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## **REVIEW OF THE AVIFAUNA OF THE TRES MARÍAS ISLANDS, MEXICO, INCLUDING NEW AND NOTEWORTHY RECORDS**

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**ABSTRACT:** We summarize the bird species known from the Tres Marías Islands, off the coast of Nayarit, western Mexico, tabulating the sources for the occurrence of each species by island. We report records of 48 species new to the archipelago and/or specific islands on the basis of our field work since 2002 and a review of published literature, museum specimens, and others' observations. These bring the number of species known from the Tres Marías Islands to 176, of which 5 represent introductions and about 46 others are known or likely to breed; about 24 of the 46 represent endemic subspecies. All resident species recorded historically still survive on at least one of the islands. In spite of our recent field work, the precise status of many species by island remains to be clarified.

The Tres Marías Islands are home to about 24 endemic subspecies of birds, some distinct enough to potentially warrant full species status (Navarro-Sigüenza and Peterson 2004, Cortés-Rodríguez et al. 2008, Montaña-Rendón et al. 2015, S. N. G. Howell pers. comm.). Following the last major review of the archipelago's avifauna by Grant and Cowan (1964), Howell and Webb (1995: appendix C) summarized its status, adding a few species on the basis of Konrad (1984, 1985). Here we update these lists, present data from our more recent expeditions, and provide detail on unpublished and overlooked records, incorporating them into an updated review of the avifauna of the Tres Marías Islands.

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### METHODS

#### Study Area

The four Tres Marias Islands—San Juanito (9 km<sup>2</sup>), María Madre (145 km<sup>2</sup>), María Magdalena (70 km<sup>2</sup>), and María Cleofas (20 km<sup>2</sup>)—lie between 21° and 22° N and between 106° and 107° W, 80 km from the nearest point on the coast of mainland Nayarit.

After the islands' European discovery in 1531, pirates used them as a base, and significant human disturbance began in the nineteenth century with the establishment of a small settlement on Isla María Madre dedicated to cutting wood and capturing parrots for trade with passing ships (A. J. Grayson in Lawrence 1872a). During the 20th century, the depletion of valuable lumber on the islands led to unsuccessful attempts at farming cotton, corn, and beans (Nelson 1899a), and later planting agave for rope, including on Isla San Juanito (Stager 1957). In 1905 the Mexican government established on Isla María Madre a penal colony, still extant, where the inmates are not enclosed behind bars and some live with their families. Prisoners and security personnel account for most of the approximately 1100 inhabitants of María Madre, but government officials, teachers, and clergy also occupy the island's 11 villages. Land has been cleared for agriculture, cattle raising, urban development, and roads, and various non-native plants have been introduced, including the coconut palm (*Cocos nucifera*). At one point there was a small barracks on Isla San Juanito; María Magdalena and María Cleofas have had temporary encampments, such as a camp for 200 fishermen and navy personnel that apparently existed for 20 years on María Cleofas around the 1980s and 1990s (fisherman "Abel," pers. comm. to Hamilton).

Other forms of human disturbance to the ecosystems of the islands include the introduction of White-tailed Deer (*Odocoileus virginianus*) to Isla María Magdalena during the early 20th century (Hanna 1926), the introduction of Elegant Quail (*Callipepla douglasii*) to Isla María Madre (Leopold 1959), and the introduction of goats (*Capra hircus*), rats (*Rattus rattus*), and cats (*Felis catus*) to the three larger islands, where they have become feral (UABC 2008). Of the three larger islands, the last to be colonized by cats and goats was Isla María Cleofas, which was free of cats in 1975 (Wilson 1991) and free of goats in 1986 (GECI 2007a,b) but which had populations of both from 2002 through 2016 (pers. obs.). It is unclear whether introduced mammals have appeared on Isla San Juanito.

The climate of the four islands is similar, generally dry, with rains in the summer and fall. As measured on Isla María Madre, monthly mean temperatures range from 21.2 to 28.7 °C and mean annual precipitation is 617 mm (García 1987). Permanent fresh water is scarce, and by the end of the dry season the only sources of fresh water on the islands are small pools persisting in otherwise dry river beds.

The islands have relatively flat areas, mountain slopes, and steep canyons. Their natural vegetation types are low tropical deciduous forest (all four islands), tropical semideciduous forest of medium height (three largest islands), *Agave*-dominated succulent scrub (southern end of San Juanito; very small patches on María Cleofas), mangroves (small stands on María Magdalena

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and María Cleofas), and coastal dunes (all four islands) (González-Medrano and Hernández-Mejía 2007). The shorelines surrounding the islands range from sandy beaches to rocky cliffs. A saltwater lagoon is found along the southeastern coast of María Madre.

### Expeditions

The islands were first explored ornithologically by Andrew Jackson Grayson during three expeditions in 1865, 1866, and 1867 (Lawrence 1872a). Grant and Cowan (1964) reviewed the results of “approximately twenty-five” visits by ornithologists to various islands within the archipelago, including their own from 1957 through 1963. More recent expeditions include those by P. Konrad (1984 and 1985), Eduardo Iñigo-Eliás (2007 and 2008; unpublished), Aaron Hebshi and Sandra Larsen (8 February 2002, pers. comm.), and our own, as follows:

- 23 January–8 February 2002 (mainly Cleofas and Magdalena, with a half-hour each on Madre and San Juanito; Hamilton).
- 10–24 November 2009 (Madre; Cruzado)
- 20–23 March 2012 (Madre; Cruzado)
- 16–18 November 2015 (Cleofas; J. Cruz)
- 2–5 March 2016 (Cleofas and <1 day on Magdalena; J. Cruz, M. A. Cruz, and Vásquez)
- 25 April–5 May 2016 (Cleofas; Gómez de Silva, Pérez, J. Cruz, Cruzado, and Vásquez)

### Evaluation of Records

We compiled the bird species recorded on each island in the archipelago, incorporating the published literature, the unpublished notes of Konrad and Iñigo-Eliás, and specimen records available through [www.vertnet.org](http://www.vertnet.org) (downloaded 24 May 2016). Sightings or specimens that would represent new records for the archipelago were verified by direct examination or through correspondence with the relevant curators, at the Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City (UNAM), and the University of British Columbia, Vancouver (UBC). We tabulate the reference(s) for each species–island combination (Table 1), detailing new records in the species accounts.

We do not include records of pelagic species observed from boats in open water near the islands, such as Craveri’s Murrelet (*Synthliboramphus craveri*; Howell and Webb 1995:318), but have included the record of a Sooty Tern (*Onychoprion fuscatus*) seen from shore by Nelson (1899b) and, where noteworthy, list certain high counts of species observed between islands. We include species reported by Konrad (1984, 1985) except that we list his “Brewer’s Sparrow” as “*Spizella* sp.” and we do not include species he credited to “Monzano Hernandez (unpublished data),” as at least some of these, such as the Gray-throated Chat (*Granatellus sallaei*), Rose-bellied Bunting (*Passerina rositae*), and Altamira Oriole (*Icterus gularis*) were clearly misidentified. Our list thus omits some of the species listed for the archipelago by Howell and Webb (1995), though they designated most of these as hypothetical. Finally, we do not include records that merely clarify a

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**Table 1** Birds of the Tres Marías Islands

Species <sup>a</sup>	Island <sup>b</sup>			
	San Juanito	María Madre	María Magdalena	María Cleofas
<i>Anas discors</i> , Blue-winged Teal		M,R	P	
<i>Anas cyanoptera</i> , Cinnamon Teal		M		
<i>Anas clypeata</i> , Northern Shoveler		T		
<i>Anas crecca</i> , Green-winged Teal		R		
<i>Mergus serrator</i> , Red-breasted Merganser	N			
<i>Callipepla douglasii</i> , Elegant Quail		J,K,M,R,S,T		
<i>Podilymbus podiceps</i> , Pied-billed Grebe		R		
<i>Podiceps nigricollis</i> , Eared Grebe		M,R		
<i>Columba livia</i> , Rock Pigeon		M,P,R,S		
<b><i>Patagioenas flavirostris madrensis</i>, Red-billed Pigeon</b>		A,B,D,E,J, K,M,R,S	B,D,J, K,M,P	C,F,R,U,V,W
<i>Streptopelia decaocto</i> , Eurasian Collared-Dove		T		W
<i>Columbina inca</i> , Inca Dove		M,R		
<i>Columbina passerina</i> , Common Ground-Dove	K,M	A,B,D,E,K, M,P,R,S,T	B,D,J, K,M,P	J,K,N,P, R,U,V,W
<b><i>Leptotila verreauxi capitalis</i>, White-tipped Dove</b>	M	A,B,D,E,J, K,M,R,S,T	B,D,J,K, M,P,V	F,J,K,N, P,U,V,W
<i>Zenaida asiatica</i> , White-winged Dove	J,K,N	B,D,E,J,K, M,R,S,T	B,D,J,K	B,J,K,R,U,W
<i>Zenaida macroura</i> , Mourning Dove		B,M,R,S		U
<i>Coccyzus minor</i> , Mangrove Cuckoo		B,E,K,M	K	U,V
<i>Crotophaga sulcirostris</i> , Groove-billed Ani		M,O,R,S	M,P,V	P,U,V,W
<i>Chordeiles acutipennis</i> , Lesser Nighthawk		J,K,M		K,U,W
<b><i>Nyctidromus albicollis insularis</i>, Common Pauraque</b>		A,B,D,E,M,R	D,J,K, M,P,V	F,K,P,R, U,V,W
<i>Selasphorus rufus</i> , Rufous Hummingbird		M		
<b><i>Cynanthus latirostris laurencei</i>, Broad-billed Hummingbird</b>	B,K,M	A,B,D,J,K, M,R,S,T	B,D,J,K, M,P,V	B,C,J,K,N, R,U,V,W
<b><i>Amazilia rutila graysoni</i>, Cinnamon Hummingbird</b>	K	A,B,D,J, K,M,R,S	D,J,K, M,P,V	C,F,J,K,N, P,R,U,V,W
<i>Rallus limicola</i> , Virginia Rail		R		
<i>Gallinula galeata</i> , Common Gallinule			P	
<i>Fulica americana</i> , American Coot		E,J,K,N,R,T		W
<i>Himantopus mexicanus</i> , Black-necked Stilt		E,J,K,M, R,S,T		

(continued)

## REVIEW OF THE AVIFAUNA OF THE TRES MARÍAS ISLANDS, MEXICO

**Table 1** (Continued)

Species <sup>a</sup>	Island <sup>b</sup>			
	San Juanito	María Madre	María Magdalena	María Cleofas
<i>Haematopus palliatus</i> , American Oystercatcher	J,K,M	A,J,K,M,R	J,K,M,P	B,K,N,P
<i>Pluvialis squatarola</i> , Black-bellied Plover	N	M,R	K,M	K,U,W
<i>Pluvialis dominica</i> , American Golden-Plover		R	J,K	
<i>Charadrius nivosus</i> , Snowy Plover	M	M	K,M	K,N,P
<i>Charadrius semipalmatus</i> , Semipalmated Plover	M	A,J,K,M,R,T	K,M	K
<i>Charadrius vociferus</i> , Killdeer		E,J,R	K	
<i>Numenius phaeopus</i> , Whimbrel	J,K	R	J,K,V	U,V,W
<i>Numenius americanus</i> , Long-billed Curlew	M	E,J,K,M	M	
<i>Limosa fedoa</i> , Marbled Godwit	M			
<i>Arenaria interpres</i> , Ruddy Turnstone		M		
<i>Arenaria melanocephala</i> , Black Turnstone		M		
<i>Calidris canutus</i> , Red Knot		M		
<i>Calidris virgata</i> , Surfbird		N		
<i>Calidris himantopus</i> , Stilt Sandpiper		R		
<i>Calidris alba</i> , Sanderling	J,K	M	M	W
<i>Calidris alpina</i> , Dunlin		O		
<i>Calidris bairdii</i> , Baird's Sandpiper		I,K		
<i>Calidris minutilla</i> , Least Sandpiper		M,S	K	
<i>Calidris melanotos</i> , Pectoral Sandpiper	J,K	E,J,K	J,K	
<i>Calidris mauri</i> , Western Sandpiper		M		
<i>Limnodromus griseus</i> , Short-billed Dowitcher		O		
<i>Limnodromus scolopaceus</i> , Long-billed Dowitcher		M		
<i>Gallinago delicata</i> , Wilson's Snipe		O		
<i>Actitis macularius</i> , Spotted Sandpiper	B,K,M	B,K,M,T	B,K,M,V	B,K,N,P,U,V,W
<i>Tringa solitaria</i> , Solitary Sandpiper		R	K,V	
<i>Tringa incana</i> , Wandering Tattler	J,K,M	K,M	K,M	K,N
<i>Tringa semipalmata</i> , Willet	J,K,M	M,R,S,T	J,K,P	K
<i>Tringa flavipes</i> , Lesser Yellowlegs		B,J,K,N,R		
<i>Phalaropus tricolor</i> , Wilson's Phalarope		I,K,M,R		
<i>Phalaropus fulicarius</i> , Red Phalarope			UNAM	
<i>Chroicocephalus philadelphia</i> , Bonaparte's Gull		M		

(continued)

## REVIEW OF THE AVIFAUNA OF THE TRES MARÍAS ISLANDS, MEXICO

**Table 1** (Continued)

Species <sup>a</sup>	Island <sup>b</sup>			
	San Juanito	María Madre	María Magdalena	María Cleofas
<i>Leucophaeus atricilla</i> , Laughing Gull		K,N		
<i>Larus heermanni</i> , Heermann's Gull	N	J,K,M, P,R,T	J,K,M,V	B,C,J,K,N, P,R,V,W
<i>Larus delawarensis</i> , Ring-billed Gull		K,M	K	K
<i>Larus occidentalis/livens</i> , Western/Yellow-footed Gull		P		C
<i>Larus argentatus</i> , Herring Gull	B,K	R		
<i>Onychoprion fuscatus</i> , Sooty Tern		B		
<i>Sternula antillarum</i> , Least Tern				W
<i>Hydroprogne caspia</i> , Caspian Tern		Q		
<i>Thalasseus maximus</i> , Royal Tern		R		B,K
<i>Thalasseus elegans</i> , Elegant Tern		K		
<i>Phaethon aethereus</i> , Red-billed Tropicbird	J,K, M	J,K,R	J,K	C,K,P
<i>Fregata magnificens</i> , Magnificent Frigatebird	J,K,M	M,O,R,S,T	D,K,M,V	C,J,K,N, R,U,V,W
<i>Sula neboxii</i> , Blue-footed Booby	B,J,K,M,P	D,E,M, P,R,T	D,M,P	J,K,N,P, R,U,V,W
<i>Sula leucogaster</i> , Brown Booby	J,K,N	E,M,R	V	B,C,J,K,N, P,R,U,V
<i>Pelecanus occidentalis</i> , Brown Pelican	B,J,K,M,P	B,D,K,M, P,R,S,T	B,D,K,M,P	B,C,J,K,N, P,R,U,W
<i>Ardea herodias</i> , Great Blue Heron	J,K,M	A,D,J,K, M,R,S,T	D,J,K,M,P	J,K,N,P,U,W
<i>Ardea alba</i> , Great Egret	K	A,J,K,S	K	K
<i>Egretta thula</i> , Snowy Egret	M	A,J,K,R,T		
<i>Egretta caerulea</i> , Little Blue Heron		K,M	K	
<i>Egretta tricolor</i> , Tricolored Heron		M,R,S		
<i>Bubulcus ibis</i> , Cattle Egret		M		W
<i>Butorides virescens</i> , Green Heron		A,J,K,R	D,K,M,P	K,N,P, R,U,W
<i>Nyctanassa violacea</i> , Yellow-crowned Night-Heron	M			
<i>Plegadis chihi</i> , White-faced Ibis		E,J,K,R		
<i>Coragyps atratus</i> , Black Vulture		E,K,M		K,N
<i>Cathartes aura</i> , Turkey Vulture	J,K,M	A,B,E,J,K, M,P,R,S,T	J,K,M,P,V	C,F,J,K,N, P,R,U,V,W
<i>Pandion haliaetus</i> , Osprey	B,K,M	A,B,K, M,R,S,T	B,K	B,F,K,P,U
<i>Chondrohierax uncinatus</i> , Hook-billed Kite		S	J,K	W
<i>Circus cyaneus</i> , Northern Harrier		A,K		
<i>Accipiter cooperii</i> , Cooper's Hawk		R		
<i>Buteogallus anthracinus</i> , Common Black Hawk			K	
<b><i>Buteo jamaicensis fumosus</i>, Red-tailed Hawk</b>		A,B,D,J, K,M,R,S,T	B,J,K,M,P	B,J,K,N,P,W

(continued)

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**Table 1** (Continued)

Species <sup>a</sup>	Island <sup>b</sup>			
	San Juanito	María Madre	María Magdalena	María Cleofas
<i>Tyto alba</i> , Barn Owl		A,J,K,R	L	V,W
<i>Megascops</i> sp., screech-owl sp.			L	
<i>Micrathene whitneyi</i> , Elf Owl		R	L,P,V	V,W
<i>Athene cunicularia</i> , Burrowing Owl		A,R		L
<i>Trogon elegans goldmani</i> , Elegant Trogon		A,B,D,E,J, K,M,R,S,T	B,D,J,K, M,P,V	F,J,N,P, R,U,V,W
<i>Megaceryle torquata</i> , Ringed Kingfisher				K,C
<i>Megaceryle alcyon</i> , Belted Kingfisher	M	A,E,J, K,M,R	K	F,K,N, P,U,V
<i>Chloroceryle americana</i> , Green Kingfisher		O,T		
<i>Sphyrapicus varius</i> , Yellow-bellied Sapsucker		T		W ( <i>Sphyrapicus</i> sp.)
<b>Picoides scalaris graysoni</b> , Ladder-backed Woodpecker	B,J,K,M	A,B,D,J,K, M,R,S,T	B,D,J,K, M,P,V	B,C,F,J,K, N,P,R,V,W
<b>Caracara cheriway pallida</b> , Crested Caracara	B,J,K,M	A,B,D,E,J, K,M,P,R,S,T	B,J,K, M,P,V	B,C,F,J,K,N, P,R,U,V,W
<i>Falco sparverius</i> , American Kestrel	M	A,E,J,K, M,R,S	K	F,K,N,P,R
<i>Falco columbarius</i> , Merlin		A,K,R		C,K
<i>Falco rufigularis</i> , Bat Falcon		A		
<i>Falco peregrinus</i> , Peregrine Falcon	Q	A,J,K,M	K,M	F,K,P,U,W
<b>Forpus cyanopygius insularis</b> , Mexican Parrotlet		A,B,D, K,M,R,S	B,D,K,M,P	K,P,R,U,V,W
<i>Amazona finschi</i> , Lilac-crowned Parrot		B		V
<b>Amazona oratrix tresmariae</b> , Yellow-headed Parrot	J,K,M	A,B,D,E,J, K,N,R,S,T	D,J,K, N,P,V	C,F,J,K,N, P,R,U,V,W
<i>Camptostoma imberbe</i> , Northern Beardless Tyrannulet	J,K,M	B,K,M,S	K,M,P	J,K,P,W
<b>Myiopagis viridicata minima</b> , Greenish Elaenia	N	A,B,K,M,D	B,K,M,P	F,K,N,P,W
<i>Contopus sordidulus</i> , Western Wood-Pewee		B,K,R		R
<i>Empidonax minimus</i> , Least Flycatcher		UNAM		
<i>Empidonax difficilis</i> , Pacific-slope Flycatcher		A,B,K,M,R,S	B,K,P,V	F,J,K,P,R,U,V,W
<i>Pyrocephalus rubinus</i> , Vermilion Flycatcher		G,H,K		P
<i>Myiarchus tuberculifer</i> , Dusky-capped Flycatcher	B,J,K,M	A,B,D,E, J,K,M,S	B,J,K, M,P,V	B,C,F,J,K, N,P,U,V,W
<i>Myiarchus tyrannulus</i> , Brown-crested Flycatcher	B,M	A,B,D,E, K,M,R,T	B,K	B,K,W

(continued)

## REVIEW OF THE AVIFAUNA OF THE TRES MARÍAS ISLANDS, MEXICO

**Table 1** (Continued)

Species <sup>a</sup>	Island <sup>b</sup>			
	San Juanito	María Madre	María Magdalena	María Cleofas
<i>Tyrannus melancholicus</i> , Tropical Kingbird		B,E,K, M,R,S,T	B,K	J,K,U,W
<i>Tyrannus verticalis</i> , Western Kingbird				W
<b><i>Pachyrampus aglaiae insularis</i>, Rose-throated Becard</b>		A,B,J,K,M,R	K,M,P	
<b><i>Vireo hypochryseus sordidus</i>, Golden Vireo</b>		A,B,D,J, K,M,R	B,J,K, M,P,V K	F,J,K,P, R,U,W
<i>Vireo cassinii</i> , Cassin's Vireo			K	
<i>Vireo gilvus</i> , Warbling Vireo			K	W
<b><i>Vireo flavoviridis forreri</i>, Yellow-green Vireo</b>		B,D,J,K,R	B,D,J,K	J,K,W
<i>Tachycineta albilinea</i> , Mangrove Swallow		M,R		
<i>Stelgidopteryx serripennis</i> , Northern Rough-winged Swallow				U,W
<i>Hirundo rustica</i> , Barn Swallow	Q	B,R		P,W
<b><i>Pheugopedius felix lawrencii</i>, Happy Wren</b>	M,P	A,B,D,E,J, K,M,R,S,T	B,J,K, M,P,V P,V	F,J,K,N, P,R,U,V,W P,U,V,W
<i>Polioptila caerulea</i> , Blue-gray Gnatcatcher				
<i>Regulus calendula</i> , Ruby-crowned Kinglet			P	P
<b><i>Myadestes occidentalis insularis</i>, Brown-backed Solitaire</b>		A,B,K,M,R	B,K	F,H,K
<i>Catharus ustulatus</i> , Swainson's Thrush		A,B,K,M,R	J,K,M,P	K,U,W
<i>Hylocichla mustelina</i> , Wood Thrush			UNAM	
<i>Turdus assimilis</i> , White-throated Thrush				W
<b><i>Turdus rufopalliatus graysoni</i>, Rufous-backed Robin</b>	B,M	A,B,D,E,J, K,M,R,S,T	B,D,J,K, M,P,V	B,F,J,K,N, P,R,U,V,W
<b><i>Melanotis caerulescens longirostris</i>, Blue Mockingbird</b>	K	A,B,D,E,J, K,M,R,S,T	D,J,K, M,P,V	F,J,K,N,P, R,U,V,W
<i>Mimus polyglottos</i> , Northern Mockingbird	M	A,B,E,K, M,R,S	J,K,M,P,V	F,P,U,V,W
<i>Bombycilla cedrorum</i> , Cedar Waxwing	M	M		
<i>Passer domesticus</i> , House Sparrow		M,O,P,R,S		N,V,W
<i>Anthus rubescens</i> , American Pipit			K	
<i>Haemorhous cassinii</i> , Cassin's Finch		D,K		

(continued)

## REVIEW OF THE AVIFAUNA OF THE TRES MARÍAS ISLANDS, MEXICO

**Table 1** (Continued)

Species <sup>a</sup>	Island <sup>b</sup>			
	San Juanito	María Madre	María Magdalena	María Cleofas
<b><i>Spinus psaltria witti</i>, Lesser Goldfinch</b>		A,B,D,J,K,M	D,J,K,M,P	F,J,K,N,P,W
<i>Seiurus aurocapilla</i> , Ovenbird		D,K,M,R,T	K,M,P	J,K,P,V,W
<i>Parkesia motacilla</i> , Louisiana Waterthrush		UNAM	K	
<i>Parkesia noveboracensis</i> , Northern Waterthrush		M	K,M,P	U,V,W
<i>Mniotilta varia</i> , Black-and-white Warbler		M,R	K,P,V	N,P,U,V,W
<i>Oreothlypis peregrina</i> , Tennessee Warbler			UNAM	
<i>Oreothlypis celata</i> , Orange-crowned Warbler		K,M,R	K,V	U,W
<i>Oreothlypis ruficapilla</i> , Nashville Warbler			UNAM	
<i>Geothlypis tolmiei</i> , MacGillivray's Warbler		M	K	P
<i>Setophaga ruticilla</i> , American Redstart			K,P	W
<b><i>Setophaga pitiayumi insularis</i>, Tropical Parula</b>	B,J,K,M,P	A,B,D,E,J, K,M,P,R,S,T	B,D,J,K, M,P,V	B,F,J,K, P,R,U,V,W P,W
<i>Setophaga petechia</i> , Yellow Warbler		B,D,K,M,R	K	
<i>Setophaga coronata auduboni</i> , Audubon's Warbler	J	B,E,K,M,P,R	K,P	B,K,N,P,U,W
<i>Setophaga dominica</i> , Yellow-throated Warbler		P		
<i>Setophaga nigrescens</i> , Black-throated Gray Warbler			K	
<i>Setophaga townsendi</i> , Townsend's Warbler		K,B	K	
<i>Cardellina pusilla</i> , Wilson's Warbler		D,K,M,R	P	B,K,W
<i>Sporophila torqueola</i> , White-collared Seedeater		H,K		
<i>Spizella</i> sp., <i>Spizella</i> sparrow			M	
<i>Pooecetes gramineus</i> , Vesper Sparrow		M,T		
<i>Chondestes grammacus</i> , Lark Sparrow		N,R,T	UNAM	
<i>Melospiza lincolni</i> , Lincoln's Sparrow		O		
<i>Zonotrichia leucophrys</i> , White-crowned Sparrow	G,K	R		
<i>Piranga ludoviciana</i> , Western Tanager		B,D,K,M	K,M	
<b><i>Piranga bidentata flammea</i>, Flame-colored Tanager</b>	M	A,B,D,E,K, M,P,R,T	B,D,J,K, M,P,V	F,J,K,N,P,U,V,W

(continued)

REVIEW OF THE AVIFAUNA OF THE TRES MARÍAS ISLANDS, MEXICO

**Table 1** (Continued)

Species <sup>a</sup>	Island <sup>b</sup>			
	San Juanito	María Madre	María Magdalena	María Cleofas
<b><i>Cardinalis cardinalis mariae</i></b> , <b>Northern Cardinal</b>	B,J,K,M,P	A,B,D,E,J, K,M,R,S,T	B,J,K, M,P,V	B,C,F,J,K,N, P,R,U,V,W
<i>Pheucticus melanocephalus</i> , Black-headed Grosbeak		H,K	H,K	W
<b><i>Granatellus venustus francescae</i></b> , <b>Red-breasted Chat</b>		A,B,D, E,K,M,R	J,K,M,P	J,K,P,V,W
<i>Passerina cyanea</i> , Indigo Bunting		H,K		
<i>Passerina versicolor</i> , Varied Bunting			K	W
<i>Passerina ciris</i> , Painted Bunting		M	J,K	
<i>Spiza americana</i> , Dickcissel		O		
<i>Quiscalus mexicanus</i> , Great-tailed Grackle		B,K		
<i>Molothrus ater</i> , Brown-headed Cowbird	J,K	M	K	W
<i>Icterus cucullatus</i> , Hooded Oriole				W
<b><i>Icterus pustulatus graysonii</i></b> , <b>Streak-backed Oriole</b>	B,J,K,M	A,B,D,E,J, K,M,R,S,T	B,D,J,K, M,P,V	B,C,F,J,K,N, P,R,U,V,W
<i>Icterus bullockii</i> , Bullock's Oriole			UBC	
Total	54	151	103	99

<sup>a</sup>Endemic subspecies highlighted in boldface.

<sup>b</sup>Sources coded as follows: A, A. J. Grayson in Lawrence (1872a); B, Nelson (1899b); C, Bailey (1906); D, McLellan (1926); E, McLellan (1927); F, Heilfurth (1930a); G, Heilfurth (1930b); H, Heilfurth (1933); I, Bond and Meyer de Schauensee (1944); J, Stager (1957); K, Grant and Cowan (1964); L, Northern (1965); M, Konrad (1984); N, Konrad (1985); O, Contreras (1987); P, field work by Hamilton in 2002; Q, A. Hebshi and S. Larsen (pers. comm., 8 February 2002); R, E. Iñigo (unpubl. data, 2007–2008); S, field work by Cruzado in 2009; T, field work by Cruzado in 2012; U, field work by J. Cruz in 2015; V, field work by J. Cruz, Vásquez, and M. A. Cruz in March 2016; W, field work by Gómez de Silva, Pérez, J. Cruz, Cruzado, and Vásquez in April and May 2016; UNAM, specimen in the Instituto de Biología, UNAM, Mexico City; UBC, specimen in the University of British Columbia, Vancouver.

species' seasonal status as reported by Howell and Webb (1995) and others (e.g., mid-winter records of a species considered to be a transient). Evaluation of many species' seasonal status will require considerable additional field work and is best addressed in a future publication.

Where dates of specimens according to www.vertnetorg differ from those reported in the literature—for example, the dates 13 March 1957, 20 and 25 March 1958, 5 March 1960, 21 February 1961, and 4 and 5 March 1962 for UBC specimens contrast with the expedition dates provided by Grant and Cowan (1964)—we defer to the dates published in the literature. Also, we assumed that A. J. Grayson visited Isla María Madre only (see Stager 1957), and that his visits took place in mid-late January 1865, mid-April 1866, and early June 1867 (on the basis of incomplete information in Lawrence 1872a, b).

## REVIEW OF THE AVIFAUNA OF THE TRES MARÍAS ISLANDS, MEXICO

We follow the subspecies-level taxonomy of del Hoyo et al. (1992–2011) and del Hoyo and Collar (2014), except that we exclude *Pheugopedius felix magdalenae*, which we consider invalid, a synonym of *P. f. lawrencii*. The subspecies-level taxonomy of Clements et al. (2015) differs only in considering *Trogon elegans goldmani* to be an additional endemic subspecies and *Vireo flavoviridis forreri* to be more widespread in northwestern Mexico and therefore not endemic or nearly endemic. The taxonomy of the International Ornithological Congress (Gill and Donsker 2016) also considers *Trogon elegans goldmani* to be endemic to the Tres Marias archipelago and further differs from the taxonomy followed in Table 1 in not recognizing *Caracara cheriway pallida* and in considering *Piranga bidentata flammea* to be widespread in western Mexico. We do not assign a seasonal status to each species because of insufficient knowledge of avian seasonality in the Tres Marias Islands.

## RESULTS

### Species–Island Combinations

Table 1 presents an updated list of the avifauna of the Tres Marias archipelago with the sources for occurrence on each island specified.

### Noteworthy Records

Below we provide details of 48 species we recorded as new to the Tres Marias archipelago and/or to individual islands during our fieldwork, or that were overlooked in the prior reviews by Grant and Cowan (1964) and Howell and Webb (1995). After the species name, we specify whether it is new to the entire archipelago (18 new species), to Isla María Madre (8 new species), Isla María Magdalena (11 new species), Isla María Cleofas (31 new species), or Isla San Juanito (3 new species). The following are sight records unless noted otherwise.

**BLUE-WINGED TEAL** *Anas discors*. New to Magdalena. Common winter visitor throughout mainland Mexico (Howell and Webb 1995) and previously recorded on Madre. The only record for Magdalena is of three videotaped on 6 February 2002 (Hamilton).

**NORTHERN SHOVELER** *Anas clypeata*. New to archipelago. Common winter visitor throughout mainland Mexico (Howell and Webb 1995). The only record for the archipelago is of a male and female photographed on Madre on 23 March 2012 (Cruzado; Figure 1).

**EURASIAN COLLARED-DOVE** *Streptopelia decaocto*. New to archipelago. First recorded in Nayarit in 2009 ([www.ebird.org](http://www.ebird.org)). Subsequently a few have been found in the Tres Marias Islands, with single individuals seen in a settlement in the south of Madre on 23 March 2012 (Cruzado), near the beach at the northeastern end of uninhabited Cleofas on both 25 April (flocking with four White-winged Doves, *Zenaida asiatica*, Gómez de Silva, Cruzado, Pérez, Vásquez) and 2 May 2016 (Cruzado), and in forest of *Piranhea mexicana* and *Cedrela odorata* 1.1 km from the beach in the south of Cleofas on 30 April 2016 (J. Cruz).

**MOURNING DOVE** *Zenaida macroura*. New to Cleofas, with one near the island's coast on 18 November 2015 (J. Cruz). Previously recorded only on Madre (Grant and Cowan 1964).

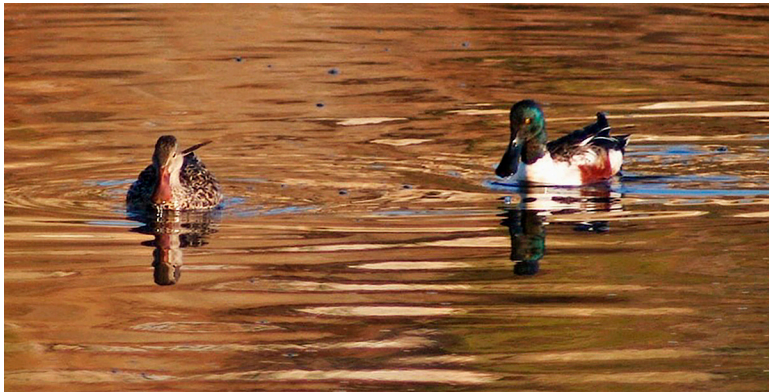


Figure 1. Male and female Northern Shoveler (*Anas clypeata*) on Isla María Madre, 23 March 2012.

Photo by Juan Cruzado Cortés

**MANGROVE CUCKOO** *Coccyzus minor*. New to Cleofas, where our only records are of two seen separately on 17 November 2015 and one photographed on 3 March 2016 (J. Cruz, Vásquez; Figure 2). Breeds on Madre and Magdalena (Grant and Cowan 1964).

**GROOVE-BILLED ANI** *Crotophaga sulcirostris*. New to Cleofas. As noted by Konrad (1985), this species appears to have colonized the archipelago after the visits of Grant and Cowan (1964), but it had not been recorded on Cleofas until we noted up to five there 25 January–2 February 2002 (Hamilton, video), two on 17 and 18 November 2015; one or two seen daily 3–5 March 2016 (J. Cruz, Vásquez), and up to three from 26 April to 4 May 2016 (Pérez, Vásquez, Gómez de Silva).

**COMMON GALLINULE** *Gallinula galeata*. New to archipelago, where the only record is of an adult on Magdalena on 6 February 2002 (Hamilton). Common resident or winter visitor throughout mainland Mexico (Howell and Webb 1995).

**AMERICAN COOT** *Fulica americana*. New to Cleofas, on the basis of two decomposed corpses found on 3 May 2016 (Gómez de Silva, Pérez, Vásquez). Common resident or winter visitor throughout mainland Mexico (Howell and Webb 1995) and previously known from Madre (Grant and Cowan 1964).

**WHIMBREL** *Numenius phaeopus*. New to Cleofas, with two on 16 November 2015, one on 5 March 2016 (J. Cruz, Vásquez), and two or three from 25 to 30 April 2016 (Vásquez, Pérez, Gómez de Silva). Winter visitor previously recorded on San Juanito, Magdalena, and Madre (Grant and Cowan 1964, E. Iñigo-Eliás pers. comm.).

**SANDERLING** *Calidris alba*. New to Cleofas, with one photographed on 29 April 2016 (Pérez, Vásquez, Gómez de Silva). Recorded previously as a transient on San Juanito (Grant and Cowan 1964).

**RED PHALAROPE** *Phalaropus fulicarius*. New to archipelago, the only records being of three specimens in UNAM (AV006931–AV006933, collected by Hernando Cabral and Josefina Arreola-G.), labeled as coming from the tropical deciduous forest of Magdalena (presumably from a body of water surrounded by such forest), dated 24, 26, and 27 November 1986. Additionally, Hamilton observed approximately 700 individuals offshore between Magdalena and Madre and another 700 between

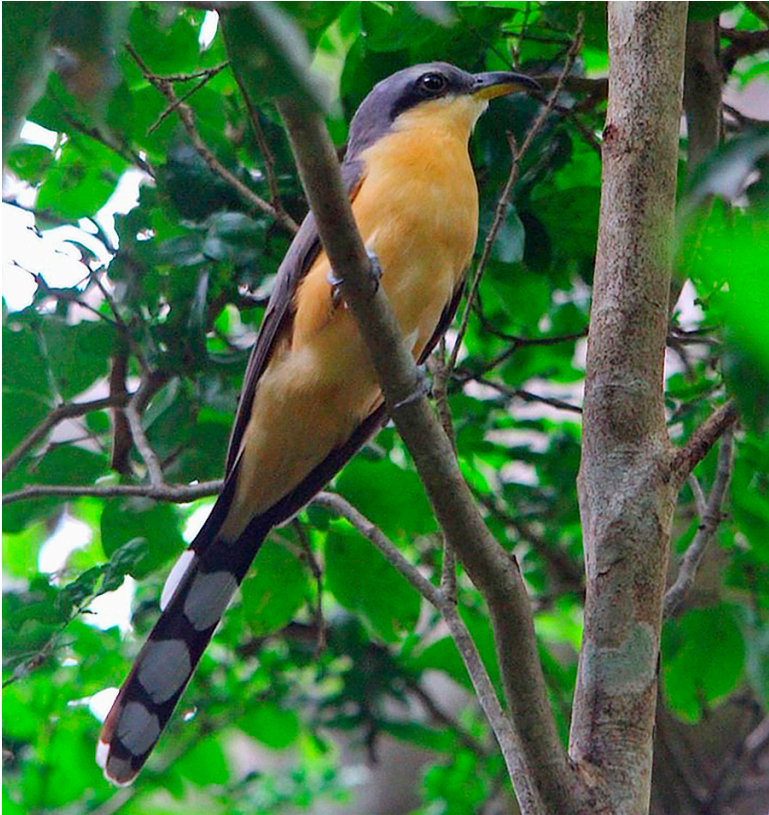


Figure 2. Mangrove Cuckoo (*Coccyzus minor*) on Isla María Cleofas, 3 March 2016.

Photo by Javier Cruz Nieto

Magdalena and Cleofas on 8 February 2002. The species is a common winter visitor off the Pacific coast of Mexico from Baja California Sur south (Howell and Webb 1995)

WESTERN/YELLOW-FOOTED GULL *Larus occidentalis/livens*. New to Madre. Not listed for the archipelago by Grant and Cowan (1964) or Howell and Webb (1995), but Bailey (1906) reported the “Western Gull *Larus occidentalis*” from Cleofas before *L. livens* was described. A distant immature bird belonging to one of these species was seen on Madre on 8 February 2002 (Hamilton).

LEAST TERN *Sternula antillarum*. New to archipelago. Found year round along the Pacific coast of mainland Mexico (Howell and Webb 1995), but the only record for the Tres Mariás Islands is of a complete wing found at the base of the lighthouse on Cleofas on 4 May 2016 (Pérez, Gómez de Silva; Figure 3). The lighthouse is on top of a high promontory and surrounded by forest, so this wing was not the result of a carcass floating in the ocean washing up on a beach but was probably discarded by a predator that carried it to the lighthouse.



Figure 3. Remains of Least Tern (*Sternula antillarum*) found on Isla María Cleofas, 4 May 2016.

Photo by Héctor Gómez de Silva

CASPIAN TERN *Hydroprogne caspia*. New to archipelago, with one at San Juanito on 8 February 2002 (A. Hebshi and S. Larsen, pers. comm.). Winter visitor and local breeder along the Pacific coast of Mexico (Howell and Webb 1995).

GREEN HERON *Butorides virescens*. New to Cleofas. First recorded in the archipelago from Madre (Konrad 1984). The only other record is of an adult on Cleofas on 25 and 30 April 2016 (Pérez, Gómez de Silva).

HOOK-BILLED KITE *Chondrohierax uncinatus*. New to Madre and Cleofas.



Figure 4. Female Hook-billed Kite (*Chondrohierax uncinatus*) on Isla María Madre, 20 November 2009.

Photo by Juan Cruzado Cortés

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Recorded as a summer resident on Magdalena (Grant and Cowan 1984). The only record from Madre is of one on 20 November 2009 (Cruzado; Figure 4), and the first records from Cleofas are of single individuals on 17 November 2015 (J. Cruz), 27 April (Pérez), and 30 April and 3 May 2016 (J. Cruz), suggesting that this species may be a rare permanent resident in the archipelago.

**BARN OWL** *Tyto alba*. New to Cleofas. Recorded previously only on Madre, where considered accidental (Grant and Cowan 1964) or vagrant/possibly resident (Howell and Webb 1995). We saw single birds in a grotto on Cleofas on 3 and 4 March (J. Cruz, Vásquez) and on 27 April 2016 (Vásquez, Gómez de Silva, Pérez). On these dates, we found pellets and molted feathers underneath a ledge near the mouth of the grotto, implying the species might indeed be resident here.

**ELF OWL** *Micrathene whitneyi*. New to Cleofas. Previously known in the archipelago from one late March record from Magdalena by Northern (1965), and considered a transient by Howell and Webb (1995). Our own records from Magdalena include one found dead (specimen not preserved) on 25 January 2012 (Carlos Gracia García, Hamilton) and one seen alive on 5 March 2016 (J. Cruz, Vásquez; Figure 5). On Cleofas, a pair was found roosting in a hole in a *Piranhea mexicana* tree on 3 March (J. Cruz, M. A. Cruz; photo) and seen again on 27 April, one individual was heard on 4 March 2016 (J. Cruz, Vásquez), and at least 12 were heard in various parts of the island 25 April–5 May 2016 (J. Cruz, Gómez de Silva, Pérez, Vásquez). These records suggest that the Elf Owl may in fact be a fairly numerous, if localized, resident in the Tres Marias Islands.

**YELLOW-BELLIED SAPSUCKER** *Sphyrapicus varius*. New to archipelago. Fairly common winter visitor on the Pacific slope of Mexico from Nayarit south (Howell and Webb 1995), but the only record from the Tres Marias Islands is of an adult female on Madre on 21 March 2012 (Cruzado; Figure 6). Drillings left by unidentified sapsuckers were found near the highest point of Cleofas on 2 May 2016 (Gómez de Silva, Pérez, Vásquez).

**PEREGRINE FALCON** *Falco peregrinus*. New to San Juanito, with one seen on 8 February 2002 (A. Hebshi and S. Larsen, pers. comm.). Winter visitor to the archipelago (Grant and Cowan 1964, Howell and Webb 1995).

**LILAC-CROWNED PARROT** *Amazona finschi*. New to Cleofas. Mentioned for Madre by Nelson (1899b) and Heilfurth (1938) on the basis of second-hand reports of occasional individuals of *Amazona* smaller than *A. oratrix*, likely escapees. One identified by its lilac crown, smaller size, and different vocalization was seen in a group of 36 Yellow-headed Parrots feeding at *Agave* flower stalks in the northeast corner of Cleofas on 5 March 2016 (J. Cruz).

**LEAST FLYCATCHER** *Empidonax minimus*. New to archipelago. Common winter visitor to the lowlands of mainland Mexico (Howell and Webb 1995), but the only record for the archipelago is based on UNAM AV017589, collected 8 October 1982 on Madre by Antonio Martínez.

**VERMILION FLYCATCHER** *Pyrocephalus rubinus*. New to Cleofas. Previously known only from Madre (Grant and Cowan 1964), this species was considered a transient by Grant and Cowan (1964) and Howell and Webb (1995). A male was videotaped near the beach on Cleofas on 31 January and 4 February 2002 (Hamilton).

**WESTERN KINGBIRD** *Tyrannus verticalis*. New to archipelago. Common transient and rare winter visitor to Nayarit (Mark Stackhouse, pers. comm.; www.ebird.org), but the only records from the archipelago are from Cleofas in 2016: one on 29 April, 16 on 30 April, and three photographed on 4 May (Gómez de Silva, Pérez, Vásquez, Cruzado).

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WARBLING VIREO *Vireo gilvus*. New to Cleofas, where we noted two on 30 April 2016 (Pérez, Gómez de Silva, Vásquez). Previously recorded in the archipelago only from Magdalena, where considered a transient by Grant and Cowan (1964) and a winter visitor by Howell and Webb (1995).

NORTHERN ROUGH-WINGED SWALLOW *Stelgidopteryx serripennis*. New to archipelago, on the basis of ten on Cleofas on 18 November 2015 (J. Cruz) and one there on 28 April 2016 (Gómez de Silva, Pérez, Vásquez). Common resident on the Pacific slope of Mexico (Howell and Webb 1995).

BARN SWALLOW *Hirundo rustica*. New to Cleofas (one on 1 and 3 February 2002, Hamilton; one or two on 27 and 30 April 2016, Gómez de Silva, Pérez, Vásquez) and San Juanito (one on 8 February 2002, A. Hebshi and S. Larsen pers. comm.). Common winter visitor in Nayarit (Howell and Webb 1995), yet there is only a single previous record for the Tres Mariás Islands (Madre).

BLUE-GRAY GNATCATCHER *Polioptila caerulea*. New to archipelago. Common winter visitor on the Pacific slope of Mexico (Howell and Webb 1995), but the only records from the archipelago are recent: On Magdalena, one and five were seen on 26 and 27 January 2002, respectively (Hamilton). On Cleofas, up to 14 were videotaped daily from 28 January to 4 February 2002 (Hamilton), eight were seen in various parts of the island from 16 to 18 November 2015 (J. Cruz), one was seen on 5 March 2016 (J. Cruz, Vásquez), and one or two were observed most days from 26 April to 3 May 2016 (Gómez de Silva, Pérez, Vásquez, J. Cruz, Cruzado).

RUBY-CROWNED KINGLET *Regulus calendula*. New to archipelago. Common winter visitor to the higher elevations of Nayarit (Howell and Webb 1995), but the only records from the Tres Mariás Islands are of one on Magdalena on 27 January 2002 and one on Cleofas on 2 February 2002 (Hamilton).

WOOD THRUSH *Hylocichla mustelina*. New to archipelago, on the basis of UNAM AV017599, collected 22 November 1986 on Magdalena by Josefina Arreola-G. The species is practically unknown from the Pacific slope of Mexico north of the Isthmus of Tehuantepec, though a common winter visitor to the Gulf slope (Howell and Webb 1995).

WHITE-THROATED THRUSH *Turdus assimilis*. New to archipelago, where our only record is of presumably the same bird at pools in an arroyo at the east end of Cleofas on 26 April and 4 May 2016 (Vásquez, Pérez, Gómez de Silva; Figure 7). Common resident on the Pacific slope of mainland Mexico, though mainly at higher elevations (Howell and Webb 1995).

HOUSE SPARROW *Passer domesticus*. New to Cleofas, where the only records for this uninhabited island are of a pair near an abandoned structure just behind the beach on the northeast side of the island on 5 March 2016 (Vásquez, J. Cruz) and a male photographed eating the pulp of a cactus fruit near the abandoned lighthouse on the island's southeastern corner on 30 April 2016 (Cruzado). Previously known in the archipelago only on Madre, where first recorded by Konrad (1984).

LOUISIANA WATERTHRUSH *Parkesia motacilla*. New to Madre on the basis of UNAM AV017569, collected on 8 October 1982. Fairly common winter visitor to much of the lowlands of mainland Mexico (Howell and Webb 1995) but previously recorded in the archipelago only on Magdalena (Grant and Cowan 1964).

NORTHERN WATERTHRUSH *Parkesia noveboracensis*. New to Cleofas, with single birds seen on 18 November 2015 (J. Cruz), 4 March 2016 (J. Cruz, Vásquez), and 26 April and 6 May 2016 (Gómez de Silva, Pérez, Vásquez). Fairly common winter visitor to much of the lowlands of Mexico (Howell and Webb 1995), previously recorded in the archipelago only on Magdalena (Grant and Cowan 1964) and Madre (Konrad 1984).



Figure 5. Elf Owl (*Microathene whitneyi*) on Isla Maria Magdalena, 5 March 2016.

*Photo by Javier Cruz Nieto*



Figure 6. Female Yellow-bellied Sapsucker (*Sphyrapicus varius*) on Isla María Madre, 21 March 2012.

*Photo by Juan Cruzado Cortés*



Figure 7. White-throated Thrush (*Turdus assimilis*) on Isla María Cleofas, 26 April 2016.

Photo by Mónica G. Pérez-Villafaña and Héctor Gómez de Silva

TENNESSEE WARBLER *Oreothlypis peregrina*. New to archipelago, on the basis of UNAM AV008479, collected 23 November 1986 on Magdalena by Josefina Arreola-G.. Rare winter visitor to the Pacific slope of Mexico from Guerrero south (Howell and Webb 1995).

ORANGE-CROWNED WARBLER *Oreothlypis celata*. New to Cleofas, with single birds seen on 17 November 2015 (J. Cruz) and 26 April 2016 (Gómez de Silva,



Figure 8. Yellow-throated Warbler (*Setophaga dominica albilora*) on Isla María Madre, 8 February 2002.

Photo from a videotape by Robert A. Hamilton

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Pérez, Vásquez). Common winter visitor to most of Mexico (Howell and Webb 1995) but previously known in the Tres Mariás Islands only from Madre and Magdalena (Grant and Cowan 1964).

NASHVILLE WARBLER *Oreothlypis ruficapilla*. New to archipelago on the basis of UNAM AV008559 and AV008560, collected 25 and 26 November 1986 on Magdalena by Ernesto Díaz and Humberto Berlanga, respectively. Common winter visitor to most of Mexico (Howell and Webb 1995).

MACGILLIVRAY'S WARBLER *Geothlypis tolmiei*. New to Cleofas, with one seen on 30 January 2002 (Hamilton). Common winter visitor to much of Mexico (Howell and Webb 1995) but known previously in the Tres Mariás Islands only from Magdalena (Grant and Cowan 1964) and Madre (Konrad 1984) and considered a transient or possibly winter visitor by Howell and Webb (1995).

AMERICAN REDSTART *Setophaga ruticilla*. New to Cleofas, with a female or first-winter male photographed on 30 April 2016 (J. Cruz). Common winter visitor to much of the Mexican lowlands (Howell and Webb 1995) but known previously in the Tres Mariás Islands only from Magdalena (Grant and Cowan 1964), where considered a transient (Grant and Cowan 1964) or winter visitor (Howell and Webb 1995).

YELLOW WARBLER *Setophaga petechia*. New to Cleofas, with one seen on 1 February 2002 (Hamilton) and up to five observed on 26, 28 and 30 April 2016 (Gómez de Silva, Pérez, Vásquez). All represented the migratory *aestiva* group of subspecies. Common winter visitor to most of the Mexican lowlands (Howell and Webb 1995) but known in the Tres Mariás Islands previously only from Magdalena and Madre, where considered a transient (Grant and Cowan 1964) or transient/possible winter visitor (Howell and Webb 1995).

YELLOW-THROATED WARBLER *Setophaga dominica albiflora*. New to archipelago. This subspecies is a casual visitor/vagrant to western Mexico (Dunn and Garrett 1997); one was videotaped on Madre on 8 February 2002 (Hamilton; Figure 8).

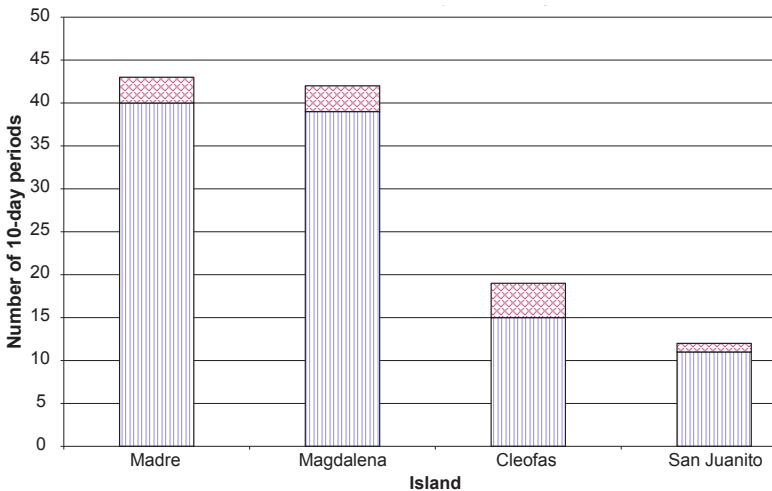


Figure 9. Relative effort of ornithologists in the the Tres Mariás archipelago, by number of 10-day periods per island. Hatched areas, our effort; vertical stripes, earlier efforts.

## REVIEW OF THE AVIFAUNA OF THE TRES MARÍAS ISLANDS, MEXICO

WILSON'S WARBLER *Cardellina pusilla*. New to Magdalena, with a male videotaped on 7 February 2002 (Hamilton). Common winter visitor to most of Mexico (Howell and Webb 1995) but known in the archipelago previously only from Madre and Cleofas, where considered a transient (Grant and Cowan 1964) or transient/transitory winter visitor (Howell and Webb 1995).

LARK SPARROW *Chondestes grammacus*. New to Magdalena, on the basis of UNAM AV011324, collected 23 November 1981 by Josefina Arreola-G. Considered a transient in the archipelago by Howell and Webb (1995) and previously recorded only from Madre.

BLACK-HEADED GROSBEAK *Pheucticus melanocephalus*. New to Cleofas, with one male in mesic forest at high elevation on 2 May 2016 (Vásquez, Pérez, Gómez de Silva). Considered a transient in the archipelago by Howell and Webb (1995) and previously recorded only from Madre and Magdalena.

VARIED BUNTING *Passerina versicolor*. New to Cleofas, where our only record is of a male at pools in an arroyo on 5 May 2016 (Pérez, Gómez de Silva, Vásquez). Considered a transient to the archipelago by Howell and Webb (1995) and previously recorded only from Magdalena.

BROWN-HEADED COWBIRD *Molothrus ater*. New to Cleofas, on the basis of a male flying out to sea from the mangroves near the northeast corner of the island on 29 April 2016 and two females on 4 May 2016 (Gómez de Silva, Pérez, Cruzado, Armando Calderón pers. comm.). Considered a transient in the archipelago by Howell and Webb (1995) and previously recorded only from the three northern islands.

HOODED ORIOLE *Icterus cucullatus*. New to archipelago, with one record of an immature male in a narrow strip of *Agave*-dominated succulent scrub near the beach on Cleofas on 29 April 2016 (Gómez de Silva, Pérez, Vásquez). Common winter visitor to Nayarit (Howell and Webb 1995).

BULLOCK'S ORIOLE *Icterus bullockii*. New to archipelago on the basis of UBC B010854, an immature male collected on Magdalena on 8 March 1962 by Ian McTaggart Cowan. It was originally labelled "*Icterus pustulatus*," but Alvaro Jaramillo reidentified it in 1996 (data and photographs of specimen provided to us by Ildiko Szabo). Common winter visitor to the Pacific slope of mainland Mexico (Howell and Webb 1995).

## DISCUSSION

While this study brings up to date the avifauna known from the Tres Mariás Islands, each expedition continues to add species to the list of birds known from each island and from the archipelago as a whole. Clearly, our knowledge of the avifauna of the Tres Mariás archipelago remains fragmentary. Histograms of the number of visits to each island (Figure 9) and the dates of expeditions (Figure 10) show that María Madre is the only island visited by multiple expeditions spread throughout the year. The greatest gaps in visitation to the archipelago are from early September to early October (single expedition), and only five expeditions have been made in November and December. San Juanito is the island with the fewest expeditions, with none from June to early January. Both María Magdalena and María Cleofas also remain lightly studied, especially during the fall and winter. The dearth of visits to the archipelago in September and October may be explained by the hurricane season, which peaks in fall (CONANP 2007).

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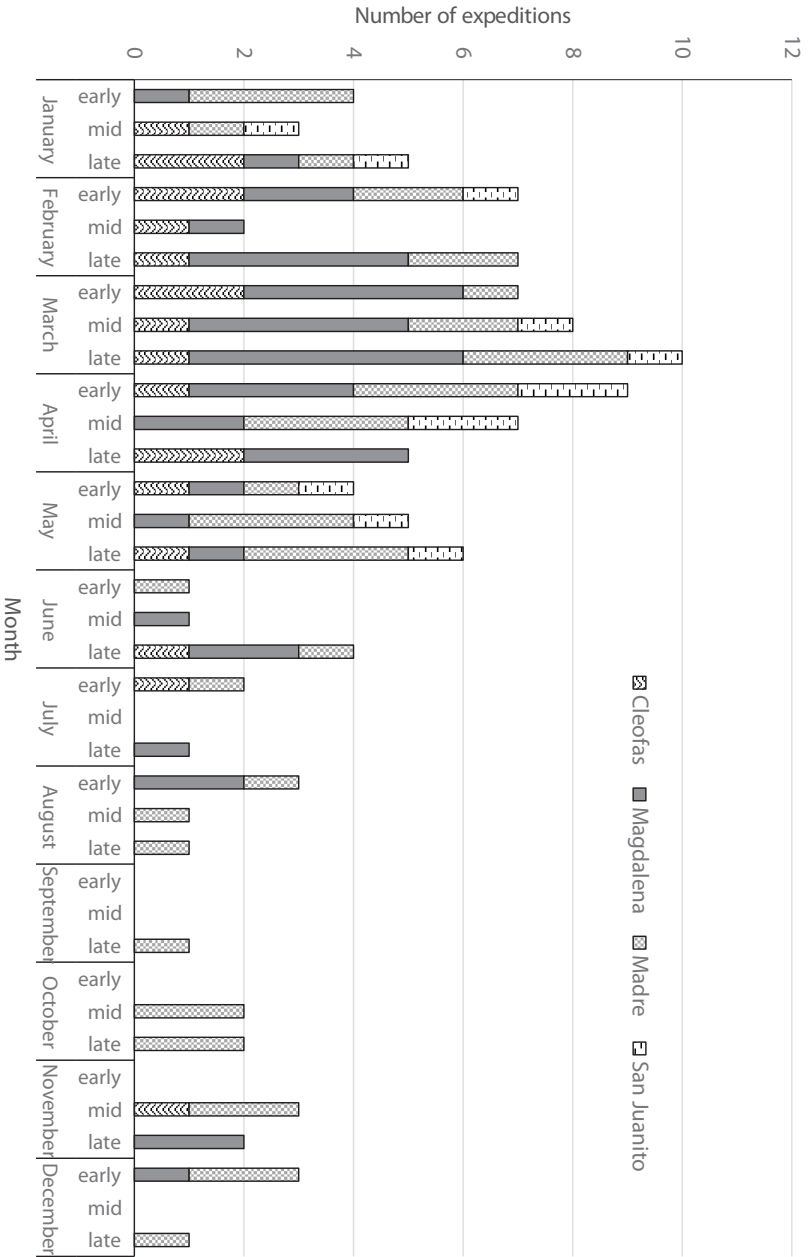


Figure 10. Relative effort throughout the calendar year dedicated to ornithological exploration of the Tres Marias Archipelago. See Methods for notes on date discrepancies.

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Although the Tres Marías Islands have suffered perhaps less human disturbance than most parts of North America, the presence of introduced mammals on all of the islands (except, significantly, perhaps San Juanito) is a cause for concern. The current lack of medium-sized cycads and thick undergrowth in the forest of medium height on Isla María Cleofas (pers. obs.) contrasts with the abundance of cycads and thick undergrowth still there in 1955 and 1976, respectively (e.g., Stager 1957: plate 20, Wilson 1991: figure 9), suggesting much degradation of the forest in the past few decades. It is well known that introduced goats (e.g., Cabin et al. 2000, Dukes and Mooney 2004, Dixon 2011, Chynoweth et al. 2013), cats (Medina et al. 2011), and rats (Shiels et al. 2014, ISSG 2016) devastate ecosystems and native species. These species have been successfully eradicated from other islands of western Mexico (Aguirre et al. 2008), and we hope that similar efforts will be taken to ensure the continued well-being of the birds and other native wildlife of the Tres Marías Islands.

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