FILE

August 23, 1954

Regional Supervisor
Fish and Wildlife Service
Albuquerque, New Mexico

Dear Sir:

Attached hereto are two copies of Job Completion Report for Job B-7, Project F-2-R-1, as prepared by Leader Kenneth C. Jurgens, which are submitted for your review.

Very truly yours,

Marion Toole
Chief Aquatic Biologist

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State TEXAS

Project No. F-2-R-1, Job B-7

Period June 1, 1953 - Feb. 15, 1954

JOB COMPLETION REPORT

by

Kenneth C. Jurgens

TITLE

Inventory of species present in those portions of the San Gabriel River and Brushy Creek, within Williamson County, Texas.

OBJECTIVES

To determine the distribution of the species present, their relative abundance and the ecological factors influencing their distribution.

TECHNIQUES USED

A total of 26 stations were selected prior to the beginning of the project and were indicated on the maps of Williamson County submitted with the description of Job B-7 for Project F-2-R-1. Some of these were found not suitable and others were substituted. The appended map shows all stations visited. Stations 18, 19, 21, 26 and 27 were abandoned because silt on the bottom was too deep to work on and Brushy Creek was too narrow to permit the use of gill nets.

Each station was visited at least once when seining or netting collections of fish specimens were made. At one location on Berry Creek, a tributary of the San Gabriel River, specimens were collected with rotenone.

Rotenone was not used more often because of high water velocity or large gOlume flow. These conditions made the use of rotenone prohibitive not only because of thelarge amount of rotenone needed to effect a kill but also because it was feared the rotenone would kill fish over too large an area and thus cause unfavorable public opinion.

Thirty foot straight seines were used in the pools until they were later replaced with bag seines. Eight foot common sense seines were used on the riffles.

When nets were used, they were gill nets 125 ft. long, eight ft. deep, with mesh sizes in 25 ft. sections ranging from one square inch through three inches sq. in one-half inch intervals.

Where chemical and physical data were collected, pH, dissolved oxygen and carbon dioxide were determined by standard procedures as outlined by Lagler in his, HANDBOOK OF FRESHWATER FISHERIES BIOLOGY. Temperatures were read directly from a mercury, Fahrenheit thermometer, and turbidity was recorded as outlined by Lagler.

FINDINGS

San Gabriel River - Distribution of Fishes: - Thirty-three species, representing ten families, were found to be present in the San Gabriel River. These are listed in the annotated species list which follows.

Forage species, including cyprinids (minnows) poecilids and cyprinodonts (topminnows) accounted for 65.127 percent of the specimens collected by all methods. (Table 1)

Game species, including the centrarchids (black basses and sunfish) and ameiurids (catfish) accounted for 26.520 percent of the total specimens. However, the black basses, i. e., the largemouth bass, the spotted bass and the Texas spotted bass, comprised only 1.789 percent of the total and channel catfish, plus the flathead or yellow catfish, comprised only 0.764 percent. Seven species of sunfish accounted for 29.930 percent of the total with the bulk of those made up by the longear sunfish (22.495 percent). The other ameiurid species, (the yellow bullhead) accounted for only 0.037 percent. (Table I)

The darters, another forage group, accounted for 5.128 percent of the total. Most of these being orange throat darters with 3.562 percent of the total. (Table I)

The rough or obnoxious species, including the gars, buffalo, suckers and fresh water drum, accounted for only 3.220 percent of the total specimens collected. (Table I)

In general, the San Gabriel River has an extremely large forage fish population, especially if the sunfish are also included in that category, and a very small game fish population. The rough fish population is not sufficiently large to be classed as a problem for the river as a whole. Perhaps the greatest single factor affecting the fish population of the San Gabriel River is the lack of rain which in recent years has caused the river to stop flowing numerous times. Coupled with this, poor land management has allowed erosion to deposit large quantities of silt in the lower reaches of the river, making much of the river unsuitable as a habitat for the more desirable game species.

Though there are a few species of fish which are more abundant in the upper reaches of the river, there is no distinct break in the population make up and with minor exceptions, most species may be found throughout the river. The only possible ecological barriers in the river are the series of small dams in the Georgetown area.

SAN GABRIEL RIVER - - Annotated Species List

Family Lepisosteidae - Gars

Lepisosteus platostomus Rafinesque, shortnose gar: - A total of forty-five shortnose gar were taken from three localities on the San Gabriel River. Since all of the dams on the river are relatively low, there is not permanent ecological barrier to confine the shortnose gar to any portion of the river, even though the majority of them were taken from below the dams at Georgetown. From the fact that eight specimens were taken from a pool several miles above the most upstream dam, it is suspected that the species range widely throughout the river and may be expected to occur wherever fairly deep pools are found.

The places where the gar were taken have a point of similarity which suggests a preference for moderately deep, clear water pools in which some aquatic vegetation is found.

In one locality, Katy Lake, approximately one-half mile south of Weir, thirty-four individuals weighing a total of 57 pounds, 2 ounces were taken in 250 feet of net. This was a deep pool with abundant vegetation in the form of Myriophyllum heterophyllum or coontail. Large gizzard shad were also taken from this same pool.

Family Clupeidae - shads and herrings

Dorosoma cepedianum (Le Sueur), gizzard shad - The gizzard shad was collected from only a single locality, Katy Lake, on the San Gabriel River. A total of twelve specimens weighing a total of 19 lbs. 9 oz. were taken from the pool. The largest individual weighed 2 lbs. 9 ozs. and measured 18.1 inches in total length. This is probably close to a record for this species in Texas waters.

Since gizzard shad were not taken above the dams at Georgetown, its occurence in the San Gabriel River appears to be more or less limited to the downstream pools.

Family Catostomidae - suckers and buffalofishes

Ictiobus bubalus (Rafinesque), smallmouth buffalo: - only a single specimen of this species was taken from the San Gabriel River. It also came from the Katy Lake.

The feeding habits of the smallmouth buffalo allow it to live off minute aquatic organisms as well as vegetation. This suggests that it might be found elsewhere in the river where there are deep water pools, some vegetation and sufficient bottom fauna to support them. That they were not taken in any of the upstream pools indicates that their upstream distribution may be limited by the barren bedrock bottom and the lack of vegetation which are prevalent above the locality where they were found.

Carpiodes carpio (Rafinesque), river carpsucker: - Eighty-one specimens of river carpsuckers were taken from nine localities, widely distributed throughout the entire San Gabriel River in Williamson County. This is one of the most widely distributed species occuring in the San Gabriel and small schools of young carpsuckers are commonly seen in the deeper water even well upstream where deep water is not common.

Moxostoma congestum (Baird and Girard), gray redhorse: - The gray redhorse was taken from two localities on the North San Gabriel River and in the rotenone collection from Berry Creek, a main tributary in Williamson County. That it was not taken in the main stream of the San Gabriel indicates that the species prefers the smaller streams and tributaries. This is in line with information concerning this species from other waters in the state.

Minytrema melanops (Rafinesque), spotted sucker: - Only a single specimen of the spotted sucker was collected from the San Gabriel. It came from an area with slighly turbid water, over a gravel bottom with some silt. At the time of capture, the river was at low water stage. Since it was not taken more than once, little can be said concerning its distribution in the river.

Family Cyprinidae - shiners and minnows

Notropis venustus (Girard), blacktail or spottail shiner: - This species was taken in all collections made with seines from all localities sampled on the San Gabriel River. It was by far the most abundantly taken species found to occur in the river. Its preferred habitat appeared to be the swift water just below an obstruction in the stream. It was seen feeding on small aquatic insects and other aquatic organisms, darting out into the current after its prey as the prey was being swept downstream.

Since the young of the blacktail shiner were collected in the summer and in the winter, it is probable that the species spawns more than once a year in this river.

The young were seen in large numbers, in mixed schools with other minnows, along the shoreline, out of the current.

Abberant individuals appear to be interspecific hybrids with Notropis Lutrensis, (Baird and Girard) and intergrades between the two parent species are common.

The blacktail shiner accounted for more than 23 percent of the total number of fish specimens taken in all collections.

Notropis lutrensis (Baird and Girard), red shiner or redhorse minnow: - The red shiner was taken along with the spottail shiner in every seined collection from all localities but was not so abundant as the spottaill It accounted for about 11 percent of the total number of specimens captured or about half as many as the spottail shiner.

Its habits appear to coincide almost exactly with the spottail shiner even to spawning and food habits. For this reason it is natural that there would be so many intergrade hybrids between the two species.

Notropis volucellus Cope, mimic shiner: - Mimic shiners were collected from seven localities on the San Gabriel River most of which wer in the upstream section of the river. In every case the species was found in relatively clear water where there was at least scant amounts of vegetation, and the shiners were taken along the shoreline near the vegetation. Its distribution in the river is apparently restricted to areas with clear water, some vegetation and either bedrock or gravel bottom. No large numbers of this species were collected although it could in no way be classed as a rare species for the stream.

Notropis buchanani Meek, ghost shiner: - Twenty-five specimens of the ghost shiner were collected from a single locality on the San Gabriel River. This was the only place the species was found. At this point the river was slightly turbid with a gravel and silt bottom, swift current and scant vegetation in the form of filamentous algae along the edges of the pools. This species is closely related to the mimic shiner and apparently replaces that species in the more turbid portions of the river.

Dionda episcopa Gizard, roundnose minnow: - Only eight specimens of the round nose minnow were collected from two localities in the upstream portions of the river, six from one locality on the North San Gabriel and two from a locality on the South San Gabriel. In both cases these minnows came from areas near small flowing streams, with clear water and bedrock bottom. Since the species is known to occur near springs in other parts of the State, its distribution in the San Gabriel River is likely restricted to areas adjacent to springs.

Pimephales promelas Rafinesque, fathead minnow: - Forty-three specimens were taken from a single locality on the North San Gabriel River. Since they were not taken elsewhere little can be said concerning their distribution in the river.

Pimephales vigilax Baird and Girard, parrot minnow:- the parrot minnow was found throughout the San Gabriel River, and was the fourth most commonly taken minnow accounting for 11 per cent of the total number of specimens from all collections.

Campostoma annomalum Rafinesque, stoneroller or steelback: - The stoneroller was especially common on the bedrock riffles in the upstream section of the river where extremely large schools of the species were seen during the summer and fall. Though more frequently encountered upstream, it was also found in two localities in the downstream portion of the river. Apparently the stoneroller is widely distributed throughout the San Gabriel River in Williamson County, but it is more abundant

in the upper reaches of the river.

Family Ameiuridae - catfish

Ictalurus punctatus (Rafinesque) , Southern channel catfish: - Of the game species occuring in the San Gabriel River, the southern channel catfish is the most widely distributed. Though not abundant, it was collected from ten of the fourteen stations were seining collections were made. The upper sections of the river seem to be more favorable for this species shce there are abundant undercut banks in the limestone banks and a plentiful food supply in the form of minnows and small sunfish.

In talks with local residents along the river, it was learned that the stream once contained a large population of this species. However, drouth and consequently low water for the past few years has caused the species to become seriously depleted. It is possible the introduction of hatchery raised fingerlings could locally help reestablish the large population of channel catfish in this river.

Ameiurus natalis (LeSueur), yellow bullhead: - Only two specimens of yellow bullheads were taken and both came from the same locality. However, in work on City Lake at Georgetown, the yellow bullhead was found to occur in the impoundment. Thus, even though the species was not encountered frequently, it was found in two widely separated places, once well upstream and again in City Lake, which indicates that the yellow bullhead may be widely distributed in the river.

Pilodictus olivaris (Rafinesque), flathead or yellow catfish: - In a river which is said to have abound with this species, the flathead catfish is at present relatively rare. Only a single specimen was collected, coming from Katy Lake the deepest pool found in the river. This specimen was small indicating there is still a brood population somewhere in the river.

Family Cyprinodontidae - killifishes and topminnows

Fundulus notatus (Rafinesque), blackstripe topminnow: - Eighteen specimens of blackstripe topminnow were collected from six localities on the San Gabriel River. In all cases they were found at the edge or near the edge of the bank of the quieter pools, always within easy reach of cover. That the species was not found above the dams in the upstream section of the river suggests that the dams' are an ecological barrier above which the species can not pass.

Family Poecilidae - mosquitofishes

Gambusia affinis (Baird and Girard), gambusia or common mosquitofish: - This species was taken from eight localities on the San Gabriel River. In all 107 specimens were collected. They were found to have widespread distribution in the lower section of the river though they were taken only once above the dams at Georgetown. There appears to be a temporary depletion of the species in the upper stream section probably due to the drouth and predation. Like the blackstripe topminnow, the gambusia was always found along the edge of quiet pools and always within easy reach of cover.

Family Centrarchidae - black basses and sunfishes

Micropterus punctulatus Rafinesque, spotted black bass: - the spotted black bass was collected from six localities in the upper section of the river. In no case was it found below Katy Lake. In all sixty-two specimens were taken.

The clear water areas where the species was found had swift current, bedrock and gravel bottom, and scant cover in the form of boulders, brush or aquatic vege-

tation. Usually these bass were found at the upper end of pools just below riffles where they could lie in wait for prey organisms to be carried to them by the current.

That the spotted bass was not taken below Katy Lake suggests a preference for the clear water areas where they were taken and/at their distribution may be limited by changes in bottom type or increases in turbidity.

Micropterus treculi Hubbs and Bailey, Texas spotted bass: - Only eight specimens of Texas spotted bass were collected and these came from two widely separated stations. One was the most upstream station on the North San Gabriel River and the other was on Berry Creek near its confluence with the San Gabriel. That they were found in these localities suggests a preference for the smaller streams rather than the larger rivers.

That The spotted bass and the Texas spotted bass were found to occur together in the same localities contradicts a theory held by some that this does not occur.

Micropterus salmoides (Lacepede) Largemouth bass: - Twenty-six specimens of largemouth bass were taken from nine localities, both above and below the Balcones Escarptment indicating that the species is not restricted in its distribution by either dams, turbidity or bottom type. This is understandable since they are stocked throughout the state by the Game and Fish Commission in may different types of habitat.

The abundance of this species has probably been reduced by the periods of low water and by high turbidity during periods of heavy run-off, especially if the turbidity occurs during the spawning season. The numerous small sunfish also have helped to reduce the bass population by raiding nests and eating the eggs.

The entire river could be improved with relation to the habitat for this species if erosion could be controlled by better land use and if a series of small dams could be built to ensure permanent pools in which the species could better weather the periods of low water.

Chaenobryttus coronarius (Bartram), warmouth or goggle-eye: - Only four specimens of the warmouth were captured during the survey and each came from a different locality. That they were found only in places where there was vegetation in abundance suggests that the species is limited in its distribution to places with aquatic vegetation.

Lepomis punctatus (Cuvier), spotted sunfish: - Only a single specimen of spotted sunfish was taken and this was during the single rotenone collection on Berry Creek near its confluence with the San Gabriel. Since more specimens were not taken it is not possible to estimate the distribution of this species.

Lepomis cyanellus Rafinesque, green sunfish or goggle-eye: - Thirty-nine specimens of the green sunfish were collected from nine scattered localities. The species is widely distributed in the San Gabriel River and may be found both on the riffles and in the pools although more frequently in the pools.

Lepomis microlophus (Gunther), redear sunfish or Georgia bream: - One specimen of the species was collected by seining although more were seen in the creels of fishermen in the vicinity of City Lake at Georgetown. This area has been stocked in recent years by the Game and Fish Commission. That the species was not taken elsewhere suggests its distribution is more or less limited to the area between City Lake at Georgetown and the lower end of Katy Lake. All of this area has abundant aquatic vegetation and cover.

Lepomis macrochirus (Rafinesque), bluegill: - Nineteen bluegills were collec-

ted from four localities, three of which was in the Georgetown area and one on the North San Gabriel River, west of Georgetown. Bluegills are raised by the Game and Fish Commission and may have been stocked in these areas. Usually the species is found in the deeper pools where the current is slow and where there is some cover in the form of aquatic vegetation or brush or both.

Lepomis humilis (Girard), orangespotted sufish: - Thirtyen specimens of the orangespotted sunfish were collected from two localities. In both these places the river was clear with a bedrock bottom and abundant vegetation in deep pools with slow current. There is some indication that the species is restricted to the upper reaches of the river and the smaller tributaries of that portion of the river.

Lepomis megalotis (Rafinesque): longear sunfish: - the longear was the most frequently collected sunfish and second most abundantly taken species in the river. In all, 1206 specimens were taken, accounting for more than 22 percent of all specimens combined. The species was found in all parts of the river and in most habitat types.

Family Percidae - perches and darters

Hadropterus scierus Swain, dusky darter: - A single specimen of this species was taken during the rotenone collection on Berry Creek. This area had swift clear water over a long riffle, not over a foot deep on the average. The bottom was composed of boulders and rubble providing abundant cover. Since no other speciemens were taken, little can be said concerning the distribution of this species in the San Gabriel.

Percina caprodes (Rafinesque), logperch: - Eighty-three logperch were taken from three localities and seventy of these were collected after rotenone treatment of a portion of Berry Creek. Since a specimen was collected miles above the dams at Georgetown the species is probably widely distributed throughout theupper portions of the river.

Etheostoma spectabile Agassiz, orangethroat darter: - This darter was the most abundant and most widely distributed darter found in the San Gabriel River. It was found at ten of the fourteen stations and 191 specimens were taken in all. Like other darters it was found under rocks on the riffles in swift water. A preference for the clearer waters of the upper stream sections is indicated.

Family Sciaenidae - croakers, drum and weakfishes

Aplodinotus grunniens Rafinesque, freshwater drum or gaspergou. A single specimen of freshwater drum was netted at Katy Lake. Though this was the only place the species was taken it is probable that the species occurs in the deeper pools of the lower portions of the river.

Brushy Creek - Distribution of Fishes: In general the fish population of Brushy Creek is composed of three groups: forage species, game species and rough or obnoxious species. The forage group included the shiners, minnows, topminnows, gambusia, darters and sunfish. Combined, this group provided 94.883 percent of the total number of specimens collected during the survey. Game species, including the largemouth bass and the channel catfish, provided only 0.192 percent while the rough fish species including the gars, gizzard shad and suckers accounted for 4.640 percent of the total number of specimens. (Table II)

Like the San Gabriel River, Brushy Creek has suffered alternately from periods of drouth and heavy rains. During dry spells, the creek has been reduced to a series of small pools throughout most of its length, with a few large pools impound-

ed behind the small dams in the Round Rock area. It is in these pools where the game species have been able to survive. During periods of heavy runoff, the creek has flooded out of its banks, especially in the lower reaches and has been clogged by large deposits of silt. This pollution by silt is the direct result of the poor land management prevalent over much of the area drained by Brushy Creek.

The deposition of silt has made the lower reaches of the creek undesirable as habitat for the game fish species since most of the pools are very shallow, having been filled in. Only in the upper reaches of the creek has the habitat for game fish been maintained and in the pools impounded by the small dams a small game fish population has been able to maintain itself with the aid of infrequent stocking.

Brushy Creek - Annotated Species List

Family Lepisosteidae - gars

Lepisosteus platostomus Rafinesque, shortnose gar: - Relatively uncommon in Brushy Creek, a single specimen was collected from slightly turbid water over a silt and gravel bottom in the lower reaches of the stream. This stream section was devoid of aquatic vegetation. Since Brushy Creek has been intermittent many times in recent years itis doubted that the species occurs above the dams in the Round Rock area.

Family Clupeidae - shads and herrings

Dorosoma cepedianum (Le Sueur), gizzard shad: - The gizzard shad was collected at only a single locality in the more turbid downstream section of the stream. The pools, devoid of vegetation, consisted of holes not over four feet deep with silt and gravel bottoms, undercut banks which were easily shaded, and little cover. Since the gizzard shad is easily affected by abnormal conditions resulting from sudden muddy rises, it is likely to be confined to the lower reaches of Brushy Creek.

Family Catostomidae - suckers and buffalofish

Carpiodes carpio (Rafinesque), river carpsucker: - the river carpsucker, common in the headwater section of Brushy Creek, was not collected at any point below Round Rock. Since the species is present in all parts of the San Gabriel River it is probable that the species also occurs throughout Brushy Creek, from its mouth on the San Gabriel River to the headwaters even though it was not collected. From observations of schools of this fish, there is some indicated preference for areas with bedrock bottom on which a thin layer of silt has been deposited.

Moxostoma congestum (Baird and Girard) gray redhorse: - Relatively rare in Brushy Creek, only two specimens of gray redhorse were collected in the small impoundment on North Brushy Creek, just above the confluence of the two branches. Since this species is known to inhabit the smaller creek and tributaries, it is likely that it occurs throughout the upper reaches of Brushy Creek.

Family Cyprinidae - shiners and minnows

Notropis venustus (Girard) blacktail or spottail shiner, - common throughout Brushy Creek, the species is generally found in the pools just below riffles where it lies in wait for prey to be carried to it by the current. Though the species is present in all parts of Brushy Creek it is not quite so numerous in the more turbid downstream sections.

Notropis lutrensis (Baird and Girard), red shiner or redhorse shiner: - The redhorse shiner was the most frequently collected minnow found in Brushy Creek. It was found in large concentrations in the upstream clear water pools over bedrock but not found in large numbers in the downstream sections.

Notropis volucellus Cope, mimic shiner: - the mimic shiner is relatively common throughout Brushy Creek except in the more turbid downstream areas. Generally the species is found in relatively quiet water but may also be taken on occasion from the shallow riffles, especially in areas where the water is slightly turbid.

Notropis buchanani Meek, ghost shiner: - This species is relatively rare in Brushy Creek, taken at only two localities inthe more turbid areas of the downstream section. The ghost shiner usually supplants the closely related mimic shiner in turbid water although they may be found to occur together on occasion.

Pimephales vigilax Baird and Girard, parrot minnow: - The parrot minnow was commonly taken in all parts of Brushy Creek and was frequently found in mixed schools with spottail, redhorse and mimic shiners in the pools just below riffles over either bedrock, gravel or silt bottoms. The distribution of the species is not noticeably influenced by the increased turbidity of the downstream sections.

Pimephales perspicuus Girard, bullhead minnow: - Specimens tentatively identified as bullhead minnows were collected from two localities on Brushy Creek. The specimens were inadvertently discarded and positive identification was not made. No other specimens were collected.

Campostoma annomalum Rafinesque, stoneroller or steel back: - Though commonly seen in large schools on the bedrock riffles of the clear water areas in the upper stream section, relatively few specimens were collected from the more turbid water in the downstream sections. The species was however, widely distributed throughout the stream.

Family Ameiuridae - catfish

Ictalurus punctatus Rafinesque, Southern channel catfish - only two specimens of the Southern channel catfish were collected from the small impoundment on North Brushy Creek. Sime the species is considered a game fish, stocking might help establish a population in the other impoundments on the creek. It is likely that the species would do well if introduced.

Family Cyprinodontidae - Killifishes and topminnows

Fundulus notatus (Rafinesque), blackstripe topminnow: - Relatively rare in Brushy Creek, it was collected at only two localities in the clear water of the upstream sections. As would be expected for these species, it was collected from the edges of pools within easy reach of cover.

Family Poecilidae - mosquitofishes

Gambusia affinis, Baird and Girard, gambusia or common mosquitofish: - Locally called pot-bellied minnows, the common mosquitofish was commonly found along the edges of pools and in quiet back waters throughout Brushy Creek.

Family Centrarchidae - black basses and sunfishes

Micropterus salmoides (Lacepede), largemouth bass: - Though relatively rare in Brushy Creek, five specimens were collected and many more were observed in the deeper clear pools of the upper portions of the creek. These pools were generally over five feet deep, well shaded and had good cover in the form of boulders and brush. The bass in them were extremely warey and could not be collected in seines. Since the pools were very short, net could not be used. It is likely that the larger pools, especially the impoundments near Round Rock could support relatively large numbers of bass if stocked from hatchery supplies. Food in the form of minnows, small sunfish and aquatic insects are in plentiful supply and cover is good.

Chaenobryttus coronarius Bartram, warmouth or goggle-eye: - Only a single specimen of this species was collected at the farthest downstream station in Williamson County. Normally this fish is found associated with luxuriant vegetation but the specimen came from an area devoit of any vegetation. It is likely that this specimen escaped from a farm pond during the most recent floodfng of Brushy Creek or that it made its way upstream from the San Gabriel River.

Lepomis cyanellus Rafinesque, green sunfish or goggle-eye: - relatively common and evenly distributed throughout Brushy Creek, the species was frequently found in the deeper pools in clear and turbid water alike.

Lepomis macrochirus Rafinesque, bluegill: - Common only in the clear pools of the upper portions of the stream, the bluegill was, with the exceptionof the warmouth the least commonly collected sunfish in Brushy Creek. Though the reason for the restricted occurence of the bluegill is not apparent, it is suspected that sudden, highly turbid rises in the downstream portions of the stream have had the effect of excluding the bluegill from those portions of Brushy Creek.

Lepomis megalotis Rafinesque, longear sunfish: - The longear sunfish is apparently the best adapted, most abundant and most widely distributed sunfish which occurs in Brushy Creek. It was common throughout the stream although more abundant in the upper reaches. This would tend to indicate some preference for clear water.

Family Percidae - perches and darters

Etheostoma chlorosomum (Hay), bluntnose darter: - Vary rare in Brushy Creek, a single specimen was collected from a shallow, turbid pool at the farthest downstream station in Williamson County.

Etheostoma gracile (Girard), western swamp darter: - Like the bluntnose darter, the western swamp darter is a very rare species in Brushy Creek, being collected only once from a turbid pool with a silt and bedrock bottom in the more turbid downstream section of the creek.

Etheostoma spectabile Agassiz, orange-throat darter: - the orange throat darter was relatively common riffles throughout Brushy Creek. It was most abundantly taken from pools just above the riffles. This would indicate that the species is not necessarily restricted to riffles as commonly assumed.

SUMMARY

1. Thirty-three species are known to occur in the San Gabriel River and twenty-two occur in Brushy Creek.

2. Though certain species are more abundant in the upstream portions and others are more abundant in the downstream portions of both the San Gabriel River and Brushy Creek, no distinct break in population continuity was discovered in the survey. Most species range throughout both streams.

3. The large minnow populations which occur in both streams are probably the result of the law for Williamson County which prohibits the taking of minnows for commercial purposes.

4. Game fish, including largemouth bass and catfish are more abundant in the upstream portions of both Brushy Creek and the San Gabriel River. Spotted bass are relatively abundant in the upper portions of the San Gabriel.

5. Rough fish species including gars, suckers and shad are relatively scarce and may be considered as problems only in scattered localities.

6. Drouth and erosion of top soil are the two factors which most seriously affect the fish populations of both streams.

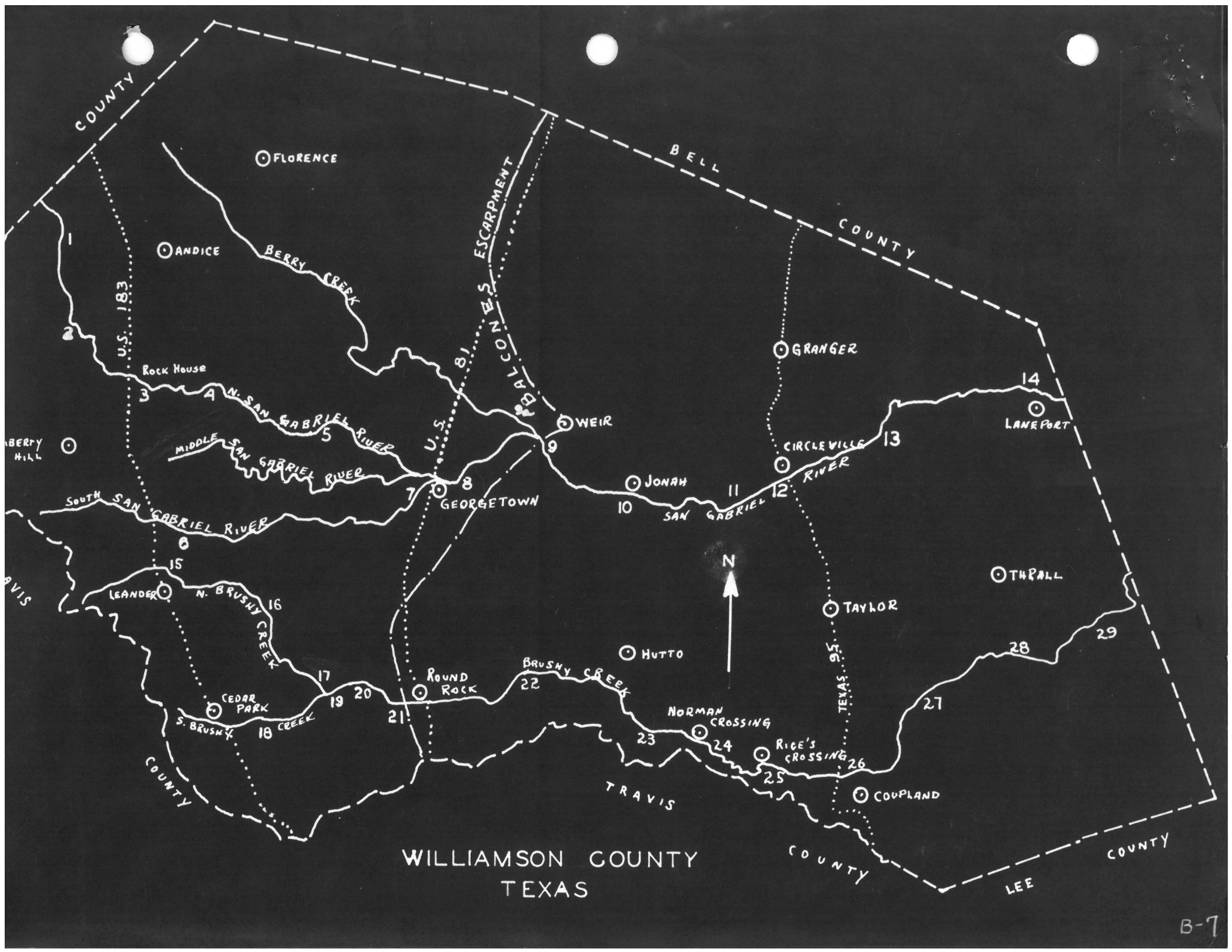
7. Pollution due to silt is widespread in the lower reaches of Brushy Creek and this form of habitat destrubtion has noticeably reduced the fish population in those portions of the stream.

Table 1. Specimen Collections, San Gabriel River

Species	Survey Stations																Percent of Total
	1	2	3	4	5	6	7	8	9	9a	10	11	12	13	14	Total	
Lepisosteus platostomus					8			3		34						45	0.837
Dorosoma cepedianum										12						12	0.223
Ictiobus bubalus										1						1	0.018
Carpiodes carpio	1	6	5		6	12				38	1		2		10	81	1.510
Moxostoma congestum				2	1				28							31	0.596
Minytrema melanops												1				1	0.018
Notropis venustus	82	79	52	52	106	48	267	249	127		89	120	9	39	121	1250	23.312
Notropis lutrensis	9	60	83	66	49	137	47	2	43		6	36	54	33	10	635	11.844
Notropis volucellus	8			2	2		2	2	13			25				54	1.007
Notropis buchanani															25	25	0.466
Dionda episcopa				6		2										8	0.149
Pimephales promelas				43												43	0.802
Pimephales vigilax	19	47	49	37	3	14	13	66	143			27	60	15	102	595	11.098
Campostoma anomalum	6	153	168	65	6	57	122	38	100			40	2			757	14.120
Ictalurus punctatus			4	3	1			1	13	1	1	2	12	2		40	0.746
Ameiurus natalis			2													2	0.037
Pilodictus olivaris									1							1	0.018
Fundulus notatus							4	8	2			2	1	1		18	0.335
Gambusia affinis						30	5	9	3			3	15	40	2	107	1.995
Micropterus punctulatus	21		6	23	1			2	9							62	1.156
Micropterus treculi	1								7							8	0.149
Micropterus salmoides			1		1	1	2	4	4	1	2	10				26	0.484
Chaenobryttus coronarius					1	1	1	1								4	0.074
Lepomis cyanellus	4	1	5	12	2	11		2	1			1				39	0.0727
Lepomis punctatus									1							1	0.018
Lepomis microlophus								1								1	0.018
Lepomis macrochirus				9			4	1	5							19	0.354
Lepomis humilis							12		1							13	0.244
Lepomis megalotis	141	69	96	67	48	89	39	85	197		44	122	60	121	8	1206	22.495
Hadropterus scierus									1							1	0.018
Percina caprodes					1			12	70							83	1.548
Etheostoma spectabile			2		36	22	7	20	81			2	3	13	5	191	3.562
Aplodinotus grunniens										1						1	0.018
Totals	292/415/		503/387/		272 424		325	506	850	88	143	391	218	264	283	5361	99.996

Table 11. Specimen Collections, Brushy Creek

Species	Survey Stations										Totals	% of Total
	15	16	17	20	22	23	24	25	28	29		
Lepisosteus platostomus								1			1	0.064
Dorosoma cepedianum								38			38	2.450
Carpiodes carpio	2	3	26								31	1.998
Moxostoma congestum			2								2	0.128
Notropis venustus	2	30		50	3	11	11	1		1	109	7.027
Notropis lutrensis	196	8			85	21	205		2	46	563	36.299
Notropis volucellus	7	3		7		1	12	72			102	6.576
Notropis buchanani						1	2				3	0.192
Pimephales vigilax	46				13	10	80	54		3	206	13.281
Pimephales perspicuus	5				2	1	1	20			25	1.611
Campostoma anomalum		9			2	1	1	4			17	1.088
Ictalurus punctatus			2								2	0.128
Fundulus notatus		8		3							11	0.709
Gambusia affinis	1	9		13	25	2	48	12	33	101	244	15.731
Micropterus salmoides	3		2								5	0.323
Chaenobryttus coronarius										1	1	0.064
Lepomis cyanellus	6	1	1					2	6	5	21	1.353
Lepomis macrochirus	14	4					4				22	1.411
Lepomis megalotis	17	40		2	9	2	18	2		9	99	6.383
Etheostoma chlorosomum										1	1	0.064
Etheostoma gracile								1			1	0.064
Etheostoma spectabile		1		3	2	2	29	7		3	47	3.030
Total	299	116	33	79	139	151	410	214	41	170	1551	99.974



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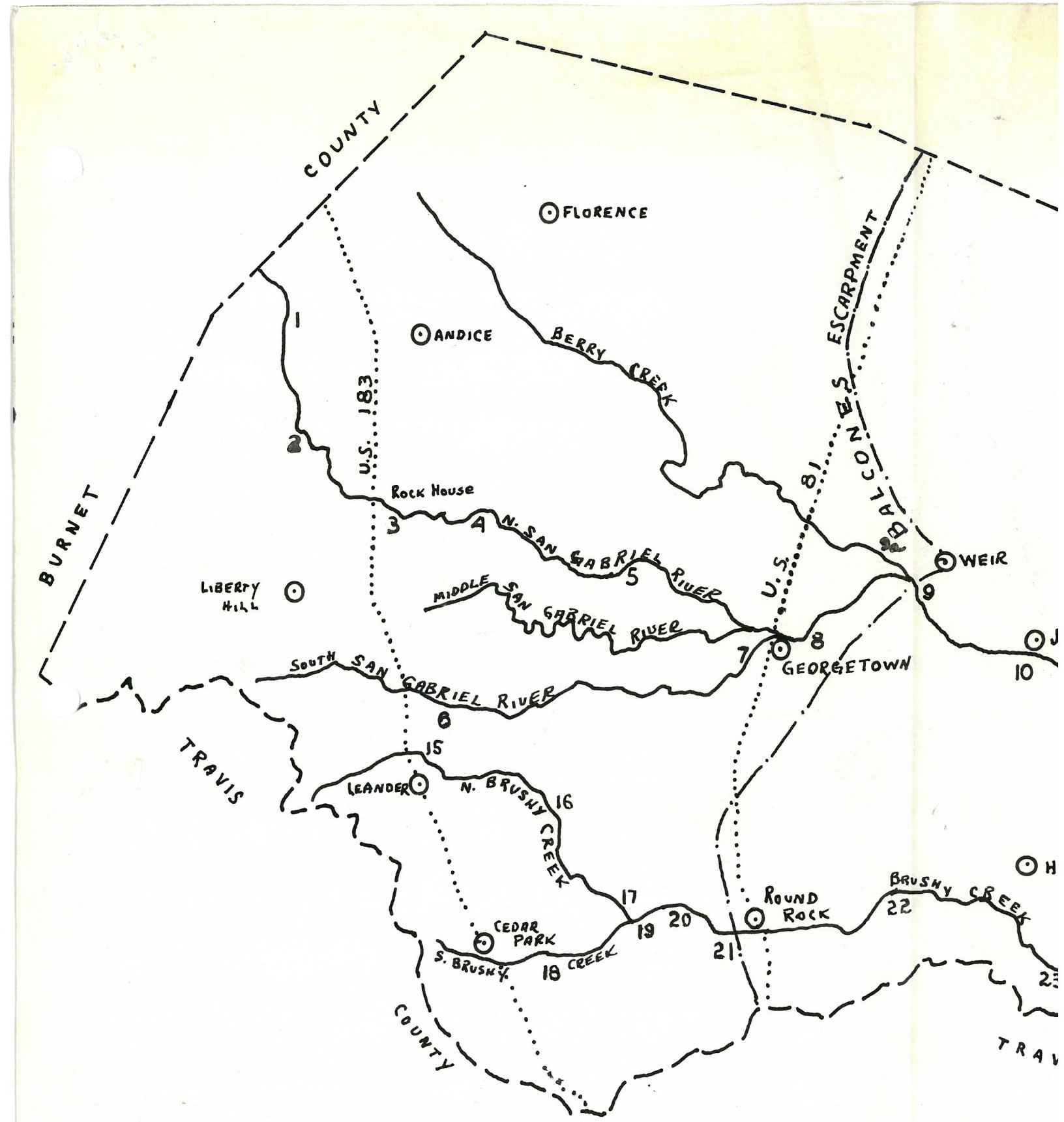

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