THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712

Department of Zoology

April 21, 1977

Clayton Garrison
Executive Secretary
Texas Parks and Wildlife
4200 Smith School Road
Austin, Texas 78744

Dear Mr. Garrison:

I enclose herein the report of our analysis of the fishes of the Lower Canyons of the Rio Grande. Our study extended between 3 and 8 April, 1977. The time limits were constrained by scheduling requirements of Professor Miller's and mine. Inland Fisheries Biologists D. J. Morris and Bob Zerr participated along with Dr. Robert R. Miller of the University of Michigan. The bulk of the logistics were planned by Morris. Boat operations, etc. were the primary responsibilities of Morris and Zerr and fish collections the primary responsibility for Miller and me. Despite these allocations of primary responsibility, all four of us participated in each duty whenever it was beneficial. I take this occasion to repeat my commendation to Morris and Zerr for a job well done. They participated fully in collection activities whenever boat repairs and maintenance did not preclude such cooperation. Their boat operations were quite successful - no boats swamped, etc. so that we were able to concentrate on our primary responsibility of studying the fish fauna.

Professor Miller and my ti[illegible] constraints restricted the segment we could study and we chose the segment between Maravillas Canyon and Lozier Canyon as the one with the greatest promise and at the same time the area which best fit the time available. River travel and collection were influenced by water volumes released from Luis L. Leon Reservoir (ca 1300 ft^3/second). Without that release the river flow would have been less and the water clear. The increased flow facilitated boating operations as many rapids were sufficiently deep that we could easily float through - these occasions when we hit bottom were more "interesting" as the flow increased the rate of impact. More critically, the flow restricted collections as we could never sample from bank to bank with the equipment available.

Often our seining operations were no more than 2 meters off shore - commonly we boated to the opposite shore to complete our collection. We found that our riffle samples (rapid water environment) were less profitable in the fastest and deepest samples suggesting that the unavailable environment would not have substantially added to our harvest. The quiet water samples were different with our deepest samples as fruitful (within the limits of our gear) as the shallowest ones. It is in this habitat that our samples may have missed fishes present.

We made 13 collections during the trip. Their locations may be found on the map as well as a previous sample (C) made in 1954 by Dr. V. G. Springer and me. The list of fishes obtained is on the enclosed table. The numbering and lettering sequence is designed to be in conjunction with a previous series of collections obtained in March between Fort Quitman and the mouth of Alamito Creek. That report concluded that the river segment between the Fort Quitman ruins and the confluence with the Conchos was distinct from that below the confluence (and in the Conchos) due to the high salt load and interrupted flow of the Rio Grande upstream from the Conchos. The segment of the Rio Grande flowing through the Lower Canyons resembles that of the Conchos and Rio Grande below the confluence.

Most of the fish reported were preserved and placed in permanent depositories (odd numbers Texas Natural History Collection, even numbers University of Michigan Museum of Zoology). Some large fish - gar, shad, carp, etc. - were discarded or returned to the river.

Our samples were notable by the recurrance of abundance patterns. Six species (Rhinichthys cataractae, Notropis jemezanus, Notropis lutrensis, Hybopsis aestivalis, Cycleptus elongatus, Notropis braytoni)were collected at 11 or more of the 13 stations. All but N. lutrensis were absent in the Rio Grande above the Conchos confluence. Four species (Dorosoma cepedianum, Ictalurus furcatus, Ictalurus punctatus, Carpio des carpio) were taken 9 or 10 times. All were in that upper segment. Five species (Pylodictis olivaris, Lepisosteus osseus, Gambusia affinis, Menidia beryllina, Micropterus salmoides) were taken three to six times. Only G. affinis was in that upper segment (but M. beryllina was predicted to soon become dominant there). Seven species (Ictiobus bubalus, Cyprinus carpio, Astyanax mexicanus, Pimephales promelas, Notropis chihuahua, Fundulus kansae, Lepomis macrochirus, Lepomis cyanellus) were taken one or two times, commonly in specific and limited habitats. The collections made during our survey are quite similar to the 1954 collection (C) most notably differing by the absence of R. cataractae from the August 1954 samples. The differences with the upper segment are underscored by the relative scarcity of carp, the most frequently captured species in the upper segment and green sunfish which tied for second most frequently captured

species. In many ways this segment resembles the Rio Grande east of Presidio (below channelization) and the Rio Conchos upstream.

The 1977 survey indicated a number of notable fish distributional items.

(1) The abundance of Rhinichthys cataractae. The longnose dace populations in the lower Rio Grande (+ Conchos) are separated from the rest of the populations by the dry and salty Rio Grande segment between El Paso and Presidio. This separation has preceded civilization but has been expanded by irrigation inversions. Representatives of this disjunct population look different from other longnose dace and undoubtedly represent a unique genetic assemblage. Prior to this survey specimens of lower Rio Grande longnose dace were scarce. The Texas Natural History Collections contained six records with 30 specimens, of these, two records and three individuals were from Texas. Additional records are available but these typically contain 1 or 2 dace. Thirteen collections with 47-850 specimens is clear indication that the heart of the range of this disjunct population is in the Lower Rio Grande Canyons. The abundance of longnose dace was increased by the seasonality of the collections. The dace were or just had been breeding and the bulk of our individuals were young. Nevertheless we obtained more than 50 adults, a number exceeding the total numbers captured in previous work.

(2) The presence of Notropis chihuahua at the mouth of Maravillas Cr. This record is a downstream extension of the range of the Chihuahua shiner from the mouth of Tornillo Creek, a range extension of about 55 kilometers.

(3) The abundance of young Cycleptus elongatus. Young blue suckers were collected commonly in quiet shallow water. Whenever this habitat was found we could predict with reasonable accuracy that blue sucker young would be present. We observed large fish in deep turbulant rapids that may well have been adults living in an environment not available to our sampling gear at that water stage.

(4) After four or five collections it was possible to predict the fishes most likely to be obtained in a given seine haul. Shallow rapids young Rhinichthys cataractae; deep rapids, adult R. cataractae; deepest and fastest rapids, no fish; moving water, Hybopsis aestivalis; big rocks in current, Pylodictis olivaris; quiet water in river, Ictalurus furcatus, Notropis braytoni and Notropis jemezanus, side pools, Dorosoma cepedianum, Notropis lutrensis, Gambusia affinis, Lepisosteus osseus. The scarcity of flowing water in the lower segments of tributary canyons was a disappointing surprise. Otherwise one would have expected capture of more Notropis chihuahua, Astyanax mexicanus and the other typical Chihuahuan fishes that abound in lower Alamito, Terlingua, and Tornillo creeks.

(5) Two recent introductions have supplemented the species list. Fundulus kansae has undoubtedly dispersed downstream to Maravillas Creek from the abundant populations now present near the mouth of Tornillo Creek. Menidia beryllina is a likely upstream migrant from Amistad Reservoir. Our samples provide a representation of the migratory route that the tidewater silverside previously taken near Presidio must have followed. Like the older exotic Cyprinus carpio, neither of the two new exotics are expected to achieve substantial population densities in the Rio Grande within the Lower Canyons.

(6) We checked for abundance of localized endemics in warm spring tributaries and found none. All springs found were sufficiently close to the river bank that they would be commonly inundated by moderate level floods and any specialized populations would be subject to typical riverine conditions. Spring pool endemics usually are found in springs above normal river flood levels. Similarly creek mouth endemics were not found as most creeks were dry at their mouths.

(7) We were favorably impressed with the number and diversity of game fishes. We had expected to catch many Pylodictis olivaris, Ictalurus punctatus, and I. furcatus and our results confirmed that good catfish catches would be expected. We also caught a relatively large number of Micropterus salmoides which suggests opportunity to add bass fishing to the usual recreational opportunities of a canoe float trip.

(8) We looked for but did not capture two riverine species with endangered status; Scaphirhynchus platorynchus and Notropis simus. It is not likely that either now occurs there but if they do it would be in the deeper parts of the channel.

We also enjoyed the aesthetic aspects of the trip. The scenery, both geologic and biologic, was striking. The time frame imposed on our activities prevented us from fully exploiting the viewing opportunities of the typical float trip. Those who have made this trip can not fail to appreciate the aesthetic aspects of this prime float trip. The nature of each rapids adds a challenging component to the lower canyon experience.

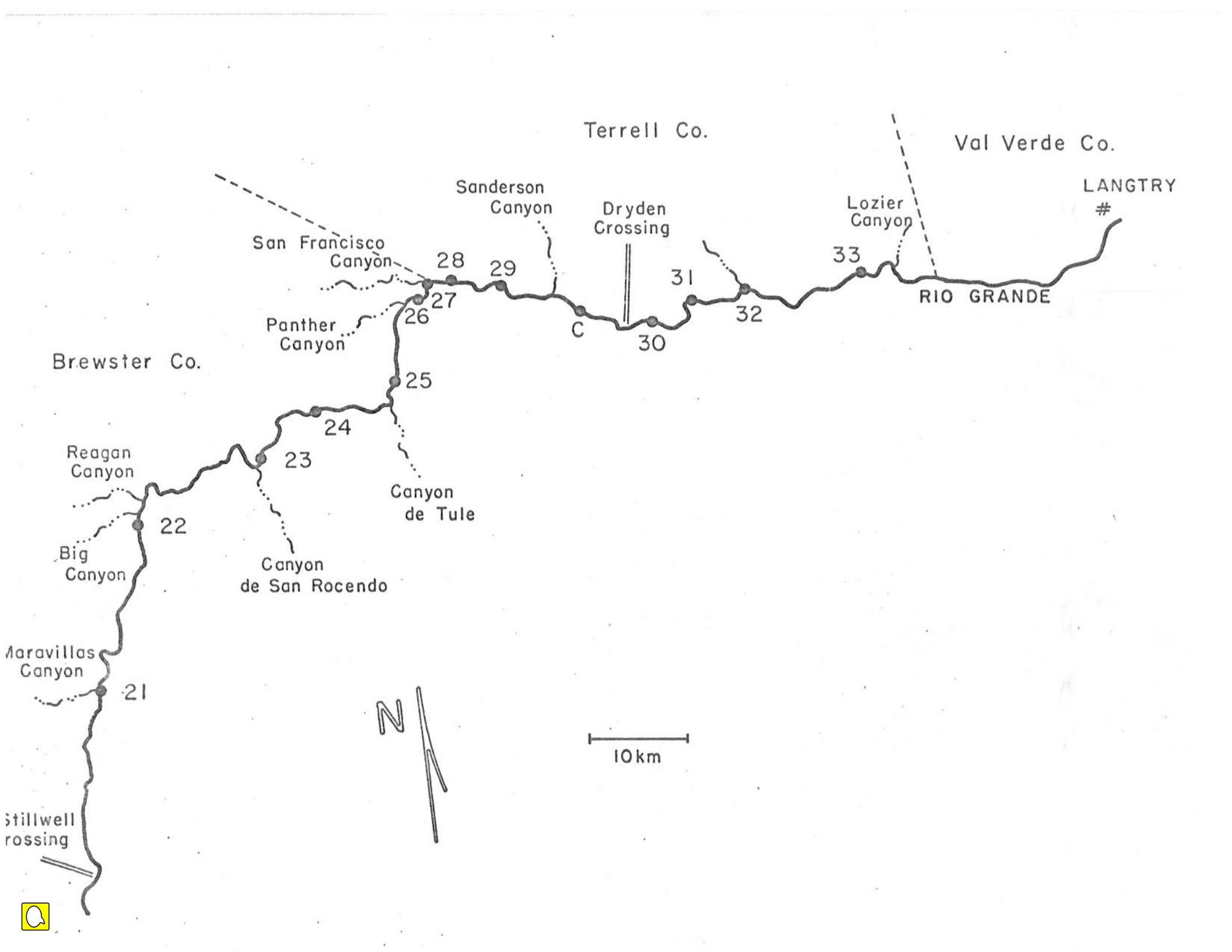
The biological diversity and magnificent scenery impressed us. It seems appropriate to designate the Lower Rio Grande Canyons as a wild river.

Sincerely yours,

Clark Hubbs

Clark Hubbs
Professor

CH:phh


Terrell Co.
Val Verde Co.
Brewster Co.
Sanderson Canyon
Dryden Crossing
Lozier Canyon
LANGTRY
#
San Francisco Canyon
Panther Canyon
RIO GRANDE
28
29
27
26
C
30
31
32
33
25
24
23
22
21
Reagan Canyon
Big Canyon
Canyon de Tule
Canyon de San Rocendo
Maravillas Canyon
Stillwell Crossing
N
10km

STATIONS:	21	22	23	24	25	26	27	28	29	30	31	32	33	C
Lepisosteus osseus			1			1			2	1		1		1
Dorosoma cepedianum	15				3	21	1	2	7	11	3	5	1	
Cycleptus elongatus	108	2	15	1	6	7	2			5	4	19	1	
Carpiodes carpio	5	1		1	1		1	2		1	2	8		31
Ictiobus bubalus	1											1		1
Astyanax mexicanus						1						33		1
Cyprinus carpio	3						1							1
Rhynichthys cataractae	188	182	209	92	87	77	47	184	141	191	168	850	167	
Hybopsis aestivalis	4	13	36	8	6	7	4	6	3	3		9	9	2
Pimephales promelas			1							1				
Notropis chihuahua	1													
Notropis jemezanus	3	5	7	4	20	19	3	3	48	5	16	6	12	11
Notropis lutrensis	6	1	19	1	5	112	4	6	2	12	29	37		1
Notropis braytoni		2	11	3	15	9	4	19	6		6	10	3	25
Ictalurus punctatus		1	7	2	2		3		2		2	1	7	2
I. furcatus		5	13	10	6		4	3	8	1	4		2	69
Pylodictus olivaris		1	4		2						3	1	2	6
Fundulus kansae	2													
Gambusia affinis	3		4			4	4					1		
Menidia beryllina				2		1			1			2		
Micropterus salmoides				1	1							4		
Lepomis cyanellus	1													
Lepomis macrochirus	1		1											