

AVIFAUNAL AREAS

KNOWLEDGE of the climatic zones and the biota of Sonora has increased greatly since Hinds, in 1843, included the State in his "Chihuahua Region" of vegetation. But not even Baird, Allen, and Merriam were fully aware of the abrupt variations in climate, flora, and fauna which approximate in complexity those of California more nearly than is the case in any other Mexican state. Pioneers in the recognition of the diversity of these features were Mearns in the north and Goldman in the south, but even as late as 1910, the "Fourth Provisional Zone Map of North America" as published in the third edition of the American Ornithologists' Union Check-list failed to recognize that the arid division of the Lower Tropical zone covers a large part of southern Sonora. That it does so is now realized by most botanists and by zoologists generally. The most recent attempts to divide Sonora into biotic or zoological faunal areas or "provinces" have been made by van Rossem (1931c; 1936d), Burt (1938), Dice and Blossom (1937), and Dice (1939). Among these individuals there is reasonably close agreement (save unfortunately in terminology) as concerns the larger divisions. As to details there is considerable disunity, some of which may be due to disproportionate degrees of activity but more, I suspect, to the understandable tendency to put special emphasis on a particular field and to dismiss or gloss over contradictory evidence provided elsewhere. For that matter there is never likely to be complete harmony as to the limits of faunal areas or districts when different media are employed in their delineation, except in cases of insular or other sharply limited territory. These, perhaps trite, remarks are to stress the fact that the map here given (Frontispiece) is based on the distribution of bird life as it is known to me at this time. In other words it is an *ornithological* map, the boundaries of which in some details coincide and in others do not with a mammalian or other map of the same region. I believe it safe to say, however, that the boundaries here given agree more closely with climatic zones and their characteristic vegetations than do the boundaries for mammals, if one may judge by Burt's account.

Five major avifaunal land areas or "provinces" contribute in varying degree to the ornithological make-up of the State. For these areas I employ, tentatively, the names used by Burt, Dice, and Blossom, not because of agreement either as to appropriateness or significance in all cases but in the interest of concordance so far as is possible at this elementary stage in studies of the biota of northwestern Mexico.

THE SONORAN is the southern continuation of the desert avifauna of southwestern Arizona, southeastern California, and northeastern Baja California and lies wholly within the Lower Sonoran zone. Differentiation centers or districts now apparent are the Yuma District which is more or less the equivalent of the Western Desert Tract of Mearns (1907) and the Colorado River District of Grinnell (1928), and the Tucson District which, northerly, is the western part of Mearns' "Elevated Central Tract." The former centers mainly in the delta of the Colorado but extends eastward in dilute form to about longitude 113° and around the head of the Gulf at least to Puerto Lobos and probably to Puerto Libertad. The latter covers the remainder, and by far the larger portion, of the Sonoran area within the State. Topographically, the whole of the Sonoran is undulating desert, broken frequently and irregularly by low, barren mountains of no particular directional trend. Aside from the Río Colorado no streams or rivers reach the sea except as seepages or for short periods following flash floods.

THE SINALOAN is the northern extension of the Arid Lower Tropical avifauna of Sinaloa. Although by no means all of the members characteristic of that area or "province" reach Sonora, a large proportion of them do so and in families, genera, species, and races, this southern area is abundantly distinct from the Sonoran. As in the case of the Sonoran there are two known differentiation centers. The Alamos District (in part of van Rossem, 1931c) comprises all of the lowlands south of the Sonoran and projects northward as a narrow strip along the coast to Sargent Point and as tongues up the interior river valleys nearly to latitude 30° . It is probable that exploration will reveal more extensive interdigitation with the Apachian than has been ascertained to date. The Tiburón District is limited to Tiburón Island. Although Sonoran aspects predominate in other fields, ornithologically it is more properly a division of the Sinaloan and is here so considered. Physiographically the Sinaloan is not unlike the Sonoran but the climate is more humid and the vegetation infinitely more varied and abundant. Because of the narrower width of the coastal plain and the greater drainage from the interior mountains two major rivers, the Mayo and Yaqui, reach the sea at most periods of the year. Mergence with the Durangan occurs at about 2000 feet and with the Apachian at somewhat lower altitudes.

THE APACHIAN, in part the "Elevated Central Tract" of Mearns, is the southward continuation of the avifauna of southeastern Arizona and extreme southwestern New Mexico, or rather it more properly may be said

the designated portions of those states are the northern extension of what is primarily a Mexican faunal area or "province." It occupies practically the whole of the northeastern fourth of the State, is of high average elevation, and for the most part is broken and mountainous. Toward the north along the International Boundary the terrain consists of broad, level plains which are interrupted by short mountain ranges of a general north-south trend. Upper Sonoran and Transition are the dominant zones, although the Canadian is present at the higher elevations. Mergence with the Tucson District of the Sonoran is abrupt and well defined northerly but specific information is not available for more southerly portions. There is considerable doubt as to the advisability of recognizing the Apachian and Durangan as major divisions, at least so far as concerns ornithology. They appear to me, rather, as well-defined differentiation centers or districts of the Sierra Madre Occidental and such, I believe, will be their eventual evaluation.

THE DURANGAN, which has been presumed to center in the State of Durango in the Sierra Madre Occidental, occupies the relatively limited mountainous area above 2000 feet in southeastern Sonora south of the low ground along the east-west course of the Río Yaqui. It differs from the Apachian chiefly in being more continuously mountainous and the drainage consists, in the main, of cañons rather than of plains or river valleys. The climatic and plant zones represented are Upper Sonoran and Transition with some Canadian undoubtedly present in the region about Yécora. Part of the Upper Sonoran, southerly, should perhaps be referred to the Arid Upper Tropical since it is normally frostless. Gentry (1942) considers the plant life in the Río Mayo basin to be "Subtropical" between about 1500 and 3000 feet and "Upper Sonoran" between 3000 and 5000 feet. It seems evident that botanically this region is of mixed characteristics zonally and the avifauna follows the same pattern rather closely.

THE SAN LUCAN, a term coined by Dice for the southern three-fourths of Baja California, is used with extreme reservation. If employed here it does not imply acceptance of the proposal to recognize Baja California as a separate "Biotic Province" but to emphasize the character of the avifauna of San Estéban Island. This island which lies almost exactly in mid-Gulf is a political accident so far as the present report is concerned for only one bird, a thrasher, belongs to the Sonoran mainland avifauna. So far as is known at this time all the other indicative resident races (except for an *Amphispiza*) are those of Baja California or more particularly of the San Ignacio District (of Grinnell, 1928).

MARITIME SPECIES. The preceding summary of land areas takes no account of the maritime species, the affinities of which must necessarily be considered on an oceanic basis. Although the greater number are of general west-Mexican distribution or are winter visitants or transients from other regions, it is readily apparent that the Gulf of California is a highly developed area of speciation which possesses a considerable number of differentiates of generic, specific, and subspecific rank. Some of these extend north along the Pacific coast of Baja California for varying distances but the majority are confined during the breeding season to islands lying in the Gulf, the southern limit of which is commonly considered to be between Cape San Lucas, Baja California and Cape Corrientes, Jalisco. I do not think it desirable to suggest a distinctive name at this time or until further studies of the area, now in progress, are completed.

DISTRIBUTIONAL SYNOPSES OF THE SPECIES

THE FOLLOWING ACCOUNTS of the distributions of the 532 species and subspecies of birds which are known at present to occur in Sonora are summarized from existing literature, previously unrecorded specimens in certain collections, unpublished notes, and field observations contributed by various persons. First instances of record and the amount of attention a species has subsequently attracted, in a local sense, is evident from the included bibliography.

In many cases there is a lamentable lack of information from critical areas as regards endemics. A considerable additional number of regular migrants and winter visitants undoubtedly will be detected as knowledge of the bird life of the State increases, and the number of "accidentals" may be expected to increase materially. These last, though, cannot alter the basic existing ornithological make-up of the State and are distinctly of secondary interest.

Many of the forms included in the present report are beyond the scope of the American Ornithologists' Union "Check-list." In consequence it has been desirable to follow the International code of nomenclature rather than that of the American Ornithologists' Union, a procedure which is in conformance with the practice of many American ornithologists when dealing with areas south of the United States. As a result, several generic names are at variance with those found in the "Check-list," such as *Bucephala* for the Bufflehead, *Oxyura* for the Ruddy Duck, *Micrathene* for the Elf Owl, *Hylatomus* for the Pileated Woodpecker, *Dendrocopos* for the Hairy and certain other woodpeckers, *Contopus* for the Wood Pewees, *Eremophila* for the Horned Larks, *Campylorhynchus* for the Cactus Wrens, *Parula* for the Parula Warblers, and *Chlorura* for the Green-tailed Towhee. Under the same rules the family name of the Wood Warblers becomes *Parulidae*.

The sequence of Wetmore's "A Systematic Classification for the Birds of the World" is followed for the higher groups. Generic and specific arrangements are those of Peters' "Check-list of Birds of the World" or Hellmayr's "Catalogue of Birds of the Americas"; but since neither of these is complete it is not possible to follow one exclusively. Departures from the nomenclature of these two works will be noticed but they are rare and reflect in most cases personal opinion only.