

BIOLOGICAL SURVEY
OF THE SANTA ROSA AND DEL CARMEN MOUNTAINS OF
NORTHERN COAHUILA, MEXICO

JULY 2 to SEPTEMBER 22, 1936

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Certain large areas in the mountains and on the plains have been free of livestock for twenty years and longer, while more extensive tracts have seen little detrimental affect from the few live stock that they have held.

There is little enforcing of game laws by officials in northern Coahuila, but upon those large ranches that hold the bits of concentrated population, the ranch owner takes great pride in the game upon his property, and under such conditions of abundance as exist, comparatively little hunting is encouraged. This is reflected into the unrestricted areas free from molestation, and the wildlife responds positively; so that wherever one is from without the immediate vicinity of Muzquiz, the most impressive feature is the apparent abundance of wildlife and the congeniality it holds for its progeny.

In light of these conditions I suggest -- for a more true understanding of an original, unmolested environment, and for a less expensive, more satisfactory program -- that certain areas be chosen in the Del Carmen and studied extensively, the results of which will be applicable immediately to the corresponding areas in the Texas Big Bend.

SECTIONS

I. Map of northern Coahuila

A plot of the Santa Rosa and Del Carmen Mountains showing points bearing on the survey.

II. Procedure

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XIV. Observations

A suggestion for further work.

Employed as a Student Wildlife Technician under the National Park Service, I was instructed to begin a biological survey of the Musquiz-Boquillas region of northern Coahuila, and in as far as the short time would allow, to emphasize particularly the Del Carmen Mountains lying between thirty and one hundred miles south of the United States boundary and the Texas Big Bend.

Upon making application to the regional office in Oklahoma City, I was furnished with ammunition for collecting bird specimens and a quantity of film. The University of Texas furnished presses and blotters for the plant collection.

Previous to my leaving for Eagle Pass on June 9, I went to the office of the Mexican Consul in San Antonio, and requested of him information concerning possible difficulties which might arise at my entrance into Mexico. He assured me that other than my having to have the necessary collecting permits from the Mexican department of Caza, Pesca, y Forestal for which negotiations were already under way, he knew of none that would detain me; and it was surprising to me that the Mexican immigration officials in Piedras Negras insisted on making a very technical interpretation of my entrance, to cause me a prolonged delay.

For eighteen days I worked with the Mexican officials to have one question after another arise as we progressed. On each an official ruling from the federal department in Mexico City was received before my permits were in order and my equipment bonded under the rules and regulations of Mexican law pertaining to the "Transuente" passport issued to me July 1.

I departed from Piedras Negras at late evening of July 1, and before I had gone over fifty miles, I met with a heavy rainstorm, the first of the season. A muddy dirt road, streams to be forded, and a continual deluge of rain followed me through to Muzquiz, and I considered myself most fortunate to arrive in the morning of the next day after seventeen hours on the road.

Realizing that the water was due to fall for a period of several days and that the Sabinas River would soon be out of bounds, I left immediately for the regions lying east of Muzquiz. After only this short period, the roads were near impassable and it was only with the assistance of a horse team that the car was able to arrive across country to La Mariposa.

The rains ceased on July 11; and as I had in the meantime worked with pack animals through the canyons and plains of La Mariposa, I went in the car through Santa Anna Canyon to the Zacate and on to the southern portion of the Encantada. After a week, I returned to La Mariposa and to Muzquiz where I was advised by wire from Oklahoma City to proceed northward to the Del Carmen and to make arrangements to have certain papers from Washington brought to me after their arrival in Muzquiz.

In company with Victoriano and Fidel Villarreal of Muzquiz, I left for the north on July 23 via automobile. The roads were in good condition and we had little trouble progressing over the wide valley of La Bavia and Santa Domingo. From Conejo to Piedra Blanca the road was very rocky and was difficult to pass in a heavily loaded car.

After several days consumed in working around Piedra Blanca and making arrangements for the use of horses and pack animals, I deserted the automobile at a point in the hills some twenty miles northwest of Piedra Blanca, and with burros carried my equipment thirty miles to camp at 7500 feet in Vivoras Canyon on July 2.

During the next month, I experienced alternating sieges of good luck and misfortune; so that at times, I was truly fascinated with the wilderness of virgin nature that lay on every side only later to find myself damning my incompetence and fate.

From necessity I spent long hours in the field and was able to cover quite thoroughly the canyons along the western sides of the northern Del Carmens, out over the region which I have designated as the Western Hills, and to a lesser extent the plains lying without the mountains along the Chihuahua-Coahuila line.

On August 23, I moved camp to Jardin del Sur and continued to work this more southern portion.

Certain losses from the plant and bird collections made me think it better to return to Muzquiz and thence to Eagle Pass rather than to follow the original plans of passing at Boquillas; and when the opportunity presented itself on September 10, I returned to Muzquiz and wired the office in Oklahoma City.

For the next ten days I retraced several of my former trails over La Gacha, La Mariposa and the canyons along the Santa Rosa Escarpment. On September 21, I left Muzquiz for Piedras Negras and after encountering no trouble on crossing the border, I arrived again in Austin on September 25.

PHOTOGRAPHS

Comments on the photographic material:

The following section of the report consists of a summary of the photo-subjects obtained over the region of northern Coahuila. The number captioning each topic corresponds with a negative on file with the NPS office in Oklahoma City.

Through the cooperation of the Visual Instruction Bureau of the University of Texas, a set of forty colored slides has been prepared from as many of the better subjects and are on file with the Bureau for use of interested parties.

DATA ON PHOTOGRAPHS OF MEXICO-BIG DEER PARK
SUMMER 1936

Nos.

247. Deserted grain fields quickly become grassland meadows. An almost pure stand of Sorghum halepense with the invading dominant, Huisache tree. Musquiz, Coahuila.
248. South of Musquiz with the Santa Rosa Mountains in the distance. A field of wild sunflower, Helianthus annuus.
- 249, 250. The fascination of the little Mexican village lies in its simple customs. A common scene on "main street". Musquiz, Coahuila.
- 251, 252, 253. Gale days of fiesta reach out for even the poorest "woodgatherer" and hundreds of natives from the mountains and plains stream into the nearest village to celebrate.
- 254, 255, 256, 257, 258, 259, 260. Bright colored birds and a tropical vegetation combine to form a most lovely spot just under the brink of the Santa Rosa Escarpment. Views in the Musquiz Swamp.
261. Three turbulent mountain springs join to form the only permanent natural body of water in northern Coahuila. The Rio de Las Sabinas, the River of Cypress, and true to the name, the beautiful cypress trees form a picturesque canopy under which the clear waters flow.
- 262, 263. Forty years ago a pair of peacocks were imported from the south and given the range of the Hacienda de Las Russias and today it is no rare thing to find the half wild descendants of the original pair roosting and nesting far from their abode at the hacienda.
264. Nothing so lovely as a mountain spring, a crystal pool, and fern covered banks. A spot on Las Russias Ranch, three miles east of the Sabinas River.
265. 267. With a hearty welcome and a lasting hospitality, the pleasures of a visit to a Mexican ranch are never forgotten. Hacienda de Las Russias.
268. Many thousands of acres of grassland and huisache furnish an ideal haven for the White tail deer. Large herds of cattle are grazed on such lands as maintain an adequate water supply. La Mariposa Ranch, 30 miles east of Musquiz.

269. The hostess of La Mariposa and an Indian woman who after 80 years still can walk 20 miles to beg a meal.
270. Assyris vigilans, commonly known as the century plant or agave, grows abundantly in the foothills and lower canyons. Scene in mouth of Palm Canyon on Mariposa Ranch.
271. A cattle watering tank kept filled by small springs of water which occur throughout the mountains.
272. One shot that missed....the place where deer had been.
273. Watering troughs at La Sorpresa Spring, Mariposa Ranch. The bamboo is a large variety of Arundo-donax.
274. In the heat of the day many a shaded canyon affords a cool retreat for a flock of wild turkey. The bird discernable in the mid-portion of the picture was the last of a band of 17 who took offense at the interruption of their siesta hour. Yarde Canyon, La Mariposa.
275. Chapparal brush, lechuguilla, and several bunch grasses form the principal cover of the rocky limestone hills where numerous bands of peccary, the mountain lion, and occasional black bear roam together. In the foothills of the Santa Rosa Mountains.
276. The giant agave with leaves ten feet long and a flower stalk that towers in the air as high as fifty feet. This species is not native to the Muzquiz area though it is quite commonly found around homes, fields, and waste places. This plant is grown on huge plantations in southern Mexico, and from its sweet sap are made the famous Mexican drinks Pulque, Tequila, and Mescal.
277. Diastrophism in all its complexities shown in beautiful examples of colored rock along the walls of Santa Anna Canyon. Note the vertical strata to left and in foreground with the horizontal strata in upper right.
278. Picturesque Mexican straw and rock huts serve as home for both the family and the animals. A black hog and a Mexican cowboy's home on the ranch, El Zacate, 65 miles north of Muzquiz.
279. Intricate canyons and distant mountain chains, a common scene in the more northern Santa Rosa Mountains. At Sundown in upper Santa Anna Canyon.
280. Looking west into the face of the 3,000 foot Del Carmen Escarpment. From a distance of 20 miles. The rim of this escarpment is the abrupt ending of the Fresno Mesa country, a wide expanse of some 40 square miles of grassland mesa. La Bavia Ranch.

231. A Mexican Cormorant, Phalacrocorax vicia mexicanus, probably a rare visitor from the south. Killed at Tanque de Los Melones, La Bavia Ranch, July 24, 1936.
232. Del Carmen Escarpment from east of Santa Domingo.
233. Blazing a new trail via automobile through the dry hills northeast of La Sierra del Jardin. La Sierra del Jardin in background.
234. The beginning of a month's burro-trek over the northern Del Carmens.
235. Approaching La Sierra del Jardin from the north. While this country is not yet surveyed, La Sierra del Jardin is probably the highest peak in northern Coahuila.
236. A lagoon in the northern Del Carmens, west of Vivoras Canyon, 8,500 feet altitude.
237. Cattle corrals at Hacienda del Jardin. ^{N. of VIBORAS SPRING} Large Quaking (asthenes?) aspen trees in the background.
238. Rest on trail to Jardin del Sur.
239. Looking north over the Hacienda del Jardin on to the southern slope of the Fronteriza Escarpment.
290. Rough and rocky for rattlesnakes, occasional bands of peccary and blacktail deer. Western Hills.
291. A well wrecked camp.
292. A tired dog in the former home of a captured rattlesnake.
293. Daybreak at 9,000 feet on side of La Sierra del Jardin. ^{Look SW} A sister peak in background.
294. A vicious green rattler, Crotalus molossus molossus.
- 295a, 295b. A pair of young Couch Rock Squirrels, Otospermophilus grammurus conchi.
296. Sotol and maguey on the flats at 7,000 feet. West of Jardin del Sur.
297. Looking north ^{west} from Jardin del Sur out over southern ^{end} of the Fronteriza Escarpment. The dim horizon is in Texas.
298. Skyward up a 150 foot Rocky Mountain Longleaf pine.

299. Deep canyons, rocky crags, and distant peaks meet the visitors eye on every side. Looking south over the bear country from the northern divide. Del Carmen Mountains. (Three miles toward the background) = Del Carmen
300. An evening silhouette of fir and pine in upper Vivoras Canyon. Del Carmen Mountains.
301. A common inhabitant up to 7,500 feet in the Del Carmens. Texas Jack Rabbit, Lepus californicus texianus.
302. A study in anatomical similarities. A jackrabbit and a jackass.
303. South of the northern divide. Del Carmen Mountains, at 9,000 feet.
304. Southeast from atop La Sierra del Jardin.
305. Dry arroyos and rocky hills near Western Hills Tank. Del Carmen Mountains.
306. A seven foot bull snake, Pituophis savi affinis, captured in Shuperosa Canyon, August 15.
307. Looking west into the state of Chihuahua from lower brink of Catedrales Canyon.
308. Same as 303.
309. Up among the pines west of Vivoras Canyon. Del Carmen Mountains. A dense cover of oaks and underbrush and bunch grasses form an ideal haven for the Fantail Deer.
310. Homeward bound in arroyos east of Jardin del Sur. Del Carmens.
311. A Rio Grande Spotted Snake killed by coyotes. North of Jardin del Sur.
312. Three species of Agave. A. wicilizoni in rear, the slender leafed A. lechuguilla, and a hybrid form in the foreground.
313. A sight fitting to the climax of a visit to Mexico's part of the Big Bend International Park. Looking west from Piedra Blanca with the three most northern peaks of the Del Carmens some 40 miles in the distance.
314. The beautifully colored and venomous coral snake. Collected near Austin, Texas, in the Edwards Plateau region.

REPTILES AND AMPHIBIA OF THE
NORTHERN DEL CARMES

Lizards....

Gerrhonotus sp.

Found one specimen under damp leaf
deposits near 8,000 feet in Vivoras Canyon.

Sceloporus variabilis marmoratus *2,11,12.

Numerous in trees and on rocks above
4,000 feet. Three specimens collected.

Sceloporus torquatus poinsettii 15,8,9.

Commonly seen on cliffs and large
rocks, darting into cracks for safety.
Collected three specimens, two in Western
Hills at 4,000 feet and a third at 7,500
feet above Vivoras Spring.

Phrynosoma cornutum

One specimen collected near the well
at Piedra Blanca. Saw none in upper
regions.

Snakes....

Pituophis zavi affinis 4. "Bull Snake"

On August 15, collected a seven foot specimen on rock cliffs below the falls in Shupereza Canyon (Ref. Photo. No. 306)

Elaps fulvius "Coral Snake"

Reported as being common in the northern Carmens. Specimens killed in past years at the Jardin huts and at Piedra Blanca.

Coluber flagellum flavi-gularis "Red Racer"

One specimen seen in the mesquite flats northwest of Piedra Blanca.

Coluber tenebrosus schotti 3, 10.

Numerous. Two specimens collected in arroyos of the Western Hills.

Thamnophis eques 1. "Water Snake"

Probably rare. One specimen collected in the swampy laguna down from the springs at the Jardin huts.

Crotalus atrox "Western Diamond Rattler."

The skin of a large specimen five feet long was in a cowboy's hut at Piedra Blanca. Reported as having been killed several miles east in the brush covered low hills.

Crotalus molossus molossus 6. "Green Rattler"

One specimen collected. Nine specimens
seen from 9,000 feet in Vivoras Canyon to 5,000
feet in the Western Hills. (Ref. Photo. No. 294)

BIRDS OF THE DEL CARMEN MOUNTAINS

Phalacrocorax virginianus (Brandt.) Mexican Cormorant

Killed a male specimen on La Bavia tank, July 24, 1936.
Probably a rare visitor from the south. (Ref. Photo. No. 281)

Nettion carolinense (Gmelin). Green Wing Teal *(27)

Approximately 100 birds on Western Hills tanks September 4.
Saw a male and female in a canyon waterhole near the Puerta
on September 5. Common migrant.

Ousquedula cyanoptera cyanoptera (Vieill.) Cinnamon Teal (39)

A male and female found together in a small waterhole
east of Santa Domingo on September 10. One male collected.
Common migrant to the south.

Patula acuta tsitchoa (Linn.) Pintail Duck (39)

A male specimen collected from a small waterhole in the
Western Hills on September 3. Three females seen on La
Bavia tank on September 10. Several hundred seen near Muzquiz
in December.

Fulica americana Gmelin. Coot or Mudhen

Found singly, sometimes several together, and more often
with other species on ponds and tanks throughout the region.

Gallinago delicata (Ord. Wilson's Snipe

Occasional resident or migrant north to Piedra Blanca.
Common in flats and near water tanks east of Muzquiz. Two

*Specimen collected. Identified by

Dr. Harry C. Oberholser, Senior Biologist, U.S. Biological Surv.
seen at La Bavia tank, July 24, 1936.

Pisobia melanota

Sandpiper (28)

Two males and three females on Western Hills tank

September 4. Quite common around waterholes south to Muzquiz.

Totanus flavipes (Gmelin) Yellow-legs (30)

Some fifteen birds seen on Western Hills tank September 4.

Common around permanent water holes to south.

Actites macularia (Linn.) Spotted Sandpiper (29)

Collected one male on Western Hills tank September 4.

Common on ponds and tanks to south.

Oxyechus vociferus (Linn.) Killdeer

Common near water holes on plains. On July 25, saw three birds near water pila north of Piedra Blanca.

Callipepla squamata castanogastris Brewster. Chestnut-bellied Scales Quail or Callipepla s. squamata Scaled Quail

Abundant on the mesas and arid flats of Piedra Blanca through the mountains to the Fresno Mesa country, the Encantada and the Zacate valley. Not found in the region east of Muzquiz and around the escarpment up to nearly the mid-line of La Bavia Ranch.

Cyrtonyx montezumae nearnsi Nelson. Mearns's Quail (37)

Collected a male specimen at Jardín del Sur on September 7. A covey of some fifty birds fed for a week in the mesquites on the mesa to the northeast. Common in the uplands south to La Encantada.

Melocoris gallopavo intermedia Sennet. Wild Turkey

Present in small numbers between Piedra Blanca and Santa Domingo and south along the escarpment. Numerous in the more humid lowlands of La Bavia, La Rosita and La Mari-posa Ranches.

Chloroceryle fasciata fasciata Band-tailed Pigeon (10)

Abundant throughout the northern Del Carmens. Appearing in great numbers with as many as one hundred birds flying together as they feed on the acorns and wild cherries growing in the arroyos of the upper foot-hills. In late afternoon they retire up the mountains to roost in the rocky crags and tall conifers of the upper canyons. At dawn they begin their return flight to the feeding grounds.

A female specimen collected at 9,000 feet in the early morning of August 9 contained within her crop twenty-three acorns over a half inch in length besides several partly masticated ones in the gizzard. As the acorns and wild berries began to ripen in the upper regions after September 1, there became a noticeable lessening of the numbers which appeared below.

This beautiful bird has evidently found its perfect habitat here in the northern Carmens. An abundant food supply of acorns and various wild fruits that ripen in successive seasons throughout the year and the absence of its most destructive enemy, man, have gone far toward establishing this ideal relationship. Very few are killed by the Mexicans living within the region.

To the south the birds appear in decreasing numbers. It is a rare thing to see a pair in the canyons along the Santa Rosa Escarpment on the Mariposa.

Zenaidura macroura (Linn.) Mourning Dove

Two old nests of the Mourning Dove were found in the brushy thickets near the spring at El Jardin. Three birds came frequently to feed in the garden plot below the spring. Common on the humid plains of La Bavia and south to Musquiz.

Melospiza asiatica (Linn.) White-winged Dove

In September I saw two specimens flying over the low hills northeast of Piedra Blanca. Probably common through the hill regions and lower canyons south to Musquiz. Abundant in vicinity of Musquiz and to east.

Chaenodonta passerina pallescens Baird. Mexican Ground Dove

Common along the Del Carmen Escarpment. Rarely seen in the mountains above 7,000 feet. I saw three on July 25 near tank north of Piedra Blanca. Common in region of Musquiz.

Scardafella inca (Less.) Inca Dove

Two birds came in to water at the tank in Western Hills late in the afternoon of September 4. Commonly seen in early morning and late afternoon around the water holes south of Piedra Blanca to La Bavia. Abundant on plains east of Musquiz.

Carthartes aura septentrionalis Wied. Turkey Vulture

The Turkey Vulture in flight over the plains and mountains is one of the most common sights throughout the region.

Cathartus uruba uruba (Vieill.) Black Vulture

Occurs in slightly less numbers than the Turkey Vulture throughout the region.

Accipiter velox (Wilson). Sharp-shinned Hawk (7)

Collected one young male of a family of five nesting in the tall pines of upper Vivoras Canyon. Common south to Muzquiz. A specimen collected in Santa Anna Canyon in December.

Parabuteo unicinctus harrisi (Aud.) Harris' Hawk

Commonly seen on the plains and up to 6,000 feet in the mountains. Several specimens seen in Del Carmen.

Buteo abbreviatus Cabanis. Zone-tailed Hawk

Two birds seen near Fronteriza Mines. Common south to region of Muzquiz.

Buteo swainsoni Bonap. Swainson's Hawk

Common around Piedra Blanca and through the Western Hills. One specimen seen at 8,000 feet in El Rincon.

Aquila chrysaetos (Linn.) Golden Eagle

Commonly seen in both the Santa Rosa and Del Carmen Mountains and ranging out over the plains surrounding.

The question has often been raised as to whether the Golden Eagle actually does kill young stock animals. In the Spring of 1934, seven week-old registered calves were killed over a period of several days in a mountain pasture of La Mariposa Ranch. The ranch manager reported the cause as being a nesting eagle. On investigating, I found each animal mortally wounded by three to five deep holes occurring along the sides of the vertebral column. Four had broken

spinal cords; all seven had punctured viscera. One was lacking a tail. There were few scratches over the body. None of the flesh had been eaten, but the mother of a young calf is a mindful caretaker and no doubt gave chase to the attacker.

While the evidence seemed enough to indict the eagle, a pack of dogs was brought in. Two calves were found hardly more than an hour after being attacked in the early morning, and from neither site were the dogs able to pick up the trail of a lion or bear. In the end it became necessary to move the herd of cattle temporarily from the canyon.

I do not know that any other than circumstantial evidence has been gathered to convict the eagle. In the Del Carmen Mountains, I saw an eagle kill a large jackrabbit and fly several miles with it dangling from his claws. I think the occasions are few when he finds it necessary to attack animals so large as calves, but when there comes the time, his great strength and courage can serve him well.

Mr. Paulay, manager of the Encantada Ranch, reports that it is no rare thing to find an eagle devouring great quantities of flesh from the carcass of a recently dead horse or cow - even to the extent of forty pounds in one meal. Occasionally these large birds are roped by horsemen who after allowing the eagle to gorge himself with food, suddenly jump out from under cover to run down the confused bird who can take to the air only with the greatest effort.

Falco sparverius sparverius Linn. American Sparrow Hawk

Rarely seen on the plains and in the Del Carmens.

Extends south through the Santa Rosas to the vicinity of Muzquiz.

Aluco pratincola (Bonaparte.) Barn Owl

One came whistling over cabin on trail to Fronteriza Mines on night of September 4. Probably common.

Otus asio cineraceus (Ridgw.) Mexican Screech Owl (20)

A pair visited my camp at Jardin del Sur on night of August 28. I killed the male and the female continued to visit in the neighborhood until I left the region. She would sit in the same tree from which I shot her mate and call for two or three hours and would then go away to return the next night.

Speotyto cunicularia hypoleuca (Bonap.) Burrowing Owl

Reported from near Piedra Blanca. Collected a specimen from La Bavia Ranch during November, 1936.

Geococcyx californianus (Less.) Road-runner

Numerous throughout lower regions from Muzquiz north through the Del Carmens. Rarely seen above 7,500 feet. Once while crossing the Bavia country, I had four birds running at the same time within a hundred yards of the front of the car.

Coccyzus americanus occidentalis (Ridgw.) California Cuckoo

One bird seen in the large arroyo running down out of El Rincon. Heard the call of another bird from the oak note

on the east wall of Catedrales Canyon.

Ceryle alcyon (Linn.) Belted Kingfisher

One seen at La Bavia tank in July and again in September. Probable common visitors to water holes around Piedra Blanca and in Western Hills. Several seen in the Muzquiz Swamp and along the Sabinas River.

Chloroceryle americana septentrionalis Sharpe. Texas Kingfisher (1)

Collected a male specimen on July 24 at Tanque de Las Melones on La Bavia Ranch. Only the single bird present. Numerous in the southern part of the region.

Dryobates scalaris cactophilus Texas Woodpecker (12)

One specimen killed at 7,000 feet in Vivoras Canyon of the Del Carmen on August 11. Common along the arroyos and canyons of the Western Hills.

Balanosphyra formicivora formicivora Ant-eating Woodpecker (15)

Common throughout the region. Collected a young male at Jardin del Sur on August 21.

Colaptes cafer nanus Flicker (9)

Collected a male specimen on side of La Sierra del Jardin on August 7. Appear common above 7,000 feet throughout the northern Carmens.

Antronotus vociferus macromystax (Wagler). Stephen's Whip-poor-Will

Commonly heard throughout the mountains in late evening. Usually from above 7,000 feet. One seen in El Rincon.

Plainscoptes nuttalli nuttalli (Aud.) Poor Will

Several seen in the upper canyons of the Del Carmen, especially under the caks east of Vivoras Canyon. Almost nightly there were

cells from above camp at Jardin del Sur.

Chordeiles scutipennis texensis Lawrence. Texas Nighthawk

Two birds were frightened up from the ground on the plains north of Piedra Blanca. Commonly seen in flight during late afternoon over the Del Carmen.

Archilochus colubris (Linn.) Ruby-throated Hummingbird

Common in upper canyons. Frequently seen in early morning bathing at water falls in Chuparosa and Catedrales Canyons.

Archilochus alexandri (Bon. & Mul.) Black Chinned Hummingbird (4)

Common throughout the Del Carmen and surrounding plains. Collected specimen near spring at Piedra Blanca on July 25, 1936.

Muscivora forficata (Gmel.) Scissor-tailed Flycatcher

I saw five birds, two adults and three near-mature young, on the first fence south of the Government station at Conejo. Present along through the plains regions south to Musquiz where during the Spring season they are numerous.

Sayornis sayus sayus (Bonap) Say's Phoebe (25)

Numerous in Western Hills and El Rincon. Common in locality of Musquiz and to the east. Collected a male specimen in Del Carmen of September 2.

Pyrocephalus rubinus flaneus Vermilion Flycatcher (3)

A common inhabitant of plains, valleys and along waterways south of Santa Domingo. Saw one specimen near Conejo but none within the northern Carmen. Collected male specimen on July 24 from east of Santa Domingo.

Aphelecoaps sieberi couchi (Baird). Couch Jay (6)

Specimen collected on August 2 in Viveras Canyon. One of the most abundant birds in the northern extremes of the Del Carmen; certainly the most conspicuous. Seldom seen on the plains. Fewer in the canyons south to Musquiz.

Corvus brachyrhynchos hesperis (Ridgw.) Western Crow

Abundant in the region of Musquiz and east around the escarpment to Santa Domingo. Some ten birds visited in the cherry trees in Chuparosa Canyon during the first part of September.

Molothrus ater ater (Bodd.) Cowbird

Common on the plains and mesas up to 7,500 feet, feeding with the cattle herds.

Xanthocephalus xanthocephalus (Bonap) Yellow-headed Blackbird (2)

Three male specimens in company with a flock of Red-wings were seen on plains east of Santa Domingo. One specimen collected. Rarely seen in small bands east of Musquiz.

Agelaius Phoeniceus richmondi Nelson. Vera Cruz Red-wing

Common in migrating groups from Musquiz north to above Santa Domingo. Few resident flocks scattered over region.

Sturnella neglecta Aud. Western Meadowlark

Common on the grassy plains from Musquiz north to Piedra Blanca. Collected a series of five specimens from La Gacha, La Rosita, and La Bavia Ranches in December, 1936.

Icterus parisorum Bonap. Scott's Oriole

In the early morning of September 1, I saw one specimen in the cherry trees near camp at Jardín del Sur.

Euphagus cyanocephalus (Wagler). Brewer's Blackbird

Occurring in greater groups with the Redwing and Yellow-head from Muzquiz north to Piedra Blanca plains.

Macquiscalus major macrourus (Swains.) Great-tailed Grackle

Abundant on the plains east of Muzquiz. Fewer to north through La Bavia Ranch. Several males and a female were seen near the first tank on road to south of Conejo.

Spirus psaltria psaltria Siskin (16)

Appearing in scattered migrating groups along the canyons up to 8,000 feet. One specimen collected in Chuperosa Canyon.

Chondestes grammacus strigatus Swains. Western Lark Sparrow (34)

Abundant in Western Hills and along the mountains southward. Rarely occurring over 6,000 feet.

Junco phaeonotus palliatus Ridgw. Arizona Junco (14)

One specimen killed in Vivoras Canyon at 8,500 feet. Some three or four together at this time. One pair observed below the falls in Chuperosa Canyon on August 22.

Amphispiza bilineata grisea Desert Sparrow (21)

A male specimen collected at 7,000 feet at Jardin del Sur. Common through the Western Hills and out onto the plains.

Aimophila ruficeps boucardi Rufous Sparrow (17)

One specimen collected under the huisaches on the plain mesa to the east of Chuperosa Canyon on August 22. Common in the mountains to 8,500 feet.

Pipilo maculatus montanus Swarth. Spurred Towhee (18)

Commonly heard in the upper canyons above 8,000 feet. Collected one specimen in Vivoras Canyon August 25.

Pipilo fuscus maculicornis Baird. Canyon Towhee (15)

Numerous in flocks over the open brush mountain sides and mesas around 7,000 feet. Common in the Western Hills. Collected one specimen in El Rincon.

Cardinalis cardinalis canescens Chapman. Gray-tailed Redbird

Rare in the Del Carmen. Saw two females and a male in arroya east of Jardin del Sur on August 9. Common to the south.

Cyanocitta stelleri (Less.) Western Blue Grosbeak (8)

Fairly common on the plains east of Musquiz and in the low hill country of La Rosita Ranch. Occurring in the northern Del Carmen up to 8,000 feet. Rarer on the arid plains around Piedra Blanca. Two specimens collected at Viveras Spring on August 3 and August 17.

Passerina ciris pallidior Painted Bunting (5,22)

A common inhabitant of the regions to the south of Conejo to Musquiz. Collected a male specimen on flats north of Piedra Blanca on July 25. Another collected in El Rincon. A third specimen seen in the Western Hills on September 7.

Piranga ludoviciana (Wilson) Western Tanager (36)

Several families of young birds seen feeding together near Jardin del Sur and El Rincon. Collected one specimen September 7.

Hirundo erythrogastra Bodd. Barn Swallow

A small group of birds seen on the fence one mile northeast of Santa Domingo ranch house and at La Bavis. Appear intermittently at Piedra Blanca. Abundant in the region of Musquiz.

Lanius ludovicianus excubitorides Swains. White-rumped Shrike

One bird seen September 4 northeast of El Jardin on trail to Piedra Blanca. Common along the Del Carmen Escarpment. Two specimens collected in November.

Mniotilta varia (Linn.) Black and White Warbler (23)

A band of some seven specimens came down Chuperosa Canyon on September 1. Collected one specimen. Several seen along the trail going northwest from Jardin after September 1.

Dendroica auduboni naporabilis Warbler (21)

Saw two birds at 7,500 feet. One collected at Jardin del Sur on September 5.

Dendroica townsendi (Townsend). Townsend's Warbler (26)

First seen in the territory of the Del Carmens after September 1. Later, saw several bands working along the arroyos east and west of Jardin del Sur. Collected one specimen in Chuperosa Canyon September 2.

Setophaga picta picta Swainson. Painted Redstart (13)

A male specimen killed at Vivoras Spring on August 11. Two seen in the coniferous forests below the divide in Vivoras Canyon on August 25.

Mimus polyglottos leucopterus (Vigors). Western Mockingbird

Frequently seen in Western Hills. Saw several pair in arroyos north of rock hut at El Jardin. Numerous along the Del Carmen Escarpment and in vicinity of Mazquis.

Helodytes brunneicapillus couesi (Sharpe). Cactus Wren

Found old nest in large Opuntia near Piedra Blanca. Saw two birds on Plains southwest of Boquillas on August 30.

Salpinctes obsoletus obsoletus (Say). Rock Wren (33)

Killed one bird atop the rock hut at Jardin. Common along the trail to Piedra Blanca and through western portion of Western Hills.

Gathererpes mexicanus conspersus Ridgw. Canyon Wren

Common in the upper canyons throughout the Del Carmens and south.

Baselophus atricristatus atricristatus Cassin. Black-crested Titmouse

Two specimens collected. Common in the canyons at 7,000 feet.

Psaltiriparus melanotis lloydi Sennett. Lloyd's Bush-Tit (32)

Abundant throughout the Del Carmens from 7,000 to 8,000 feet. Some thirty or forty birds feeding together through the trees. Seldom found singly.

Hedymeles melanocephalus melanocephalus Rocky Mt. Blackheaded Grosbeak

A male specimen collected on September 5 at Jardin del Sur. No other bird seen.

MAQUILIA

Opossum - Didelphis mesamericana texensis

Nearly every inhabitant of the Del Carmens has some story to tell of this persistent "chicken hunter". Several years ago an opossum was killed in a small cave near Jardin ranch house. I found tracks of one or possibly two animals that visited a small pond in the Western Hills; also the skeleton of one dead for several years was found at the mouth of a rock cave in Shup-crosa Canyon. From experiences of previous visits in the Santa Rosa Mountains, I believe the opossum to be more numerous there - especially through the plains of La Bavia Ranch and in the region of Muzquiz.

Large Brown Bat - Myotis fuscus fuscus

The flight-call, a high pitched metallic squeak, is frequently heard after nightfall. This species and several other species of smaller bats are apparently very numerous in the Del Carmens from the lower plains region up to approximately 8,000 feet. The specimen which I collected had insisted on displacing my head as I rode horseback along the trail to camp in late evening. With the aid of a quirt, I was able to knock it to the ground.

Little Canyon Bat - Pipistrellus hesperus hesperus

I found several specimens of this species hiding in a broken huisache tree. The little Canyon Bat is very abundant throughout the Western Hills. It is a rare sight to see with the aid of a long range light after nightfall the thousands that feed over the Western Hills tank.

Black Bear - Euarctos americanus amblyceps

Shortly after my arrival in the Del Carmen Mountains, a bear paid an early morning visit to my camp in Vivoras Canyon. On August 19, just after daybreak, I saw another making his way across a rock slide to the west of Vivoras Canyon at 9,000 feet. Feeces are common in upper regions of the mountains. Jose, the man living on the trail to Piedra Blanca and a friend saw a bear which passed very near the house on September 1. Victoriano Villarreal has the skin of a large bear which he killed near Jardin del Sur in 1932. Prior to that year some 2 or three bear were killed annually on the Jardin Ranch by American hunters. In 1932 the owner of the north Carmen country, an official in the Mexican Diplomatic Corps, began to refuse permission to hunting parties, and only three bear are reported as having been taken since by residents who have stock on parts of the range.

Probably the heaviest drain on the bear in the northern Del Carmens over a fifteen year period has come as a result of hunting activities of members of the American Club, located across the mountains from the Jardin Ranch. However, over the last few years due to impassable roads the club has been inactive.

To the south bear are found relatively common through the Encantada and Zacate Ranches, in the canyons along the eastern brink of the Del Carmen and Santa Rosa escarpments, and occasionally one appears out into the hill country of the Cacha and Mariposa Ranches near Muzquiz.

In general, the present status of the bear in the Del Carmen and Santa Rosa Mountains is excellent. While there are no rigid rules of enforced preservation in existence, there is little danger

of depletion. Under such ideals of habitat as are furnished by the inaccessible rocky canyon country and a bountiful food supply of acorns, madrona berries, wild cherries, and persimmons as well as small mammals, there is every evidence of significant increases.

Mexican Coati or Honey Bear - Hasua Marica

Accounts of actual capture of the coati are few, though it is commonly known even among the disinterested portion of the native population. Mr. McKellar of the Mariposa Ranch reports the taking of one on the Mariposa near the mouth of Santa Anna Canyon about 1928. Mr. Pauley reports their presence on the Encantada. A goat trader, Pancho Hernandez, whom I met on the road to Piedra Blanca declares that he knew of two that were captured along the Del Carmen Escarpment between the Haciendas La Bavia and Santa Dominga. One of these two was killed by dogs. The other was taken alive and sold to an American Cattlebuyer from Laredo, Texas.

While he is seldom seen, I suspect the coati of being fairly common in the more humid canyon regions. If one of his habits is the raiding of food caches of mound-building ants; then my suspicions can be confirmed; for numerous examples of his depredations can be seen in canyons and adjacent huiaacha plains east of Muzquiz and north around the escarpment.

Raccoon - Procyon lotor fuscipes

If the raccoon occurs in the northern Del Carmens, he is rare. I saw no sign of this intelligent little fur bearer north of the Rosita Ranch where I found the tracks of one feeding along the edge of a small stream. The "coon" is typically a lover of wooded lowlands and sandy streams, and while two animals are reported by Mexicans living in Piedra Blanca as having been caught in upland

regions of the Carmens, they were no doubt wandering from a more southern home. The last raccoon taken from the northern Del Carmens was caught by a trap in 1930. The other specimen was taken some years before.

Mr. Paulay of the Encantada Ranch forty miles southwest of La Sierra del Jardin reports none from his country over last ten or fifteen years.

Over the lowland ranches to south of Santa Rosa Nescarpment and along streams near Muzquiz, raccoons occasionally appear. In spring of 1935 I saw a pet animal in Muzquiz. Fur buyers report a few pelts are brought in by Indians each year.

The status of the raccoon could be improved. In those regions where he is adapted to live, he is persecuted continuously by an abundance of dogs and men. He is forced to take refuge in the mountains and live in discord to his preference. It is reasonable to believe after seeing the region that raccoons were once quite common around Muzquiz and in the lowland valleys as far north as Piedra Blanca. With some enforced protection, he would come back.

Ring-tailed Cat - Bassaricus astutus flavus

Common from Texas border south to Muzquiz, and from 2,400 feet on the plains to approximately 8,000 feet in the Del Carmens. I surprised one asleep on a sunny rock ledge in El Rincon. The Mexican at the Jardin ranch house, Susano Trevino, had the pelt of one caught several years ago. The men at Piedra Blanca report several caught in traps each year. In 1935 I trapped one near Yorda Spring on La Mariposa Ranch. A number of hides are sold annually in Muzquiz, especially by the Kickapoo Indians.

The Ring-tailed Cat is seldom found in the more arid regions. He prefers wooded canyons and the lower extremes where water is plentiful.

Mink - Mustela vison

A Mexican freight hauler in Muzquiz described to me an animal which he found dead on the Sabinas River near the Russias crossing. From his description, it was a mink.

This was the only report I had of this animal habitating the region. Possibly it occurs commonly along the more southern course of the Sabinas River. It would hardly be expected to exist in locality of the northern Carmens.

Rio Grande Spotted Skunk - Spilogale leucoparia

I observed only one specimen in the Del Carmens (Ref. Photograph No. 311). Before sunrise on the morning of September 2, I was riding west on the large arroyo running down from camp at Jardin del Sur. On topping a small hill, I looked down the trail to see three coyotes in a mad tussle over a dark object. Immediately on spying me, the coyotes fled, leaving behind a dead spotted skunk, or more commonly called, Civet Cat.

This small skunk is not as abundant as one or possibly two of the larger species. However, it is reported as occurring throughout the region. During several hunts during nights on La Mariposa Ranch, the dogs encountered some thirty skunks, three of which were the Spotted Skunk.

Longtailed Texas Skunk - Mephitis masoni varians

This species is found abundant throughout the Del Carmens and Santa Rosa Mountains. In the spring of 1935 I saw and captured at

least thirty specimens of skunk on the plains to south of Piedra Blanca and east of Muzquiz. Among this number of specimens there were several quite typically the Texas Longtail but also a number with characters that tended toward the Arizona Skunk, Mephitis oston, especially in having tails penciled with white. I saw one specimen of Mephitis m. varians in northern Del Carmen at approximately 7,000 feet altitude. Burrows under rocks and dead trees are quite common, and tracks are numerous in soft mud around water holes.

Mexican Badger - Taxidea taxus berlandieri

Reports of the badger were given by inhabitants from Muzquiz to Piedra Blanca. In winter of 1935 I trapped a specimen on La Mariposa. On September 10, 1935, a man at Santa Domingo showed me the hide of a freshly killed badger.

They are most common in the lower hills and plains. Mr. Faulay reports occasional ones killed at the Encantada with a minimum altitude of 6,000 feet, and on a plateau west of La Sierra del Jardin at approximately 6,000 feet, I saw the burrow home of what appeared to be a badger.

New Mexico Desert Fox or Kit Fox - Vulpes macrotis neomexicanus

The Del Carmen Mountains and surrounding sub-tropical plains comes within the range of the Kit Fox, though I found no record that it occurs here.

Arizona Gray Fox - Urocyon cinereoargenteus

I have never seen but one specimen of what I estimated as this species, and it was only a portion of the pelt which formed a part of a skin jacket owned by a Kickapoo Indian. He had caught

the animal with dogs on the plains near Muzquiz. However fox are known to be present in the lower canyons of both the Del Carmens and Santa Rosa Mountains, and most probably it is the Arizona Gray Fox.

Twice during hunting excursions of previous years in the Santa Rosa Mountains, I have known the dogs to strike the trail of fox in the canyons. The chase would lead out over the foot hills where the dogs were soon left behind by this long winded and swift running carnivore.

Small-toothed Coyote - Canis latrans microdon.

I saw seven coyotes in the Del Carmen Mountains with two of them occurring as high as 7,000 feet. Occasionally at night I heard the wailings of coyote bands roaming the flats east of the Chihuahua line. Along the Del Carmen Escarpment running south, they live in abundance, and hardly a night passes without the "music" of this desert hunter.

The coyotes which I saw in the Carmens were typically desert animals, small and buffy-white shading to black. Appearing with this small form is another animal, larger and more attractively colored with long buff hair and less black. The larger species is less common, but I have seen at least a half dozen lovely specimens east of Muzquiz.

It is astonishing the number of coyotes which can be brought together by dragging the viscera of a butchered cow over several miles of cattle trails. Among my pleasantest experiences have been the times that I lay hidden on the leeward side of frequented trails and watched the coyote bands pass in the moonlight. I have

seen as many as twenty animals together feasting on a dead cow at dawn.

Even though the coyote lives in such abundance in the region, it is seldom condemned as a predator. Occasionally it is accused of killing goats or sheep. A few animals are trapped each year, and I have seen two dogs trained as killers that had the reputation of having betrayed many a coyote into his death.

Gray Wolf or Lobo - Canis lycaon nubilus

The wolf is present in increasing numbers. Santa Domingo to the east of the mountains reports 200 cattle killed in 1934 and 1935 by ravaging bands of lobo. Mr. Paulay brings word of a friend from Ocampo on the west who "would gladly exchange the wolf supply on his range for 100 lions." Several reports of depredations from this fiercest of our desert predators come from the arid lands southwest of Muzquiz.

I think the reports of substantial increases in the lobo here are quite true. Over the last fifteen years, the number of domestic stock pastured in northern Coahuila has more than doubled. Reports of a wolf caught by trap are rare, principally because the wolf is a wary creature and the average Mexican trapper has not learned to match his wits. Poisoning is not very effective; for where the prey is abundant, a kill is made and after eating its "fill" the lobo band moves on and seldom returns to eat again from the same carcass.

Mexican Cougar - Felis oregonensis azteca

The Mexican Cougar or Mountain Lion is regarded as being numerous in both the lowlands and mountains of northern Coahuila.

From the wide range and wandering habit of this big cat, it is difficult to say that he is more common on lowlands than in the highlands.

The accounts of the lion are many, though he is seldom seen alive. The Mexican, Jose, who has a little hut on the trail to Piedra Blanca from the Jardin Ranch killed one with poison near August 29. He brought me the claws which were the largest I have ever seen from a Mexican Lion. On the night of July 15, I heard the cough of an animal in the arroyo south of Loma Gorda. I took it to be that of a large cat, probably a lion. Several reported killed on the Jardin Ranch and near Piedra Blanca over the last five years. Also reports from the Encantada, Zacate, and out onto the plains around Musquiz.

A number of hides are found used as rugs in every hacienda. In November I saw three hides brought out from the Encantada to be tanned at Musquiz.

Most of the damage done by the lion is in the killing of young horses and deer. Mr. Paulay of the Encantada reports a lion that killed three colts in his remuda on four consecutive nights in 1935. The third colt was found dead forty miles from the site of the killing the night previous.

There is no wholesale persecution of the lion over the region. However, once a killer lion makes his appearance, he is pursued at once. With a pack of good dogs, it is only a short while until this reputedly fierce animal is brought to bay. He fights when there is necessity and attacks man rarely.

Several years ago near the Hacienda San Jeronimo on La Bavia Ranch, an inquisitive lion strolled into a one room hut inhabited by a Mexican woman and a small child. The intruder made no effort to attack; and after some delay, the badly frightened woman was able to rush the child and herself to safety out the rear door. She blocked

the front entrance with a slab of galvanized iron and held it in place while the child ran for help.

Jaguar - Felis hernandesii

Susano Trevino came to the Del Carmen Mountains in 1931 to work for Fidel Villarreal who had a few cattle on a part of the Jardin Ranch. In the summer of 1932 he went one morning into the remuda pasture lying north of the ranch huts to round up three burros that were there. He had walked for some time without finding the burros, and was standing in the bottom of the large canyon which cuts the middle of the pasture when he noticed a slight movement on the canyon wall along which he had just descended. On second glance he saw the figure of a large lion, the largest he had ever seen, and different from any he had ever seen; for this animal had many black spots over his body and the base color was more red than the other lion that he knew so well. Susano had his rifle with him, for he had been watching for a deer. He declared he was not scared of lions, for he had seen many and once had killed one by clubbing it to death, but he was very nervous this time and his hands shook so that the rifle shot went wild. The cougar jumped into the air and fled over the brink of the wall.

This was the story as told to me by Susano Trevino of a lion the likes of which he had never before seen. If the description fits the animal he saw, then it was a cougar. However, I once heard the story of a black leopard which was seen in Palm Canyon on the Mariposa near Muzquiz!

Never-the-less, I have more faith in Susano's report. An occasional cougar may wander up into the Del Carmens from regions

further south where it still abounds.

Ocelot-Felis pardalis griffithii

The ocelot is still found in the Del Carmen Mountains. Susano Trevino has a partly decayed hide in the rock hut at the Jardin Ranch. It was caught in a trap two years ago. He caught another which he sold to a "commerciante" from Muzquiz. Mr. Paulay reports several killed on the Encantada over the last 10 years. A few have been killed on the plains around Muzquiz over the last several years. I saw the skin of one in a leather shop in Muzquiz.

Probably the ocelot is on the way in this part of Coahuila as it has been through recent years in parts of Texas.

Wildcat - Lynx rufus baileyi

Victoriano Villarreal and Susano Trevino report several caught by traps in the Del Carmens. Mr. Paulay reports none from the Encantada; they are scarce on lower country out from Muzquiz.

Couch Rock Squirrel - Otospermophilus grammurus couchi

This black-rumped squirrel is apparently the most abundant of the Del Carmen mammals. Every arroyo and every canyon from the plains to near 8,000 feet is inhabited by hundreds of these rodents. I have seen as many as four squirrel feeding in one cherry tree in Shuperosa Canyon. They are also quite fond of madrona berries, and store quantities of acorns and hackberry seeds in their homes under the rocks.

I captured a five day old pair near Viveras Spring (Ref. photo. No. 295) and fed them on sweetened cornmeal for two weeks. At the end of this period, they were still quite helpless but very industrious eaters.

My experience with some fifteen or twenty adults that make their homes near the grass hut at Jardin del Sur proves that they quickly lose their fear of man. After living in the hut for two weeks, I was greeted by a great bevy of calls each time on leaving the cabin or on returning from the field. From wherever they happened to be at the time, the little animals would hold their ground until I approached within a few rods. Then with such vocal excitation they would scurry for the vicinity of their homes under the rocks where they felt more secure.

I thought this flirtations attitude very interesting, especially in view of the fact that I had lived in the hut for almost a week before I found that there was more than two or three squirrels with dens nearby.

The range of the Couch Rock Squirrel extends as far as the southern Santa Rosas, but their number decreases almost to extinction on the hills and plains at Murguiz. I saw one squirrel on the rocky walls of Santa Anna Canyon, but this is the only specimen that I have seen south of the Zacate Ranch.

Texas Antelope Squirrel - Ammospermophilus interpres

This lovely little creature is a rare sight on the rock slides and cliffs of the upper mountain regions. I saw one almost at the peak of La Sierra del Jardin and another on a rock slide at the upper extremes of Vivoraz Canyon. The latter specimen showed little fear at my presence, and while I sat and watched, it danced about over the rocks not thirty feet away searching for food in the cavities.

Those two specimens were all that I saw. It is quite probable that they extend into the Santa Rosa Mountains.

Rio Grande Ground Squirrel - Citellus mexicanus parvidens

This squirrel occurs quite commonly through the Western Hills and lowlands south to Muzquiz. Holes in the ground are numerous on the plains about Piedra Blanca where I saw a number of specimens and collected one.

Pocket Gopher - Thomomys lechuguilla or Geomys gronovius

There are three localities in the Del Carmen that I know are populated by the Pocket Gopher. The flats in El Rincon, the small mesa to south of Loma Gorda and another mesa region on the trail to Piedra Blanca. Each of these places is at an altitude between 6,000 and 7,000 feet. Also on the plains occasional mounds are found.

I did not see any specimen, though I set a number of traps in an effort to catch one. The two species listed above are only probable inhabitants. Both having a range that would extend into the Del Carmen and southward.

Rats and Mice

There are several species listed by Bailey as occurring in the Texas Big Bend. There are a number of species that inhabit the Del Carmen and Santa Rosa Mountains, making their homes in brush piles, under cactus plants, and lechuguilla. However, the observations that I made do not enable me to list definitely the different species.

Rio Grande Beaver - Castor canadensis mexicanus

There are no beaver occurring in the Sabinas River at Muzquiz. There are a few yet in the Rio Grande River up from Boquillas. From three to a half dozen animals are killed each year by trappers from

both sides of the river.

Arizona Porcupine - Erethizon epixanthum couesi

Victoriano Villarreal of Muzquiz reports that he saw three porcupine during the seven years that he lived in the Del Carmen Mountains. I saw no conclusive evidence of their inhabiting the region.

I received no reports of the porcupine from the Santa Rosas.

Texas Jack Rabbit - Lepus californicus texianus

Common from Muzquiz to 7,500 feet in the northern Del Carmens. (Ref. photo. No. 301).

Davis Mountain Cottontail - Sylvilagus robustus

It is no uncommon sight to find this large cottontail at an altitude of 8,500 feet in the Del Carmens. Fairly abundant throughout the region; recordings from Encantada, Zacate, and canyons of the Santa Rosa Escarpment.

Texas Peccary - Pecari angulatus angulatus

Peccary or javelins are abundant on the plains and foothills of the Santa Rosa Mountains from 2,000 to 3,500 feet in altitude. They are reported as being common along through the hills off the Del Carmen Escarpment and in the region of Piedra Blanca. On several occasions I found feces and tracks in the Eastern Hills.

Many stories have been told on the viciousness of North America's "wild hog," the javelina. While, unbothered, he is wary of man and his civilization and flees at the slightest provocation; and yet I can say from experience that few large mammals have the capacity to defend themselves more effectively than a male peccary which has been forced to fight.

Backed with his rear portion toward an embankment or a shallow cave, he is ready for battle, and it is only a very foolish enemy that will charge. Huge tusks emerging from the sides of the mouth and a heavy muscled neck and fore quarters, equip him to thrust and rip the enemies body with amazing rapidity. Once angered, he does not think it unwise to charge ten or fifteen feet on an unprepared foe, though he prefers to keep the sanctity of his cave and keep out intruders. If several animals have sought safety in the same hollow, it seems customary to change shifts on keeping the entrance rather than for all to expose themselves at once. The Mexican hunter is wise to this method and with dogs closely guarding the cave, the hunter approaches as close as he dares, stabs the peccary a deep thrust between the shoulder blades with a knife attached to a long pole. The wounded animal will retreat and another takes his place. One by one they are dispatched.

Often when a band containing young is routed from the feeding grounds by dogs, an old bear or sow will linger behind to delay the dogs and allow the others to escape. The Mexican hunter depends on his dogs bringing the animals to bay that he may use his knife, and it is this method of individual sacrifice that prevents the wholesale slaughter of the peccaries in the region of Muzquiz.

Never-the-less, many are killed and their tanned hides are sold as rugs and wall-tapestries, principally to American tourists.

While the peccary is short and stockily built, he moves rapidly in running stride. Low limestone hills covered with brush furnish an ideal habitat. Certain of the succulent herbs, roots,

and various fruits and berries make an adequate diet. The wild Mexican persimmon, *Diospyros texana*, when available, is a favorite food.

Due to a very noticeable odor, the flesh is usually considered unpalatable. Young pigs can be raised in captivity but once the opportunity presents itself, they flee back into the wilds.

This picturesque creature which has been almost extirpated from the Texas Big Bend is probably more abundant in the low hills to the north and east and west of the Del Carmen than my evidence from the region would tend to show. He is not conspicuous. His inherent timidity of man keeps him out of sight. The peccary killed in this northern region are from chance meetings between him and man, and seldom are they hunted for the hides. The large predatory mammals take their quota of the young. An overabundance of the large predators, no doubt, keeps the population below that of the region to the south.

Texas White Tailed Deer - Odocoileus texanus

Abundant on the more humid plains regions as far north from Musquiz as Santa Domingo. Probably this white tailed deer exists commonly in the lower grassy valleys radiating from the upper Carmen but my last recording was near Santa Domingo.

On the Bavía and Mariposa ranches I have seen as many as twelve deer of this species grazing together. Once in half an hour I counted 27 deer that passed through a glade in the Sorpresa pasture on La Mariposa.

They prefer the open huisache grasslands (Ref. photo. No. 263) of the wide mountain valleys, seldom occurring higher than 3,500 feet in altitude. The toll taken by bear, lion, and man compared to their abundance is small.

Sonora White Tail or Arizona Flagtail Deer - Odocoileus concolor

Common and even abundant in the higher altitudes from La Sierra del Jardin south to the Sacate.

The Arizona Flagtail is the principal deer of the high mesa country of the Encantada and Fresno. Vivoras Canyon, El Rincon, and the canyons and forested mountain sides between are prominent havens in the northern Del Carmons.

They prefer the thickly forested regions above 5,000 feet where they feed principally on tall bunch grasses. The invasion of these upper areas by cattle seeking shelter and food in the winter furnishes the major controlling factor.

Mexican Mule Deer - Odocoileus hemionus caninus

I say only two specimens in the Del Carmons, two females feeding near Western Hills Tank on September 5. They are reported as being common in the low hill regions and Chaparral country east and west of the mountains. Mr. Paulay reports a few Black tail occur on the Encantada with a minimum altitude of 6,000 feet. They are rare on the hill regions near Murguiz if present at all.

Antelope - Antilocapra americana mexicana

Antelope are restricted almost entirely to the flat mesa country of the Encantada and east where they are commonly seen in small herds. They probably extend their range almost to the northern extremes of the Del Carmons.

Mr. Paulay states that he notices no perceptible increase or decrease in numbers over the last ten years; and very few are killed by man.

I find no evidence that antelope have existed in any other near locality since thirty years past. Likewise, there seems to be no evi-

dence to indicate they are spreading their range at present. Probably any increase in numbers only tends to offset those who fall victim to numerous predators - bear, lion and eagle.

Texas Bighorn Sheep - Ovis canadensis texiana

Mr. Pauley of the Encantada reports that one Bighorn sheep was killed in a canyon west of the ranch house in 1932 by a man employed in the U. S. Immigration Service at Eagle Pass.

Fantelson Villarreal of Marquis and Boquillas reports that several years ago a strange sheep followed a mixed herd of goats and sheep into a corral down from the mouth of Catedrales Canyon. When a man entered the corral, the animal hurtled the corral fence and fled back up the mountain side.

I found the skull of a sheep, which I believe to have been a Bighorn, on the eastern side of the divide just south of La Sierra del Jardin at approximately 9,000 feet. There were no other bones present. The skull had a pair of slightly curved horns still attached and was quite bleached with age.

A number of American hunters are reported as having hunted the Bighorn in northern Coahuila some ten or fifteen years back with various degrees of success. There has been little hunting over recent years. Only a few natives ever climb up into the heights inhabited by the sheep; therefore they are rarely seen. It would take a thorough investigation to determine the status of the Bighorn Sheep in the Del Carmen and Santa Rosa Mountains.

Texas Armadillo - Dasypus novemcinctus texanus

The armadillo is a common inhabitant through the low limestone hill country and the mountain canyons to approximately 8,500 feet in the Del Carmen.

He is a typical inhabitant of foot hill regions, preferring to make his home under the brush covered arroya walls rather than in higher canyons. Burrows are often found within clusters of scrubby mesquite and huisache.

While the flesh of the armadillo is even more savory than that of many of our common game animals, his protective bony plate covering and rocky cavern home furnish him security from both man and beast. Should he be attacked before reaching a hole, he displays the shelled upper parts to his enemy and digs into the ground with amazing rapidity. Almost within a minutes time, the only evidence of the Armadillo is a fresh dirt filled hole and the sound of muffled grunts that he emits when hard at work.

FLORA OF THE DEL CARMEN AND SANTA ROSA MOUNTAINS

Contents.

The plant phase of this report consists only of a taxonomical list of plants collected in the Del Carmen and Santa Rosa Mountains. I am to release later under the Department of Botany, University of Texas, a paper entitled, An Ecological Study of Plants in Northern Coahuila, Mexico. Such a paper may be of interest to combine with this report.

During the summer of 1936, I collected several thousand specimens of plants representing some 850 species from the area which I traversed. In as far as this number has been classified, I am giving the following list with field numbers. (10 new species)

The collection is in the process of being assimilated for presentation to the National Park Service.

PLANTS OF THE SANTA ROSA AND DEL CARMEN MOUNTAINS

Lycopodiaceae

270. *Selaginella Pringlei* Baker

Equisetaceae

473. *Equisetum laevigatum* A. Br.

Pinaceae

406. *Taxodium mucronatum* Ten.

569. *Juniperus mexicana* Spreng.

722. *Juniperus mexicana* Spreng.

794. *Juniperus flaccida* Schlecht.

803. *Pinus Kelaani* Shaw.

822. *Pseudotsuga mucronata* (Ref.) Sudw.

830. *Pinus brachyptera*

Gnetaceae

694. *Ephedra trifurca* Torr.

Graminae

252. *Andropogon barbinodis* Lag.

265. *Cynodon dactylon* (L.) Pers.

286. *Triodia texana* S. Wats.

287. *Cenchrus pauciflorus* Benth.

238. *Panicum hallii* Vasey
290. *Bouteloua trifida* Thurber.
292. *Paspalum pubiflorum* Rupr.
293. *Aristida roemeriana* Scheele
296. *Triodia pilosa* (Buckl.) Merr.
315. *Aristida glauca* (Nees) Walp.
396. *Setaria geniculata* (Lam.) Beauv.
399. *Chloris latisquamea* Nash
404. *Rottboellia fasciculata* Lam.
405. *Echinochloa colonum* (L.) Link
410. *Agrostis verticillata* Vill.
427. *Panicum hallii* Vasey
428. *Echinochloa colonum* (L.) Link
429. *Chloris virgata* Swartz
430. *Trichachne insularis* (L.) Nees
433. *Aristida adscensionis* L.
434. *Setaria geniculata* (Lam.) Beauv.
435. *Paspalum* sp. Probable new species. Agnes Chase
-
436. *Sorghum halepense* (L.) Perz.
437. *Cenchrus myosuroides* H.B.K.
438. *Tripsacum lanceolatum* Rupr.
463. *Panicum obtusum* H.B.K.
467. *Bouteloua trifida* Thurber.
495. *Sporobolus wrightii* Kunze
496. *Setaria macrostachya* H.B.K.
497. *Hilaria mutica* (Buckl.) Penth.

- 498. *Aristida glauca* (Nees) Vulp.
- 502. *Triodia pilosa* (Buckl.) Merr.
- 503. *Boutelous trifida* Thurb.
- 531. *Euchloe dactyloides* (Nutt.) Engelm.
- 546. *Boutelous curtispandula* (Michx.) Torr.
- 549. *Muhlenbergia monticola* Buckl.
- 570. *Boutelous gracilis* (H.B.K.) Lag.
- 583. *Heteropogon contortus* (L.) Beauv.
- 607. *Andropogon scoparius* Michx.
- 613. *Brachypodium mexicanum* Link
- 624. *Muhlenbergia emersaleyi* Vasey
- 628. *Bromus anomalus* Rupr.
- 629. *Stipa pringlei* (Beal) Scribn.
- 630. *Panicum bulbosum* var. *minus* Vasey
- 631. *Koeleria cristata* (L.) Pers.
- 635. *Elymus canadensis* L.
- 638. *Andropogon barbinodis* Lag.
- 642. *Boutelous curtispandula* (Michx.) Torr.
- 655. *Muhlenbergia emersaleyi* Vasey
- 657. *Boutelous hirsuta* Lag.
- 658. *Lycurus Phleoides* H.B.K.
- 665. *Aristida longiseta* var. *robusta* Merr.
- 675. *Aristida adscensionis* L.
- 697. *Setaria macrostachya* H.B.K.
- 692. *Triodia pulchella* H.B.K.
- 693. *Boutelous gracilis* (H.B.K.) Lag.

699. *Echinochloa colonum* (L.) Link
705. *Muhlenbergia monticola* Buckl.
717. *Muhlenbergia parviglumis* Vasey
719. *Muhlenbergia rigida* (H.B.K.) Kunth
723. *Leptochloa dubia* (H.B.K.) Nees
740. *Cynodon dactylon* (L.) Pers.
746. *Muhlenbergia firma* Nees
749. *Chloris virgata* Swartz
751. *Echinochloa crusgavonis* (H.B.K.) Schult.
760. *Sorghum halepense* (L.) Pers.
762. *Setaria grisebachii* Fourn.
766. *Eragrostis neomexicana* Vasey
767. *Leptochloa dubia* (H.B.K.) Nees
783. *Sitanion hystrix* (Nutt.) J.G. Smith
800. *Eragrostis lugens*
841. *Aristida glauca* (Nees) Walp.
852. *Setaria macrostachyum* H.B.K.
853. *Hilaria mutica* (Buckl.) Benth
872. *Muhlenbergia microsperma* (DC.) Kunth
878. *Stipa tenuissima* Trin.
887. *Bouteloua hirsuta* Lag.
891. *Echinochloa crusgavonis* (H.B.K.) Schult.
896. *Bouteloua eriopoda* (Torr.) Torr.
898. *Schleropogon brevifolius* Phil.
903. *Setaria macrostachya* H.B.K.
907. *Muhlenbergia arenacea* (Buckl.) Hitchc.
908. *Triodia mutica* (Torr.) Scribn.

- 938. *Panicum condensum* Nash
- 936. *Setaria geniculata* (Lam.) Beauv.
- 942. *Triodia pilosa* (Buckl.) Merr.
- 964. *Panicum obtusum* H.B.K.
- 975. *Arundo donax* L.
- 977. *Bouteloua trifida* Torr.
- 978. *Paspalum mutabile* Chase
- 979. *Eragrostis*
- 980. *Bouteloua curtipendula* (Michx.) Torr.
- 983. *Setaria grisebachii* Fourn.
- 984. *Chloris andropogonoides* Fourn.
- 985. *Opismenus hirtellus* (L.) Beauv.
- 986. *Sorghastrum nutans* (L.) Nash
- 993. *Heteropogon contortus* (L.) Beauv.
- 1000. *Tragus berteroniensis* Schult.

Cyperaceae

- 400. *Dichromena colorata* (L.) Hitchc.

Bromeliaceae

- 328. *Tillandsia recurvata* L.

Commelinaceae

- 354. *Commelina elegans* H.B.K.
- 356. *Tradescantia brachyphylla* Greene.
- 485. *Tradescantia tuberosa* Greene.
- 796. *Commelina dianthifolia* Del.
- 805. *Tradescantia rhodantha* Torr.

816. *Tradescantia crassifolia* Cav.

950. *Tradescantia Pringlei* Wats.

951. *Commelina elegans* H.B.K.

Liliaceae

265. *Smilax Bona-nox* L.

535. *Cooperia Drummondii* Herb.

609. *Allium cernuum* Roth.

810. *Kolina*

Salicaceae

650. *Populus arizonica* Sarg.

Juglandaceae

513. *Juglans rupestris* Engelm.

Fagaceae

535. *Quercus porphyrogenita* Trel.

335. *Quercus Mohriana* Buckley

337. *Quercus chisosensis* (Sarg.) C.H. Mull.

339. *Quercus chisosensis* (Sarg.) C. H. Mull.

373. *Quercus Mohriana* Buckley

518. *Quercus fusiformis* Small

591. *Quercus chisosensis* (Sarg.) C. H. Mull.

768. *Quercus chisosensis* (Sarg.) C. H. Mull.

823. *Quercus Marshalli* C. H. Mull. Species new.

829. *Quercus diversicolor* Trel.

- 831. *Quercus hypoleuca* Engelm.
- 832. *Quercus grisea* Liebm.
- 854. *Quercus Mohriana* Buckley
- 870. *Quercus undulata* Torr. var. *Vaseyana* Rydb.

Ulmaceae

- 438. *Celtis pallida* Torr.
- 774. *Celtis reticulata* Torr.

Moraceae

- 340. *Morus celtidifolia* H.B.K.

Urticaceae

- 909. *Boehmeria scabra* (Porter) Small

Loranthaceae

- 567. *Phoradendron Bolleanum* (Seem.) Eichl.
- 569. *Phoradendron Bolleanum* (Seem.) Eichl.

Aristolochiaceae

- 10. *Aristolochia Marshii* Standl. Species new

Polygonaceae

- 402. *Polygonum opelousanum* Ridd.
- 439. *Eriogonum tenellum* Torr. var. *caulescens* T. & G.
- 660. *Eriogonum atrorubens* Engelm.
- 683. *Eriogonum undulatum* Benth.
- 761. *Polygonum lapathifolium* L.
- 806. *Eriogonum Wrightii* Torr.
- 931. *Polygonum punctatum* Ell.

Chenopodiaceae

- 680 a. *Chenopodium ambrosioides* L.
- 686. *Chenopodium Berlandieri* Moq.
- 758. *Chenopodium Berlandieri* Moq.

Amaranthaceae

- 285. *Portulicaria interrupta* (L.) Moq.
- 352. *Iresine heterophylla* Standl.
- 371. *Gomphrena Haageana* Klotzsch.
- 466. *Celosia Palmeri* Wats.
- 524. *Portulicaria interrupta* (L.) Moq.
- 559. *Amaranthus blitoides* Wats.
- 602. *Guilleminia densa* (Willd.) Moq.
- 683. *Alternanthera polygonoides* (L.) R. Br.
- 714. *Gomphrena decumbens* Jacq.
- 787. *Iresine Schafferi* Wats.
- 799. *Iresine heterophylla* Standl.
- 843. *Tidestromia lanuginosa* (Nutt.) Standl.

Nyctaginaceae

- 535. *Asclepias longiflora* Gray.
- 552. *Boerhaavia gracillima* Keimert.
- 578. *Cyphomeria gypsophiloides* (M. & G.) Standl.
- 735. *Allionia incarnata* L.
- 867. *Allionia incarnata* L.
- 882. *Mirabilis ciliatifolia* (Weatherby) Standl.
- 902. *Nyctaginia capitata* Choisy.
- 941. *Boerhaavia linearifolia* Gray.

270. *Boerhaavia caribaea* Jacq.

Phytolaccaceae

459. *Rivina humilis* L.

781. *Rivina humilis* L.

Portulacaceae

370. *Talinum aurantiacum* Engelm.

457. *Portulaca pilosa* L.

678. *Cyphomeria gypsophiloidea* (H.&G.) Standl.

Caryophyllaceae

871. *Drymaria gracilis* Cham. & Schl.

Nymphaeaceae

937. *Nymphaea ampla* (Sahib.) DC.

Ranunculaceae

16. *Delphinium madrense* Wats.

24. *Polanisia uniglandulosa* (Cav.) DC

248. *Clematis Drummondii* Torr. & Gray.

606. *Aquilegia longissima* Gray.

897. *Clematis Drummondii* Torr. & Gray.

Berberidaceae

779. *Berberis Fremontii* Torr.

Mexispermaceae

267. *Cocculus carolinus* (L.) DC.

Cruciferae

464. *Oreocia camporum* Gray.

- 549. *Lesquerella argyrea* Wats.
- 554. *Thelypodium linearifolium* (Gray) Wats.
- 561. *Hrysimum asperitum* (Greene) Rydb.
- 598. *Thelypodium longifolium* (Benth.) Wats.
- 659. *Thelasperma subsimplicifolium* A. Gray.
- 696. *Lesquerella Fendleri* (Gray) Wats.
- 769. *Sisymbrium streptocarpum* Fourr.
- 778. *Thelasperma subsimplicifolium* A. Gray
- 820. *Cardamine hirsuta* L.
- 894. *Lesquerella Fendleri* (Gray) Wats.

Capparidaceae

- 25. *Polanisia uniglandulosa* (Cav.) DC.
- 477. *Polanisia uniglandulosa* (Cav.) DC.

Crassulaceae

- 527. *Sedum*.
- 702. *Echeveria*
- 852. *Sedum*

Saxifragaceae

- 881. *Fendlera linearis* Rehder.

931. *Polygonum punctatum* Kll. (Polygonaceae)

Platanaceae

385. *Platanus glabrata* Fernald.

Rosaceae

482. *Fallugia paradoxa* (Don) Endl.
614. *Holodiscus dumosus* (Nutt.) Heller.
619. *Rubus strigosus* Michx.
637. *Fallugia paradoxa* (Don) Endl.
709. *Prunus virens* (Woot. & Standl.)
757. *Rosa serrulata* Raf.
773. *Crataegus Rosei* Eggleston.
883. *Cercocarpus breviflorus* Gray.

Leguminosae

29. *Krameria secundiflora* DC.
30. *Petalostemon truncatus* Rydb.
31. *Mimosa Lindheimeri* Gray
33. *Hoffmannia densiflora* Benth.
34. *Cologania pulchella* H.B.K.
35. *Clitoria humilis* Rose.
38. *Melilotus indica* (L.) All.
42. *Bauhinia lunarioides* Gray
45. *Calliandra Coulteri* Wats.
46. *Desmanthus velutinus* Scheele

47. *Lupinus leonensis* Wats.
 48. *Acacia anisophylla* Wats.
 49. *Pithecolobium pallens* (Benth.) Standl.
 50. *Tephrosia potosina* Brandeg.
 52. *Cassia Greggii* Gray
 53. *Acacia Roemeriana* Scheele
 54. *Acacia Berlandieri* Benth.
 55. *Acacia villosa* (Sw.) Willd.
 57. *Acacia aznata* DC.
 58. *Cassia Roemeriana* Scheele
 59. *Indigofera leptosepala* Nutt.
 60. *Eysenhardtia polystachya* (Ortega) Sarg.
 62. *Lippia Wrightii* Gray
 63. *Schrankia paniculata* (Britt. & Rose) Standl.
 245. *Lippia neriiflora* (L.) Michx.
 300. *Canavalia villosa* Benth.
 301. *Rana dichondrifolia* Standl. New species
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305. *Metastelia Palmeri* Wats.
 318. *Acacia aznata* DC.
 320. *Mimosa palacophylla* Gray
 325. *Leucaena retusa* Benth. New for Mexico P. Standley
 329. *Acacia angustissima* (Will.) Kuntze.
 331. *Indigofera leptosepala* Nutt.
 343. *Sophora secundiflora* (Ort.) Lag.

354. *Phaseolus atropurpureus* DC.
379. *Parosela trifoliolata* (Lag.) Rydb.
407. *Lippia liquastrina* (Lag.) Britton.
424. *Galactia brachystachya* Benth.
440. *Calliandra Coulteri* Wats.
447. *Indigofera Lindheimeriana* Scheele.
449. *Cassia Roemeriana* Scheele.
484. *Rhynchosia texana* Torr. & Gray
508. *Cassia Greggii* Gray
518. *Calliandra eriphylla* Benth.
555. *Desmodium psilophyllum* Schlecht.
581. *Parosela Greggii* (Gray) Haller
590. *Parosella plumosa* (Wats.) Rose.
593. *Phaseolus plagiocalyx* Harms.
679. *Lotus puberulus* (Benth.) Greene.
690. *Parosela aures* (Nutt.) Britton
728. *Rhynchosia texana* Torr. & Gray.
733. *Cassia Lindheimeriana* Scheele.
782. *Cassia Lindheimeriana* Scheele.
804. *Acacia constricta* Benth.
812. *Astragalus orthanthus* Gray.
856. *Cercis canadensis* L.
865. *Cassia Roemeriana* Scheele.
873. *Mimosa cuspidata* Schlecht.
876. *Eysenhardtia polystachya* (Ort.) Sarg.

- 906. *Cassia Greggii* Gray
- 917. *Desmodium Pringlei* Wats.
- 943. *Rhynchosia minima* (L.) DC.
- 956. *Indigofera leptosepala* Nutt.
- 963. *Desmodium* cf. *psilophyllum* Schlecht.
- 969. *Stylosanthes mucronata* Willd.
- 987. *Desmodium Pringlei* Wats.
- 989. *Bauhinia luzarioides* Gray.

Geraniaceae

- 562. *Geranium mexicanum* H.B.K.
- 605. *Geranium atropurpureum* Heller.

Oxalidaceae

- 553. *Oxalis dichondraefolia* Gray.
- 775. *Oxalis albicans* H.B.K.
- 966. *Oxalis divergens* Benth.

Linaceae

- 67. *Linum rupestre* Engelm.
- 366. *Linum Schiedeanum* Cham. & Schl.
- 664. *Linum Schiedeanum* Cham & Schl.

Zygophyllaceae

- 460. *Kallstroemia parviflora* Norton
- 703. *Larrea tridentata* (DC. Cav.
- 734. *Kallstroemia parviflora* Norton.

1006. *Kalstroemia parviflora* Norton.

Rutaceae

253. *Amyris Marshii* Standl. Species new

319. *Zanthoxylum Fargara* (L.) Sarg.

359. *Citrus sinensis* (L.) Osbeck.

988. *Amyris madrensis* Wats.

Meliaceae

919. *Melia Azedarach* L.

Malpighiaceae

350. *Aspicarpa hyssopifolia* Gray.

423. *Mascagnia lilacina* (Wats.) Nogu.

541. *Janusia gracilis* Gray.

Polygalaceae

157. *Polygala Lindheimeri* Gray

667. *Polygala puberula* Gray.

Euphorbiaceae

74. *Groton neomexicanus* Kusll. Arg.

76. *Euphorbia polycarpa* Benth.

78. *Tragia nepetifolia* Cav.

80. *Phyllanthus polygonoides* Kutt.

85. *Acalypha phleoides* Cav.

87. *Euphorbia villifera* Scheele
283. *Acalypha hederacea* Torr. & Gray.
291. *Stillingia angustifolia* Engelm.
309. *Croton Torreyanus* Muell. Arg.
332. *Euphorbia brasiliensis* Lam.
339. *Phyllanthus polygonoides* Nutt.
341. *Tragia volubilis* L.
499. *Croton dioicus* Cav.
504. *Acalypha hederacea* Torr. & Gray.
533. *Croton Torreyanus* Muell. Arg.
539. *Euphorbia albomarginata* Torr. & Gray.
545. *Bernardia myricifolia* (Scheele) Wats.
599. *Euphorbia Greggii* Engelm.
639. *Acalypha phleoides* Cav.
641. *Euphorbia serpyllifolia* Pers.
706. *Croton morifolius* Willd.
753. *Euphorbia serpyllifolia* Pers.
755. *Euphorbia dentata* Michx.
791. *Croton corymbulosus* Engelm.
868. *Acalypha phleboides* Cav.
926. *Euphorbia torrida* DC
959. *Euphorbia uniglandulosa* Wats.
962. *Chiropetalum Schiedeianum* (M. Arg.) Pax. — Hoffm.
968. *Euphorbia capitellata* Engelm.
994. *Euphorbia albomarginata* Torr. & Gray.
996. *Euphorbia barbellata* Engelm.

Anacardiaceae

- 91. *Pistacia mexicana* HB.K.
- 358. *Pistacia Mexicana* H.B.K.
- 566. *Rhus virens* Lindh.
- 634. *Rhus lanceolata* (Gray) Britton
- 833. *Rhus microphylla* Engelm.

Sapindaceae

- 333. *Serjania incisa* Torr.

Rhamnaceae

- 26. *Colubrina Greggii* Wats. A small leaved form of this, I think. P. Standley
- 310. *Colubrina texensis* (T. & G.) Gray
- 342. *Karwinskia Humboldtiana* (R. & S.) Zucc.
- 461. *Condalia mexicana* Schlecht.
- 608. *Ceanothus luxifolius* Willd.
- 814. *Rhamnus caroliniana* Walt.

Vitaceae

- 254. *Vitis arizonica* Engelm.
- 377. *Parthenocissus quinquefolia* (L.) Planch.
- 622. *Vitis arizonica* Engelm.

Malvaceae

- 93. *Abutilon hypoleucum*
- 94. *Sida*. Probably an undescribed species. P. Standl.
- 95. *Pavonia lasiopetala* Scheele
- 99. *Sphaeralcea*. Near *L. elichii* Ulbr., but probably a new species. P. Standley

100. *Callirrhoe sidalceoides* Standl., new species

246. *Malvastrum coromandelianum* (L.) Garcke.

250. *Sida procumbens* Sw.

277. *Sida longipes* Gray.

353. *Sida filipes* Gray.

332. *Sida procumbens* Sw.

389. *Abutilon incanum* (L.) Sweet.

419. *Hibiscus cardiophyllus* Gray.

420. *Abutilon hypoleucum* Gray

442. *Abutilon incanum* (Link.) Sweet

456. *Sida procumbens* Sw.

479. *Geyoides crispum* (L.) Small

547. *Hibiscus Coulteri* Harv.

584. *Sphaeralcea angustifolia* (Cav.) Don.

649. *Malva parviflora* L.

712. *Sida Lindheimeri* Engelm. & Gray.

729. *Sida procumbens* Sw.

836. *Abutilon incanum* (Link.) Sweet

916. *Abutilon reventum* Wats.

973. *Malvaviscus Drummondii* Torr. & Gray

1011. *Sida angustifolia* Lam.

Sterculiaceae

345. *Hermannia texana* Gray.

383. *Faltheria Americana* L.

444. *Melochia pyramidata* L.

949. *Ayenia Berlandieri* Wats.

972. *Melochia pyramidata* L.

Outtiferac

235. *Hypericum perforatum* L.

Koeberlinaceae

710. *Koeberlinia spinosa* Zucc.

Passifloraceae

479. *Passiflora foetida* L.

Loasaceae

106. *Mentzelia multiflora* (Nutt.) Gray
279. *Cevallia sinuata* Lag.
425. *Mentzelia hispida* Willd.
670. *Mentzelia hispida* Willd.
673. *Mentzelia pumila* (Nutt.) Torr. & Gray
860. *Mentzelia pumila* (Nutt.) Torr. & Gray
918. *Mentzelia hispida* Willd.
1012. *Cevallia sinuata* Lag.

Lythraceae

262. *Lythrum vulneraria* Ort.
446. *Lythrum linearifolium* (Gray) Small.

Punicaceae

1015. *Cuphea lanceolata* Ait.

Oenotheraceae

108. *Oenothera tetraptera* Cav.
109. *Oenothera Greggii* var. *Pringlei* Munz.

- 110. *Oenothera Hartwegii* Benth.
- 111. *Gaura Coccinea* Nutt.
- 112. *Gaura sinuata* Nutt.
- 392. *Gaura sinuata* Nutt.
- 529. *Oenothera rosea* Ait.
- 643. *Hartmannia rosea* (Ait.) Don.
- 742. *Epilobium mexicanum* DC.
- 764. *Oenothera*
- 784. *Gaura sinuata* Nutt.
- 846. *Gaura parviflora* Dougl.

Umbelliferae

- 115. *Apium Anni* (L.) Urban
- 411. *Hydrocotyle verticillata* Thunb.
- 616. *Aletes acaulis* (Torr.) C. & R.
- 1002. *Oenothera Hartwegii* Benth.

Cornaceae

- 375. *Garrya ovata* Benth.
- 602. *Garrya ovata* Benth.
- 824. *Cornus xalapensis* stolonifera Michx.

Ericaceae

- 25. *Eruca sativa* Lam.
- 711. *Arbutus xalapensis* H.B.K.

Primulaceae

- 115. *Saxolus floribundus* H.B.K.

Sapotaceae

281. Bumelia lanuginosa (Michx.) Pers.

780. Bumelia lanuginosa (Michx.) Pers.

Oleaceae

372. Fraxinus Greggii Grau.

574. Fraxinus cuspidata Torr.

915. Fraxinus Berlandieriana A. DC.

Loganiaceae

452. Cynoctonum Mitreola (L.) Britton

437. Eudaleia scordioides H.B.K.

935. Cynoctonum Mitreola (L.) Britton

Gentianaceae

947. Eustoma exaltatum (L.) Griseb.

Apocynaceae

114. Ansonia longiflora Torr.

317. Macrosiphonia macrosiphon (Torr.) Heller.

884. Macrosiphonia macrosiphon (Torr.) Heller

Asclepiadaceae

118. Vincetoxicum reticulatum (Gray) Heller

119. Metastelma Palmeri Wats.

255. Centaurium calycosum (Buckl.) Fern.

441. Roulinia Palmeri Wats.

677. Asclepias brachystephana Engelm.

811. Asclepiodora decumbens Gray.

910. Asclepias incarnata L.

Convolvulaceae

- 124. *Evolvulus sericeus* Swartz
- 128. *Convolvulus incanus* Vahl.
- 131. *Operculina ornithopoma* var. *megacarpa* (Brandeg.) Rob.
- 363. *Merremia dissecta* (Jacq.) Hallier
- 373. *Evolvulus alsinoides* L.
- 470. *Cuscuta indecora* Choisy
- 510. *Evolvulus Hallierii* Van Oostr.
- 582. *Evolvulus alsinoides* L.
- 737. *Guanoelit coccinea* (L.) Moench.
- 813. *Ipomoea purpurea* (L.) Lam.
- 840. *Punastrium Cynanchoides* (DC.) Schltr.
- 921. *Ipomoea gilliae* (Willd.) Choisy.
- 945. *Ipomoea Marshii* Standl., new species.

Polemoniaceae

- 96. *Gilia rigidula* Benth.
- 398. *Gilia incisa* Benth.
- 785. *Gilia aggregata* (Pursh) Spreng.
- 837. *Gilia rididula* Benth.
- 875. *Loeselina ciliata* L.

Hydrophyllaceae

- 301. *Nema dichondrifolium* Standl. New Species.
- 530. *Nema janicense* L.
- 948. *Nema Palmeri* Gray.

Borraginaceae

- 88. *Coldenia canescens* DC.
- 125. *Opthalodes acuminata* Wats.
- 141. *Opthalodes aliena* Gray

- 143. *Lithospermum* cobrense Greene
- 289. *Heliotropium* angustifolium Torr.
- 508. *Oreocarya* multicaulis (Torr.) Greene
- 509. *Heliotropium* angustifolium Torr.
- 521. *Heliotropium* confertifolium Torr.
- 937. *Heliotropium* phyllostachyum Torr.
- 974. *Heliotropium* Palmeri Gray

Verbenaceae

- 147. *Verbena* canescens H.B.K.
- 148. *Lantana* macropoda Torr.
- 149. *Lantana* Camara L.
- 150. *Verbena* delticola Small
- 278. *Verbena* neomexicana (Gray). Small
- 545. *Lantana* achyranthifolia Desv.
- 409. *Lantana* achyranthifolia Desf.
- 494. *Verbena* canescens H.B.K.
- 542. *Lippia* Berlandieri Schauer.
- 684. *Verbena* Halei Small
- 707. *Verbena* ambrosiifolia Rydb.
- 777. *Lippia* Wrightii Gray.
- 838. *Lippia* ligustrina (Lag) Britton
- 859. *Verbena* xutha Lehm.

Labiatae

- 151. *Hedeoma* pinnoides Scheele
 - 155. *Monarda* austromontana Epling
 - 153. *Scutellaria* lythroides Standl., new species.
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- 1 159. *Scutellaria Drummondii* Benth.
160. *Salvia farinacea* Benth.
273. *Scutellaria ovata* var. *bracteata* (Benth.) Blake
517. *Salvia ballotaeiflora* Benth.
532. *Polionantha glabrescens* Gray.
559. *Marrubium vulgare* L.
604. *Monarda Eplingiana* Standl., new species
656. *Salvia regia* Cav.
672. *Monarda austromontana* Epling
833. *Salvia*
849. *Mentha Piperita* L.
971. *Salvia ballotaeiflora* Benth.

Nolanaceae

752. *Teucrium cubense* L.
848. *Teucrium canadense* L.

Solanaceae

165. *Physalis mollis* Nutt.
256. *Capsicum baccatum* L.
516. *Solanum Torreyi* Gray
594. *Solanum nigrum* L.
422. *Chamaesaeacha Coronopus* (Duval) Gray. var.
476. *Chamaesaracha Coronopus* (Duval) Gray. var.
493. *Physalis lobata* Torr.
651. *Solanum nigrum* L.
727. *Solanum cornutum* Lam.
770. *Solanum nigrum* L.

772. *Margaranthus Solanaceus* Schl.

895. *Solanum elaeagnifolium* Cav.

976. *Capsicum baccatum* L.

Scrophulariaceae

563. *Castilleja lanata* Gray.

455. *Buchnera pilosa* Benth.

465. *Maurendia antirrhiniflora* Willd.

544. *Leucophyllum texanum* Benth.

589. *Seymeria chihuahuana* (Pennell) Standl.

900. *Leucophyllum texanum* Benth.

920. *Gerardia calycina* Pennell.

955. *Seymeria virgata* (A.B.K.) Benth.

982. *Eacopa procumbens* (Mill.) Grenum.

Bignoniaceae

430. *Tecoma stans* var. *angustata* Rehder.

794. *Tecoma stans* var. *angustata* Rehder

Acanthaceae

92. *Siphonoglossa pilosella* Torr.

174. *Dyschoriste decumbens* (Gray) Kuntze

259. *Jacobinia incana* (Nees) Hemsl.

314. *Ruellia tuberosa* L.

327. *Siphonoglossa pilosella* Torr.

347. *Ruellia tuberosa* L.

395. *Lianthera americana* L. new for Mexico P. Standl.

408. *Anisacanthus Wrightii* (Torr.) Gray

- 448. *Tetramerium hispidum* Nees.
- 512. *Ruellia Parryi* Gray.
- 738. *Tetramerium hispidum* Nees.
- 958. *Ruellia* sp.
- 991. *Tetramerium hispidum* Nees.

Plantaginaceae

- 914. *Plantago major* L.

Rubiaceae

- 136. *Bouvardia ternifolia* (Cav.) Schlecht.
- 185. *Galium Pringlei* Greenm.
- 272. *Galium uncinulatum* DC.
- 282. *Houstonia acerosa* Gray
- 297. *Houstonia angustifolia* Michx.
- 330. *Houstonia longipes* Wats.
- 386. *Cephalanthus salicifolius* H. & E.
- 505. *Houstonia acerosa* Gray.
- 555. *Galium Pringlei* Greenm.
- 576. *Bouvardia ternifolia* (Cav.) Schl.
- 587. *Houstonia angustifolia* Michx.
- 612. *Helbanium microphyllum* (Gray) Hemsf.
- 735. *Houstonia polypromoides* Gray
- 789. *Houstonia angustifolia* Michx.
- 815. *Galium asperum* Gray.

Caprifoliaceae

- 610. *Lonicera pilosa* (H.B.K.) Willd.

888. *Sambucus mexicana* Presl.

Cucurbitaceae

519. *Melothria pendula* L.

Campanulaceae

180. *Lobelia Berlandieri* DC.

453. *Lobelia*

617. *Campanula rotundifolia* L.

653. *Lobelia splendens* Willd.

911. *Lobelia cardinalis* L.

Compositae

187. *Senecio flaccidus* Less.

188. *Pinaropappus roseus* Less.

190. *Lepachys columnifera* (Nutt.) Macbr.

191. *Lepachys columnifera* (Nutt.) Macbr.

192. *Viguiera dentata* (Cav.) Spreng.

193. *Englemannia pinnatifida* Torr. & Gray

194. *Centaurea americana* Nutt.

195. *Helianthus annuus* L.

196. *Aplopappus spinulosus* (Pursh) DC

197. *Erickellia laciniata* Gray

198. *Vernonia Lindheimeri* Gray

199. *Sanvitalia ocyroides* DC

200. *Gaillardia simplex* Scheele

201. *Eicnastophora campestris* Gray

203. *Erickellia ocontophylla* Gray

205. *Senecio Sanguisorbae* DC
206. *Gaillardia mexicana* Gray
207. *Selloa glutinosa* Spreng.
208. *Thelesperma subsimplicifolium* Gray
209. *Eupatorium Greggii* Gray
211. *Franeria tenuifolia* Gray
212. *Dyssodia puberula* (Eydb.) Standl.
215. *Eupatorium ageratifolia* DC.
221. *Chrysactinia mexicana* Gray
276. *Trixis californica* Kell.
326. *Kuhnia rosmarinifolia* Vent.
346. *Brickellia odontophylla* Gray
376. *Parthenium lyratum* Gray
381. *Heterotheca subaxillaris* (Lam.) Britt. & Rusby
384. *Achaetogeron pinnatifidus* Gray
388. *Gaillardia mexicana* Gray
443. *Heterotheca subaxillaris* (Lam.) Britt & Rusby
445. *Ambrosia artemisiifolia* L.
453. *Eupatorium betonicifolium* Mill. var. *integrifolium*
(Gray) Rob.
486. *Dyssodia micropoides* (DC) Loes.
485. *Tradescantia tuberosa* Greene.
492. *Parthenium incanum* H.B.K.
513. *Dyssodia Berlandieri* (DC.) Blake
515. *Eupatorium Greggii* Gray
520. *Helenium Ooclinium* Gray

522. *Bidens laevis* (L.) E.S.P.
523. *Fiddellia gnaphaloides* (DC.) Hoffm.
526. *Synedrella vialis* (Less.) Gray.
527. *Helianthus annuus* L.
534. *Actinea linearis* (Nutt.) A. Nels
572. *Brickellia veronicifolia* (DC) Gray
579. *Selloa glutinosa* Spreng.
585. Compositae
595. *Stevia salicifolia* Cav.
600. *Erigeron divergens* Torr. & Gray
603. *Stachys coccinea* Jacq.
644. *Bidens*
652. *Lepachys columnifera* (Nutt.) Macbr.
654. *Verbesina encelioides* (Cav.) B. & H.
671. *Bahia absinthifolia* Benth.
674. *Gutierrezia Berlandieri* Gray
676. *Aster tanacetifolius* H.B.K.
680. *Chenopodium ambrosioides* L.
685. *Erigeron canadensis* L.
691. *Eupatorium Greggii* Gray
693. *Trixis californica* Zell.
700. *Actinea linearis* (Nutt.) A. Nels.
716. *Micranocarpus parviflorus* Gray.
721. *Dyssodia ciliaris* (Hydb.) Standl.
730. *Artemisia dracunculoides* Pursh.
738. *Aster hebecladus* DC.

739. *Erigeron canadensis* L.
759. *Xanthium canadense* Mill.
771. *Grindelia inuloides* Willd.
786. *Stephanomeria neomexicana* (Greene)
792. *Liatris punctata* Hook.
793. *Parthenium incanum* H.B.K.
797. *Senecio filifolius* Nutt.
817. *Stevia salicifolia* Cav.
819. Compositae
826. *Eupatorium ageratifolium* DC
827. *Viguiera annua* (Jones) Blake
842. *Perezia Parryi* Gray
846. *Verbesina encelioides* (Cav.) B. & H.
851. *Psilactis asteroides* Gray
855. *Melampodium leucanthum* Torr. & Gray
857. *Zinnia grandiflora* Nutt.
861. *Parthenium lyratum* Gray
864. *Gutierrezia Berlandieri* Gray
874. *Eiguiera stanoloba* Blake
877. *Artemisia albula* Wooton.
880. Compositae
899. *Dyssodia Berlandieri* (DC) Blake
901. *Riddellia gnaphaloides* (DC) Hoffm.
904. *Eahia biternate* Gray
905. *Baccharis neglecta* Britton
912. *Spilanthes ocimifolia* (Lam.) Moore

- 915. *Heterotheca subaxillaris* (Lam.) Britt. & Rusby
- 922. *Solidago canadensis* L. var.
- 927. *Ambrosia artemisiifolia* L.
- 952. *Erickelia odontophylla* Gray
- 954. *Tetragonotheca texana* Engelm. & Gray
- 980. *Sanvitalia ocimoides* DC
- 981. *Eupatorium odoratum* L.
- 985. *Liatris punctata* Hook.
- 995. *Eschlandiera lyrata* Benth
- 997. *Baccharis neglecta* Britton

* This list is to be supplemented as additional material
of the collection is classified.

SUPPLEMENTARY LIST

PLANTS OF COAHUILA

Selaginellaceae

1041. *Selaginella lepidophylla* Spring.

1042. *Selaginella Pringlei* Baker

Cyperaceae

403. *Eleocharis sulcata* (Roth) Nees.

439. *Cladium jamaicense* Crantz.

451. *Eleocharis sulcata* (Roth) Nees.

511. *Cyperus microdontus* Torr.

647. *Juncus Torreyi* Cov.

743. *Juncus balticus* Willd.

744. *Scirpus lacustris* L.

745. *Juncus Torreyi* Cov.

747. *Eleocharis palustris* (L.) R. & S.

748. *Cyperus esculentus* L.

750. *Juncus tenuis* Willd.

801. *Cyperus Schweinitzii* Torr.

809. *Cyperus ferax* Rich.

835. *Cyperus hermaphroditus* (Jacq.) Standl.

889. *Cyperus*

929. *Fuirena simplex* Vahl.

930. *Eleocharis interstincta* (Vahl) R. & S.

932. *Eleocharis interstincta* (Vahl) R. & S.

933. *Cyperus ferax* Rich.

934. *Cyperus esculentus* L.

Caryophyllaceae

1040. *Stellaria cuspidata* Willd.

Oxalidaceae

1033. *Oxalis stricta* L.

Malvaceae

1039. *Anoda cristata* (L.) Schlecht.

1043. *Hibiscus acicularis* Standl.

Loasaceae

1037. *Euclisa bartonioides* Zucc.

Labiatae

1044. *Salvia Greggii* Gray.

Solanaceae

1032. *Capsicum baccatum* L.

103. *Solanum triquetrum* Cav.

1035. *Nicotiana nudicaulis* Wats.

1038. *Lycium Berlandieri* Lamal.

1046. *Nierembergia viscosa* Torr.

Hydrophyllaceae

1036. *Nama Marshii* Standl., New Species.
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Compositae

1020. *Erigeron divergens* Torr. & Gray

1021. *Chaptalia nutans* (L.) Polak.

1022. *Gnaphalium oxyphyllum* DC.

1023. *Bidens pilosa* L.

1024. *Hymenoclea monogyra* Torr. & Gray.

1025. *Brickellia laciniata* Gray.
1026. *Flaveria trinervia* (Spreng.) Mohr.
1027. *Aster hebacladus* DC.
1028. *Viguiera* Sp.
1029. *Bidens laevis* (L.) B.S.P.
1030. *Eupatorium porphyranthemum* Gray.
1031. *Eupatorium leiophyllum* Less.
1045. *Perezia runcinata* Lag.

Observations:

In view of the following facts I recommend for consideration of the National Park Service that wildlife research in the Del Carmen Mountains be made continuous from this study as a cooperative program between the Department of National Parks in Mexico and the National Park Service of the United States:

1. Such a program would be welcomed and beneficial to the Mexican department.
2. Such a program would stimulate a very desirous spirit of cooperation between the corresponding departments in the two nations.
3. Such a program would facilitate in time, money, and results the rehabilitation of the Big Bend Park area.

In reports on the Big Bend area by Dr. McDougall, Dr. Johnson, and Mr. Stevenson, the most urgent need specified by each individual was the making of certain ecological studies in order to determine the original status of plants and animals over the land area, and to observe the relation of one species with another toward the end of rehabilitation of the depleted wildlife. Such a program is vitally necessary to stop the depletion of certain

stock quota from the Big Bend and equally necessary to accomplish an understanding of the physical environment most conducive to a favorable propagation and distribution of native plant and animal species.

Subjected for many years to the adverse influence of man and livestock, the Big Bend as a National Park area has been sorely used, and it will take many years to reestablish the depleted wildlife. Such environmental conditions as could be generated on experimental plots for ecological study could not be of the most desirable character. Once a maladjustment is stimulated, even though the cause is in time removed, the original set-up cannot be established except over long periods of years, and the need of results is for the immediate future in order that a directional influence can be placed upon phases of the Big Bend wildlife to accomplish a timely restoration.

Across the Rio Grande River in Mexico lie the Del Carmen Mountains. Structurally and biologically, a region essentially identical to that of the Texas Big Bend and the Chisos Mountains. The Del Carmen Mountains and the surrounding plains for a number of years have been subjected to the influence of man, but to such a lesser degree, that excepting certain localities, words as overgrazing and depletion are not needed in descriptive phrases.