

THE FAUNAL AREAS OF BAJA CALIFORNIA DEL NORTE

WITH MAP

By GRIFFING BANCROFT

OUR accepted authority for the faunal mapping of southern California is Dr. Grinnell. For northern Lower California there has been no material revision since the lines were drawn by Dr. Nelson after his memorable exploration. Where the mapping of these two authorities meets, on the international line, it at once becomes apparent that there are very considerable inconsistencies in their conclusions. In order to bring harmony between the two maps and with the physical geography of the country, it seems necessary to make some changes, especially with respect to the southern territory. The recognition of two or more new areas is unavoidable, as is a drastic shortening of the southern extensions of both the San Diegan and Colorado Desert areas.

THE COLORADO DELTA DISTRICT

Let us consider first the delta of the Colorado. It differs from the surrounding desert in that it is watered by the river. In fact the delta country may be defined with accuracy as the region adjacent to the Lower Colorado which is directly irrigated, either subterraneously or by overflow.

The boundaries of this Colorado Delta District are the Gulf of California on the south and the Hardy River on the west. While it is true that at places delta conditions do occur on both sides of that stream, the acreage so occupied is too negligible to necessitate further qualification. The Delta District extends to the eastward well into Sonora until it meets the deserts of that state. Its northern boundary is not fixed, for it is steadily being forced southward by the encroachments of agriculture. Once the land is cut off by levees and cleared, it becomes as any other part of the cultivated Imperial Valley. Much of the animal life of the desert filters in following closely the harrow and the plough.

The delta, or what is left of it after hundreds of thousands of acres have been taken, is unlike anything else in this rainless land. The key is water, and relative altitudes figure here, often as measureable in inches. Some water levels are seasonal, depending on the flow of the river, which in turn is determined by the melting snows in far distant mountains. Others are tidal, which means that they vary as much as forty feet according to the phases of the moon. There are land levels too. The combination results in a multitude of local areas of diversified vegetation.

Near the mouth of the river are great fields of salicornia, a plant which is able to withstand, and even demands, regular flooding. Next in elevation are the fields of grass, the grazing-ground of migratory geese and the home of the Large-billed Sparrow. The grass flourishes under its monthly wetting, which comes with the high tides.

Then there is the typical delta jungle, of several phases. There are the areas of little water, where brush and stunted mesquite stand in larger or smaller otherwise sterile open spaces. There are the close-grown tracts of mesquite, where often the trees attain quite respectable size, verging into and encroaching upon the forests. The latter typically are of willow saplings twenty to thirty feet tall growing too closely together to admit of any but the smallest lateral branches. There are some, but comparatively few, large willows and cottonwoods. Their fickle enemies, drought and flood, are not permissive of longevity. One finds the survivors of the fierce struggle

for existence, usually in rows that are spaced quite far apart and appear to run at random. The cause lies in some obscure water way, perhaps drainage, perhaps sub-irrigation. There is apt to be a heavy undergrowth here, as in all favorable places.

Such is the delta, as fascinating, as puzzling, and as changeable as weather. Surrounded by desert and constantly fighting to preserve its identity, it is as unlike its immediate surroundings as adjoining countries well can be. Host to most of the desert birds, which seek out its arid phases as they find them here and there, still it has, from Caracaras on the north to Large-billed Sparrows on the south, its quota of birds which hereabouts do not make their homes elsewhere.

SAN PEDRO MARTIR DISTRICT

Concerning this area it must be noted that from Valle de la Trinidad at least to the foot of the Cuyamaca Mountains there is a plateau of homogeneous character. This strip is of indeterminate width. It rises gradually on the Pacific side to a minimum altitude of 4000 feet. The rainfall it receives decreases rapidly toward the east; consequently semi-arid vegetation filters into it almost imperceptibly.

Between the plateau and the floor of the Colorado Desert is another strip. This one runs along the eastern slope of San Jacinto Peak and south to the San Pedro Martir Mountains, including them both. It is the most inhospitable region in temperate North America. Generally speaking, it is a mass of barren, weather-worn rocks, piled into towering hills and spurs, or crowding the sides of abysmal cañons. It represents a fall of many thousands of feet in but a few miles. Almost devoid of plant or animal life, it is a barrier to intercourse with, or contact between, the mountains on one side and the comparatively fertile desert on the other. This strip is cut by quite a few ravines that carry the rare and intermittent rivers to oblivion in the sands below. But the courses cut by the water, however seldom it may run, have established points of contact eagerly seized by both flora and fauna.

The plateau region has a minimum width of about twenty miles. It is consistently covered with a heavy growth of the greasewood that flourishes in decomposed granite soil. There are to be considered timbered spots as well. Along the stream bottoms that slope toward the Pacific are to be found many groves of oak and borders of sycamore, with accompanying undergrowth. On the higher points are the conifers. These do not form a continuous line. They appear here and there in smaller or larger forests. Also there are the intermediate conditions, typified largely by the piñons.

It is difficult to take these parallel strips and harmonize them with any of the faunal districts already established. On the other hand, it is not desirable to make two or even one separate area of them. But I do insist that to whatever life-zone they are referred they be treated the same in California as in Mexico. Either Nelson's San Pedro Martir District should be brought north to the foot of the Cuyamacas, if indeed it do not include them, and Palomar and the Lagunas as well, or else Grinnell's San Diegan District should be extended to Valle de la Trinidad. Either alternative would satisfy geography.

We had best, I believe, accept the San Bernardino District as it stands, and the San Pedro Martir District as ending at Trinidad. The international line certainly should be erased and dropped from further consideration. Until something better is decided upon, I would regard the sterile region, apparently a regular home chiefly of the Rock Wren, as a factor of no importance other than the prime one of breaking contact between the San Diegan and the Colorado Desert districts. Farther south,

as it widens until it includes a goodly part of the Peninsula along the towering mountains, it also marks the southern end of the Colorado and the eastern limit of the San Pedro Martir districts.

The result of this procedure is to confine the San Pedro Martir District largely to the western slopes from Trinidad to the plains below San Quintin.

THE COLORADO DESERT DISTRICT

This includes all that portion of the northeastern corner of Lower California of which disposal has not already been made. The development of the farming industry has been very rapid both south and east from Mexicali. This is especially true with regard to cotton. From Volcano Lake to the Bee River and the sand hills, drainage and cultivation have brought in Imperial Valley conditions. West of Black Butte and the Hardy River the desert extends southerly in a rather narrow strip until it is pinched out by the barren lands already described. This takes place somewhere north of the peak of San Pedro Martir. We go into an area practically devoid of bird life. On the north is one desert, on the south another. But the two are as effectively separated as though a small world stood between them.

Dr. Nelson disregards this condition and carries the Colorado Desert District along the shores of the Gulf almost to the southern line of Baja California del Norte. His line runs inland fifty miles or more—to what? Certainly not to any natural boundary either of physical geography or of soil. The plant life and the climate are those of the country included in the Vizcaino Desert area.

For the present, at any rate, we can conclude only that the Colorado Desert District ends somewhere near the northeastern corner of the San Pedro Martir. A more exact determination will not come without farther exploration and the accumulation of more data.

THE VIZCAINO DESERT DISTRICT

The northern limits of this area push past both sides of the southern end of San Pedro Martir. On the east they reach the "bad lands", on the west the Sierra Agua Blanca. Farther south the Vizcaino Desert spreads across the Peninsula from shore to shore. It follows the Gulf to and beyond the southeastern corner of Baja California del Norte. On the Pacific it and the hills end together at Rosarita Point.

The area I have outlined is a desert in the sense we use the word. It is heavily overgrown in many places; but the vegetation is characterized by cactus and thorns. At Santo Domingo there is a very respectable willow bottom, and there is another at El Rosario. The bird life in these, except for the Song Sparrow, seems to be very largely that of the San Diegan District. At San Telmo and a few other spots sumach is quite abundant. It is the home of *Toxostoma redivivum helvum*. Below San Antonio del Mar, and more especially in the neighborhood of San Quintin and to a limited extent at El Rosario, we have marsh conditions similar to those of San Diego County. On some of the higher plains cactus is rare, being replaced with sage and thorns. There are regions of no small size that suggest the beds of old alkali lakes. On the whole, however, the most distinct impression brought home by one who visits this country is of the veritable jungle of cacti.

Some of the desert plants, the sahuaro and the cirio, for example, are directly responsible for the presence of the woodpeckers and screech owls. Others, the low-growing species, afford homes to thrashers and wrens, to shrikes and house finches. Mile after mile, as one drives through the valleys or over the mesas, the landscape remains substantially unchanged. It differs in appearance, in vegetation, in life conditions, from anything in the United States.

Dr. Nelson has placed the dividing line between this district and the San Diegan at El Rosario River; but that is nearly a hundred miles too far south. The debatable area has no characteristics separating it from the Vizcaino Desert. On the contrary it is as much part and parcel of it as any other portion of this great expanse. There is no break at El Rosario. If the San Diegan District extends that far it must also reach at least to the borders of Baja California del Sud. For as one progresses southward the character of the landscape presents merely the changes to be expected of gradually increasing aridity. On both sides of the peninsula, as a rule, there is little vegetation for the first few miles inland. But the cactus belt, it might almost be called the cirio belt, is always present in the interior and does not break until the mountains end. Follow either coast or cross the mainland where you will, the one outstanding fact that will impress itself upon you is the homogeneity of this great sweep of territory.

It is noticeable that the bird life shows that isolation from the Colorado Desert is more ancient and much more complete than from the San Diegan District. A few striking examples, such as the gnatcatchers, the shrikes and the quail, emphasize this point more strongly than compiled lists. One would naturally expect the two deserts to merge into each other. The reason they do not, it seems to me, is to be found in the ancient shore line that encircles the Imperial Valley.

THE SAN DIEGAN DISTRICT

The western border of this district is the Pacific Ocean. I have attempted to establish an intermittent littoral strip along the coast to be added to the Coronados and especially the Todos Santos islands. Neither group is far enough from the mainland to secure isolation through distance. The open water is perhaps some six miles in one case and two in the other. The vegetation, nor as far as I have been able to observe, the conditions of life on the adjoining coast, is not sufficient excuse for the existence of strictly insular types. But the evidence obtained from bird life is inconclusive that I have dropped the idea. Nevertheless this is done with reluctance and with a feeling that the alternative, the carrying of the San Diegan District throughout its length to the water, rings a discordant note.

Otherwise the extension of the San Diegan District into Mexico is marked with few basic changes. Near Ensenada, both north and south, the Upper Sonoran plateau approaches much more closely to the ocean than the same zone does in California. There are many places, indeed, marked with such high and precipitous cliffs that severing of the Lower Sonoran is complete. This is virtually true of the southern seventy miles, except the Ensenada Bay region. In the interior the valleys incline to be more arid than those with which we, in Upper California, are familiar. There are places where Antelope Valley seems to be reproduced. Mesquite and the Joshua tree become more abundant, the cacti larger and coarser, while the sycamore is found less often than the cottonwood.

On the other hand most of the varied aspects of southwestern California are reproduced without change. I do not know a single instance of a bird which nests in San Diego County that could not reasonably be expected to be found in Lower California. In fact there are almost none I have not found. The converse also is true, if my limits be accepted. The San Diegan District contains almost no known breeders in its Mexican extension that have not been found in the United States.

There is no graduated merging of the San Diegan into other districts as one progresses southwards. Ensenada is surrounded by mountains; it is in a little pocket. The setting is typically San Diegan. So it is at Santo Tomas, even at San Vicente—and the pure Vizcaino desert is only twenty miles away.

The assumption that "somewhere below the line the two intergrade" has been made of many subspecies in ornithological literature and has seldom been sustained by facts. Nothing but disappointment awaits the explorer who expects any substantial change in the first hundred miles below the line.

THE ISLANDS

The Coronados and Todos Santos islands are clearly a continuance of Dr. Grinnell's Santa Barbara Channel group. Guadalupe is important enough in its tragic history to be assigned a district of its own. San Martin and San Geronimo islands, together with the small islets and rocks that lie in the Pacific near the Vizcaino Desert, had best be included within that district. They are the homes of sea birds and of a few rather unimportant endemic forms of life. Their choice by the sea birds is more a matter of soil condition than of geography. San Martin is a solid volcanic mass with comparatively little soil, just enough, apparently, to permit of a rather generous growth of sage and ice-plant. San Geronimo, on the other hand, is soft, with perhaps half its area barren. Its rocks are weathered and some of its cliffs have crumbled. Naturally it is preferred by burrowing birds and crevice nesters to its stern northern neighbor.

The other islands of the Pacific, notably Cedros and the Benitos, are included within the district next to be described. There remain, then, those islands in the Gulf of California that lie within the political boundaries of Baja California del Norte. It would seem at first as if they, too, should be referred to the Vizcaino Desert; for with one exception, in the San Luis Archipelago, they have no known endemic birds, and with them, too, their selection by breeding water birds seems largely a matter of finding suitable physical conditions coupled with freedom from vermin.

It is only when the breeding birds on the two sides of the Peninsula are compared that one realizes how ancient and complete is the barrier. It is true that there are to be found eight genera of water birds which are common to both seas. Even this statement must be made with hesitation, for as far as I am aware no adequate comparisons have been made to ascertain whether or not these eight are in fact identical. There are seventeen species which nest commonly on the islands of one side of Baja California del Norte and not on the other. A strip which narrows to fifty miles with no considerable elevation would hardly account for this.

Distinct species and subspecies still more emphasize the necessity of separate insular districts. For example, the Southern Western Gull (*Larus occidentalis wymani*) is found the full length of the Vizcaino Desert on the west, while some form of gull which, for want of fuller information, is called *Larus occidentalis livens*, breeds south to the 28th parallel in the Gulf. Xantus Murrelet (*Brachyramphus hypoleucus*) and Craveri Murrelet (*B. craveri*) add a last and most convincing touch, for the breeding ranges of the two are separated absolutely by the Peninsula.

There is one important point which must not be overlooked. Complications will enter into this comparatively simple scheme of dividing the islands when the waters of Baja California del Sud are reached. It is not within the field of this paper to enter upon such problems, other than to draw attention to their existence and to the fact that in the end they do not weaken the divisions here made.

SAN IGNACIO DISTRICT

From Point Rosarita to Point Pequeña I have drawn a line following the base of the mountains, roughly the hundred-foot contour. Since a considerable area is thus included it must of course be an almost level country. It has, not long since, been an ocean bed. In fact emergence is not yet complete, as witness the large and

numerous sloughs. Over its surface are scattered shells, some fossil, but many recent. The salt is strong in the soil, and the vegetation low and scanty. It is a region of fierce and long continued winds which tear down and rebuild veritable mountains of sand. I have named this district after its principal central settlement.

As but a small triangular corner of the San Ignacio District enters Baja California del Norte on the mainland, what concerns us chiefly is the geographical picture when this portion of the earth's surface was under the waters of the Pacific Ocean. I have outlined on the map a series of the probable islands. At that time this district was an archipelago which included Cedros, the Benitos, and perhaps a part of Natividad. It was also the channel between the ocean and the gulf that greatly reduced the size of Baja California del Sud and made of it one or more great islands—a condition which would seem to explain nearly all the peculiarities of faunal distribution between the two territories.

One of the most interesting fields now open to ornithological research, and one which I hope soon to explore, is comprised in these ancient islands. How far did they develop endemic bird and mammal life and how far did they retain such developments? Especially how complete, during the centuries, has been the isolation and how far has life crossed the great salt flats? If there has been an interchange of influence, from which side did it come?

San Diego, California, June 6, 1926.

THE CALIFORNIA FORMS OF *AGELAIUS PHOENICEUS* (LINNAEUS)

WITH FIVE ILLUSTRATIONS

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THE present paper, the first part of a proposed general revision of the forms of *Agelaius phoeniceus*, deals primarily with the distribution of the various Californian races during the breeding season. Winter ranges are touched upon only casually; for the comparative scarcity of winter record stations, particularly in the north, precludes the possibility of satisfactorily outlining the winter distribution of the subspecies even in the restricted area which is under survey at the present time.

A word of explanation regarding the individuals which are here classed as breeding birds is in order. In most cases the term is applied to birds known either to be actually nesting in a certain area, or to be about to do so. In addition, a certain small proportion of males taken prior to the breeding season is included in this category. The males of most and probably all of the western forms of *phoeniceus* select and mount guard over the future nesting sites, while the females are still drifting about the country in irresponsible flocks. These "established" males have been used in all cases where the experience and discrimination of the collector has been sufficient to give value to his opinion. Another and still smaller class includes the birds of both sexes which unequivocally represent the resident form and which are present during the proper season in the breeding metropolis of the race, but which through one cause or another chance to be non-breeders. These are principally one-year-old birds, many of which fail to breed at this age. In some cases these birds have been used; in others they have been ignored, as circumstances dictated. A considerable number of the specimens examined have no indication on their labels as to whether or not they were breeding.