

Wichita COUNTY ROLLED SKETCH NO. 20
Comments on Changes in the Red River Since 1921
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COMMENTS ON CHANGES IN THE
RED RIVER SINCE 1921

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After Thirty Years: Comments on Changes in the
Red River Since 1921

A treaty between the United States and Spain, February 22, 1819, fixed the boundary between northeastern lands belonging to Spain, and the territory covered by the Louisiana Purchase, as along the west bank of the Sabine River to the 32° of latitude, thence due north to Red River and westward along said river to the 100th meridian of W. longitude, thence due north to the Arkansas and west along its south bank to its source. Thus the Red River became the northern boundary of Texas, at that time a part Spain's province of Mexico. In 1836 Texas declared its independence of Mexico, set itself up as a republic, and in 1845 won admission as one of the United States.

Discovery of oil in what is known as the Beg Bend of Red River in Wichita County in 1919 greatly enhanced values and prompted the State of Oklahoma to take steps to attempt to establish the location of the south bank (inferentially the boundary) of the river as of 1819, as being at the very base of the Texas bluff. Thus resulted a suit brought by Oklahoma against Texas in the Supreme Court of the United States.

Texas countered with a claim to the middle of the channel as the boundary line in accordance with common law governing boundaries along streams where such a stream alone is mentioned as constituting the boundary. The Department of Justice intervened in behalf of the United States,* claiming that the south bank had been fixed as the northern

*In this suit the United States made common cause with Oklahoma, inferentially intending, in case Texas lost the suit, to settle the location of the southern boundary of Oklahoma, by appropriate court action, as being the mid-channel.

boundary of Texas, but that, nothing having been said as to the southern boundary of Oklahoma, such boundary was in fact the medial line of the channel.

The case was tried before a special commissioner appointed by the Court; this in the fall of 1921. The case was argued in 1922 (April 25-27), decided January 15, 1923; a decree was entered March 12, 1923; a commission was appointed June 4, 1923 to lay out the boundary and also to map the medial line of the channel; its report was received April 25, 1924 and adopted June 9, 1924.*

*As a basis for this discussion it appears pertinent to quote briefly from the record as found in:

Cases argued and decided in the Supreme Court of the United States, Vols. 67, 68

Vol. 67, pp 428ff

Argued April 25, 26, 27, 1922; decided January 15, 1923.

1. "The boundary between Oklahoma and Texas, where they are separated by the Red River, is along the southern bank of such river."

Bank defined:

2. "The bank of Red River, fixed as the boundary between the states of Oklahoma and Texas, is the water-washed and relatively permanent elevation or acclivity at the outer edge of the river bed, which separates the bed of the river from the adjacent upland, and serves to confine the waters within the bed, and to preserve the course of the river."

Bed of River defined:

3. "The bed of a river is the area which is kept practically bare of vegetation by the wash of the waters of the river from year to year in their onward course, although parts of it are left dry for months at a time."

(Footnote, cont.)

4. Water - application of the doctrine of erosion and accretion:

"The doctrine that a river continues to be a boundary, notwithstanding erosion and accretion, applies to the Red River so far as it constitutes a boundary between Oklahoma and Texas, notwithstanding that, during periods of high water, the changes in the banks are rapid and material."

5. Evidence - burden of proof - changes in boundary rivers:

"One asserting material changes in the course of a boundary river, which will affect the boundary, has the burden of proving them."

6. Boundaries - avulsion - effect.

"The boundary of a state along a river is not changed by a sudden change of the river channel so as to cut an island off from the mainland, but the island will remain within the boundaries of the state to which it formerly belonged."

Page 436, column 2, line 4:

"Burke Bet island and Goat island, both near the Big Bend area, are claimed by Texas on the theory that in 1821 they were part of the land on the south side. We think the evidence, all considered, falls short of establishing the claim, and tends rather to show that neither island was ever part of the permanent fast land on that side. The claim is accordingly rejected."

March 12, 1923 - Decree entered.
Volume 67, page 688.

1. "The boundary between the states of Oklahoma and Texas, where it follows the course of the Red river from the 100th meridian of west longitude to the eastern boundary of the state of Oklahoma, is part of the intersectional boundary established by the Treaty of February 22, 1819 between the United States and Spain, and is on and along the south bank of that river as the same existed in 1821, when the treaty became effective, save as hereinafter stated."

2. "Where intervening changes in that bank have occurred through the natural and gradual processes of

(Footnote, cont.)

erosion and accretion, the boundary has followed the change; but where the stream has left its former channel and has made for itself a new one through adjacent upland by the process known as avulsion, the boundary has not followed the change but has remained on and along what was the south bank before the change occurred."

3. "Where, since 1821, the river has cut a secondary or additional channel through adjacent upland on the south side in such a way that land theretofore on that side has become an island, the boundary is along that part of the south bank as theretofore existing which, by the change, became the northerly bank of the island; and where by accretion or erosion there have been subsequent changes in that bank, the boundary has changed with them."

4. "The rules stated in the last two paragraphs will be equally applicable to such changes as occur in the future."

5. "The south bank of the river is the water-washed and relatively permanent elevation or acclivity, commonly called a cut bank, along the southerly side of the river, which separates its bed from the adjacent upland, whether valley or hill, and usually serves to confine the waters within the bed, and to preserve the course of the river."

6. "The boundary between the two states is on and along that bank at the mean level attained by the waters of the river when they reach and wash the bank without overflowing it."

7. "At exceptional places where there is no well-defined cut bank, but only a gradual incline from the sand bed of the river to the upland, the boundary is a line over such incline, conforming to the mean level of the waters, when at other places in that vicinity they reach and wash the cut bank without overflowing it."

8. Big Bend area defined as "lying between a southerly extension of the east line of range 13 west in Oklahoma and a southerly extension of the west line of range 14 west in that state. It has been, since before 1821, fast upland on the southerly side of the river, is within the state of Texas, and never was owned by the United States. The northerly border of that area is part of the south bank of the river on and along which the state boundary extends."

(Footnote, cont.)

9. "Burke-Bet island and Goat island both of which are in the vicinity of the Big Bend area are islands in the river, have been islands since before 1821, are within the State of Oklahoma and are the property of the United States."

June 4, 1923.
Volume 68, page 1094.

Boundary commissioners are "ordered to survey and run upon the ground and to delineate upon a suitable plot the medial line between such (Texas) state boundary and the northern bank of such river for a total length of three miles in the vicinity of the river-bed oil wells."

April 25, 1924.
Volume 68, page 852.

Report of the commissioners received by order of the Supreme Court.

Volume 68, page 1119.

"...the Secretary's (of the Interior) authority will extend to such lands only as may lie between the interstate boundary and the medial line of the river, as the two are settled by this court. Under present conditions the United States has the sole proprietary interest in whatever may be within these limits, and it is not excepting to the boundary reported by the commissioners."

Volume 68, page 1121.

Report of the Boundary Commissioners.

Volume 68, page 1132.

Reference Monument No. 10 as being "in the valley in the extreme north of the "Big Bend," about $1\frac{1}{2}$ miles north of the foot of the Texas bluff and circa 400 feet south of the south bank of Red River. This is an auxiliary monument."

Volume 68, page 1155.

Plotting of the medial line approved and adopted (June 9, 1924).

During the summer of 1921, in connection with scientific investigations then being made on behalf of the State of Texas preparatory to responding to the suit, it fell the lot of this writer to undertake to marshal the ecological evidence. His findings were presented in testimony before the Commissioner delegated to try the case. Later they were included in brief as part of a publication* summarizing scientific testimony submitted by the State of Texas, the text of which was supplemented by detailed maps identical with those used in testimony. All scientific investigations for Texas were under the direction of Dr. E. H. Sellards. One of his personal assistants was Paul T. Seashore, a graduate student in engineering at the University of Texas.

Because of the discovery of oil in the valley of the "Big Bend" in Wichita County, immediately above Burkburnett, which discovery had prompted the filing of the suit, that locality became the focus of investigations. Ecologic investigation consisted in large part in endeavoring to make full listings of species represented in the vegetation along various transects across critical areas, and in the comparison of these lists to point up similarities and differences. Numerous photographs** were also used to show conditions. All in all there resulted what was believed to be a reasonably accurate and detailed picture of conditions prevailing as of the summer of 1921.

Following completion of the hearing, the Court took the case under study and in January 1923 rendered a decision. The following March a

*Investigations on the Red River made in connection with the Oklahoma-Texas boundary suit, Univ. of Texas Bul. 2327; July 15, 1923. E. H. Sellards, B. C. Tharp and R. T. Hill.

**Photographs were by a commercial photographer who, presumably, retained the negatives. Prints in the possession of the author are too faded for use as illustrations. Aerial photography was practically unknown, as was color photography. *counter 79553*

commission composed of A. A. Stiles and A. D. Kidder was appointed by the Court to locate and mark on the ground the south bank of the river, which by the Court's decision constituted the northern boundary of Texas. These men set permanent concrete monuments well up on the Texas bluff (with a few control reference ones also on the Oklahoma bluff and one, R.M. 10, near the apex of the valley land bulge), each with a bronze plate appropriately identifying it. From these, course and distance were taken in sequence to each of numerous wood posts set at frequent intervals along the boundary bank.* This work was completed in December 1923 and the report accepted by the Court in 1924.

The writer had hoped, and purposed, to revisit the area at the expiration of a twenty-five year interval in order to check the vegetation and the physiographic conditions and to note the nature and extent of changes during that period. Circumstances attendant upon World War II and its immediate post-war period precluded the carrying out of this purpose, and it was not until early May of 1953** that opportunity to do so occurred. Occasioned by a visit of Mr. Seashore to the Texas Memorial Museum to receive testimonial recognition for significant gifts, Dr. Sellards and the writer became the guests of Mr. Seashore on a visit to the Big Bend site of our 1921 investigations--the first time any one of us had been back since that time.

What we found was amazing. Had it not been for outstanding bluff

*The approximate location of the line along which these posts were set--the boundary line as of 1923--is indicated by Fig. 2. Substantial erosion had evidently occurred on the upstream margin of the valley land bulge and similar, though less extensive, accretion on the downstream margin within the space of two years.

**A second visit of four days was made in early June 1953 in company with a surveying party under the direction of Mr. Curtis Hale of the Texas Land Office through the courtesy of Land Commissioner Bascom Giles.

features we should have been completely unable to orient ourselves. Even from unmistakably identifiable points of vantage on the bluffs, the whole valley looked almost utterly strange. True, the normal low-water channel at the apex of the bend was still against the Oklahoma bluff; its course upstream diagonally across the valley some $4\frac{1}{2}$ miles to the Texas bluff followed the general pattern of 1921, and downstream it still followed the Oklahoma bluff of our 1921 map to a point below the M.K.T. railroad bridge.* But the appearance of the valley was wholly changed. Whereas in 1921 the soils map of the area showed approximately half of it to constitute a substantially bare sand flat from which much sand was being transported by the wind to form active dunes along and behind the vegetation covered "cut" bank, in 1953 no such bare flats occur and no active dunes appear. Imagine coming to the edge of the sand flat with the image of conditions as of 1921 on your mind and being met with the current thickets of Tamarix stretching entirely across your recollected bare sand! Not only that, but Tamarix in even denser stand covering all the lowland flats between older fixed dunes over the entire area lying back of the cut banks on both the Texas and Oklahoma sides! Goat Island, downstream from the principal Texas mainland bulge and separated from it by a distinct high water channel of bare sand in 1921, in 1953 is tied firmly to the mainland, its former separating channel now choked by such dense thickets of Tamarix that only occasional relict unfilled channel depressions identify it as a former channel at all!

*Just off the accompanying mapped area downstream.

The mergence of Goat Island with the mainland is startlingly offset, however, by erosional inroads into the upstream side of the mainland bulge. Erosion has taken off more than half of the west end of this bulge north of parallel $39^{\circ}9'7''$. A bluff cut-bank up to seven or eight feet high now stretches north some 50° east from approximately lat. $34^{\circ}9'7''$ long. $98^{\circ}37'30''$ to a new apex approximately north of the former upstream end of Goat Island near lat. $34^{\circ}9'20''$ long. $98^{\circ}37'20''$. The former dunes with their cottonwoods have been washed away and are now replaced by an undulating sand flat covered with the usual Tamarix thickets. On this flat, lying diagonally across parallel $34^{\circ}9'30''$ and meridian $98^{\circ}37'30''$ some $7''-8''$ to the north and west of their intersection is an island with a southeastward bluff cut bank some 7 to 8 feet high. This island, about half a mile long and an eighth mile wide, is covered principally with Populus and Baccharis on its more elevated portions, Tamarix on the flats. The cottonwoods all seem to be too young to date back to 1921, certainly too young to have attained much size as of that date. This suggests that this may be a young island, although its position places it within the apex of the cottonwood area as of 1921.

Upstream, between meridians $98^{\circ}39'20''$ and $98^{\circ}40'30''$, the south cut bank of the river appears to be appreciably farther north than it was in 1921. Exactly how much farther can only be ascertained by an engineer's crew running its present meanders and plotting them on the 1921 map. In the vicinity of $98^{\circ}40'00''$ it is a bluff bank some 5-7 feet high. Back of this bank is an area of Populus, Baccharis, Tamarix and other vegetation in varying density and admixture. In this area are numerous producing wells on which information was to the effect that taxes on the oil produced

are being paid to Oklahoma. Applying the principles laid down by the Court in its Decree of March 12, 1923 (see paragraphs 2, 3 and 4 of the Decree, p. 4), it would seem as if at least some of these wells are clearly now in Texas as a consequence of material accretion to the south bank of the river since 1921, when, presumably, these wells were drilled on the sand flat of the river.

Date of the greatest flood in this portion of Red River since 1921 was May 18, 1935. On that date, about 9:30 P.M., a section of the Missouri Kansas Texas railway trestle dislodged by floodwaters (above Burkburnett) was carried downstream where it rammed out two sections of a new concrete bridge on U. S. Highway 281. Presumably it was this flood which caused the enormous change in the valley lands of the Big Bend.*

In this connection the three accompanying maps (Figs. 1, 2 and 3), each with its explanation, are offered as a visual aid in representing just what has happened to the location of the south cut bank since 1921. Figure 1, delineates the bank as of 1921.

Figure 2, indicates the measured amount of change in the two-year interval to 1923.

Figure 3, indicates the approximate conditions thirty years later, 1953.

The precise location can only be determined by accurate use of a transit to run its present meanders--and those meanders will continue to change by both erosion and accretion with every flood.

This instability of location, together with the difficulty occasioned by efforts on the part of any common citizen to locate it at any given

*From records in the State Office of the Texas Highway Department, Austin.

time, would seem to justify an effort on the part of the State to seek a re-examination of the situation by proper United States government authority with a view of determining the desirability of giving to Texas the southern half of the channel. The only reason for continued Federal ownership would appear to inhere in the possibility that somewhere along its course as the boundary oil may again be discovered--an eventuality in which Federal interests could be easily safeguarded by its retaining all mineral rights. This would in no way hurt Texas' interests, because under present conditions Texas has neither mineral nor surface rights. And State sovereignty over the surface seems to be both right and highly desirable.

For example, Oklahoma now has the responsibility for administering all laws north of the south bank. How are its officers, peace, revenue or game and fish, going to know when sought offenders are within their jurisdiction? A case is related of some hunters on the Texas side violating game laws beyond the south cut bank. Apprehended by an Oklahoma warden and told they they must accompany him to Oklahoma to answer to charges he purposed to file in Cotton County, they offered no resistance but asked to go back and inform their wives (waiting in a car up on the bluff) of their predicament. The obliging officer accompanied them, and upon reaching indisputably high ground was told, "Now you d----d so and so we are in Texas. You get to hell back to Oklahoma." And he did! At least so goes the story.

Another case involved a prominent Oklahoma lawyer, who, having crossed into Texas to get wherewithal to slake his thirst, was arrested by Oklahoma officers who stopped his car as soon as it passed the point on the bridge directly over the apparent south cut bank.

Both these incidents were told as being factual; the second by a very highly creditable member of the University of Texas Law School. Both are reasonable in sound and doubtless could be virtually replicated many times up and down the river.

If the middle of the stream were the boundary there could never be any such confusion as inheres in the present situation. Texas officers would rightly enforce laws on the Texas side--where their authority would extend well beyond the cut bank, wherever it might be,--and Oklahoma officers on the Oklahoma side. The exact location of the cut bank would no longer have any significance and Texas citizens would no longer have cause to resent interference on the Texas side by officers from Oklahoma.

Incidentally, Goat Island, now tied, as above mentioned, firmly to the Texas mainland, constitutes another problem, in case the mid-channel is not made the boundary. Adjacent landowners have extended their meridional lines by survey entirely across it, have presented claims to the Land Commissioner, and their claims have been allowed. This to lands specifically reserved to the United States by its Supreme Court's decision and decree!

The whole matter would seem to be easily soluble by the United States giving to Texas a strip which would neither leave itself poorer nor Texas richer; but which gives to the State the law enforcement responsibility which by all rights should belong to it; and to citizens along the river the feeling of dignity to which they are justly entitled--the same rights to the river as are enjoyed by Oklahomans, including the right to be arrested by their own officers if they violate the law.

Fig. 1. Topographic map of the apex of the Big Bend, summer of 1921. Contour interval two feet. Scale: 1 inch = 2000 feet. Reduced from original base map offered in testimony in which 1 inch = 500 feet.

Stippled area represents substantially bare sand bed, or "sand flat," of river, which—except for low, incipient islands—was covered with water by every slight flood. Each such flood reduced the whole river bed to quicksand and caused greater or less change in the position of the low-water channel at "normal" stage.

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J. A. UDDEN, DIRECTOR

REDUCED MAP
THE STATE OF TEXAS
RECLAMATION DEPARTMENT
AUSTIN

40° 30" 40° 39° 38° 30" 38° 37° 36° 30"

STATE OF OKLAHOMA
TILLMAN AND COTTON COUNTIES

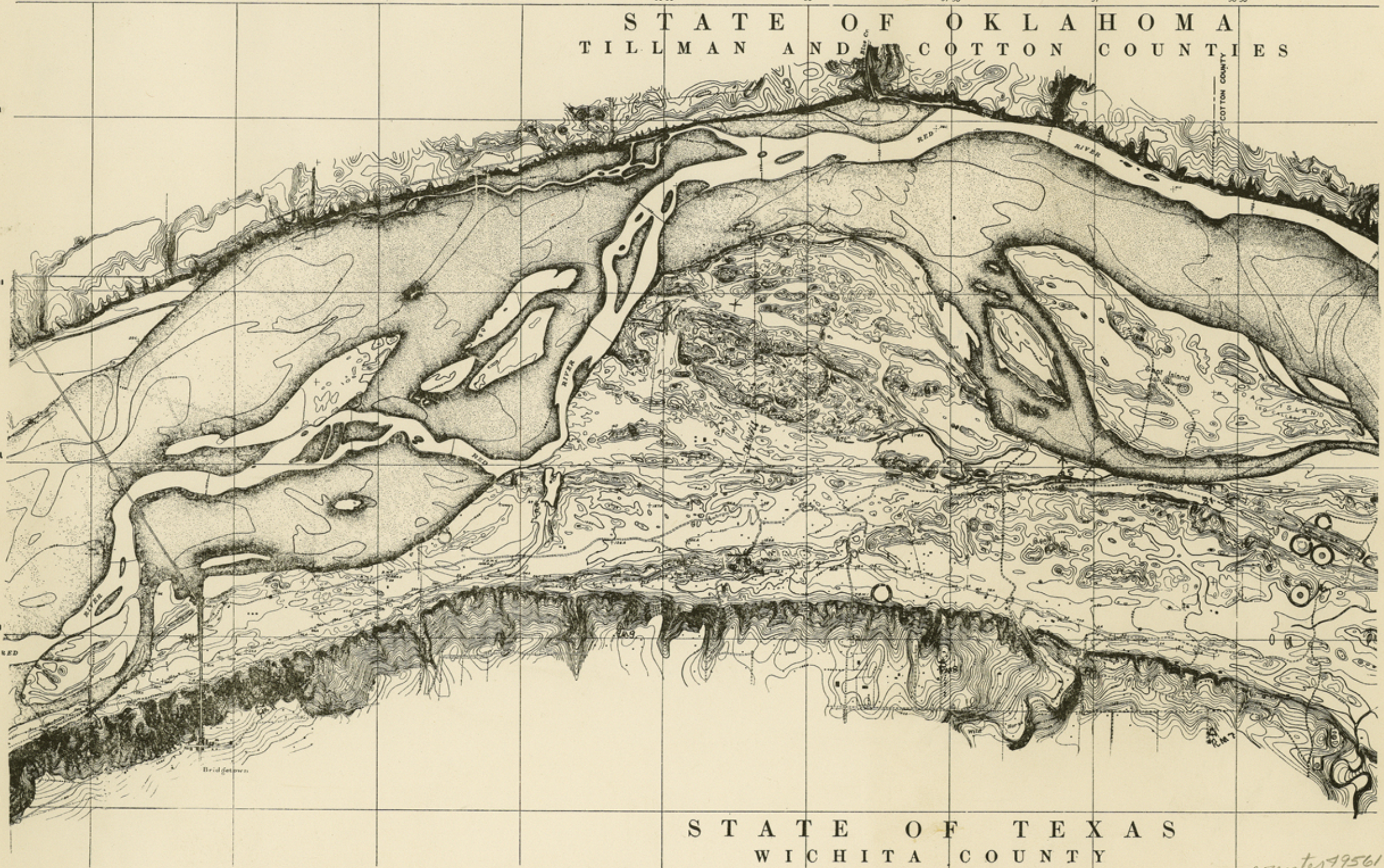
34° - 10'

09' - 30"

09' - 00"

08' - 30"

34° - 08"





STATE OF TEXAS
WICHITA COUNTY

FIG. 1

counter 19561

Fig. 2. Changed position of the marginal cut bank around the valley land bulge of the Big Bend as of 1923.

 Eroded strip along upstream side and around the apex.

 Accreted strip along downstream side of overflow channel which cuts off Goat Island.

The position of the active channel, accurately placed along the eroded strip would obviously be against the eroding bank.

The "new" position of the cut bank is that of the line of posts set by the commissioners in 1923 to mark the bank as of the dates the meanders were run (summer and fall).

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REDUCED MAP
THE STATE OF TEXAS
RECLAMATION DEPARTMENT
AUSTIN

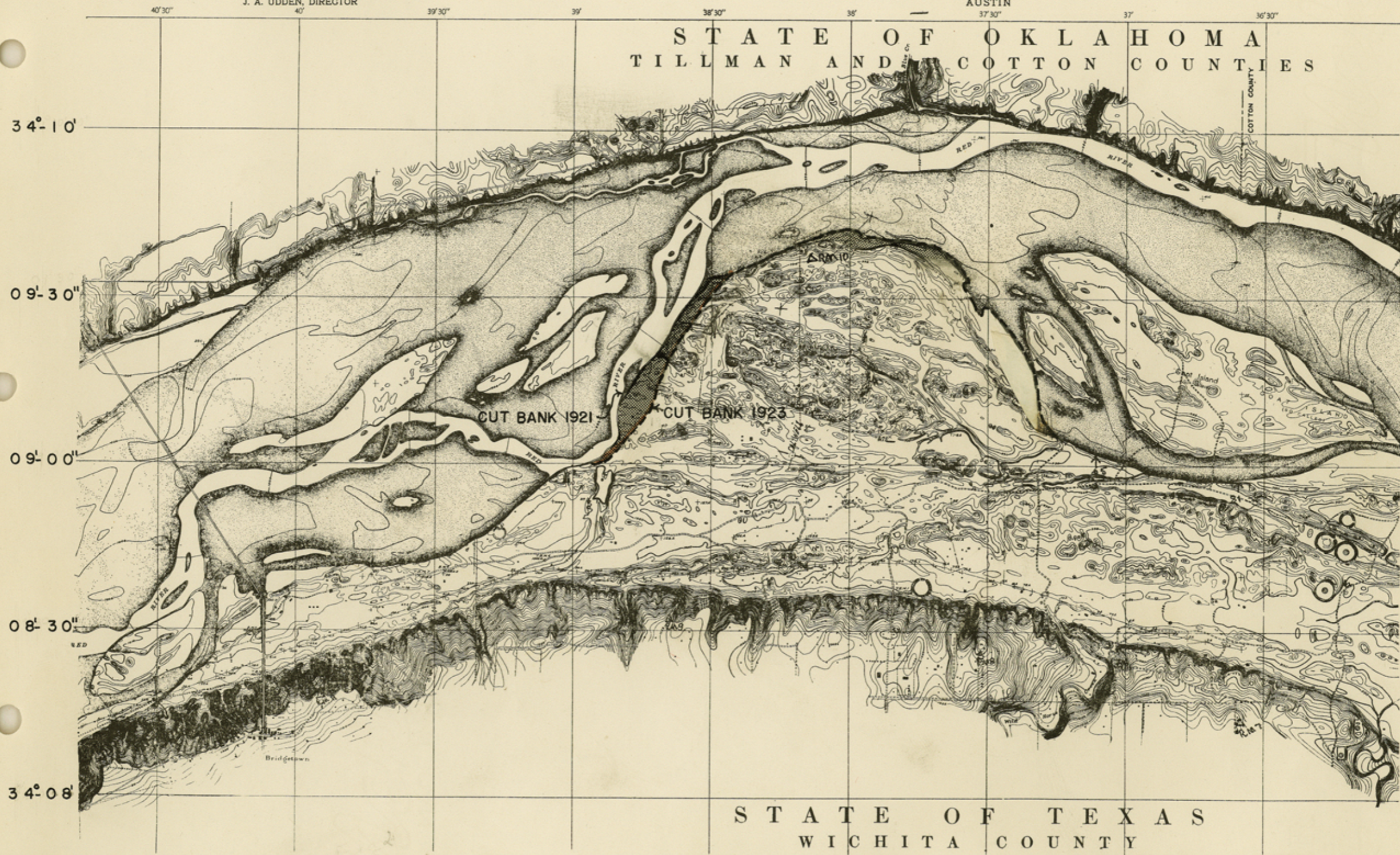


FIG. 2

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Fig. 3. A representation of the character and approximate extend of changes in the flood-plain valley of the Big Bend from 1921 to 1953.

Zip-a-tone areas currently exhibit the same condition as does the formerly bare sand flat. Both are dominated by Tamarix with which are intermixed lesser numbers of *Salix* and *Populus*, together with sedges, grasses and other herbaceous plants common to such habitats.

Lines across the channel cutting off Goat Island in 1921 indicate the current fusion of that island with the mainland. This channel, currently choked with Tamarix, is now difficult to distinguish on the ground. Whether the current island (lat. $34^{\circ}-9'-34''$, Long. $98^{\circ}-38'-05''$) is an avulsive vestige or a new one has not been determined. The new secondary channel is approximately correctly located. A second such channel, which lies against the southeastern bluff bank of the island, connects with the first near its confluence with the main channel downstream; but where this second channel leaves the main channel was not determined.

The exact location of the current diagonal main channel was not determined; but it passes beyond the mapped vestigial island somewhat eastward of its position in 1921.

STATE OF OKLAHOMA
TILLMAN AND COTTON COUNTIES

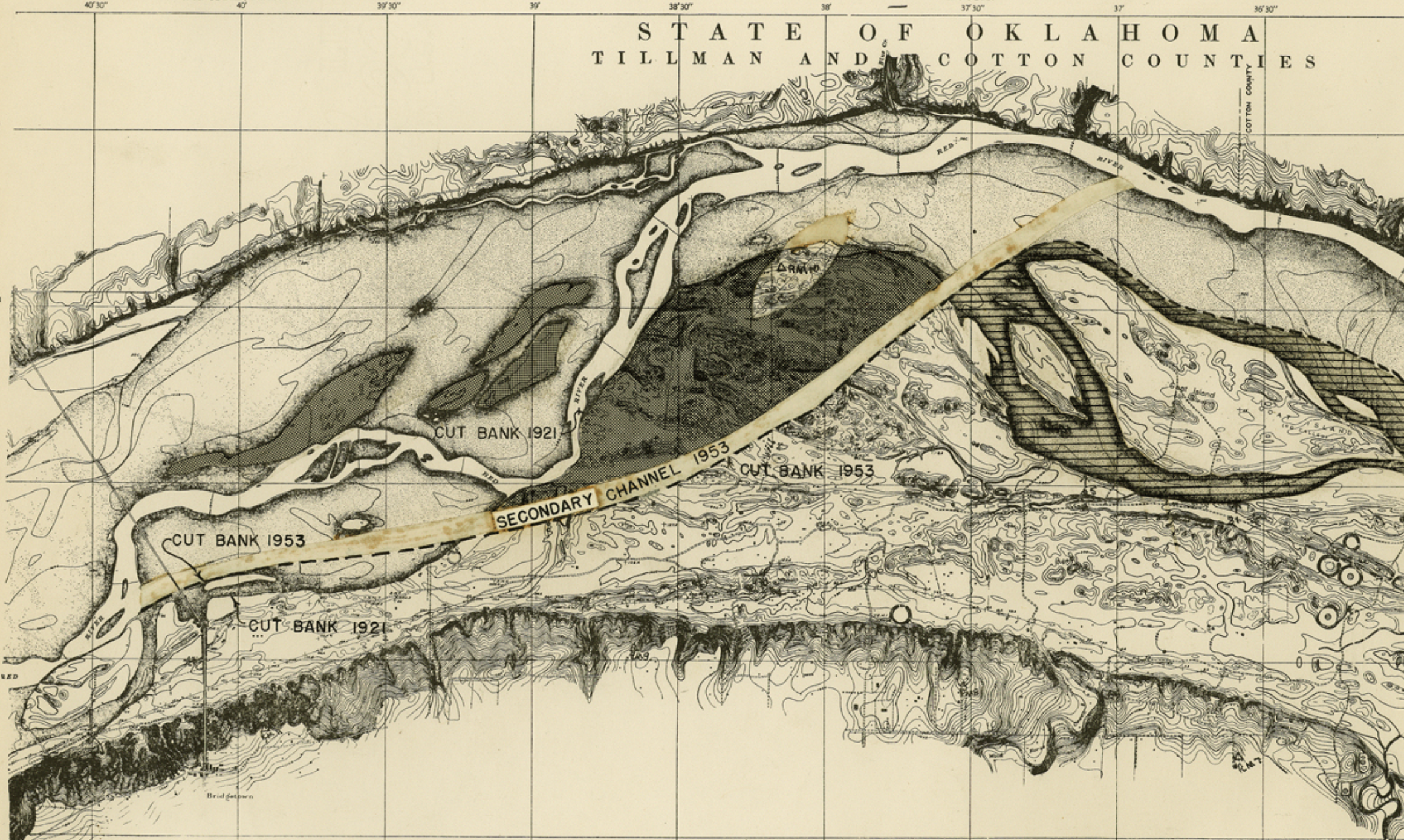
34°-10'

09'-30"

09'-00"

08'-30"

34°-08"



STATE OF TEXAS
WICHITA COUNTY

FIG. 3

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