

A REVIEW OF THE AVIFAUNA OF THE TRES MARIAS ISLANDS, NAYARIT, MEXICO

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The Tres Marias Islands lie between fifty and sixty miles from the west coast of México between latitude 21° and 22° N and are part of the state of Nayarit. The group is composed of four islands, San Juanito, María Madre, María Magdalena, and María Cleofas, which in that order lie in an approximate northwest to southeast line. The first recorded biological observations made on these islands were those of William Dampier (1729); however, no further investigations were made until the last hundred years, in which period the islands have been visited by biologists approximately twenty-five times, starting with the visits of A. J. Grayson in the years 1865 to 1867 (Grayson, 1872).

Good general descriptions of the biotic and abiotic features of the Tres Marias have been made in connection with studies on the geography and geology (Hanna, 1926; Zweifel, 1960; and Melendez, 1960), the flora (Ferris, 1927), and the fauna (Nelson, 1899; Stager, 1957).

From 1957 to 1963 the University of British Columbia has had at least one party on the islands each year. The dates of the visits are: March 29–April 3, 1957; February 14–26, 1958; February 20–April 5, 1959 (not continuously); February 23–March 4, 1960; February 23–March 25, and August 4–8, 1961; March 6–12, June 23–30, and July 28–August 1, 1962; March 18–19, April 21–27, and June 19–26, 1963.

Even though much of the biological activity was directed toward the fishes, birds were collected and observations were made on each visit.

The purpose of this paper is to bring up to date the information on the avifauna of the islands, which was last dealt with by Stager (*op. cit.*).

THE BREEDING BIRDS

Stager (*op. cit.*) listed 40 species as breeding in a total of 88 recorded on the islands. The majority of visits to the islands have been made in the months from February to May inclusive, which has permitted the visitors to observe the breeding of the sea birds, hawks, parauque, and parrots and one or two other land birds. Observations in June, July, and August suggest that the majority of the land birds breed in the latter two months following the onset of the rainy season in late June. Previously only G. Vanderbilt and A. Forrer visited the islands in these two months, and neither reported upon the breeding of the birds. Therefore, until now, the breeding status of the land birds has been inferred from numbers, distribution, and behavior in the nonbreeding season. Our more extensive studies have substantiated the breeding status of most of those species. The species for which some evidence of breeding was obtained are indicated in the check-list on pages 224 to 226. Occupied nests of most of the passerine bird species were found.

Three species have been added to the breeding list. Cowan found an occupied nest, with eggs, of the Yellow-crowned Night Heron (*Nyctanassa violacea*) on María Magdalena in March, 1962. In June, 1963, Grant found the Mangrove Cuckoo (*Coccyzus minor*) nest building and the Northern Beardless Flycatcher (*Camptostoma imberbe*) paired, singing, and displaying. A male of the latter species was collected in breeding condition. This inconspicuous species may have been overlooked by most previous visitors to the island. Nelson (*op. cit.*) attributed its presence in the first half of May to a migration. Heilfurth (1938), who stayed on the islands from May 25 to June 22,

1930, did not record it at all, which may mean that it has only recently become a breeding resident of the islands.

Two other species may also breed. The Hook-billed Kite (*Chondrohierax uncinatus*) was recorded by Stager (*op. cit.*). On June 23 and 28, 1962, two different birds were seen in the same arroyo on María Magdalena; in plumage these corresponded to the descriptions of the male (gray phase) and female (brown phase) in Blake (1953). Again two birds were seen on June 20 and 22, 1963, although none had been seen during the week spent on María Magdalena in April of that year. The Lesser Nighthawk (*Chordeiles acutipennis*) may breed on María Madre; G. Vanderbilt recorded "young" in July (Bond and de Schauensee, 1944). The species was first collected in 1897 by C. L. Herrick, but it has been seen by only one of our parties.

Our observations of the breeding passerines on the islands, and of the same species breeding at Tepic, San Blas (at approximately the same latitude as the islands), and at Puerto Vallarta on the mainland, suggest a later breeding season on the islands. The degree of fat deposited and the development of the gonads at various times in the summer support this contention. This will be dealt with more fully in a later publication. Possibly the reason for the retarded breeding season on the islands is to be found in the response of the deciduous trees to the rainfall in June and July.

MIGRANTS AND ACCIDENTALS

The pattern of occurrence of charadriiforms, ciconiiforms, and falconiforms has not been studied as critically as that of the other land birds. Therefore, the following remarks apply only to the latter group.

At the end of the summer the Tropical Kingbird (*Tyrannus melancholicus*) and the Yellow-green Vireo (*Vireo flavoviridis*) leave the islands. The White-winged Dove (*Zenaida asiatica*) and the Wied Flycatcher (*Myiarchus tyrannulus*) may also leave, although local changes in distribution of the latter could account for its apparent absence in some years (winters of 1957, 1958, 1962, 1963).

To date 31 species and subspecies of passerines have been recorded as winter residents, transients, or accidentals, as a result of 19 surveys (table 1); however, very few specimens have been subspecifically determined. Of these 31 species, two, the Boat-tailed Grackle (*Cassidix mexicanus*) and the White-collared Seedeater (*Sporophila torqueola*), are referred to as residents on the Pacific coast in Part II of the Mexican Check-list (Pac. Coast Avif., 1957), and their occurrence on the Tres Marias can be considered as accidental. The rest migrate on the mainland, and their presence on the islands is considered to be the result of such movement. This even applies to the Vermilion Flycatcher (*Pyrocephalus rubinus*) which has been described as a partial migrant (Phillips and Amadon, 1952). The question arises, are any of these occurrences on the islands sufficiently regular for the species concerned to be considered winter residents rather than transients? Unfortunately the collecting on each survey contains considerable bias, which varies from one visit to the next. The following factors are considered to contribute to this bias: place and length of visit, time of the year, experience of the collector, success in collecting, and relative abundance and conspicuousness of the species. The results of these visits thus cannot be expected to give a very reliable answer to the foregoing question. However, it seems likely that a species recorded on at least half of the visits during the nonbreeding period will be a winter resident: only the Western Flycatcher (*Empidonax difficilis*) qualifies on this basis (see table 1). This judgment is reinforced by the fact that this species is also the most abundant of the visitors (for example, in 1961, 11 specimens were collected).

Another approach is to consider more specifically the months in which the tran-

TABLE 1
DETAILS OF OCCURRENCE OF NONBREEDING PASSERINE SPECIES

	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	No. visits on which recorded
<i>Pyrocephalus rubinus</i>	x ¹								1
<i>Empidonax difficilis</i>	x	4 ♂ 2 ♀		5 ♂ 7 ♀	x	1 ♀			10
<i>Contopus sordidulus</i>						1 ♂			1
<i>Hylocichla ustulata</i>	x	2 ♂		1 ♂	1 ♀	1 ♂ 1 ♀			5
<i>Anthus spinoletta</i>				1 ♂ 2 ♀					1
<i>Vireo solitarius</i>					1 ♀				1
<i>Vireo gilvus</i>			1 ♂	x	1 ♀				3
<i>Mniotilta varia</i>			2 ♂	x	x				4
<i>Vermivora celata</i>				1 ♂ 1 ♀					2
<i>Dendroica petechia</i>					1 ♂	5 ♂ 1 ♀			4
<i>Dendroica auduboni</i>			1 ♀	1 ♂	x	1 ♀			5
<i>Dendroica nigrescens</i>				3 ♂					3
<i>Dendroica townsendi</i>					1 ♂	1 ♀			2
<i>Seiurus aurocapillus</i>			2 ♂		x	1 ♂ 1 ♀			5
<i>Seiurus motacilla</i>								1 ♀	1
<i>Seiurus noveboracensis</i>			1 ♂	3 ♂ 1 ♀					5
<i>Wilsonia pusilla</i>						1 ♀			2
<i>Oporornis tolmiei</i>					x				1
<i>Setophaga ruticilla</i>			1 ♂						1
<i>Molothrus ater</i>					1 ♂				2
<i>Cassidix mexicanus</i>						x			1
<i>Piranga ludoviciana</i>					3 ♂ 1 ♀	3 ♂			3
<i>Pheucticus melanocephalus</i>					1 ♀		1 ♀		2
<i>Passerina cyanea</i>							1 ♂		1
<i>Passerina versicolor</i>				1 ♂	1 ♀				2
<i>Passerina ciris</i>			x	1 ♂	1 ♀				2
<i>Carpodacus cassinii</i>						1 ♂			1
<i>Sporophila torqueola</i>								x	1
<i>Zonotrichia leucophrys</i>	1 ♂								1
Monthly totals of all sexed individuals ²	1 ♂	13 ♂ 3 ♀	17 ♂ 11 ♀	6 ♂ 7 ♀	12 ♂ 7 ♀	1 ♂ 1 ♀	1 ♀	

¹ These, together with the June record of *Pheucticus melanocephalus* and the April record of *Passerina versicolor*, constitute the sight records.

² Sexed individuals were collected (except *Pheucticus melanocephalus* in June and *Passerina versicolor* in April).

sients are recorded: unfortunately surveys have been made mostly in February, March, April, and May, at a time when northward migration is taking place on the mainland. Nevertheless, the records of the Western Flycatcher and the Swainson Thrush (*Hylocichla ustulata*) span five months, and those of two others, the Audubon Warbler (*Dendroica auduboni*) and the Oven-bird (*Seiurus aurocapillus*), cover a period of four months. On these grounds the first two species are considered regular winter residents, and the other two at least occasional winter residents. An arbitrary line is thus drawn between these four and the others which are transients. Some of the latter, for example, Yellow Warblers (*Dendroica petechia*) have been recorded several times, in moderate numbers and in two consecutive months only, suggesting regular migration at this time of year. For other species the records are more dispersed among the spring months and further investigations are needed to confirm their status.

Table 1 also shows the sexes of the individuals collected or reliably identified by plumage in the field. Males have been recorded approximately twice as frequently as

females. Migrants are not singing and it seems unlikely that differences of plumage and behavior between the sexes can account for this result. Our data indicate that males in transit reach the islands earlier and more often than females; data from the Tres Marietas islands indicate the same (Grant, MS).

Where possible, subspecific identification has been attempted. An examination of the breeding grounds of the transients shows that they are mainly in the west of North America, as would be expected. However, the Oven-bird (*Seiurus aurocapillus cinereus*), the Indigo Bunting (*Passerina cyanea*), and the Painted Bunting (*Passerina ciris pallidior*) have a more central distribution in summer, and the Black-and-white Warbler (*Mniotilta varia*) and the Louisiana Waterthrush (*Seiurus motacilla*) are clearly eastern species. Their presence on these islands and the Marietas is therefore a little surprising (see also Phillips, 1961).

CHECK-LIST OF THE BIRDS OF THE TRES MARIAS

The most comprehensive list of the birds of the islands was published by Stager (1957). However, he did not consult all the references to these islands in the ornithological literature, and his list was therefore incomplete; also subsequently more records have been obtained.

In compiling the present check-list the validity of the records presented by Stager was accepted, with the exception of one species the Yellow-crowned Elaenia (*Myiopagis (Elaenia) viridicata jaliscensis*); a taxonomic study in progress indicates that the two specimens which have been attributed to this subspecies are more likely to be large members of the insular race. Part I of the Mexican Check-list (Pac. Coast Avif., 1950) lists in error the Red-footed Booby (*Sula sula websteri*) and the Sooty Tern (*Sterna fuscata crissalis*), presumably following Nelson (1899). Nelson's description of the booby clearly applies to the Brown Booby (*Sula leucogaster nesiotus*) and the latter, together with the Black Petrel (*Oceanodroma melania*) and Wedge-tailed Shearwater (*Puffinus cuneatus*), have never been known to land on any of the islands. Heilfurth (1938) refers to the Lilac-crowned Parrot (*Amazona finschi*) on María Madre: this may have been introduced to the penal colony there as a caged bird, and subsequently escaped, and therefore it has been omitted from the list.

In the list which follows, species not collected are marked with * in front of the name; additions to Stager's list are signified by †. One + in tabulation by island simply means a record. A second + indicates that this species has been observed breeding in the last seven years, and (+) refers to a past record of breeding not supported by recent observation. The symbols under the heading of status refer to the following: B=Breeding; WR=Winter Resident; M=Migrant; A=Accidental.

	Juanito	Madre	Magdalena	Cleofas	Status
<i>Phaëthon aethereus mesonauta</i>	++(+)	+(+)	+(+)	++(+)	B
<i>Pelecanus occidentalis californicus</i>	+(+)	+	+	+(+)	B
<i>Sula nebouxii</i>	++(+)			++(+)	B
<i>Sula leucogaster</i>	+(+)			+(+)	B
<i>Fregata magnificens rothschildi</i>	+(+)		+	+(+)	B
<i>Ardea herodias</i>	+	+	+	+	WR
†* <i>Florida caerulea</i>			+		A
<i>Casmerodius albus egretta</i>	+	+	+	+	WR
<i>Leucophox thula thula</i>		+			A
†* <i>Hydranassa tricolor</i>		+			A
<i>Nyctanassa violacea bancrofti</i>		+	++	+	B

	Juanito	Madre	Magdalena	Cleofas	Status
<i>Plegadis falcinellus mexicana</i>		+			A
<i>Coragyps atratus</i>		+		+	A
<i>Cathartes aura teter</i>	+	+	+	+	B
<i>Chondrohierax uncinatus uncinatus</i>			+		B
<i>Buteo jamaicensis fumosus</i>		+	+	+	B
†* <i>Buteogallus anthracinus</i>			+		A
†* <i>Circus cyaneus</i>		+			M
<i>Pandion haliaëtus carolinensis</i>	+	+(+)	+	+	B
<i>Caracara cheriway pallidus</i>	+	+	++	+	B
<i>Falco peregrinus anatum</i>		+	+	+	WR
<i>Falco albicularis</i>		+			A
†* <i>Falco columbarius</i>		+		+	WR
<i>Falco sparverius</i>		+	+	+	WR
<i>Lophortyx douglasii</i>		+			B
<i>Fulica americana americana</i>		+			M
<i>Haematopus ostralegus frazari</i>	+	+	+	+	B
†* <i>Squatarola squatarola</i>			+	+	A
<i>Pluvialis dominica dominica</i>			+		M
<i>Charadrius hiaticula semipalmatus</i>		+	+	+	M
† <i>Charadrius alexandrinus</i>			+	+	M
<i>Charadrius vociferus vociferus</i>			+		M
<i>Numenius phaeopus hudsonicus</i>	+		+		WR
<i>Numenius americanus</i>		+			M
<i>Tringa flavipes</i>		+			M
†* <i>Tringa solitaria</i>			+		M
<i>Actitis macularia</i>	+	+	+	+	WR
<i>Catoptrophorus semipalmatus</i>	+		+	+	WR
<i>Heteroscelus incanus</i>	+	+	+	+	M
<i>Crocethia alba</i>	+				M
† <i>Erolia minutilla</i>			+		M
†* <i>Erolia bairdii</i>		+			M
<i>Erolia melanotos</i>	+	+	+		M
<i>Himantopus mexicanus</i>		+			M
†* <i>Steganopus tricolor</i>		+			M
<i>Larus heermanni</i>		+	+	+	M
†* <i>Larus delawarensis</i>		+	+	+	WR
<i>Larus argentatus smithsonianus</i>	+				M
† <i>Larus atricilla</i>		+			M
<i>Thalasseus maximus maximus</i>		+		+	WR
† <i>Thalasseus elegans</i>		+			A
<i>Columba flavirostris madrensis</i>		+	++	+	B
<i>Zenaidura macroura carolinensis</i>		+			M
<i>Zenaida asiatica mearnsi</i>	+	+	++	+	B
<i>Columbigallina passerina pallescens</i>	+	+	+	+	B
<i>Leptotila verreauxi capitalis</i>		+	++	+	B
<i>Forpus cyanopygius insularis</i>		+	+	+	B
<i>Amazona ochrocephala tresmariae</i>	+	+	+	+	B
<i>Coccyzus minor palloris</i>		+	++		B
* <i>Tyto alba pratincola</i>		+			A
<i>Chordeiles acutipennis texensis</i>		+		+	B?
<i>Nyctidromus albicollis insularis</i>		+(+)	+	+	B
<i>Cyananthus latirostris lawrencei</i>	+	+(+)	++	+	B
<i>Amazilia rutila graysoni</i>	+	+	++	+	B
<i>Trogon elegans goldmani</i>		+	+	+	B

	Juanito	Madre	Magdalena	Cleofas	Status
†* <i>Ceryle torquata torquata</i>				+	A
<i>Ceryle alcyon caurina</i>		+	+	+	WR
<i>Dendrocopos scalaris graysoni</i>	+	+(+)	++	+	B
<i>Platypsaris aglaiae insularis</i>		+	++		B
†* <i>Pyrocephalus rubinus</i>		+			M
<i>Tyrannus melancholicus occidentalis</i>		+	++	++	B
<i>Myiarchus tyrannulus gamister</i>		+	+	+	B
<i>Myiarchus tuberculifer tresmariae</i>	+	+	+	+	B
<i>Contopus richardsonii</i>		+			M
<i>Empidonax difficilis difficilis</i>		+	+	+	WR
<i>Myiopagis viridicata minimus</i>		+	+	+	B
<i>Camptostoma imberbe</i>	+	+	++	+	B
<i>Thryothorus felix lawrencii</i>		+	++	+	B
<i>Melanotis caerulescens longirostris</i>	+	+	++	+	B
<i>Mimus polyglottos leucopterus</i>		+	+		B
<i>Turdus rufo-palliatu graysoni</i>		+	++	+	B
<i>Myadestes obscurus insularis</i>		+	+	+	B
<i>Hylocichla ustulata ustulata</i>		+	+	+	WR
<i>Hylocichla ustulata swainsoni</i>		+	+		WR
† <i>Anthus spinoletta</i>			+		M
<i>Vireo hypochryseus sordidus</i>		+	+	+	B
† <i>Vireo solitarius</i>			+		M
<i>Vireo flavoviridis forreri</i>		+	++	+	B
† <i>Vireo gilvus swainsonii</i>			+		M
† <i>Mniotilta varia</i>			+		M
† <i>Vermivora celata lutescens</i>		+	+		M
<i>Parula pitiayumi insularis</i>	+	+	++	+	B
<i>Dendroica petechia rubiginosa</i>		+			M
<i>Dendroica petechia morcomi</i>		+	+		M
<i>Dendroica auduboni auduboni</i>		+	+	+	M/WR
† <i>Dendroica nigrescens</i>			+		M
<i>Dendroica townsendi</i>		+	+		M
<i>Seiurus aurocapillus cinereus</i>		+	+	+	M/WR
† <i>Seiurus motacilla</i>			+		M
† <i>Seiurus noveboracensis</i>			+		M
†* <i>Oporornis tolmiei</i>			+		M
<i>Granatellus venustus francescae</i>		+	++	+	B
<i>Wilsonia pusilla chryseola</i>		+		+	M
† <i>Setophaga ruticilla</i>			+		M
<i>Molothrus ater obscurus</i>	+		+		M
<i>Cassidix mexicanus</i>		+			A
<i>Icterus pustulatus graysonii</i>	+	+(+)	++	+	B
<i>Piranga ludoviciana</i>		+	+		M
<i>Piranga bidentata flammea</i>		+	+	+	B
<i>Richmondia cardinalis mariae</i>	+	+	++	+	B
† <i>Pheucticus melanocephalus</i>		+	+		M
†* <i>Passerina cyanea</i>		+			M
† <i>Passerina versicolor</i>			+		M
<i>Passerina ciris pallidior</i>			+		M
<i>Carpodacus cassinii</i>		+			M
†* <i>Sporophila torqueola</i>		+			A
<i>Spinus psaltria psaltria</i>		+	+	+	B
† <i>Zonotrichia leucophrys gambelii</i>	+				M

This list includes 31 records for the islands additional to those in the previous list. These were obtained in part as follows:

Bailey (1906): *Ceryle torquata* and *Falco columbarius*.

Forrer (1881) in Bond and de Schauensee (1944): *Steganopus tricolor*.

Heilfurth (1930): *Zonotrichia leucophrys* and *Circus cyaneus*.

Heilfurth (1938): *Pyrocephalus rubinus*, *Pheucticus melanocephalus*, *Passerina cyanea*, and *Sporophila torqueola*.

Bond and de Schauensee (1944): *Erolia bairdii*.

The remainder of the new records have accrued from visits by members of the University of British Columbia. The specimens collected are in the University Museum of Birds and Mammals. The sight records were obtained as follows:

<i>Florida caerulea</i>	I. McT. Cowan	March 9, 10, 1962.
<i>Hydranassa tricolor</i>	I. McT. Cowan	March 10, 1962.
<i>Buteogallus anthracinus</i>	I. McT. Cowan	March 10, 1962.
<i>Squataraola squatarola</i>	P. R. Grant	April 21-27, June 19-26, 1963.
<i>Tringa solitaria</i>	P. R. Grant	August 4, 1961.
<i>Oporornis tolmiei</i>	P. R. Grant	April 24, 1963.

Finally, the status of two rare species requires comment. Despite three visits to the high ground on María Magdalena, no solitaires (*Myadestes* sp.) have been recorded; they were last seen in 1930 on this island and on María Cleofas, where they were common at waterholes (Heilfurth, 1938). However, the Blue-rumped Parrotlet (*Forpus cyanopygius*), also unrecorded since 1930, was found on María Magdalena in each year from 1960 to 1963, and on María Cleofas in 1963. Although Nelson (1899) reports seeing 40 or 50 of them in 1897, no more than ten birds were seen on any one day during our investigations.

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SUMMARY

The Check-list of the birds of the Tres Marias Islands has been revised. Thirty-one new records have been added, of which 16 have been substantiated with specimens.

Nyctanassa violacea, *Coccyzus minor* and *Camptostoma imberbe* have been added to the list of breeding birds and two more species are suspected of breeding; breeding activity of the majority of summer-resident terrestrial birds has been observed.

The numbers of species of winter-resident and migrant terrestrial birds and the number of summer-resident terrestrial birds are approximately equal.

In general, male transients occur on the islands in greater numbers than females and they appear earlier in spring migration.

Nothing is known of the post-breeding movements of the resident terrestrial species and only one autumn migrant has been recorded.

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