s. These events range from isolated floods that affected local areas to basin-wide floods spawned by unusually heavy rainfalls.

February 1843: In the earliest flood for which there is a written account, floodwaters cause the Colorado River to crest at a stage of 36 feet at Austin.

July 1869: In what is considered to be the worst flood on record, the Colorado crests at 51 feet at Austin and produces record crests of 60.3 feet at Bastrop, 56.7 feet at La Grange, 51.6 feet at Columbus, 51.9 feet at Wharton and 56.1 feet at Bay City. Bastrop and La Grange are inundated. Reports describe rainfall as incessant for 64 hours, the river at Austin more than 10 miles wide, and floating buffalo carcasses in the river (indicating that some of the floodwaters originated in the High Plains). Damage is estimated at \$3 million.



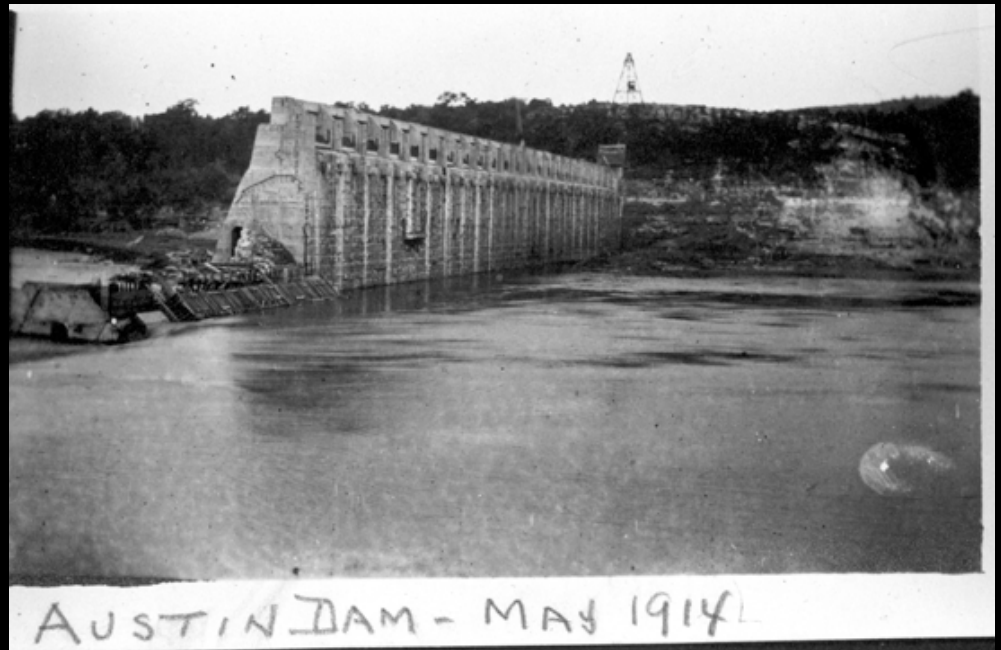
A 1900 flood destroyed the Austin Dam.

1913: Flood merged the mouths of the Colorado and adjacent Brazos rivers, forming a lake 65 miles wide.

1915: Floodwaters from storms in April and September severely damage the second Austin Dam, completed in 1912. The structure will lie unrepaired for more than two decades until it is rebuilt by LCRA in the late 1930s.



Austin History Center Photo PICA 03978



June 1935: Floodwaters from heavy Hill Country rains cause the Colorado River in Austin to crest at 50 feet, one foot below the 1869 record. The river overwhelms the Congress Avenue Bridge, cutting Austin in half. The Llano River rises to its highest recorded stage of 41½ feet, stream flow 388,000 cubic feet per second.

September 1936: Floodwaters from heavy rains throughout the basin pour through the Colorado River at Austin for a 20-day period, cresting at 31.4 feet. Earlier, floodwaters from a 30-inch rain on the Concho River had washed away nearly 300 buildings in San Angelo.

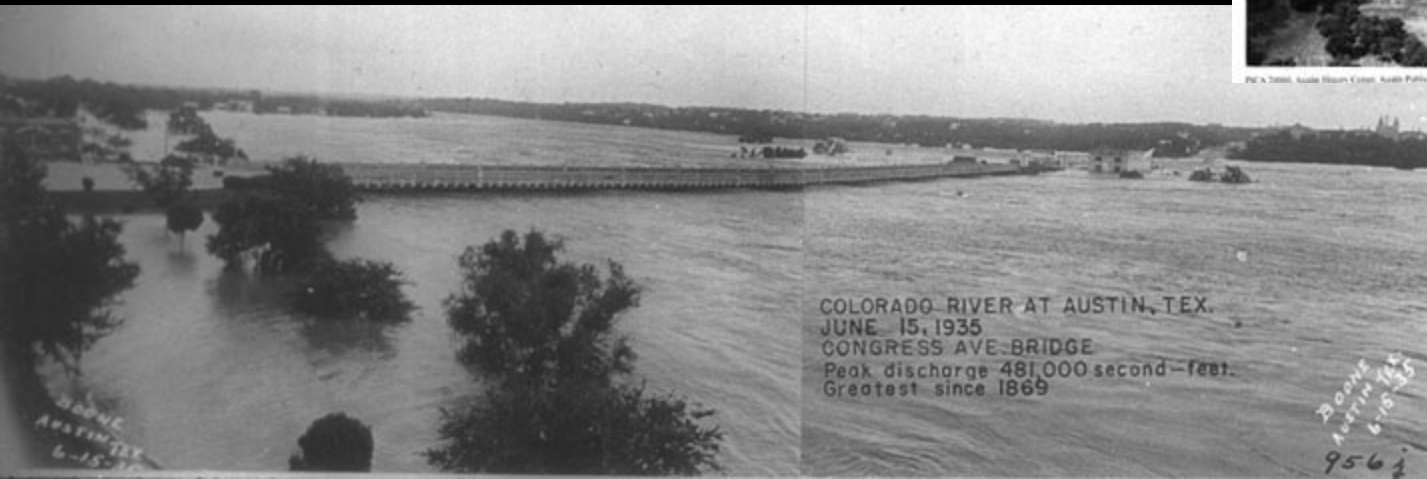
July 1938: Twenty inches of rain over 12 counties pour more than 3 million acre-feet of floodwaters into newly completed Lake Buchanan, forcing LCRA to open 22 of Buchanan Dam's 37 floodgates.



C08484-A Austin History Center, Austin Public Library



PA 6 2000, Guide House Center, Austin Public Library





Chain of Highland Lakes and Dams

Buchanan Dam – Constructed from 1935 – 1937

Inks Dam – Constructed from 1936 – 1938

Wirtz Dam – constructed from 1949 to 1950

Starcke Dam – Constructed 1949 – 1951

Mansfield Dam - Constructed from 1937 – 1941

Tom Miller Dam – Constructed from 1938 – 1940

Constructed on top of the remains of two earlier structures, both called Austin Dam, built from 1890-1893 and 1909-1912, respectively. Massive floods destroyed both structures. The lake originally was called Lake McDonald. The final dam is named for an Austin Mayor, and is leased to the LCRA by the City of Austin until 2020.

Longhorn Dam – Constructed 1960



Dams and Altered Hydrology

During the spring and summer months, significant releases are made from the Highland Lakes for irrigation of rice and other row crops in the coastal plains.

These daily releases are “pulsed” so that hydroelectric power can be generated at peak demand periods, usually during morning and evening hours.

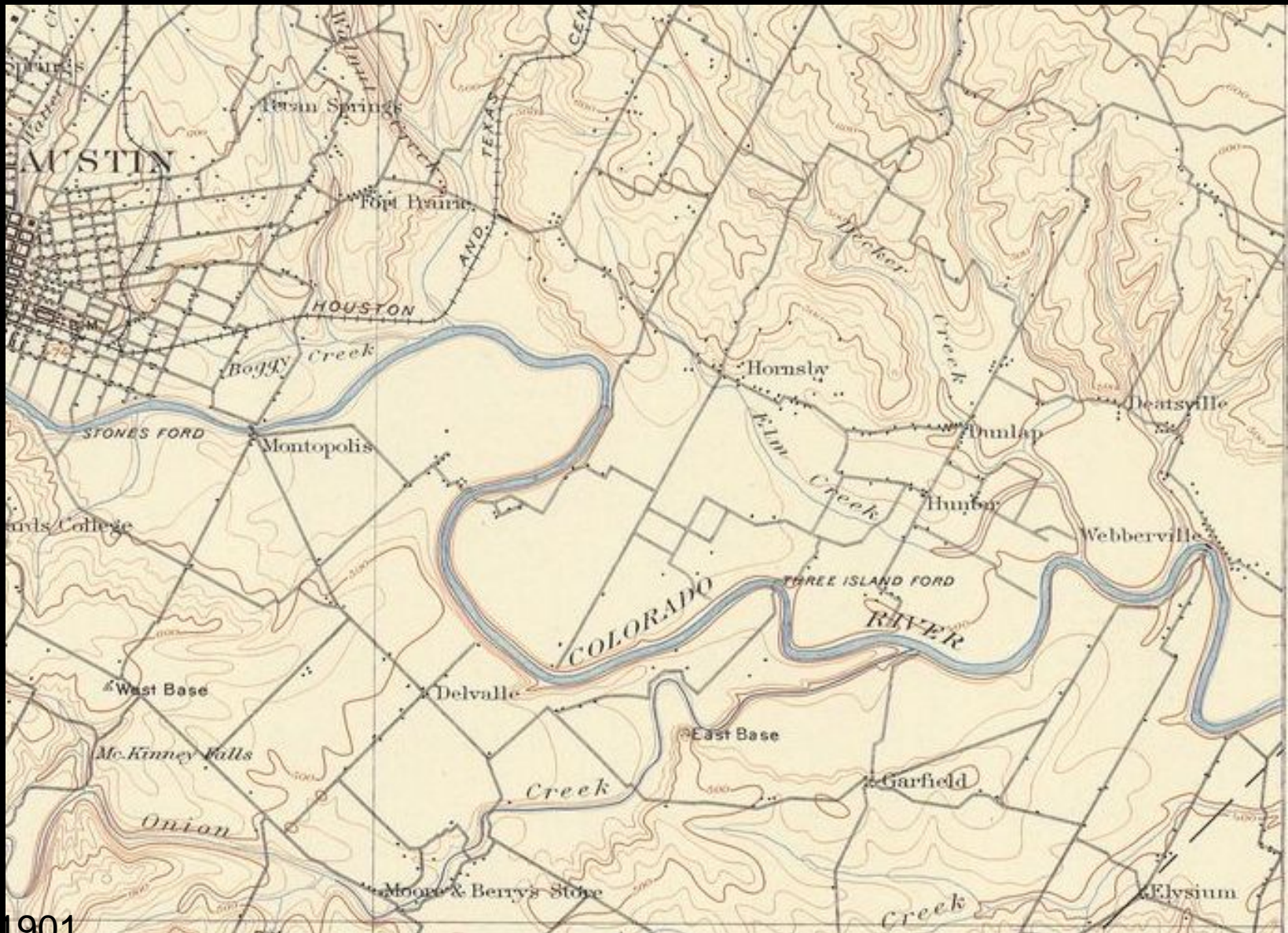




Transportation – Highways and Development 2000 onward



ROADS AND DEVELOPMENT

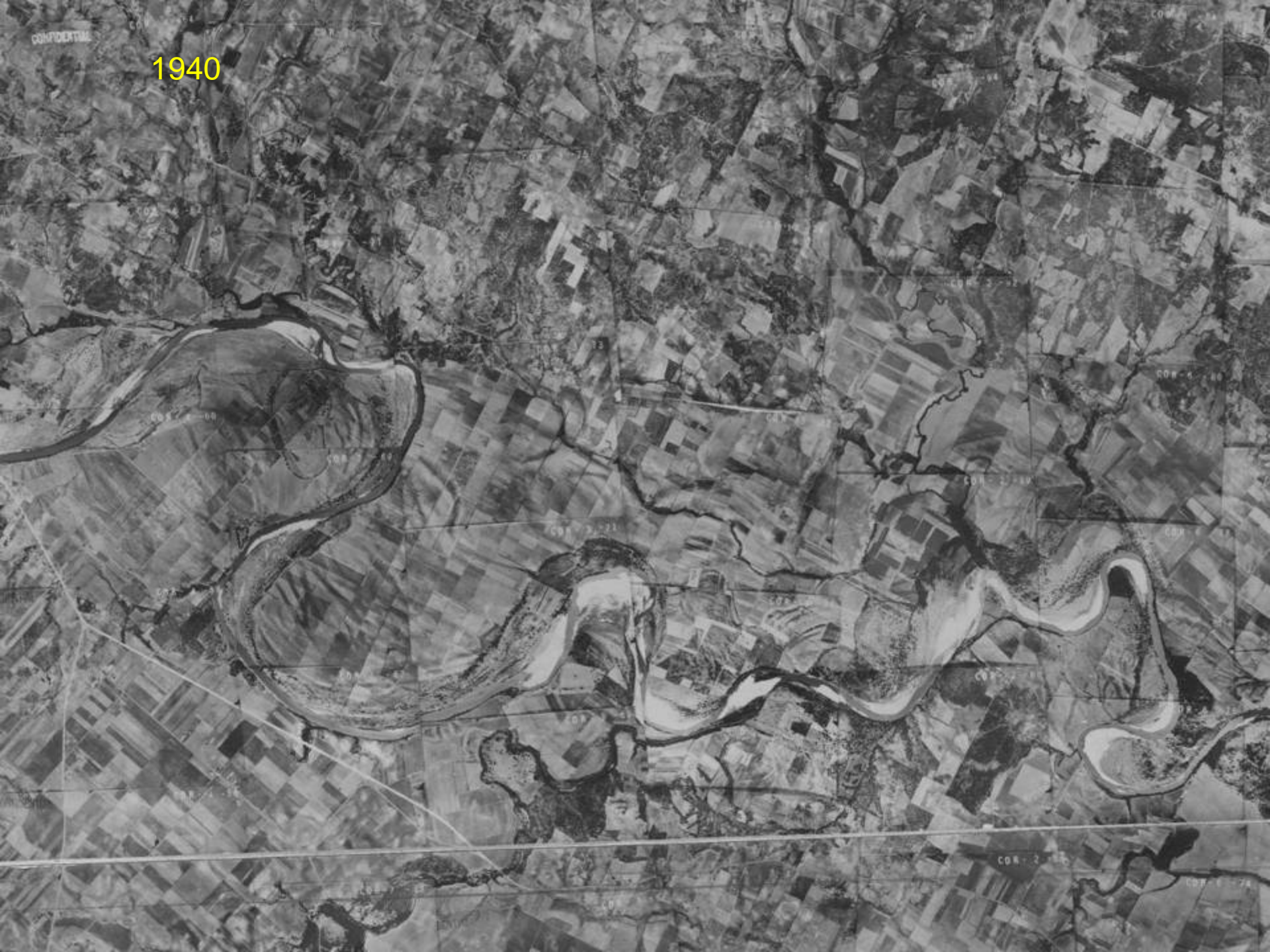


1901

1900

CONFIDENTIAL

1940



2006



2008

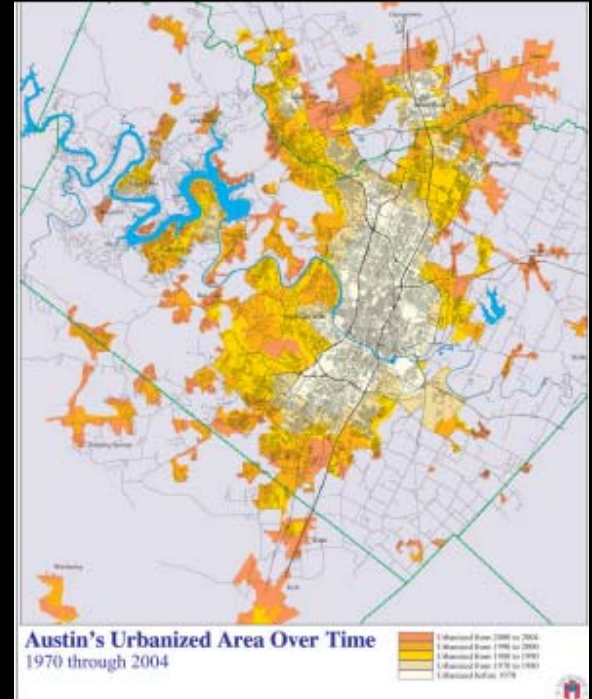




1969



2004

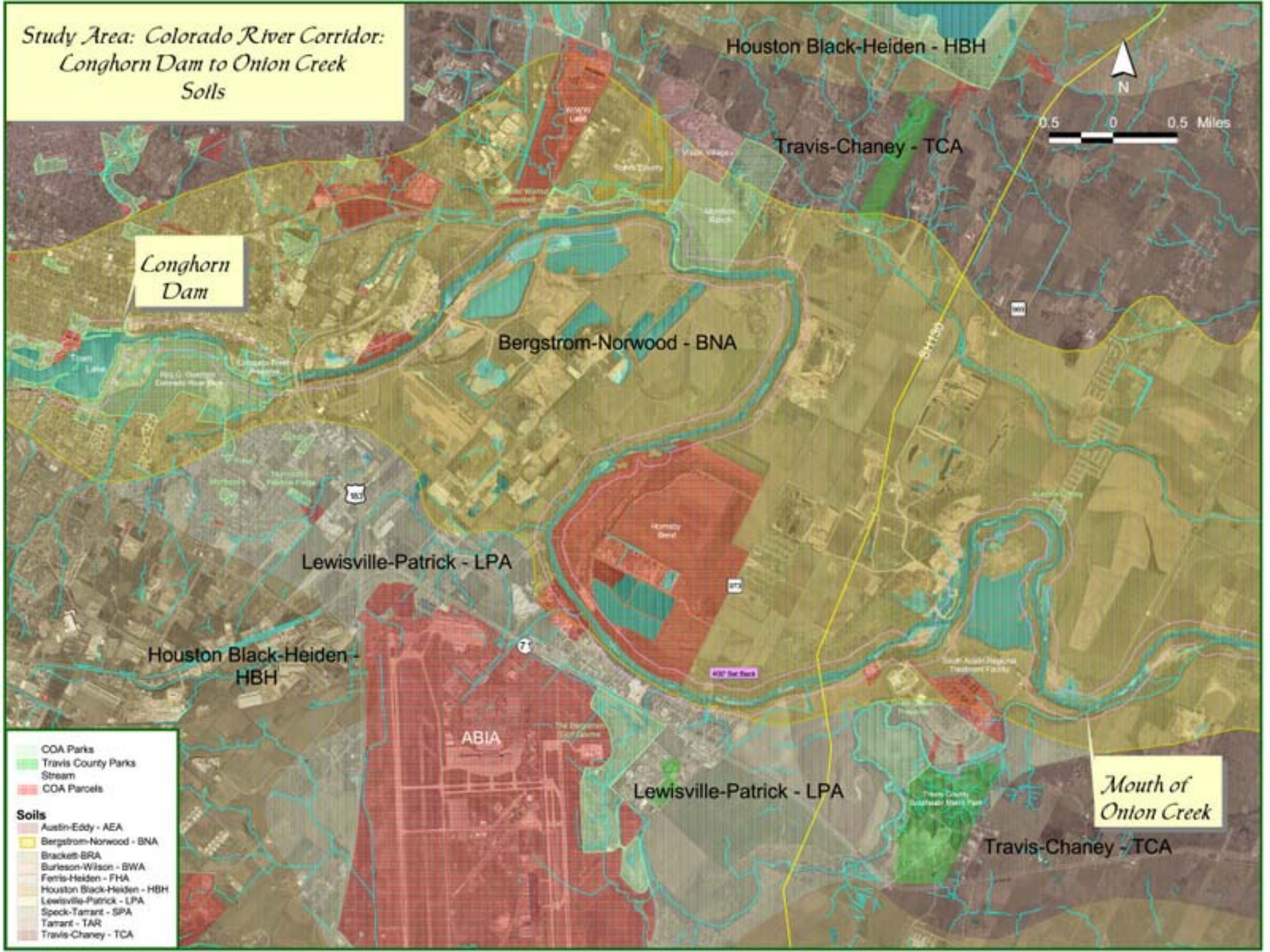


Sand & Gravel Mining





*Study Area: Colorado River Corridor:
Longhorn Dam to Onton Creek
Soils*



*Longhorn
Dam*

Houston Black-Heiden - HBH

Travis-Chaney - TCA

Bergstrom-Norwood - BNA

Lewisville-Patrick - LPA

Houston Black-Heiden -
HBH

ABIA

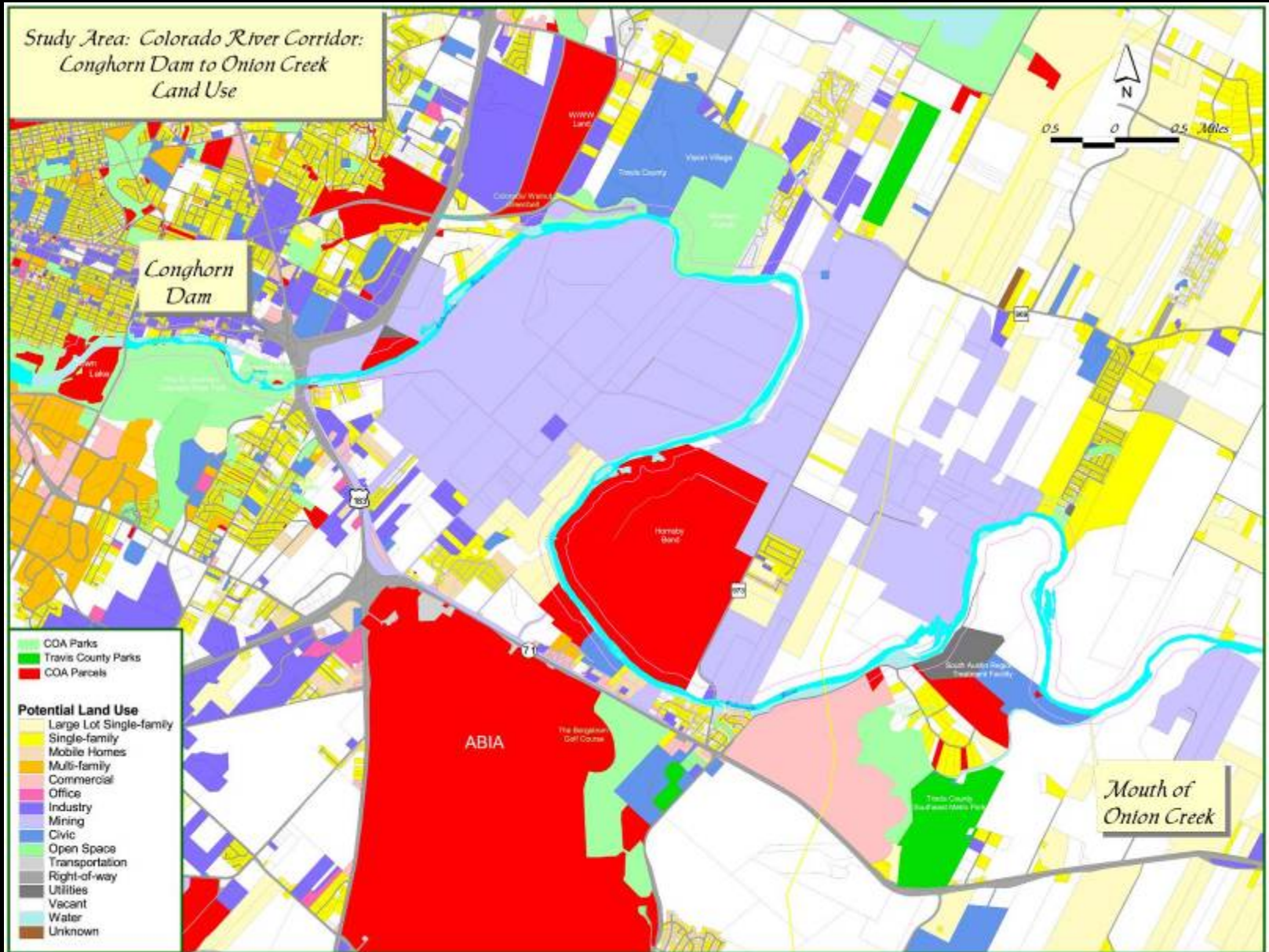
Lewisville-Patrick - LPA

*Mouth of
Onton Creek*

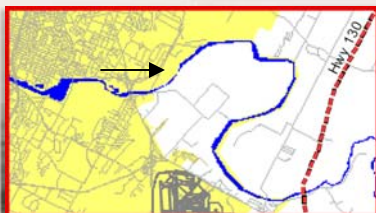
Travis-Chaney - TCA

- COA Parks
 - Travis County Parks
 - Stream
 - COA Parcels
- Soils**
- Austin-Eddy - AEA
 - Bergstrom-Norwood - BNA
 - Brackett - BRA
 - Barleson-Wilson - BWA
 - Ferris-Heiden - FHA
 - Houston Black-Heiden - HBH
 - Lewisville-Patrick - LPA
 - Speck-Tarrant - SPA
 - Tarrant - TAR
 - Travis-Chaney - TCA

Light Blue = Gravel and Sand Extraction Pit Properties



1953



3402 Montopolis Bridge, Colorado River, south of Austin

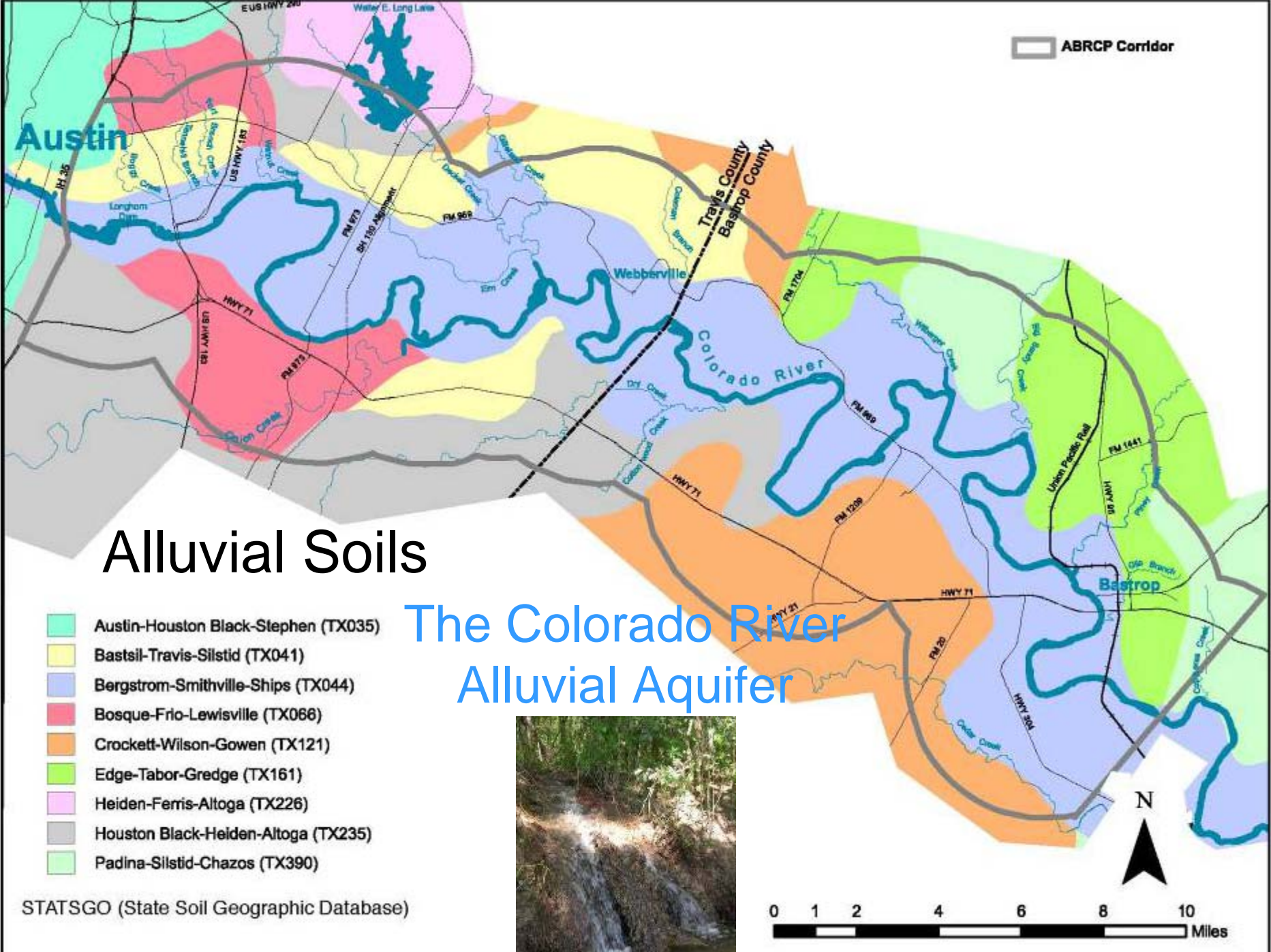


1983



Breach

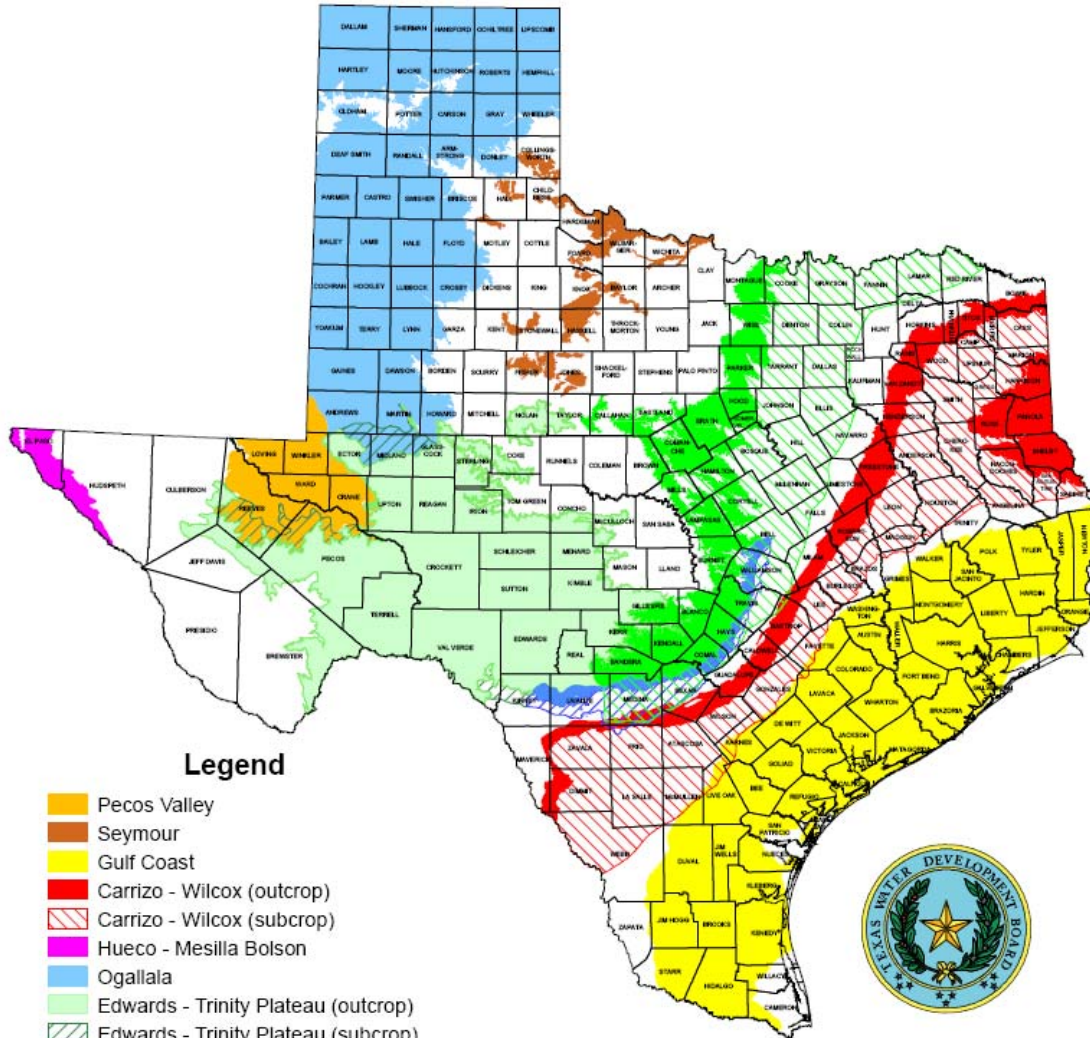
1996





The Colorado River Alluvial Aquifer

Major Aquifers of Texas



Legend

- Pecos Valley
- Seymour
- Gulf Coast
- Carrizo - Wilcox (outcrop)
- Carrizo - Wilcox (subcrop)
- Hueco - Mesilla Bolson
- Ogallala
- Edwards - Trinity Plateau (outcrop)
- Edwards - Trinity Plateau (subcrop)
- Edwards BFZ (outcrop)
- Edwards BFZ (subcrop)
- Trinity (outcrop)
- Trinity (subcrop)

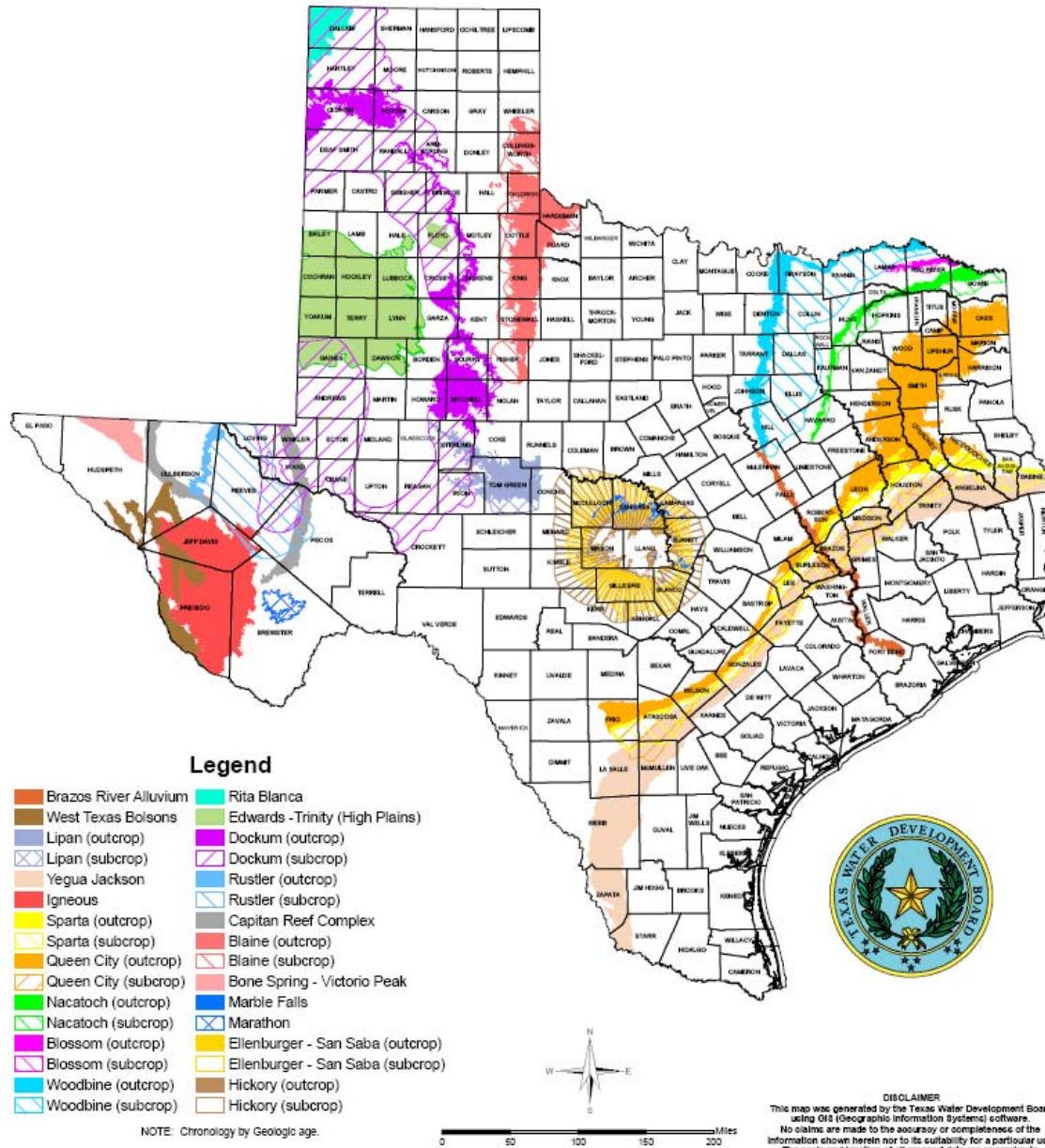
NOTE: Chronology by Geologic age.

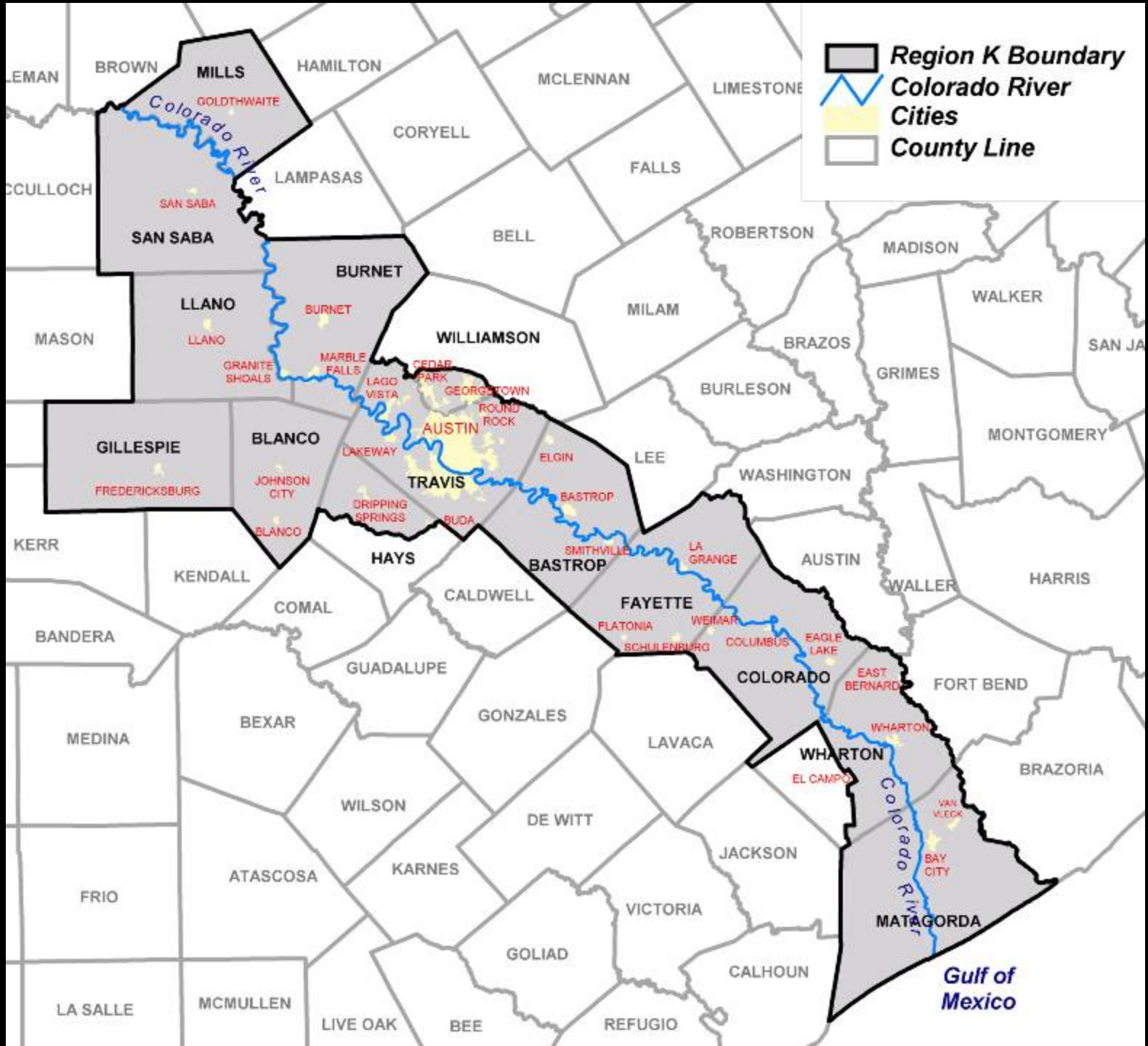
OUTCROP (portion of a water-bearing rock unit exposed at the land surface)
 SUBCROP (portion of a water-bearing rock unit existing below other rock units)



DISCLAIMER
 This map was generated by the Texas Water Development Board using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitability for a particular use. The scale and location of all mapped data are approximate.

Minor Aquifers of Texas







Applause!

Questions?



City of Austin



Austin Water Utility



Center for Environmental Research at Hornsby Bend

AWU-CER Lunchtime Lectures January – April 2011

Each talk begins AT NOON Waller Center [625 East 10th Street – between I-35 and Red River] Room 104

The 1st Wednesday of the Month! Free and Open to the Public – bring a lunch and learn

Austin and the Colorado River Corridor

We begin 2011 by exploring the ecology and geography of the Colorado River Corridor. The first four Lunchtime Lectures focus on different aspects of the Colorado River – ecological, cultural, historical, and biological.

Wednesday, January 5

The Forgotten Habitat: the Biogeography of the Colorado River Bottomlands

Wednesday, February 2

Changes in the Land: The Cultural Landscape of the Colorado River Corridor

Wednesday, March 2

Discovering the Colorado: The Austin-Bastrop River Corridor Partnership 2003-2011

Wednesday, April 6

The Nature of the River: The Flora and Fauna of the Colorado River Corridor