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NOTES ON PEARL ISLANDS ORNITHOLOGY

BY ROBERT CUSHMAN MURPHY

DURING my expedition in the schooner 'Askoy,' under the auspices of the American Museum of Natural History, thirteen stations, chiefly marine, were worked in the vicinity of the Pearl Islands, Gulf of Panama. The dates were February 9-15 and May 23-26, 1941. A general statement on the expedition has appeared in *Science* (94 (no. 2429): 57-58, 1941) and other reports have been published, are in press, or are in preparation.

The birds collected by Mr. Jose G. Correia and the writer were mostly sea fowl, which are being studied in connection with specimens obtained elsewhere on the expedition. In addition, forty-seven examples of land and shore birds, which are the subject of this note, were collected at four islands of the archipelago, namely, Pacheca (at the northern end), Saboga, La Vivienda (an outlier of Bayoneta), and El Rey or San Miguel (the main island). Our San Miguel specimens were all taken in the Santelmo Bay district, at the south end of the island.

The principal sources of ornithological information about the Pearl Islands are the reports of Thayer and Bangs (*Bull. Mus. Comp. Zoöl.*, 46: 137-160, 1905), and of Rendahl [*Arkiv för Zoologi*, 13 (no. 4): 1-56, 1920]. The latter author lists all the birds, resident and visitant, known up to his date of publication, a total of 100 species. The list has since been slightly increased by scattered records, all but a

few of which have been noted by Hellmayr (*Catalogue of Birds of the Americas*). Murphy (*Oceanic Birds of South America: 320-322, 1936*) has published a concise account of the archipelago and a chart showing all the islands.

The group numbers sixteen main islands and more than fifty islets, but San Miguel has a greater area than all the rest together. They are rocky and mostly wooded. The appearance of the vegetation differs markedly, nevertheless, from island to island, a fact probably due to the varying facilities for a standing water table in the soil during the long annual dry season of Pacific Panama. Not every island is inhabited by man, even where circumstances appear favorable.

The bird life presents similar discrepancies. As Rendahl has pointed out, several Isthmian families are lacking in the archipelago, despite its closeness to the mainland. On the other hand, flycatchers are represented by so many species that they make up a relatively high proportion (± 15 per cent) of the avifauna.

Yet there are wooded islands with few or no flycatchers—Contadora, for example—even though they are separated by only narrow straits from islands abounding in flycatchers, dipterid insects and standing water. The ecological controls are thus extraordinarily evident and graphic. No doubt they actually determine also the distribution of the human inhabitants to a far greater degree than the legendary explanations current in the archipelago. The large, green island of San José, for example, has no settlements because it is "haunted." Incidentally, it appears to support a perennial plague of mosquitoes, from which certain other islands are wholly or largely free.

The diversity of the islands could not be clearly apparent to naturalists without personal experience in the field. Thayer and Bangs, for example, refer to Saboga as the "bird rock" of the archipelago, whereas this island is probably the most luxuriant of all the larger members, and is exceptionally green and moist over much of its area, even throughout the dry season.

Mr. Correia, who has traveled much among the central and western Pacific archipelagoes, remarked frequently upon the striking superficial resemblance of the Pearl Islands to the Tonga group.

The following brief list may be of interest because of its extension of the insular ranges of several birds, its implications as to taxonomy and nomenclature, and its hints concerning the incidence of the breeding periods. In the latter connection it should be remembered that in February the dry season is in full sway, while in late May the wet season is just beginning.

BLACK VULTURE, *Coragyps atratus foetens* (Lichtenstein).—♀, Pacheca, February 10.

Rendahl refers to "*Catharista urubu*," seen at Saboga, Bayoneta, and Señora, but lists no specimens. There is some doubt about the validity of this race, the type locality of which is Paraguay (Cf. Friedmann, Proc. Biol. Soc. Wash., 46: 187, 1933).

We observed also the Turkey Vulture (*Cathartes aura* subsp.?) at San Miguel and Pacheca, and collected one example which was unfortunately tossed overboard because of its offensive odor. It seems never to have been recorded from the Pearl Islands.

PEARL ISLAND HAWK, *Buteo magnirostris alius* (Peters and Griscom).—♀, with enlarged ovaries, San Miguel, May 23.

PEARL ISLAND CARACARA, *Milvago chimachima cordatus* Bangs and Penard.—♂ and ♀, with enlarged gonads, San Miguel, February 14; ♂, La Vivienda, May 23.

The discrepancy in size between the sexes is very marked.

AMERICAN OYSTER-CATCHER, *Haematopus palliatus palliatus* Temminck.—♂ and ♀, observed and collected as a pair, Pacheca, Feb. 10.

A group of four was seen at Santelmo Bay, San Miguel, on Feb. 14.

Both our specimens have white proximal primary shafts. In this, and in all other respects, they are identical with birds from the Atlantic and Gulf coasts of North America (Cf. Murphy, *Oceanic Birds of South America*: 974-975, 1936).

RED-WINGED DOVE, *Columbigallina talpacoti rufipennis* (Bonaparte).—♂, Saboga, February 12.

SMOOTH-BILLED ANI, *Crotophaga ani* (Linnaeus).—♀, La Vivienda, May 23.

RINGED KINGFISHER, *Megaceryle torquata torquata* (Linnaeus).—♀, with enlarged ovaries, San Miguel, February 14; ♀, La Vivienda, May 23.

SAN MIGUEL WOODPECKER, *Centurus rubricapillus seductus* (Bangs).—♂ and ♀, San Miguel, February 14, both with enlarged gonads; ♀, La Vivienda, May 23.

BERLEPSCH'S KINGBIRD, *Tyrannus melancholicus chloronotus* Berlepsch.—Eight specimens, four of each sex: Saboga, February 12, May 25; Pacheca, February 10; La Vivienda, May 23. One of the May females had enlarged ovaries.

This kingbird is a conspicuous form of islets and ocean fronts southward at least as far as Gorgona Island, Colombia. Our specimens from Gorgona, and from intermediate stations, agree with Pearl Island examples.

ZIMMER'S FLYCATCHER, *Myiodynastes maculatus difficilis* Zimmer.—♂ and ♀, the former with much enlarged gonads, Saboga, February 12.

PANAMA FLYCATCHER, *Myiarchus ferox panamensis* Lawrence.—2 ♀, La Vivienda, May 23.

BRAN-COLORED FLYCATCHER, *Myiophobus fasciatus furfurosus* (Thayer and Bangs).—♂, with enlarged gonads, La Vivienda, May 23.

SMOOTH FLYCATCHER, *Sublegatus glaber glaber* Sclater and Salvin.—♂, with enlarged gonads, La Vivienda, May 23.

SAN MIGUEL BANANAQUIT, *Coereba flaveola cerioclunis* Bangs.—♂ and ♀, both in breeding state, Saboga, February 12.

FLESH-LEGGED HONEY-CREEPER, *Cyanerpes cyaneus carneipes* (Sclater).—4 ♂, all with much enlarged gonads, Saboga, February 12.

PROTHONOTARY WARBLER, *Protonotaria citrea* (Boddaert).—♀, Pacheca, February 10.

PANAMA GOLDEN WARBLER, *Dendroica petechia aequatorialis* Sundevall.—3 ♂, Saboga, one February 12, the others May 25. Only one of the May birds had enlarged gonads.

BALTIMORE ORIOLE, *Icterus galbula* (Linnaeus).—♀ immature, Saboga, February 12.

NORTHERN BLUE TANAGER, *Thraupis episcopus diacona* (Lesson).—2 ♀, Pacheca, February 10; ♂, 2 ♀, Saboga, February 12, May 22 and 25; ♀, La Vivienda, May 23.

Two of the May birds had enlarged gonads.

PEARL ISLAND TANAGER, *Ramphocelus dimidiatus limatus* Bangs.—♂, with greatly enlarged gonads, Saboga, February 12.

PEARL ISLAND SALTATOR, *Saltator albicollis speratus* Bangs and Penard.—♂, Saboga, February 12.

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SEX RATIOS OF DUCKS IN SOUTHWESTERN WASHINGTON

BY JAMES R. BEER

THIS study of the sex ratios of ducks in southwestern Washington covers the periods of fall migration, winter residence, and spring migration. Due to the late date at which some of the ducks complete the molt to adult plumage, most of the data were obtained during the winter and spring periods.

The object of this survey is to determine the make-up of the populations of the various species that use this portion of the Pacific flyway. A qualitative survey of the duck populations is as important to the