Revista Mexicana de Biodiversidad

Revista Mexicana de Biodiversidad 97 (2026): e975757

Conservation

The reef-associated fishes of the Revillagigedo National Park (Mexican Pacific): a curated, annotated and illustrated inventory

Los peces asociados a arrecifes del Parque Nacional Revillagigedo (Pacífico mexicano): un inventario curado, comentado e ilustrado

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ISSN versión electrónica: 2007-8706; Universidad Nacional Autónoma de México, Instituto de Biología. http//doi.org/10.22201/ib.20078706e.2026.97.5757

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Received: 27 August 2025; accepted: 13 April 2026

Abstract

Accurate inventories of species living at isolated islands are essential for understanding the biogeographic and functional composition of insular faunas, habitat area vs. faunal-size relations and levels of endemism, as well as for purposes of conservation and management. Constructing such inventories involves new field research and rigorous winnowing of existing records that have errors in specimen identification and metadata or are unsubstantiable due to a lack of reliable source information. This paper provides a curated, photographically illustrated inventory of reef-associated fishes found at the 4 islands in the Revillagigedo National Park (RNP), 400 km southwest of Baja California. We assessed the quality of data about records relating to 364 species and added new data (specimens of 132 species and images of 182 species) that confirm species occurrences at each island in the park. The resultant inventory includes 234 accepted species occurrences, with 121 unaccepted occurrences (33.2% of the assessed species). Among the confirmed species, 166-189 (70.9-80.8%) evidently are park residents. New information indicates that the RNP fauna includes 23 named and probable species of endemics, representing 9.8% of the accepted species and 12.2-13.9% of the residents, highlighting the uniqueness of the RNP and its importance for conservation.

Keywords: Tropical Eastern Pacific; Isolated oceanic island; Rocky reefs; Elasmobranchs; Bony fishes

Resumen

Los inventarios precisos de especies en islas aisladas son esenciales para comprender la composición biogeográfica y funcional de las faunas insulares, las relaciones área-fauna y los niveles de endemismo, además de ser fundamentales para la conservación y manejo. Su elaboración requiere nuevas investigaciones de campo, además de un riguroso cribado de registros existentes con errores de identificación o metadatos no verificables. Este artículo presenta un inventario ilustrado de los peces asociados con arrecifes del Parque Nacional Revillagigedo (PNR), ubicado a 400 km al suroeste de Baja California. Se evaluó la calidad de registros de 364 especies, incorporando datos nuevos (especímenes de 132 especies e imágenes de 182) que confirman presencias en cada una de las islas. El inventario resultante incluye 234 presencias aceptadas y 121 no aceptadas (33.2 % de las especies evaluadas). Dentro las confirmadas, entre 166 y 189 especies (70.9%-80.8%) son residentes del parque. La nueva información indica que la fauna del PNR incluye 23 especies endémicas nombradas y probables, representando 9.8% de las especies aceptadas y entre 12.2% y 13.9% de los residentes, lo que ilustra la singularidad ecológica del PNR y su importancia para la conservación marina.

Palabras claves: Pacífico oriental tropical; Isla oceánica aislada; Arrecifes rocosos; Elasmobranquios; Peces óseos

Introduction

Accuracy in faunal inventories for reef fishes and other reef organisms at isolated tropical islands is important for a variety of reasons. Species inventories often provide the only data used to assess the biogeographic relationships of those faunas (e.g., Castro-Aguirre & Balart, 2002; Dubic et al., 2023; Hobbs et al., 2012, 2014; Robertson & Allen, 1996; Robertson & Cramer, 2009), as well as many studies of their composition in terms of functional ecological characteristics (e.g., Bender et al., 2013; Dubuc et al., 2023; Ferrari et al., 2023; Palacios-Salgado et al.,

2019; Torres-García et al., 2025), relationships between faunal size, habitat area and island isolation (Dubuc et al., 2024; Hobbs, 2012, 2014; Olivier et al., 2018; Sandin et al., 2008) and levels of endemism (Dubuc et al., 2023; Hobbs et al., 2011, 2014; Robertson & Cramer, 2009; Victor, Grove et al., 2024). Accurate faunal inventories are also essential for management and conservation purposes (IOC-UNESCO, 2024).

Faunal inventories typically are assembled based on various combinations of information in existing scientific and grey-literature publications and in museum databases, some hosted by online aggregators, that refer to specimens collected from the 18th century to the present. They also often include personal observations by authors and the results of new research. However, as time goes by, inventories tend to accumulate species names through the uncritical acceptance of records. Constructors of inventories often fail to question and delete names except those representing obvious errors, such as the inclusion of species that do not occur in the biogeographic region in which the study area is located. However, data from primary sources of information, such as museum collections, particularly older collections, also need to be rigorously evaluated to ensure accuracy in species occurrences on inventories. For example, Mundy (2005) compiled a curated inventory of Hawaiian Islands fishes, which involved a detailed annotated evaluation of supporting information for each species. That inventory included 1,177 verified marine species plus 9.7% of the total evaluated that he regarded as invalid. Another inshore-fishes inventory by Mundy et al. (2010) for parts of the Phoenix and Line Islands included 5.6% of the species as unaccepted or requiring verification. Rates of rejection in other curated local marine fish inventories in some cases are even higher: 14.4% of marine fishes recorded at Malta (Borg et al., 2023) and 18.1% of alien marine fishes recorded at Greece (Zenetos, 2018).

The Revillagigedo Archipelago is an isolated cluster of 4 small, volcanic islands that lie 400 km southwest of the tip of the Baja California Peninsula, Mexico, in what is now the Revillagigedo National Park (RNP), which receives the highest level of protection available to Mexican parks, with no industrial fishing allowed. Research on the archipelago's fish fauna began with collections between the 1880s and 1890s studied by Gilbert (1890), Heller and Snodgrass (1903), Jordan and Gilbert (1882), Jordan and McGregor (1899), and Snodgrass and Heller (1905). This was followed by another burst of collecting activity in the mid-20th century (Beebe, 1937; Ricker, 1959; Schmitt & Schultz, 1940) and subsequent deposition of substantial collections of specimens made between the 1930s and 1970s at the California Academy of Sciences, the Natural History Museum of Los Angeles County, the University of British Columbia Fish Collection (now part of the Beaty Biodiversity Museum) and the Canadian Museum of Nature, both in Canada, Scripps Institution of Oceanography and the U. S. National Museum of Natural History. In Mexico there are collections of RNP fishes at the Colección Nacional de Peces (CNPE-IBUNAM), the Colección del Laboratorio de Ecología, Escuela Nacional de Ciencias Biológicas, Instituto Politécnico Nacional (ENCB-IPN-LEM), the fish collection at Universidad Michoacana de San Nicolás de Hidalgo (CPUM) and the Colección Ictiológica, Centro Interdisciplinario de Ciencias Marinas, Instituto Politécnico Nacional, Baja California Sur (CICIMAR).

The first major ichthyological inventory of RNP fishes that incorporated information from a variety of sources was that of Castro-Aguirre and Balart (2002). That inventory, which focused on the biogeographic relationships of members of that fauna, included 228 shore —and pelagic fishes— 178 of them reef-associated species. However, it lacked original (primary) source records linked to each of the species included and did not indicate occurrence of each species at the different RNP islands. Subsequently, 2 more comprehensive inventories of RNP fishes were published in 2016. Both included reef-associated and other types of fishes, provided extensive primary-source records and employed some degree of winnowing of doubtful and erroneous records. One inventory, by Del Moral-Flores et al. (2016), which provided information on species occurrences at each of the 4 RNP islands, excluded 36 (8.9%) of the total of 402 species it discussed, most due to changes to nomenclature in the taxonomic literature, but some arising from issues with the geographic ranges of certain species and possible inappropriateness of archipelago habitats for others. The other inventory, by Fourriére et al. (2016), which did not include information on occurrences at each of the RNP islands, classed 10 (2.5%) of 399 species as doubtful occurrences.

Some of the RNP specimens from 19th-mid 20th century museum collections have been reassessed during taxonomic studies that targeted specific groups of archipelago fishes. These include species in various families of blennies (Dawson, 1975; Hastings & Robertson, 1999; Hubbs, 1953; Kresja, 1960; Rosenblatt et al., 2013; Springer, 1962); wrasses (Allen & Robertson, 1992a; Bussing, 1987); pipefishes (Dawson, 1981, 1985; Fritsche, 1980); gobies (Bussing, 1990; Ginsburg, 1947; Miller & Stefanni, 2001); soapfishes and groupers (Allen & Robertson, 1999; Guimares, 1999; McCarthy, 1979); damselfishes (Allen & Woods, 1980); clingfishes (Briggs, 1951, 1955); needlefishes (Collette & Banford, 2001); and frogfishes (Pietsch & Arnold, 2020). However,

a substantial fraction of the museum material and its provenance have yet to be reexamined in the light of current taxonomic knowledge. That knowledge, now readily accessible in vast online resources, was not available to people responsible for making and annotating 19th to mid-20th century faunal collections and documenting that information in publications.

Here we expand on the "two 2016 efforts" to produce an improved inventory based on a more comprehensive verification of species records. In addition, in November 2022 a group of 17 scuba divers (7 diving ichthyologists plus 10 citizen-scientist underwater photographers) from Mexico, the USA and Panama spent 9 days diving at the 4 islands of the RNP. The objective of that expedition was to document occurrences of reef fishes at each island by photographing as many species as possible in their natural habitats and collecting specimens of some for further study (see Estape [2023] for a video presentation of that expedition). The present paper developed from that effort by including detailed assessments of species in the RNP based on various types of pre-existing information to produce a comprehensively curated inventory of the archipelagos reef-associated fishes that also documents their distribution among the different islands. That pre-existing information includes records in professional ichthyological publications that provide useable primary-source information: accessible and assessable species-level location data and selected museum specimens that date from collections in the later 19th to mid-20th century that have never been reassessed since those specimens were accessioned by the museums. This paper also incorporates a substantial amount of additional new primary-source data obtained in the RNP at different times during the past decade by different coauthors: specimen collections, DNA analyses, images of live and freshly collected specimens, and reliable field observations.

Materials and methods

The Revillagigedo Archipelago comprises 4 small volcanic islands situated southwest of the tip of the Baja California peninsula, with the closest island, San Benedicto, 406 km from the tip of Baja and the farthest, Clarion, 700 km from Baja. Three of the islands (Socorro, San Benedicto, and Roca Partida) are relatively close together (50-140 km apart) on the eastern side of the archipelago and are well separated from Clarion Island, the westernmost island, by distances ranging from 290 to 430 km. These islands are the base of the Revillagigedo National Park (the RNP), a rectangular 148,000 km^2 marine park bounded by latitudes 17.655° to 20.009° N and longitudes -110.078° to -115.471° W. That reserve encompasses the Revillagigedo archipelago and a surrounding area of 6,400 km^2 of deep sea, which is imbedded in a 142,000 km^2 buffer zone (Fig. 1). The 4 islands are relatively small, ranging from < 1 ha. for Roca Partida to ~ 130 km^2 for Socorro. Marine habitats consist mainly of rocky shorelines plus some soft bottoms, which drop rapidly off into deep water, intertidal rock pools and a few sheltered bays on Socorro and Clarion that have sandy beaches, with 1 on Socorro having a marine lagoon behind it. Reefs of the RNP islands are predominately rocky (Ramírez-Zúñiga et al., 2025), although scattered coral colonies and communities are common.

Here we follow the family and genus level classification of fishes as indicated in Eschmeyer's Catalog of Fishes (Fricke et al., 2026).

Reef-associated fishes

Coral and rocky reefs down to depths of ~ 250 m have reef-fish faunas dominated by members of families of bony fishes found associated with shallow reefs (Baldwin et al., 2018). The inventory presented here focuses on species belonging to such families because those are what are traditionally considered to be reef fishes. Reef-associated fishes include not only demersal and benthic species that live in or on consolidated hard substrata (coral- and rocky reefs) but also demersal and benthic species that are restricted to unconsolidated or soft bottoms (sand, mud, and gravel) immediately adjacent to or within the matrices of reefs. Reef-associated fishes also include pelagic species that live in the water column, facultatively associate with reefs, are regularly seen over and immediately adjacent to them, and have trophic interactions with organisms on reefs. Those trophic interactions can include contributing food to reefs (e.g., material removed from the skin of large pelagics by reef fishes, e.g., *Mobula birostris* in the RNP (Clarión Angelfish & Manta) or *Mola alexandrini* at the western Galápagos (Bodianus & Mola) or extracting food from them (e.g., *Carcharhinus falciformis* and *Thunnus albacares* preying on juvenile *Elagatis bipinnulata* on reef at Cocos Is.; Auster et al., 2016). This definition follows Cord et al. (2024) and Robertson (2024).

The inventory presented here, which includes both bony fishes and elasmobranchs, is based on a wider range of species than those classed as reef fishes by Fourriére et al. (2016), who split the fauna into reef fishes and non-reef fishes, with the latter group including many pelagic and soft-bottom fishes that we class as reef-associated (see Robertson [2024] for a list of Tropical Eastern Pacific (TEP) reef-associated bony-fish species), as well as deep-water species belonging to non-reef families. The inventory of Del Moral-Flores et al. (2016) did not consider reef-associated fishes as a separate group.

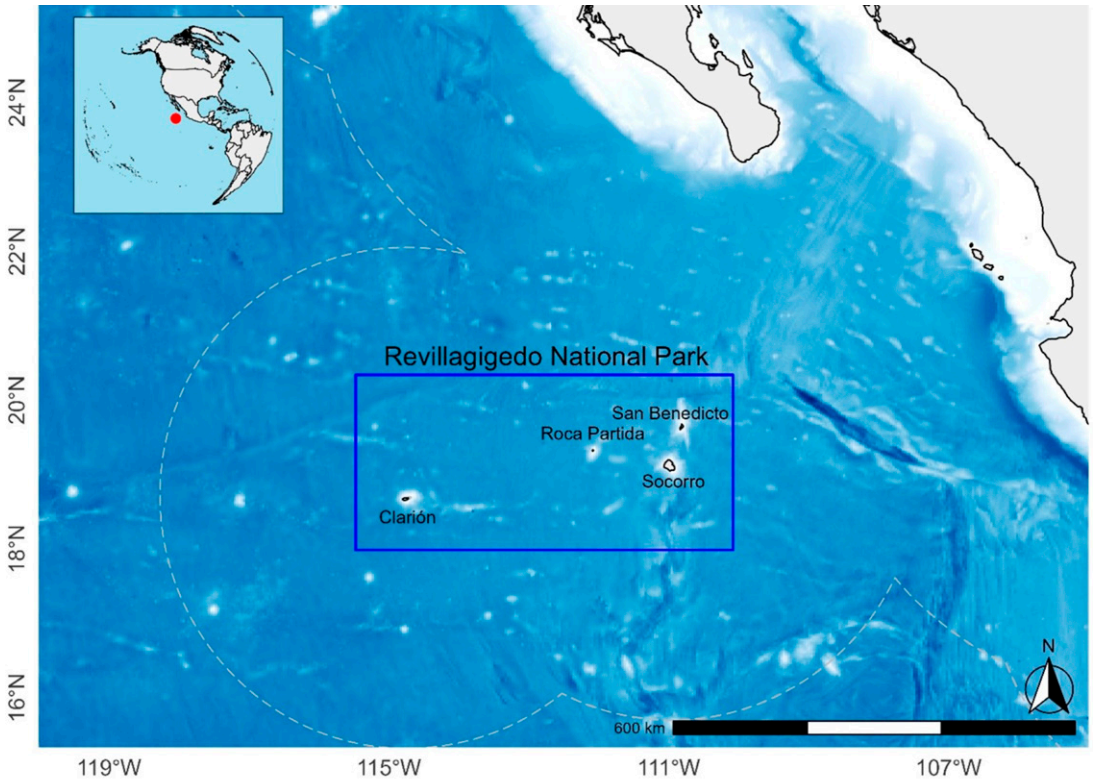

Figure 1. Map of the Revillagigedo National Park (RNP).

Categories of species evaluated

The categories are: *i)* Confirmed/accepted species: species confirmed as part of the RNP fauna comprise those with positive identifications from 1 or more primary sources (see below). Accepted species also include a few common, widely distributed TEP species with distinctive morphological features that make them readily recognizable to divers and that were observed at 1 or more islands by a coauthor of this paper or in existing published professional ichthyological studies. They also include settlement-stage juveniles of benthic and demersal reef-associated species that were collected at a night-light while the ship was anchored immediately adjacent to the 3 largest islands during the 2022 expedition. *ii)* Unaccepted species: such species lack any identifiable support from primary sources that would confirm their presence in the RNP. They include misidentified museum specimens reassessed as such by museum curators, museum specimens that are too small or in such poor condition as to be unidentifiable to species, those with inadequate or erroneous location data, those whose occurrence is based on museum specimens that have been all lost and demersal/benthic species recorded as present based on specimens of pelagic larvae collected well offshore rather than benthic or settlement stage individuals. *iii)* Unresolved species: these include species that have been recorded at and plausibly could occur in the RNP, based on their geographic ranges, and occurrence at other TEP offshore islands, but currently lack adequate primary source data that verify their records. They also include species recorded as observed in previous studies that might have been confused with other visually similar species confirmed as present in the RNP.

Residency status

We regard a reef-associated species as being a resident in the RNP if there is evidence of long-term, persistent occurrence or an extant breeding population at 1 or more of the 4 islands. That evidence includes multiple observations of adults and, especially, juveniles at 1 or more of those islands during the 2022 expedition, repeated collections of multiple individuals over many years, multiple vouchered records at 1 or more islands over multiple recent years of ecologically non-cryptic species and recent images from iNaturalist and other sources at those islands. We used the yardstick of "multiple occurrences at multiple islands and/or multiple, well separated years, particularly if there are records since 2000". This leaves a group we class as

uncertain residents. These mainly include a few species that have a single, usually old record in the RNP and that lack recent records due to sampling difficulties may have led to their abundance being underestimated. Among them are some cryptic species, such as ophichthid eels and flatfish that bury in soft bottoms or live deep inside crevices (bythitids) that are normally effectively sampled only with ichthyocides. They also include species typically found below normal scuba depths (e.g., some congrids, tilefishes, serranids, scorpionfishes, and bythitids), that are less likely to have been sampled. Some may eventually be shown to be residents, while others may be vagrants. Non-residents or vagrants: species that do not fit either of the above categories and that have sufficiently few records that they likely represent species that occasionally recruit to the RNP but do not establish a breeding population there. They mainly include demersal, readily visible species living in shallow water, that, if they were residents, would be expected to be recorded repeatedly, in substantial numbers, over multiple years.

Endemics and the rate of endemism

Endemics are species that have a resident population only in the RNP. They include some species known from the mainland or other islands in small enough numbers to lack self-sustaining populations outside the RNP. Genetic evidence of endemism includes RNP populations composed entirely of local haplogroups or almost entirely when there are vagrant individuals at other sites, while non-endemics have substantial amounts of shared haplogroups with other sites, on the mainland and other TEP oceanic islands.

Levels of endemism frequently are measured as the percentage of the total number of species known from a location that are endemics, because those are the only data available. Examples for TEP fishes include Briggs (1974), Briggs and Bowen (2013), Del Moral-Flores et al. (2016), and Fourriére et al. (2014, 2016, 2017). In their discussion of geographic patterns of endemism among shore-fishes of the TEP, Robertson and Cramer (2009) considered endemism in relation to numbers of regional residents and excluded regional vagrants (c.f., Pinheiro et al., 2018). However, they did not consider more localized (provincial or island) endemism in relation to site residency and used the percentage of all species present at each site because residency information was not available for most oceanic islands. McCosker and Rosenblatt (2010) assessed the rate of endemism among Galápagos fishes in relation to local (Galápagos) residency, excluding local vagrants, while Victor, Grove et al. (2024) assessed it both in relation to the total fauna and to residents. If endemism is related to the total local fauna its rate will gradually decline through time as new vagrants appear at a site, even though the number of resident species may remain constant. Vagrants also have quantitatively negligible and temporary influence within local ecosystems, on resident populations or on the evolution of endemic populations. Hence, here we also focus on residents in calculating the rate of endemism for RNP reef-associated fishes.

Data sources

Primary sources used here comprise various types of sources that provide species-level data relating to occurrence of fishes within the RNP that we were able to assess for validity. They include information on specimen records in museum databases and online aggregators of such data, scientific publications by professional ichthyologists that recorded species during fieldwork within the RNP and taxonomic publications that involved examination of museum specimens from the RNP. They also include taxonomically diagnostic images of species taken in the RNP, including images taken by the authors and by visitors to the archipelago that are hosted by iNaturalist. Those sources also include DNA sequence data obtained from collections in the archipelago by some of this paper's coauthors. The present paper is based on information from primary sources, which include 2 previous comprehensive inventories, by Del Moral-Flores et al. (2016) and Fourriére et al. (2016) — collectively referred to as the "two 2016 inventories"— both of which listed museum data for individual species. Del Moral-Flores et al. (2016) also listed which islands each species had records from, while Fourriére et al. (2016) recorded observations of species in different years, without indicating species occurrences at individual islands in the archipelago. Del Moral-Flores et al. (2016) referred to collections from 4 Mexican museums and 11 museums in other countries and mentioned the physical review of museum specimens. However, besides including a figure of images of 10 common species from 2 museum collections, the Colección Nacional de Peces, IBUNAM (CNPE-IBUNAM) in Mexico and the Natural History Museum of Los Angeles County (LACM) in the USA, that paper does not indicate which other specimens from which museums were examined for verification. Fourriére et al. (2016) reported no examination of any museum specimens.

We used several types of data to vouch for (i.e., validate) the occurrence of different species at different islands in the RNP. *i)* Taxonomically diagnostic images and specimens obtained during the 2022 expedition. The November 2022 expedition visited all 4 islands on a liveaboard diving support ship, the Quino El Guardián (see Estape, 2023). *ii)* Taxonomically diagnostic iNaturalist

images. Images of fishes taken by citizen scientists available on the iNaturalist website (iNaturalist) that we reviewed and confirmed the identification of provided voucher information about occurrences of species at different islands in different years. *iii)* Universidad Michoacana Team collecting efforts between 2015-2023 and genetic analyses of RNP fish populations. Groups of ichthyological students from the Universidad Michoacana (UMSNH) laboratory of coauthor ODD made 4 collecting trips (2015, 2016, 2019 and 2023) to Clarion, San Benedicto and Socorro, collecting as many species as possible, particularly those found in tide pools. That collecting by ODD's laboratory has led to genetic evaluations of the relationships of RNP populations to those on the mainland and other oceanic islands in the TEP, information that we draw on here. In addition, coauthor AAB made a series of visits to various parts of the archipelago in between 2012, 2013, 2014, 2017, 2019, 2022, 2023, 2024 and 2025, where he recorded species he observed while diving at different islands and, in some cases, took underwater videos of unusual species, from which screen captures provide island-specific voucher images used here. *iv)* UABCS, La Paz efforts between 2016 and 2025. Coauthor CS-O participated in an expedition to the archipelago during 2016 that resulted in a technical report (Aburto-Oropeza et al., 2016) based largely on several thousand hours of videos recorded by BRUVS (Baited Remote Underwater Video Systems). That report provided voucher data for a review of the occurrences of elasmobranchs and chimaeras in the RNP by Becerril-Garcia et al. (2020), which we regard as a primary-source curated inventory. Those videos also produced voucher images of deep-living bony reef fishes species included here. Monitoring reef-fish populations in the RNP by CS-O's UABCS-La Paz team also produced the most recent record of a new member of the RNP reef-associated fish fauna, in June 2025. *v)* Reassessment of museum specimens. These were made in cases where no other primary sources of data confirmed the presence of a species in the RNP. In such cases fish curators at various museums examined specimens of particular species to verify their identities. Associated collection-site metadata was also reviewed to verify whether they were collected in the RNP. That information came from a combination of aggregators, including GBIF, OBIS, Conabio (Comisión Nacional para el Conocimiento y Uso de la Biodiversidad), Fishnet2, Vertnet, and iDigBio. In addition, the online databases of museums that supplied data to those aggregators were reviewed because no aggregator provides all the data currently available in individual museum databases that feed data to that aggregator. Museum name codes follow Sabaj (2023). Those museums are: ANSP (Academy of Natural Sciences, Philadelphia), AMNH (American Museum of Natural History), CAS (California Academy of Sciences, San Francisco), CMNFI (the Canadian Museum of Nature), CNPE (Colección Nacional de Peces, IBUNAM, Mexico), CPUM (Colección de Peces de la Universidad Michoacana de San Nicolás de Hidalgo, Morelia), CSLB (California State University, Long Beach, Fish specimens), CUMV (Cornell University Museum of Vertebrates, Ithaca), FMNH (Field Museum of Natural History, Chicago, Zoology Fish Collection), LACM (Natural History Museum of Los Angeles County), MCZ (Museum of Comparative Zoology, Cambridge), NHMUK (Natural History Museum, London), ROM (Royal Ontario Museum, Toronto), SIO (Scripps Institution of Oceanography, San Diego), UBC (University of British Columbia, Beaty Biodiversity Museum; which has too many errors to represent a very reliable source), UF (University of Florida, Florida Museum of Natural History, Ichthyology), UMMZ (University of Michigan Museum of Zoology), USNM (National Museum of Natural History, Smithsonian Institution, Washington DC). In cases where questionable specimens of a particular species were lodged at multiple museums, specimens from only 1 museum typically were reviewed. If the identity in that database was confirmed, we assumed correct identifications of specimens at any other museums, since the object of these reviews was to verify occurrence in the RNP. In situations in which misidentifications or erroneous location data were detected in the first case reviewed, specimens and collection data from another museum were examined, if available. *vi)* IATTC geographic distribution data of species caught in the international tuna fishery. We also used public domain location records of pelagic species caught in the TEP by the international tuna fishery and recorded by observers of the Inter-American Tropical Tuna Commission (IATTC) to help determine which of those species that are reef-associated are found in the RNP. *vii)* Genetic analyses of 2022 expedition specimens. We used these to confirm identifications of certain species and to provide data on evolutionary relationships of RNP populations with those on other TEP oceanic islands and the mainland. *viii)* UNESCO eDNA data. In 2023 a UNESCO sponsored eDNA sampling of water at a total of 21 stations adjacent to all 4 islands. The data on species-level assignments and location of ASV reads of 3 mitochondrial genes, cytochrome oxidase-1 (CO1), 12S and 16S for each species are located at a UNESCO site (UNESCO eDNA) and at OBIS (OBIS-UNESCO eDNA). We reviewed those data and used them to add a few species to the RNP confirmation-required group of-species that had not previously been recorded there and expanded the base of voucher data on some other species that had

other existing forms of voucher data. Three species that lack other forms of voucher data have CO1 species-name assignments at the 100% confidence level, as well, in some cases, 16S reads with name assignments with 100% confidence. Given problems in name assignment due to misidentification of reference sequences in GenBank and limitations on the ability of 12S and 16S to reliably distinguish between congeners (Fontes et al., 2024), we added only species in cases in which misidentifications or confusion with other members of the same genus are unlikely, e.g., monospecific families or genera, when a species was the sole member of its genus in the TEP or when all other congeners present in the TEP were also included in the eDNA database. Other eDNA data, again mostly CO1, with 100% confidence species-name assignments, provided additional information on the occurrence and distribution in the RNP of 14 other species already confirmed by other voucher data. *ix)* Video surveys of deep-living fishes. There have been a few studies of deep-reef fishes in the RNP fauna based on videos collected by dropcams (Giddens et al., 2019), a small ROV (Remotely Operated Vehicle) operated at 30-90 m depth of both reef and adjacent sand habitat (Hollarsmith et al., 2020; Velasco-Lozano et al., 2020) and a submersible (Ayala-Bocos et al., 2015). These have provided useful information through voucher images of identifiable species at different RNP islands and information on mesophotic reef-fish abundances. However, much of the video databases produced by Aburto-Oropeza et al. (2016) and Ayala-Bocos et al. (2015) have yet to be reviewed and may in the future produce confirmation of additional species not mentioned here, as well as information that could help clarify the population status of some species already confirmed from the RNP.

Secondary sources are those that do not provide species-level data linked directly to a primary source, e.g., a georeferenced location from a museum record, or an image or indication from which island(s) in the RNP a species was recorded. Secondary sources include grey literature and government reports about the RNP that include lists of fish species. They also include some ichthyological publications that produce species lists based on data recycled from other published sources and do not individually link listed species to primary sources or to particular islands, e.g., Castro-Aguirre and Balart (2002) and Conanp (2019) and the governmental reports derived from those. The RNP species list used by Torres-García et al. (2025) to examine variation in taxonomic and functional diversity of fishes among various Mexican Pacific reefs also does not include primary-source data, does not refer to either the 2002 or 2016 checklists and appears to have used lists from government reports that recycle secondary data. Hence this paper is treated as an unusable secondary source. Other secondary sources also include digital resources by Robertson and Allen (2006, 2015) for which no primary-source information could be found in 2025 on some RNP location records. Hence, such secondary data cannot be reassessed if the basis for inclusion of each species on an inventory is unclear and such data are not relied upon here.

Results

Accepted species

We assessed the quality of existing primary-source records relating to 364 species included in various RNP databases and added new data (specimens of 132 species and images of 182 species) that confirm species occurrences at the different islands and assist estimation of their population status. Acceptance was based on a variety of factors. While reliable images demonstrated occurrences of many species, most also had other forms of supporting data. Re-examination of specimens of 46 species from 8 museums confirmed their identifications and location data, including 30 species lacking other forms of voucher data. Re-examination of museum specimens also corrected misidentifications of specimens of 12 other species, providing additional data relating to their status as RNP residents (Table 2). The resultant inventory includes 234 accepted species occurrences (including 19 not in both 2016 inventories and another 5 not in one of them), from 165 (80.5%) of the 205 assessed genera and 66 (81.5%) of the 81 assessed families (Tables 1, Supplementary material: Table S1). Among the confirmed species, 166-189 (70.9-80.8%) have sufficient records to be regarded as archipelago residents. That proportion may well increase when more information becomes available on non-resident and "residency uncertain" species.

DNA sequencing of specimens, single specimens per species in most cases, collected during the 2022 expedition provided confirmation of the identity of individuals of 35 species. More expansive genetic studies by ODD's laboratory, some of them previously published (Acevedo-Álvarez et al., 2021; Bernal-Hernández et al., 2024; Torres-García et al., 2024; Torres-Hernández et al., 2021, 2022) and some in progress, provided information on the population status of 15 species in relation to endemism. Both those sets of genetic data provided useful information about the endemism status of RNP species. UNESCO eDNA provided supporting data for 2 old single museum collections (*Pronotogramus multifasciatus*, the only member of its genus in the TEP, and *Serranus aequidens*) and 2 species that only had observational records (*Ablennes hians* and *Seriola dorsalis*). In addition,

2023 eDNA data provided additional information on the distributions of 11 other species among the different RNP islands that were already confirmed by other primary data as present. Finally, we accepted observation-only records of 5 species with distinctive morphology (*Carcharodon carcharhias*, *Lutjanus inermis*, *Anisotremus taeniatus*, *Hoplopagrus guentheri*, and *Caranx caninus*). Based on all sources of data there are 189 species known from Clarion, 126 from Roca Partida, 159 from San Benedicto and 204 from Socorro (Tables 1, Supplementary material: Table S1).

Photographic database of accepted species

The 9 photographers on the 2022 expedition produced more than 5,000 underwater images of living fishes in their natural habitats. Those images confirmed the occurrences of 137 species at various RNP islands, with another 9 species confirmed by specimen images. Similar images from 2 other coauthors (CDC and AAB), taken at Roca Partida, San Benedicto and Socorro in 2015, confirmed 25 island occurrences (Supplementary material: Files S2-4). Live-fish images taken over the past decade by 19 iNaturalist underwater photographers also provided confirmation of 123 species occurrences, among them vouchers of 13 species not photographed during the 2022 expedition, with 71 of those images being included in the 4 island-fauna supplemental plates (Supplementary material: Files S1-S4). Those iNaturalist images provided sole-source documentation of occurrence of 3 species in the RNP, *Mobula tarapacana* (previously recorded as observed), *Hemiramphus saltator* and *Mugil cephalus*. The deep-reef videos of the ROV, BRUV and submersible studies provided voucher images in the supplemental island-fauna plates for 23 occurrences at different islands of 16 species and were the only sources of images for 11 of those species (Aburto-Oropeza et al., 2016; Ayala-Bocos et al., 2015; Hollarsmith et al., 2020). Altogether those various sources provided images of 181 species in 125 genera and 57 families, including 149 species of residents, 144 of them with live-fish images. Images provided the only voucher record of 5 species (*Chaenopsis alepidota*, *Citharichthys* sp., *Platax teira*, *Scorpaena afuerae*, and *Thalassoma purpureum*) newly added to the fauna. The 4 island-fauna image plates in Supplementary material: files S1-S4 include 468 field images of living fishes plus 14 of specimens collected there in 2022. Together all those images provide confirmation of 123 species from Clarion (Supplementary material: File S1), 74 from Roca Partida (Supplementary material: File S2), 118 from San Benedicto (Supplementary material: File S3) and 151 from Socorro (Supplementary material: File S4).

Species accounts of accepted species

These accounts expand on the information contained on those species in the 2 "accepted species" tables (Tables 1, Supplementary material: ST1), providing details relating to the occurrence and population status of various species of reef-associated fishes at different islands in the RNP.

Ablennes hians. This pantropical, epipelagic needlefish occurs primarily in offshore areas and is often found inshore around islands (Collette et al., 2015). It is the only member of its genus. In the TEP it is distributed from the Gulf of California and southern Baja to northern Peru, plus the Galápagos, Cocos and Malpelo. The 2002 checklist and both 2016 inventories included *A. hians*, but without providing primary source information. Although there are relatively few museum records and iNaturalist images of this species in the TEP, that likely reflects the species use of offshore habitats rather than rarity. While there is only one museum record from the Galápagos, Grove and Lavenberg (1997) recorded large schools occurring seasonally in inshore waters of that archipelago. The only museum record relating to the RNP is an SIO specimen of *Tylosurus fodiator*, misidentified as *A. hians*, collected just outside the park limits. Coauthor AAB observed small schools (< 10 individuals) of *A. hians* at a single, high wave-energy site at San Benedicto in 2017, 2019, and 2022. The eDNA expedition of 2023 produced 603 reads of 1 ASV of CO1 plus tens of thousands of reads of multiple ASVs of 16S (100% species-name match in both cases) from Clarion, San Benedicto, and Socorro. Given these observations and the amounts of DNA recovered at the 3 main islands we class *A. hians* as a resident.

Acanthurus xanthopterus. This Indo-Pacific species is widespread in the TEP, from the Gulf of California to Ecuador and all the oceanic islands. All records of this species in the RNP are recent, from 2007 (Chávez-Comparan et al., 2010) to 2024, with the most multiyear records represented by observations by AAB at Roca Partida, plus the collection of a single specimen by ODD. All images of this readily recognizable, large (to 70 cm TL) species that are available, from both the 2022 expedition and iNaturalist, are of solitary, medium-large to large adults (Supplementary material: Files S1-S4), except for 1 of 2 adults by iNaturalist, and most are from Roca Partida. This species is known to live for up to at least 35 years (Taylor et al., 2024) and what might have been the same individual, was observed in midwater over multiple years at that tiny speck of habitat, likely feeding on the feces of carnivorous and planktivorous fishes (Abesamis et al., 2012), which are particularly abundant at Roca Partida. We tentatively class it as a resident.

Table 1
Reef-associated fishes with reliable data validating their presence in the Revillagigedo National Park (RNP).

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
Acanthuridae	yes	*Acanthurus nigricans*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (7); inat; observe; 2022- images, specimens, common
	yes	*Acanthurus triostegus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (9); inat; observe; 2022- images, specimens, schools
	yes	*Acanthurus xanthopterus*	Yes	Yes	Yes	Yes	Yes	Yes	Museum (1); inat; observe; 2022- images, singletons
	uncertain	*Ctenochaetus marginatus*	Yes		Yes	Yes	Yes	Yes	Museum (1); inat; observe; 2022- images, singletons
	yes	*Prionurus laticlavius*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (7); inat; pubs; 2022- specimens, images, common
Alosidae	no	*Sardinops sagax*				Yes	(Yes)	Yes	Museum* (1)
Antennariidae	yes	*Abantennarius sanguineus*	Yes		Yes	Yes	Yes	Yes	Museums (4); eDNA; 2022- images, specimens, DNA
	no	*Antennarius commerson*	Yes				Yes	Yes	2022- specimen, image
	no	*Antennatus strigatus*				Yes	Yes	Yes	Museum* (1), image
	yes	*Fowlerichthys avalonis*				Yes		Yes	Museum (1); pub; images
Anthiadidae	yes	*Pronotogrammus multifasciatus*	Yes	Yes	Yes	Yes			Museum (1); eDNA
Apogonidae	yes	*Apogon atricaudus*	Yes		Yes	Yes	Yes	Yes	Museums (6); inat; pubs; 2022- specimens, images, common
	no	*Apogon retrosella*			Yes		Yes	Yes	2022- specimen, image, DNA
Atherinopsidae	yes	*Atherinella eriarcha*	Yes		Yes	Yes	Yes	Yes	Museums (4); inat; pubs; 2022- specimens, DNA, common
Aulostomidae	yes	*Aulostomus chinensis*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (4); inat; observe; 2022- images
Balistidae	yes	*Balistes polylepis*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (5); inat; pubs; observe; 2022- images
	uncertain	*Canthidermis maculata#*	Yes			Yes	Yes	Yes	Museum* (2); pub

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
	yes	*Melichthys niger*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (7); pubs; inat; observe; 2022- images, specimens, common
	yes	*Sufflamen verres#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (7); pubs; inat; observe; 2022- images, specimens, common
	yes	*Xanthichthys mento*	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (8); pubs; inat; observe; 2022- images, specimens, common
Belonidae	yes	*Ablennes hians#*	Yes		Yes	Yes	(Yes)	Yes	Observe; eDNA
	yes	*Platybelone pterura*	Yes		Yes	Yes	(Yes)	Yes	Museums* (5); pubs; eDNA
	uncertain	*Tylosurus fodiator#*	Yes		Yes	Yes	Yes	Yes	Museums (2); inat; eDNA
	yes	*Tylosurus melanotus#*	Yes	Yes	Yes	Yes	Yes		Museums* (2); eDNA
Blenniidae	yes	*Entomacrodus chiostictus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (5); inat; pubs; 2022- images, specimens
	yes	*Hypsoblennius proteus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (7); pubs; inat; 2022- images, specimens
	yes	*Ophioblennius clippertonensis#*	Yes	Yes	Yes	Yes			Museum (1); inat?; DNA; 2022- images, specimens, DNA
	yes	*Ophioblennius steindachneri#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (6); inat?; pubs; 2022- images, specimens
	yes	*Plagiotremus azaleus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (3); observe; 2022- images
Bothidae	yes	*Bothus leopardinus*	Yes		Yes	Yes	Yes	Yes	Museums (3); pubs; inat; 2022- images, specimen
	yes	*Bothus mancus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); observe; pubs; inat; 2022- images, specimen
Bythitidae	yes	*Grammonus diagrammus#*	Yes				Yes	Yes	Museums* (2)
Carangidae	no	*Alectis ciliaris#*				Yes	Yes	Yes	Museum* (1); images
	uncertain	*Caranx caballus#*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museums (4); observe; inat singleton, small group; 2022- images, singletons
	no	*Caranx caninus#*		Yes	Yes		(Yes)	Yes	observe
	yes	*Caranx lugubris*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (7); inat; observe; pubs; 2022- images, common

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
	yes	*Caranx melampygus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (6); observe; inat; pubs; 2022- images, common
	yes	*Caranx sexfasciatus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (6); inat; observe; pubs; 2022- images, schools
	yes	*Decapterus macarellus*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museums (4); inat; 2022- images, large schools
	yes	*Decapterus muroadsi*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museums* (5); pub
	yes	*Elagatis bipinnulata*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); inat; pub; observe; 2022- images, common
	yes	*Ferdauia orthogrammus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (5); inat; observe; pub; 2022- images, small schools
	yes	*Naucrates ductor*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museum (1); observe; inat
	yes	*Selar crumenophthalmus*	Yes			Yes	(Yes)	Yes	Museums* (4); pubs
	no	*Selene peruviana#*				Yes	(Yes)		Museums* (2)
	no	*Seriola dorsalis#*	Yes	Yes		Yes	Yes	Yes	Four: observe; eDNA
	yes	*Seriola rivoliana*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museums (5); pubs; inat; 2022- observe, image
	yes	*Trachinotus stilbe*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (6); pubs; inat; observe; 2022- images, schools
	no	*Trachurus symmetricus*				Yes	(Yes)	Yes	Pub
	yes	*Uraspis helvola*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museums (3); inat; 2022- images, schools
Carcharhinidae	no	*Carcharhinus altimus*		Yes			(Yes)	Yes	Museum*(1)
	yes	*Carcharhinus albimarginatus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (3); observe; inat; pubs; 2022- images, common
	yes	*Carcharhinus falciformis*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museum* (1); pubs; inat; observe; 2022- images, common
	yes	*Carcharhinus galapagensis*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (5); observe; inat; pubs; 2022- images, common
	yes	*Carcharhinus limbatus*		Yes	Yes	Yes	Yes	Yes	Museums (3); observe; pubs; inat

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
	uncertain	*Carcharhinus obscurus*		Yes	Yes		Yes	Yes	Pubs; capture; observe
	no	*Nasolamia velox*		Yes	Yes	Yes	(Yes)	Yes	Pub; capture
	yes	*Triaenodon obesus*	Yes	Yes	Yes	Yes	Yes	Yes	Pubs; observe; inat; 2022- Images, common:
Chaenopsidae	yes	*Acanthemblemaria mangognatha*	Yes		Yes	Yes	Yes	Yes	Museums* (6); pub; 2022- images, specimens, common
	uncertain	*Chaenopsis alepidota#*				Yes			2022- image
Chaetodontidae	no	*Chaetodon humeralis#*	Yes			Yes	Yes	Yes	Museums (2); pub; inat
	yes	*Forcipiger flavissimus#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (8); pubs; inat; observe; 2022- images, specimens
	yes	*Johnrandallia nigrirostris*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (6); observe; inat; pubs; 2022- images, common
	yes	*Prognathodes falcifer#*	Yes	Yes	Yes	Yes	Yes	Yes	Pub; observe; images, common
Cirrhitidae	yes	*Cirrhitichthys oxycephalus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (4); pub; observe; inat; 2022- images, specimens, common
	yes	*Cirrhitus rivulatus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (8); inat; pubs; 2022- images, specimens, common
Congridae	yes	*Paraconger californiensis*	Yes	Yes		Yes	Yes	Yes	Museums* (2)
	uncertain	*Paraconger similis*		Yes			Yes	Yes	Museum* (1)
Cyclopsettidae	uncertain	*Citharichthys* sp.		Yes					Image
	no	*Syacium ovale*				Yes	(Yes)	Yes	Museum* (1)
Cynoglossidae	uncertain	*Symphurus atramentatus*				Yes	(Yes)	Yes	Museum* (1)
Dactyloscopidae	yes	*Dactyloscopus insulatus*	Yes		Yes	Yes	Yes	Yes	Museums (4); pub; 2022- image, specimen, DNA
	yes	*Gillellus semicinctus*	Yes			Yes	Yes	Yes	Museums (2); image; 2022- specimens, DNA
	yes	*Myxodagnus opercularis#*	Yes			Yes	Yes	Yes	Museums* (3); 2022- specimen, DNA
Dasyatidae	no	*Hypanus dipterurus#*			Yes	Yes	Yes	Yes	Museum (1); pub; image

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
	yes	*Hypanus longus#*	Yes		Yes	Yes	Yes	Yes	Museums (2); pub; inat; observe; 2022- images
Diodontidae	yes	*Chilomycterus reticulatus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); inat; observe; 2022- images
	yes	*Diodon holocanthus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (7); observe; inat; pub; 2022- images, specimens
	yes	*Diodon hystrix*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (4); pubs; observe; 2022- images
Echeneidae	uncertain	*Echeneis naucrates*				Yes	Yes	Yes	Museum
	yes	*Phtheirichthys lineatus*	Yes				(Yes)	Yes	Museums* (3)
	yes	*Remora remora*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museums (4); inat; pubs; observe; 2022- images
Ephippidae	no	*Platax teira*		Yes		Yes			Images: 2025(2, 1 from inat)
Epinephelidae	yes	*Alphestes immaculatus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); inat; observe; 2022- images, specimens
	yes	*Cephalopholis colonus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (7); inat; observe; pubs; 2022- images, specimens, common
	yes	*Cephalopholis panamensis*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (4); inat; observe; pubs; 2022- images, specimens, common
	yes	*Dermatolepis dermatolepis*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); pubs; inat; 2022- images, specimen
	no	*Epinephelus analogus#*				Yes	Yes	Yes	Museum* (1); pubs
	yes	*Epinephelus clippertonensis#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); inat; DNA; 2022- images, common
	yes	*Epinephelus labriformis#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (5); inat; DNA; 2022- images, uncommon
	yes	*Hyporthodus cifuentesi#*	Yes	Yes	Yes	Yes	Yes	Yes	Museum (1); pubs; images
Fistulariidae	yes	*Fistularia commersonii*	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (3); pubs; inat; observe; 2022- images
	uncertain	*Fistularia corneta*	Yes		Yes	Yes	Yes	Yes	Museums* (2)

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
Galeocerdonidae	yes	*Galeocerdo cuvier*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); pubs; observe; inat; 2022- images
Gobiesocidae	yes	*Gobiesox canidens*#	Yes	Yes		Yes	Yes	Yes	Museums (3); pubs; DNA; inat; 2022- images, specimens, DNA
	yes	*Tomicodon absitus*#		Yes	Yes	Yes	Yes	Yes	Museums (3); pubs; inat; DNA; 2022- images, specimens, DNA
	yes	*Tomicodon* sp.#	Yes						Museum (1); DNA; 2022- images, specimens
	no	*Tomicodon petersii*				Yes	Yes		Museum* (1); pub
Gobiidae	yes	*Bathygobius ramosus longipinnis*#	Yes			Yes	Yes	Yes	Museums* (5); pubs; inat; DNA
	yes	*Chriolepis* sp.#	Yes		Yes				Museums (3); 2022- images, specimens, DNA
	yes	*Coryphopterus urospilus*#	Yes		Yes	Yes	Yes	Yes	Museums (3); pub; DNA; 2022- images, specimens, DNA
	yes	*Lythrypnus* cf. *dalli*#	Yes						2022- images, specimens, DNA
	yes	*Lythrypnus insularis*#	Yes		Yes	Yes	Yes	Yes	Museums (5); pub; 2022- images, specimens, DNA
	yes	*Schindleria praematura*	Yes			Yes	Yes	Yes	Museums (5); eDNA 2022- specimen, DNA
Grammistidae	yes	*Pseudogramma thaumasia*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (3); 2022- image, specimens
	yes	*Rypticus courtenayi*#	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (7); DNA; inat; pubs; 2022- images, specimens, DNA
	no	*Rypticus nigripinnis*#				Yes	Yes	Yes	Museum* (1)
Haemulidae	yes	*Anisotremus perezponcedeleoni*#	Yes	Yes	Yes	Yes	Yes	Yes	Museums (6); DNA; pubs; inat; 2022- images, specimens
	no	*Anisotremus taeniatus*#			Yes		Yes	Yes	Observe
	no	*Orthopristis cantharina*#			Yes				Image

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
Hemiramphidae	uncertain	*Hemiramphus saltator#*				Yes	(Yes)	Yes	Inat
Holocentridae	yes	*Myripristis berndti*	Yes	Yes	Yes	Yes	Yes	Yes	Museum (1); inat; 2022- images, specimens
	yes	*Myripristis clarionensis#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (9); inat; pubs; 2022- images, specimens, common
	no	*Myripristis leiognathus#*		Yes		Yes	Yes	Yes	Museum* (1); pub; 2022- specimen, image
	yes	*Neoniphon suborbitalis*	Yes	Yes	Yes	Yes	Yes	Yes	Museum (5); pubs; 2022- images, specimens
	yes	*Plectrypops lima*	Yes		Yes		Yes	Yes	Museum (1); 2022- image, specimen
Kuhliidae	yes	*Kuhlia mugil*	Yes		Yes	Yes	Yes	Yes	Museums (8); pubs; inat; 2022- images, specimens, DNA, schools
Kyphosidae	yes	*Kyphosus elegans*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (4); pub, observe; inat; 2022- images, specimens, common
	yes	*Kyphosus ocyurus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); observe; 2022- images, common
	yes	*Kyphosus sectatrix#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (5); pubs; observe; inat; 2022- images, specimens, common
	yes	*Kyphosus vaigiensis*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (4); observe; inat; pub; 2022- image. specimens, observe
Labridae (Labrinae)	yes	*Bodianus diplotaenia*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (8); observe; pubs; inat; 2022- images, specimens, common
	uncertain	*Halichoeres adustus#*	Yes	Yes		Yes	Yes	Yes	Museums (2); inat; pubs; 2022- image, rare
	yes	*Halichoeres insularis#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (3); inat; observe; pubs; 2022- images, specimens, DNA
	yes	*Halichoeres nicholsi#*	Yes		Yes	Yes	Yes	Yes	Museums (7); pubs; inat; DNA; 2022- images, specimens, common
	yes	*Halichoeres notospilus*	Yes			Yes	Yes	Yes	Museums (5); pubs; inat; 2022- images, observe

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
	yes	*Halichoeres sanchezi*#			Yes	Yes			2022- images, specimens
	uncertain	*Iniistius pavo*	Yes		Yes	Yes	Yes	Yes	Observe; 2022- images
	yes	*Novaculichthys taeniourus*	Yes		Yes	Yes	Yes	Yes	Observe; inat; 2022- images, specimens
	yes	*Stethojulis bandanensis*#	Yes		Yes	Yes	Yes	Yes	Museum (1); inat; eDNA; 2022- images, observe
	yes	*Thalassoma grammaticum*#	Yes	Yes	Yes	Yes	Yes	Yes	Museums (8); pubs; observe, inat; 2022- images, specimens, common
	yes	*Thalassoma lucasanum*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (5); inat; observe; pubs; 2022- images, common
	no	*Thalassoma purpureum*	Yes						2022- image, single individual
	yes	*Thalassoma virens*#	Yes	Yes	Yes	Yes	Yes	Yes	Museums (6); inat; pubs; observe; 2022- images
	yes	*Xyrichtys* sp.#	Yes			Yes	Yes	Yes	Images; observe, pub
(Scarinae)	yes	*Calotomus carolinus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (6); inat; pubs; observe; 2022- images, specimens, common
	no	*Scarus compressus*				Yes	Yes	Yes	Museum (3); pub; 2022- image
	no	*Scarus ghobban*	Yes			Yes	Yes	Yes	Museum (1); pub; inat; observe; 2022- image
	yes	*Scarus rubroviolaceus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (4); observe; pub; inat; 2022- images, specimens, DNA, common
Labrisomidae	yes	*Labrisomus socorroensis*#	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (5); pubs; inat; 2022- image
	no	*Malacoctenus hubbsi*	Yes						Museum* (1)
Lamnidae	no	*Carcharodon carcharias*		Yes			Yes	Yes	Pub
Latilidae	uncertain	*Caulolatilus affinis*	Yes			Yes	Yes	Yes	Museum* (1)
	uncertain	*Caulolatilus princeps*				Yes	Yes	Yes	Pub
Lobotidae	no	*Lobotes pacifica*				Yes	(Yes)	Yes	Museum* (1)
Lutjanidae	no	*Hoplopagrus guentherii*#			Yes		Yes	Yes	Pub
	no	*Lutjanus aratus*	Yes						2022- specimen; DNA

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
	no	*Lutjanus argentiventris#*	Yes		Yes	Yes	Yes	Yes	Pub; observe; image; 2022- image
	no	*Lutjanus inermis#*				Yes	Yes	Yes	Pub
	yes	*Lutjanus peru*				Yes	Yes	Yes	Museum* (1); pub; image
	yes	*Lutjanus viridis*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (9); pubs; inat; 2022- images, specimens, common
Mobulidae	yes	*Mobula birostris*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museum (1); pubs, inat, observe; 2022- images, common
	no	*Mobula tarapacana#*		Yes	Yes	Yes	(Yes)	Yes	Pub; observe; inat
	no	*Mobula thurstoni#*	Yes	Yes	Yes				Image; eDNA; 2022- image
Monacanthidae	uncertain	*Aluterus monoceros#*		Yes	Yes	Yes	Yes	Yes	Museums (1); pub; observe; inat; 2022- images
	yes	*Aluterus scriptus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (5); pubs; inat; observe; 2022- images
	yes	*Cantherhines dumerilii*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (6); pubs; observe; inat; 2022- images, specimens
Mugilidae	yes	*Chaenomugil proboscideus*	Yes		Yes	Yes	Yes	Yes	Museums (9); pubs; inat; 2022- specimens, DNA
	uncertain	*Mugil cephalus#*				Yes			Inat
	yes	*Mugil setosus#*	Yes			Yes	Yes	Yes	Museums* (6), Image; pubs
Mullidae	yes	*Mulloidichthys dentatus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (7); pubs; inat; observe; 2022- images, specimens
Muraenidae	yes	*Anarchias galapagensis*	Yes			Yes	Yes	Yes	Museums* (3)
	yes	*Echidna nebulosa#*	Yes		Yes	Yes	Yes	Yes	Museums (2); inat; 2022- images
	yes	*Echidna nocturna#*	Yes		Yes	Yes	Yes	Yes	Museums (2); pubs; inat; 2022- observe
	yes	*Enchelycore octaviana*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); inat; observe; 2022- image, observe
	yes	*Gymnomuraena zebra*	Yes		Yes	Yes	Yes	Yes	Museum (1); pub; inat; observe; 2022- image

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
	yes	*Gymnothorax castaneus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (3); inat; pub; observe; 2022- images
	yes	*Gymnothorax dovii*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); pub; observe; inat; 2022- images
	no	*Gymnothorax flavimarginatus#*	Yes			Yes	Yes	Yes	Museum (1); eDNA; 2022- image
	yes	*Gymnothorax panamensis*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (5); inat; pub; 2022- image, specimens, DNA
	no	*Gymnothorax pictus*	Yes				Yes	Yes	Museum* (1); pubs
	no	*Gymnothorax verrilli*	Yes						2022- specimen, DNA
	yes	*Muraena lentiginosa*	Yes		Yes	Yes	Yes	Yes	Museums (3); image; pubs; observe
	yes	*Scuticaria tigrina*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (3); pub; eDNA; 2022- images
	yes	*Uropterygius macrocephalus*	Yes			Yes	Yes	Yes	Museums* (5); Image; inat; pub; 2022- specimen, DNA
Narcinidae	yes	*Diplobatis ommata*			Yes	Yes			Pub; inat; 2022- observe
	yes	*Narcine entemedor*	Yes		Yes	Yes	Yes	Yes	Museums (3); pubs; inat; 2022- images, observe
Ophichthidae	yes	*Ichthyapus selachops*	Yes				Yes	Yes	Museum* (1); DNA
	yes	*Myrichthys pantostigmius#*	Yes		Yes	Yes	Yes	Yes	Museum* (3); inat; pubs; 2022- images
	uncertain	*Paraletharchus opercularis*	Yes				Yes	Yes	Museum* (1)
	yes	*Quassiremus evionthas*	Yes						Pub; images; 2022- image
Ophidiidae	yes	*Brotula ordwayi#*		Yes		Yes	Yes	Yes	Museums* (2); image
Ostraciidae	yes	*Lactoria diaphana*	Yes	Yes		Yes	Yes	Yes	Museums* (3); inat; 2022- image, specimen
	yes	*Ostracion meleagris*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (6); inat; pubs; 2022- images, specimens
Pomacanthidae	yes	*Holacanthus clarionensis#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (9); inat; pubs; 2022- images, specimens, common
	no	*Holacanthus passer#*	Yes	Yes	Yes	Yes	Yes	Yes	Museum (2); image

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
	no	*Pomacanthus zonipectus*			Yes		Yes	Yes	Museum* (1); observe
Pomacentridae	yes	*Abudefduf troschelii*	Yes		Yes	Yes	Yes	Yes	Museums (9); pubs; inat; 2022- images, specimens, common
	uncertain	*Azurina atrilobata#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (2); pubs, observe; 2022- image, specimen, DNA
	yes	*Azurina hirundo#*	Yes	Yes		Yes	Yes	Yes	Museums (2); inat; pubs; observe; image
	yes	*Chromis alta*	Yes	Yes	Yes	Yes	Yes	Yes	Museum (1); pub; images; 2022- image
	yes	*Microspathodon bairdii*	Yes		Yes	Yes	Yes	Yes	Museums (5); Images; pubs; inat; 2022- images
	yes	*Microspathodon dorsalis*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (9); inat; pubs; observe; 2022- images, specimens
	no	*Stegastes acapulcoensis#*			Yes		Yes	Yes	2022- image, specimens, DNA
	no	*Stegastes flavilatus#*	Yes	Yes	Yes	Yes	Yes	Yes	Pub; inat; observe; 2022- image, specimens, DNA
	yes	*Stegastes leucorus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (7); pubs; inat; observe; 2022- images, specimens, common
	no	*Stegastes rectifraenum*	Yes			Yes	Yes	Yes	Museums (1): mid-20th century only
	yes	*Stegastes redemptus#*	Yes		Yes	Yes	Yes	Yes	Museums (8); inat; pubs; observe; 2022- images, specimens, DNA, common
Priacanthidae	yes	*Cookeolus japonicus*	Yes		Yes	Yes	Yes	Yes	Museums (3), pub
	yes	*Heteropriacanthus carolinus#*	Yes		Yes	Yes	Yes	Yes	Museums* (5); pubs; inat; 2022- images, specimens
	yes	*Priacanthus alalaua#*	Yes	Yes	Yes	Yes	Yes	Yes	Museum* (1); pubs; image
	yes	*Pristigenys serrula#*	Yes				Yes	Yes	Pubs; image
Rhincodontidae	yes	*Rhincodon typus*	Yes	Yes	Yes	Yes	(Yes)	Yes	Pub; inat; observe 2022- images

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
Sciaenidae	yes	*Pareques* sp.#	Yes		Yes	Yes	Yes	Yes	Museums (4); pub; DNA; 2022- images, specimens, DNA
Scombridae	yes	*Acanthocybium solandri*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museums (2); inat; observe; eDNA 2022- images, observe
	yes	*Auxis brachydorax*		Yes	Yes	Yes	(Yes)	Yes	Museum (1); eDNA; 2022- image, school
	no	*Euthynnus affinis*	Yes				(Yes)	Yes	Museum* (1); observe
	yes	*Euthynnus lineatus*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museums (3); inat; observe; 2022- image, school, observe
	yes	*Katsuwonus pelamis*	Yes	Yes			(Yes)	Yes	Museum (1); pubs; eDNA; 2022- image, school
	yes	*Scomber australasicus*#	Yes	Yes		Yes	(Yes)	Yes	Museum* (1); pubs
	no	*Scomber japonicus*#	Yes			Yes	(Yes)	Yes	Museum (1); pubs
	Yes	*Thunnus albacares*	Yes	Yes	Yes	Yes	(Yes)	Yes	Museum (1); observe; pubs; inat; 2022- images; observe, DNA
Scorpaenidae	yes	*Pontinus vaughani*	Yes	Yes	Yes	Yes	Yes	Yes	Museum* (2); images
	yes	*Scorpaena afuerae*#		Yes		Yes			Images
	uncertain	*Scorpaena histrio*		Yes		Yes	Yes	Yes	Pub; image
	yes	*Scorpaena mystes*	Yes		Yes	Yes	Yes	Yes	Museums* (4); inat; pubs; 2022- images
	yes	*Scorpaenodes xyris*#	Yes	Yes	Yes	Yes	Yes	Yes	Museums (3); pubs; 2022- images, specimens
Serranidae	uncertain	*Serranus aequidens*#	Yes			Yes	Yes		Museum (1); eDNA
	yes	*Serranus socorroensis*#	Yes	Yes	Yes	Yes	Yes	Yes	Museums* (3); pubs; observe; 2022- images, specimens
Soleidae	yes	*Aseraggodes herrei*#	Yes		Yes	Yes	(Yes)	Yes	Museums (3); Image; 2022- images, specimens, DNA
Sphyrnidae	yes	*Sphyrna lewini*	Yes	Yes	Yes	Yes	Yes	Yes	Museum (1); pubs; inat; observe; 2022- images, observe
Syngnathidae	yes	*Bryx veleronis*#	Yes			Yes	Yes	Yes	Museums* (2); pubs; 2022- specimens, DNA

Table 1. Continued.

Family	Resident	Species name	Clarion	Roca Partida	San Benedicto	Socorro	Fourr. accept	DMF accept	Supporting data
	yes	*Doryrhamphus melanopleura#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (4); pubs; DNA; 2022- images, specimens, observe, DNA
	no	*Syngnathus auliscus*	Yes				(Yes)	Yes	Museum* (1)
Synodontidae	uncertain	*Synodus lacertinus*	Yes		Yes	Yes	Yes	Yes	Museum (1); 2022- images, specimens, DNA
Tetraodontidae	yes	*Arothron hispidus*	Yes		Yes	Yes	Yes	Yes	Museum (1); observe; 2022- images, specimens
	yes	*Arothron meleagris*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (10); inat; pubs; 2022- images, specimens, common
	yes	*Canthigaster janthinoptera#*	Yes			Yes			Museum (1); inat; DNA; 2022- images
	yes	*Canthigaster punctatissima#*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (5); inat; pubs; DNA; 2022- images, specimens, DNA
	yes	*Sphoeroides lobatus*	Yes		Yes	Yes	Yes	Yes	Museums (2); inat; pub; 2022- images, specimens
Triglidae	no	*Bellator loxias*	Yes				(Yes)	Yes	Pub
Tripterygiidae	yes	*Axoclinus multicinctus*	Yes		Yes	Yes	Yes	Yes	Museums (3); inat; pub; 2022- images, specimens; DNA
	yes	*Enneanectes exsul*	Yes		Yes	Yes	Yes	Yes	Museums (4); pub; 2022- images, specimens, DNA
Zanclidae	yes	*Zanclus cornutus*	Yes	Yes	Yes	Yes	Yes	Yes	Museums (6); observe; inat; pubs; 2022- images, specimens, common

Supplementary Table S1 provides detailed information on primary-source data and island occurrences, which is expanded on in some cases in species accounts. Species name: species with name# have explanatory species accounts in text. Residency: see methods for definitions of Resident, Uncertain and Not Resident. Island names: yes -data supports occurrence of species at a particular island. Fourr (Fourriére et al. 2016): yes- accepted as a reef species, (yes) accepted as a non-reef species. DMF (Del Moral-Flores et al. 2016): yes- accepted species. Supporting data types: see methods for definitions; museums —museum (no.) with specimens, museum* indicates identification and metadata verified at one or more museums; inat - verified images from iNaturalist; observe —reliable observations by ichthyologists; capture —identification based on captured and released individual (s); eDNA —2023 UNESCO-edna data; pub(s) - publications with verifiable data; 2022- data produced by 2022 expedition (specimens/ images/ observations/ DNA).

Acanthemblemaria mangognatha. See endemics section A.

Alectis ciliaris. The only museum record of this large benthopelagic species is of a single individual collected in 1980 (LACM; specimen ID confirmed) at Socorro. AAB obtained images of 2 adults at San Benedicto in 2023 and observed single adults at that same island in 2017 and 2019 and at Socorro in 2023 and there is an iNaturalist image from Socorro (Supplementary material: File S4). These scattered observations of so few adults and no juveniles of a species known to often form schools do not indicate the presence of a resident population.

Aluterus monoceros. This circumtropical monacanthid is widely distributed in the TEP, from the Gulf of California to Chile and all the offshore TEP islands except Clipperton. The only RNP museum records are of 4 fish collected at San Benedicto in 1951 that are in SIO. Single individuals were photographed at San Benedicto and Socorro in 2022 and AAB observed single individuals at San Benedicto in 2013, Roca Partida in 2014 and Socorro in 2017 and 2023. Fourriére et al. (2016) observed it in 2012-2013 but not in 1994-1999, 2007 or 2010. These records scattered across a large range of years refer to few individuals. This species also associates with offshore flotsam (Hunter & Mitchell, 1966, 1968) and has been videoed at near-surface BRUVS deployed in deep water between Cocos and the Galápagos (Cambra et al., 2021; Vaudo et al., 2023; and see Amonoceros_floatinglog). This pelagic habit may lead to occasional recruitment to the RNP. Due to these issues, we record its population status as uncertain.

Anarchias galapagensis. This small, highly cryptic moray eel is rarely seen or collected without the use of ichthyocides. It has been collected at Socorro in 1939 (2 individuals LACM), 1971 (3 individuals LACM) and 1995 (1 individual CNPE) and at Clarion in 1959 (1 individual LACM), 1971 (10 individuals LACM) and 1974 (1 individual SIO). Since it was collected as recently as 1995 and there were multiple collections at 2 islands over several decades we class this species as a resident.

Anisotremus perezponcedeleoni. See endemics section A.

Anisotremus taeniatus. Both adults and juveniles of *A. taeniatus*, a common and widely distributed species in the TEP, have very distinctive, conspicuous color patterns that make them readily distinguishable from all other similar species. Hence, although the only record of this species is from an observation, we accept it as a validated occurrence in the RNP, as a vagrant.

Aseraggodes herrei. See endemics section C.

Axoclinus multicinctus. See endemics section A.

Azurina atrilobata. This easily recognized species is abundant on shallow reefs on the mainland, Cocos and the Galápagos and has been recorded only a few times in the RNP. There are specimens at CMNFI collected at Socorro in 1957, and a single specimen at LACM caught in deep water ~ 4 km offshore from San Benedicto (in Baja State in the database, rather than Colima State where the RNP is located), AAB observed it at Roca Partida and San Benedicto in 2012, but not 2013, 2014, 2017, 2019, 2020 or 2023. Chávez-Comparan et al. (2010) did not include this species among those they recorded at Socorro in 2007. It was photographed and a specimen collected from a small group of adults at San Benedicto in 2022 and another collected at Clarion (DNA barcoded) but not encountered at the other 2 islands. This species has been found in abundance associated with offshore flotsam (Hunter & Mitchell, 1966, 1968; Mora et al., 2001) which could facilitate its arrival in groups in the RNP. Given the paucity and intermittency of records it is regarded as an uncertain resident in the RNP.

Azurina hirundo. This species, which was described from specimens collected at Guadalupe Island, is distributed from southern California (where it now appears to have a resident population) to islands scattered along the coast of Baja California (Guadalupe, the Cedros island complex, and Alijos Rocks) and the RNP. Adults of this distinctive, readily recognizable species have a long history of being observed in the 3 easternmost islands, between the early 1990s to the early 2010s (Fourriére et al., 2016), as well as 2016, 2017, 2023, and 2024. Photographs of this species in the RNP are available from 1994, 2015, 2023, and 2024, the last 2 of groups of 9-10 individuals. However, it was not observed at any of the 4 islands during the 2022 expedition. Although its known depth range is fairly shallow, 5~30 m, this active, midwater feeding planktivore may sometimes range into deeper water when feeding and hence was missed by scuba divers in 2022. *Azurina atrilobata*, for example, is found as deep as 80 m, and *Azurina multilineata* from the Caribbean down to 130 m. However, Hollarsmith et al. (2020) used an ROV to survey 15 sites between 19-80 m depth at San Benediction and Socorro in 2018 but recorded no *A. hirundo.* In June 2024, AAB observed thousands of juveniles of this species in shallow water at Roca Partida, which, when he returned in November, had reached about 5 cm TL. We conclude that this species, which we class as a resident, undergoes substantial population fluctuations in the RNP. However, it is also possible that the RNP population is maintained to some extent by influxes of larvae carried south from more northerly populations by the California Current.

Bathygobius ramosus longipinnis. See endemics section B.

Brotula ordwayi. This large ophidiid (reaches 75 cm TL) has been collected once at Roca Partida (LACM,

1939, 1 adult) and an individual was videoed at Socorro in 2015 by CAS (Supplementary material: File S4). There are no other records. This is a deepwater species typically found well below scuba depth limits (depth range to 270 m) and neither Hollarsmith et al. (2020) nor Giddens et al. (2019) recorded this species in their video studies of fishes in deep water in the RNP. Hence, we record its population status as uncertain.

Bryx clarionensis. See endemics section D.

Canthidermis maculata. This semioceanic species is known from the mouth of the Gulf of California to Colombia, plus all the oceanic islands, and from oceanic records, where it associates with flotsam (Hunter & Mitchell, 1966) and BRUVS (Vaudo et al., 2023). There are 2 SIO specimens, collected in 1962 (several kilometers offshore from Socorro) and 1975, plus 1 more recently that is in CPUM. Berry and Baldwin (1966) also recorded it from the RNP. The occasional collection of single individuals over 60 + years indicates a persistent presence, but with an uncertain residency status due to its pelagic habits and scarcity.

Canthigaster punctatissima and *Canthigaster janthinoptera*. According to Allen and Randall (1977), *C. punctatissima* has the following species-specific coloration: a brown head and body covered in numerous small, round white to blue-white spots that extend onto the base of the caudal fin, no short pale lines radiating from the eye and no entire or partial ocellus at the base of the dorsal fin. According to those authors the only morphological and morphometric difference between *C. punctatissima* and the Indo-Central Pacific (ICP) species, *C. janthinoptera* is their coloration. In addition to a body covered in small round spots like those of *C. punctatissima* that can also extend onto the base of the caudal fin, *C. janthinoptera* has pronounced pale lines radiating from the eyes and a large, entire or partial ocellus at the base of the dorsal fin (Allen & Erdmann, 2024; Allen & Randall, 1977). Based on images of *C. janthinoptera* from the ICP on iNaturalist this species varies geographically in coloration in that large region, with the addition of thin pale lines on other parts of the head and parts of the body in some populations. There are numerous images of *Canthigaster* at various sites in the TEP that fit the definition of *C. janthinoptera*. At the RNP small, recently recruited juveniles, whose coloration was not mentioned by either Allen and Erdmann (2024) or Allen and Randall (1977), have a well-defined ocellus at the base of the dorsal fin, lines on the head and longitudinally on the nape and many fewer, more dispersed round spots on the sides of the body than is seen in adults of both species.

Among the adult *Canthigaster* at the RNP whose images are available from the 2022 expedition and iNaturalist 5 have only round spots on the body and head (Supplementary material: File S5A), 6 have radiating eye lines and a partial dorsal ocellus (Supplementary material: File S5B), and 17 have an intermediate color pattern, with scattered short lines and irregularities in spot form around the eyes and a varying degree of development of the dorsal ocellus (Supplementary material: File S5C, D). ODD and ETH (unpublished data) have found no genetic differences in terms of distribution of CO1 haplotypes within a haplotype network that included TEP fish with (n = 29) and without (n = 46) radiating eye lines (including 2 with and 6 without eye lines from the RNP) and individuals of *C janthinoptera* from the Indo-West Pacific. Sharing of CO1 lineages is present in various species complexes within *Canthigaster* (ODD, unpublished data). Given the blurred morphological character boundaries between species within this complex we include both species as part of the RNP fauna, where *C. janthinoptera* has not been recorded previously. We class both as residents because both are relatively common. We have not examined museum specimens from the RNP listed as "*C. punctatissima*" to determine how many might have color patterns consistent with *C. janthinoptera*.

Caranx caballus. This common, widespread TEP endemic carangid is known from southern California to Chile and all the offshore islands. It is a resident in the Galápagos (Victor, Grove et al., 2024), but probably a vagrant at Clipperton (Allen & Robertson, 1997). There is a long history of collections, in small numbers, and observations at all the RNP islands. However, in 2022 we photographed only 3 singleton individuals, ODD's group collected 1 specimen it between 2015-2023 and there are only 3 separate images in iNaturalist, from 2021, including 2 images of a small group of fish in a multispecies group associated with a floating refrigerator ~ 30km offshore from San Benedicto (Green Jack flotsam). An SIO specimen collected in 1962 was taken in open water several miles from Socorro. This species is notable for repeatedly recruiting in large numbers of adults at the Hawaiian Islands, where it does not persist and is regarded as a non-resident (Mundy, 2005). Adults of this species commonly associate with offshore flotsam (Hunter & Mitchell, 1966, 1968) and have been repeatedly videoed at near-surface BRUVS deployed over deep water between Cocos and the Galápagos, far from land (Cambra et al., 2021; Vaudo et al., 2023). *Caranx caballus*, which ranges down to depths of 100 m, was not recorded in the ROV mesophotic study at the RNP islands by Hollarsmith et al. (2020) and Velasco-Lozano et al. (2020). Given how few of this species have been seen recently in the RNP it is possible that the low numbers there are maintained entirely by intermittent

recruitment of adults from the mainland. Due to its persistently low abundance and strong potential for oceanic dispersal by adults we class this species as an uncertain resident.

Caranx caninus. There are no museum records of this species in the RNP. The only primary source records for this species are observations of single individuals at Roca Partida and San Benedicto in 2012 by coauthor AAB. Hence, we include it as a non-resident. *C. caninus* appears to be a specialist predator on engraulid fishes (Sánchez-García et al., 2017), none of which have been recorded from the RNP, a factor that may contribute to the lack of a population of this jack in the RNP.

Chaenopsis alepidota. The sole record of this species in the RNP is a photograph of part of the head of a single individual taken at Socorro in 2022. The identification is based on the color pattern of the head, which varies in a species-specific manner among members of that genus. This identification was confirmed by Dr. Phil Hastings, an expert in the taxonomy of TEP chaenopsids. *Chaenopsis* species are small, cryptic fishes found in sand and rubble habitats, which have not been extensively sampled in the RNP, particularly during this century. Hence, we record its population status as uncertain.

Chaetodon humeralis. The only museum records are from 1959 and 1961 collections at Socorro, housed at UBC and CMNFI (which was supplied with specimens from the UBC collection), the latter with a confirmed identification. There are iNaturalist images from Socorro taken in 2007 (a pair), 2020 (a pair) and 2024 (a single individual). ODD and students collected 4 adults from each of Socorro and Clarion in 2015, plus 2 more adults from Socorro in 2016, but none in 2019 or 2023. This species was not recorded during the 2022 expedition, or observed by AAB at Socorro, San Benedicto, and Roca Partida between 2012 and 2024. Hence, we consider it to be a non-resident, one that repeatedly arrives in the RNP in very low numbers.

Chriolepis sp. See endemics section B.

Cirrhitichthys oxycephalus. This Indo-Pacific species is widely distributed on reefs throughout the mainland (the Gulf of California to Peru) and all the offshore islands of the TEP. It is abundant at all 4 islands in the RNP, hence a resident. A recent genetic study spanning the longitudinal limits of its range (Red Sea to the Americas) found 2 major clades (Torres-García et al. 2024), one in the Indo-central Pacific and the other in the TEP. There are 2 subclades in the TEP, one at Clipperton and the other covering the rest of the TEP, with no indications that the RNP population is genetically isolated from the mainland population. That study also indicated that the name *Cirrhitichthys corallicola* Tee Van, 1940, type locality Colombia, could be resurrected for the TEP population if it is supported by a reexamination of morphological variation in this species (Torres-García et al., 2024).

Citharichthys sp. While the fish in the screen-grab image taken from a submersible video on sand at 60 m depth at Roca Partida in 2016 is identifiable as a species of *Citharichthys* (Supplementary material: File S2), it is not possible to determine which species it is due to the orientation of the fish in the image. The putative specimen of *Citharichthys xanthostigma* in USNM from Clarion was examined and is a misidentified *Citharichthys platophrys*. However, that record comes from the excluded 1889 Albatross collection compromised by problematic location data (Table 2). There are at least 6 species of this genus known from deep habitats around southern Baja, plus at least 2 insular endemic members of the genus and the Roca Partida fish could be any one of them. Hence, we include the Roca Partida fish as having an uncertain identity and population status.

Coryphopterus urospilus. See endemics section C.

Ctenochaetus marginatus. This surgeonfish, which is found in the central and eastern Pacific, is concentrated mainly from Costa Rica to Colombia on the mainland, with a few records in southern Mexico, and from all the oceanic islands of the TEP, including a multiple records at the Galápagos. Fourriére et al. (2016) recorded this species as observed in the late 1990s and 2007 (the latter by Chávez-Comparan et al. [2010], who did not record it as common), and, although they noted an SIO record from the RNP, the current online SIO catalog lists no specimens from there. There is only one other museum record, a UBC specimen collected in 1959 from Clarion. The few photographic records from 2022-2023 are almost entirely of solitary large adults, with the few iNaturalist images restricted to Socorro. ODD collected 2 individuals from Socorro and AAB has observed single adults and occasional pairs of adults at San Benedicto and Socorro. The general paucity of records, and recent observations restricted to adults of a readily recognizable surgeonfish indicates that *C. marginatus* has an uncertain residency status in the RNP. This species can live for at least 25 years and may recruit only intermittently from elsewhere to the RNP islands (Clements et al., 2012).

Dactyloscopus insulatus. See endemics section A.

Doryrhamphus melanopleura and *Doryrhamphus paulus*. See endemics section D.

Echidna nebulosa. This species is widespread and common in many parts of the TEP. There are single iNaturalist images from Socorro (2021) and Clarion (2023) and 3 different individuals were photographed at Clarion in 2022. ODD collected 1 specimen at Clarion in 2015 and 4 at Socorro in 2015, all of them in intertidal rock pools, which are now in CPUM. There are no published museum

records from the RNP. Small, reef-living cryptic moray eels are secretive and may not be readily visible and there appear to be sufficient records to class this as a resident.

Echidna nocturna. This species is another small, cryptic moray that is widespread in the TEP. In the RNP there are museum collections from Socorro (CAS 1897 [2], 1925 [1], 1979 [1], SIO 1955 [1]) and Clarion (CAS 1897 [3], 1925 [3]). One individual was observed at San Benedicto in 2022, and ODD collected 9 specimens at Clarion in 2015 and 11 specimens at Socorro in 2015, 2016, and 2023 (all from intertidal rock pools) that are in CPUM. Due to repeated collections over more than 100 y and an abundance of recent collections we class this small, reef-living cryptic moray eel as a resident.

Enneanectes exsul. see endemics section A.

Epinephelus analogus. A single LACM lot of 3 specimens collected in 1971 was examined and found to be misidentified *Epinephelus labriformis*. A USNM specimen collected in 1938 (Schmidt & Schultz, 1940) was examined and confirmed to be *E. analogus*. This species also was included among those Chávez-Comparan et al. (2010) recorded as observed. Since there is only 1 confirmed record of this species in the RNP we class it as a waif without a resident population.

Epinephelus clippertonensis and *Epinephelus labriformis. E. clippertonensis* was described from Clipperton Atoll by Allen and Robertson (1999), who, at that time, thought it was a Clipperton endemic. That description involved comparisons of the morphology, including marked differences in coloration, of 312 *E. clippertonensis* from Clipperton and 80 *E. labriformis* from Mexico, Panama, and Peru. Among the latter were 7 USNM specimens from Clarion that were collected in 1889 by the Albatross expedition to the RNP islands and other parts of Mexico. Allen and Robertson (1999) identified those 7 as *E. labriformis*, based on morphological characteristics other than coloration, which would not have been clearly discernible in those more than century-old specimens. Specimens of some species from different Albatross voyages have been erroneously mixed with those from the 1889 RNP expedition (see comments in the section on unaccepted databases and species) and others have incomplete collection data. The Albatross *E. labriformis* specimens putatively from Clarion are part of the group with an incomplete collection date, which raises the possibility that they were collected elsewhere. Assessment of the morphology of the 2 species from our very recent collections in the RNP could help resolve the issue of the degree of resemblance of both forms to *E. clippertonensis* from Clipperton.

Since *E. clippertonensis* was described it has become evident that, in addition to Clipperton, fish with *E. clippertonensis* coloration also occur in the RNP (Del Moral-Flores et al., 2016; Fourriére et al., 2016; Hollarsmith et al., 2020; Robertson & Allen, 2006, 2015), southern Baja California, and Alijos Rocks, 290 km west of southern Baja California and 735 km north of the RNP (Craig et al., 2006; and see SIO specimen database). Review of images of live fish from the 2022 expedition and the few (12) available on iNaturalist in late 2024 shows the following, in terms of coloration: RNP fish include 126 *E. clippertonensis*, 6 *E. labriformis* and 3 with intermediate coloration (all of the latter 2 groups from 2022 images). Chávez-Comparan et al. (2010) mentioned only *E. labriformis* as present at Socorro, likely due to lack of knowledge about the differences between the 2 species. At mainland Mexico among images by some of the present coauthors, but mainly from iNaturalist, 168 have coloration of *E. labriformis* and 2 of *E. clippertonensis*, both at southern Baja. All images south of Mexico have *E. labriformis* coloration: Costa Rica (51), Panama (50), Cocos (7) and Galápagos (80). Thus, based on coloration, the great majority of the current RNP population comprises *E. clippertonensis*, with a few *E. labriformis* and possibly some hybrids, and *E. clippertonensis* is largely restricted to offshore islands.

Craig et al. (2006) examined genetic relationships, using CytB mtDNA, among 304 individuals of both species from the mainland between Baja California and the Gulf of California to Panama, plus Cocos, Galápagos, Clipperton and Alijos Rocks, but included none from the RNP. They found that all 24 individuals from Clipperton had *E. clippertonensis* coloration, but 20 had *E. clippertonensis* haplotypes and 4 had the most common mainland (*E. labriformis)* haplotype. While all but 1 of 12 individuals from Alijos Rocks had *E. clippertonensis* coloration, all but 1 also belonged to a haplogroup only present there, while the remaining individual had the most common *E. labriformis* haplotype. ODD (unpublished data) sequenced 14 individuals collected in the RNP (no information on coloration available) and they form 2 haplogroups, 11 in a haplogroup closely related to the unique Alijos Rocks haplogroup and 3 in a haplogroup most closely related to *E. labriformis*. These results support the conclusion that both species are in the RNP, although *E. labriformis* is much less common. However, the existence of a large, local haplogroup involving the great majority of individuals at the RNP (and other such haplogroups at Alijos Rocks and Clipperton) and a lack of a strong relationship between genetics and *E. clippertonensis* coloration among fish at Alijos Rocks, Clipperton, and possibly the RNP, indicates that the taxonomic status of *E. clippertonensis* is complex and currently unresolved. Craig et al. (2006) provided a detailed discussion of various possible explanations of

the disconnections between coloration and genetics in *E. clippertonensis*. See also account of *E. clippertonensis* in endemics section D.

Forcipiger flavissimus and *Forcipiger longirostris*. Prior to 1898, when *F. flavissimus* was described from specimens collected in the RNP, fish from there were identified as *F. longirostris*, a name that carried over to some mid-20th century collections by UBC from the RNP. Three museums, CMFI, SIO and LACM, house 45 specimens from the RNP, including 19 individuals collected in 2022. The morphology of those was re-examined. Six from CMFI that were collected there in the 1950s and originally labelled *F. longirostris* are *F. flavissimus*. Twenty from SIO and 19 from LACM were correctly labelled *F. flavissimus.* ODD collected 15 individuals in the RNP, which have been examined morphologically and are *F. flavissimus.* Forty images of different individuals of *Forcipiger* in the RNP obtained during the 2022 expedition plus 11 from iNaturalist all appear to be *F. flavissimus*, based on snout length and, when visible, other features indicated in the images in Supplementary material: file S6. Similarly, all of the 25 identifiable (to species) images of *Forcipiger* taken elsewhere in the TEP that are available on iNaturalist plus 17 images of different individuals taken by CJE and AME at the Galápagos and Baja also appear to be *F. flavissimus*. Thus, there is no evidence that *F. longirostris* occurs in the RNP together with *F. flavissimus*, or anywhere else in the TEP, which is not included in the geographic range of *F. longirostris* in any modern publications that have such information (e.g., Allen, 1981; Mundy, 2005; Myers & Pratchett, 2010; Randall, 2005, 2007). *Forcipiger flavissimus* was 1 of the transpacific fishes examined by Lessios and Robertson (2006), who found that 5 individuals from Clipperton and 3 from the RNP had the most common sequence of ATPase mtDNA found among conspecifics from the western side of the Eastern Pacific Barrier, indicating a lack of long-term isolation of the TEP population.

Both species of *Forcipiger* are found throughout the ICP, indicating similar dispersal capabilities. Both are at all major island groups on the western border of the East Pacific Barrier, including the Line Islands, from where propagules of potential transpacific migrants can be dispatched towards the TEP on the equatorial countercurrent. In Hawaii, where both species are found, Randall (2007) noted that *F. longirostris* tends to occur in deeper water. The 2 also have dissimilar diets (Konow & Ferry-Graham, 2013; Randall, 2005), indicating that the presence of only 1 of them in the TEP likely is not due to competitive exclusion of the other. While there are no validated records of *F. longirostris* in the TEP close similarities in the appearance of those 2 species mean that attention should be given to careful review of images taken in the future to verify whether *F. longirostris* does arrive in the TEP on some occasion.

Gobiesox canidens. See endemics section A.

Grammonus diagrammus. This TEP endemic brotula is a highly cryptic black fish that lives deep in crevices and is rarely seen alive in its habitat. Such forms are rarely caught in abundance without the use of ichthyocides. The fact that it was caught in 2 different years, once with 5 different individuals, suggests that it has a resident population at Clarion.

Gymnothorax flavimarginatus. This is a large (to 120 cm), distinctively colored and not particularly secretive moray that is widely distributed in the Indo-Pacific. It is known from all the TEP oceanic islands, as a vagrant in the Galápagos (Victor, Grove et al., 2024), with a few records from the Mexican mainland and with most records concentrated in mainland Costa Rica and Panama. There are no museum records prior to its collection by ODD (specimens in CPUM) and it was not observed by Fourriére et al. in 1994-1999, 2007, 2010 or 2012-2013. Acceptance by the "two 2016 inventory" studies was based on secondary sources. A single specimen was photographed at Socorro in 2022 and a few reads of CO1 (100% name assignment) at Clarion during the 2023 eDNA study. This species is classed as an RNP non-resident.

Halichoeres adustus. See endemics section D.

Halichoeres insularis. See endemics section A.

Halichoeres nicholsi. See endemics section B.

Halichoeres sanchezi. See endemics section A.

Hemiramphus saltator. Although this species is listed in the 2002 checklist and both 2016 inventories, we were unable to locate any voucher items until a photograph of this species was taken in June 2025 by an iNaturalist contributor at Socorro (Supplementary material: File S4). That image showed a school of 4 individuals, which, the photographer stated, comprised no more than 10 individuals. Because of this paucity of records, we list this species as having an uncertain population status.

Heteropriacanthus carolinus. See *Priacanthus alalaua.*

Holacanthus clarionensis. See endemics section A.

Holacanthus passer. The only museum records of this species, which is common throughout the rest of the TEP, are a single specimen in CMNFI collected in 1968 at Socorro and 2 in CPUM, one collected at Clarion in 2014 and the other at Socorro in 2015. AAB recorded single individuals at San Benedicto in 2014 and another at Socorro in 2017. Fourriére et al (2016) reported observations in the late 1990s, 2010 and 2012-2013, but did not provide numbers of individuals or the islands at which they were

seen. Hollarsmith et al. (2020) and Velasco-Lozano et al. (2020) did not record this species during their ROV mesophotic study. This species was not recorded in 2022. We include an image of a single individual photographed at Roca Partida in 2015, and an image of a likely hybrid of *H. passer X H. clarionensis* (Supplementary material: File S7) collected at Socorro during the 2022 expedition. Given the rarity of this conspicuous, readily recognizable, demersal species we regard it as a vagrant.

Hypanus dipterurus and *Hypanus longus*. While there are multiple validated records indicating that *H. longus* is a resident in the RNP there are many fewer of *H. dipterurus*. Due to morphological similarities of those 2 species some confusion is inevitable, since a large proportion of the much longer tail of *H. longus*, which is often used for identification, is frequently lost in live individuals. There are 2 putative RNP records of *H. dipterurus* in GBIF: one LACM specimen from Socorro, on re-examination, is *H. longus* and another from MNHN is from the Gulf of California, not the RNP. However, both species were accepted in the curated RNP inventory by Becerril-García et al. (2020), based on an observation at San Benedicto as well as a museum record of *H. dipterurus* from Socorro (likely the erroneous record from LACM). Since there is one confirmed image of *H. dipterurus* from Socorro (Supplementary material: File S4) its presence in the RNP is accepted as a vagrant due to the very small number of verified records.

Hyporthodus cifuentesi. Aburto-Oropeza et al. (2017) employed deep water BRUVs and recorded this species as abundant at multiple islands, including Socorro. Hollarsmith et al. (2020) videotaped it at Clarion and San Benedicto using a small ROV, and we include an image from each of those studies. Due to its abundance, we class it as a resident.

Hypsoblennius proteus. See endemics section A.

Iniistius pavo. This species is a medium-sized, Indo-Pacific wrasse found in shallow sand habitats around the fringes of reefs. It is widely distributed in the TEP, from central Pacific Baja to the Gulf of California and south to Colombia, as well as all the offshore islands except Clipperton (which has a minuscule amount of shallow sand habitat). It was photographed at 3 islands in 2022: an adult and a juvenile at each of Clarion and San Benedicto, and an adult at Socorro. AAB only observed it once, at Socorro, in 2023 and Fourriére et al. (2016) observed it in the 1990s, but not in 2007, 2010 or 2012-2013. There are no museum records of this species. It is classed as an uncertain resident due to this pattern of observations.

Kyphosus sectatrix and *Kyphosus lutescens.* See *K. lutescens* in unaccepted-species section.

Labrisomus socorroensis. See endemics section A.

Lutjanus argentiventris. This species, which is common on the TEP mainland, often seen in schools, is rare in the RNP. It has been repeatedly observed as single individuals at different locations in different islands in different years: at Clarion in 2013 and 2022 (Supplementary material: File S1), at San Benedicto in 2013, 2017, 2018, and 2024 (Supplementary material: File S3), and at Socorro in 2019. Its rarity and the lack of museum specimens indicates that it is a vagrant that repeatedly arrives from the mainland.

Lutjanus inermis. Chávez-Comparan et al. (2010) recorded this species on 50% of 37 transects at Socorro in 2007 and that it was the ninth most abundant species on those transects. Although there are no voucher specimens or photos of this species it seems reasonable to accept this sole group of observation records owing to the distinctive form and coloration of this species that make it readily distinguishable from other *Lutjanus* species. Local abundance in this species would not be surprising as it often occurs in large aggregations. As there are no other records of this species from the RNP, *L. inermis* is classed as a non-resident.

Lythrypnus cf. *dalli*. See endemics section B.

Lythrypnus insularis. See endemics section A.

Mobula tarapacana and *Mobula thurstoni*. The only record of *M. tarapacana* is an iNaturalist image in 2021 at Clarion (Supplementary material: File S1) and an observation at Roca Partida by Becerril-García et al. (2020). The only records of *M. thurstoni* are a video of a school of at least 25 individuals at Roca Partida in 2018, a photograph of a single individual at Clarion in 2022 and 6 reads of a CO1 ASV obtained by the 2023 eDNA sampling at San Benedicto and assigned to *M. thurstoni* with 100% confidence. G. Stevens (of Manta Trust, https://www.mantatrust.org/, pers. com. 2024) considers that both these species occur too intermittently to have a resident population in the RNP.

Mugil cephalus. The first visual record of this species in the RNP is from iNaturalist images taken by Alberto Alcalá at southern Socorro in May 2024 (Supplementary material: File S4), with only a small group (~ 6 individuals) observed then. He returned to the same site at Socorro in November 2024 and obtained a photograph of 27 individuals, which he said was part of a school of ~ 80 adults (Mugil). iNaturalist hosts other images of adults of this species taken at Socorro in 2021, 2023, and 2025. Despite the existence of a school of adults, we list residency as uncertain, since there are no other records of this species in the RNP and all those images seem to have been taken at the same general site at Socorro. The type locality for *M. cephalus* is in Europe. Global-scale genetic studies of *M. cephalus*, the most recent one by Thieme et al. (2025), have concluded that putatively pantropical

M. cephalus actually comprises 16 allopatric species. Those include 2 species in the TEP, *Mugil galapagensis* (endemic to the Galápagos Islands) and another found from southern California to northern Peru. The only name of a species from that area that is listed in Eschmeyer's Catalog of Fishes (Fricke et al., 2026) as a synonym of *M. cephalus* is *Mugil mexicanus*, type locality Acapulco, which likely is the name that should be applied to the Revillagigedo population as well as the mainland TEP population.

Mugil setosus and *Mugil curema*. Gilbert (1892) described *M. setosus* from Clarion, noting its similarity to *M. curema* and stating that it was abundant there (the type collection includes 14 specimens). *M. setosus* is 1 of 2 species names that have been proposed for the TEP member of the *M. curema* species complex. Durand and Borsa (2015), in a genetic study, hesitated to provide a name for TEP members of that complex, among others, until the TEP phylogeny was resolved and proposed the name "*Mugil* species O". Their study revealed 2 close mtDNA lineages of that species on the mainland of the TEP. They did not have samples from the RNP in their analysis and did not mention *M. setosus*. New CO1 DNA-barcode data obtained by ODD (unpublished data) shows that all 6 sequenced RNP specimens belong to 1 of those 2 lineages, as do specimens from mainland Mexico and Costa Rica. The other lineage, 1.5% divergent from the former, occurs throughout the mainland of the TEP, from the Gulf of California to Ecuador. Britzke et al. (2019) compared the morphology of type specimens from Clarion and fish from the Gulf of California, Panama, Ecuador and Peru and found no morphological evidence for more than one species in the complex and concluded that *M.* sp. O is synonymous with *M. setosus*. Fourriére et al. (2016) listed only *M. setosus* for the RNP, while Del Moral-Flores et al. (2016) included both *M. setosus* and *M. curema*. Since the type location of *M. setosus* is the RNP and, to date, only a single lineage has been found there, we consider that to be *M. setosus* and that it is resident in the RNP.

Myrichthys pantostigmius. see endemics section D.

Myripristis clarionensis and *Myripristis leiognathus*. In color (uniform red) and form, these 2 species often look almost identical, so are easily confusable to the untrained eye or in less-than-ideal viewing circumstances. However, both species have large, obvious, well-defined scales on the body. The distinguishing feature visible to trained divers with a clear view of these fish and obvious in most well-focused images of these species is the number of scale rows between the lateral line and the spinous dorsal fin: 2.5 rows in *M. leiognathus* and 3.5 rows in *M. clarionensis*, with the half row running along the base of the dorsal fin above (and partly covered by) the row below of the 2 or 3 rows of fully visible scales above the lateral line (Supplementary material: File S8). All RNP museum specimens of these 2 species collected that have been examined to date (72 from SIO and 168 from LACM) have been called *M. clarionensis*, except for 2 juveniles and an adult collected in the 1960s that are housed in CMNFI and were re-examined and confirmed as *M. leiognathus*. ODD collected 21 specimens, all of which are *M clarionensis*. On the 2022 expedition we collected 8 *M. clarionensis* and 1 juvenile *M. leiognathus* and obtained identifiable images of 69 different individuals at the 4 islands, all of them *M. clarionensis*. iNaturalist has 7 identifiable images from the RNP labelled, correctly, as *M. clarionensis*, but none of *M. leiognathus*. From this we conclude, like Greenfield (1965), that, while *M. clarionensis* is a common RNP resident, *M. leiognathus* is an occasional vagrant there and does not have a resident population.

Myxodagnus opercularis. There are a number of museum collections of this species; at Clarion (LACM) in 1971, and at Socorro: 1 in 1925 (CAS), 3 individuals in 1934 (LACM), 4 in 1970 (SIO) and another 2 in 1971 (LACM). This fish is a very small, highly cryptic species that lives buried in the superficial layer of sand and hence unlikely to appear in collections that do not use ichthyocides, which have not been used since the mid-20th century to collect fishes in the RNP. Since multiple individuals were repeatedly collected at Socorro in each of 4 different years over a 46-year period and it was collected at the end of that period at 2 islands we class it as a resident.

Ophioblennius clippertonensis and *Ophioblennius steindachneri*. There are 2 currently recognized species of this genus in the TEP, *O. steindachneri* and *O. clippertonensis*. The latter was first described as a subspecies of *O. steindachneri* by Springer (1962) based on morphological differences and he included the RNP population, from which he examined 25 specimens collected in 1953 at Socorro (LACM 48933.007), as part of *O. steindachneri steindachneri*. Subsequently those 2 were raised to species status by Hastings and Springer (2009). To date, *O. steindachneri* has been thought to be the only species present on the TEP mainland and oceanic islands except Clipperton, which is occupied by the endemic *O. clippertonensis* (Fricke et al., 2026). Del Moral-Flores et al. (2016) and Fourriére et al. (2016) include only *O. steindachneri* as part of the RNP fauna. However, DNA barcodes by ODD (unpublished data) of 34 individuals from the Revillagigedos, 17 from Clipperton and 26 from the mainland and Galápagos show 3 haplogroups, 1 for mainland/Galápagos fish (*O. steindachneri*), separated by 1.3% of uncorrected pairwise genetic distances (*p*-distances) from 1 haplogroup for Clipperton and 1 haplogroup from the RNP that is closely

related (*p*-distance = 0.6%) to the Clipperton haplogroup. In addition, a few *O. steindachneri* are present at the Revillagigedos (5 of 34 total) and Clipperton (3 of 17 total) and a single "clippertonensis" haplotype is present on mainland Mexico. Given the present information the simplest explanation is that both species, with a predominance of *O. clippertonensis*, currently are in the RNP, although further study, particularly involving comparisons of the morphology of fishes collected in 1953 with those collected 70 years later during the present study, may well change that conclusion. Images of *Ophioblennius* from the RNP show a similar range of variation in coloration to that seen in *O. steindachner* on the mainland and Galápagos.

Orthopristis cantharina. Once thought to be endemic to the Galápagos, this species is known from Baja California and the Gulf of California as well (GBIF-O. cantharina; Robertson & Allen, 2024). There are no reliable museum records from the RNP (see comments about the problematic databases, below). However, video by AAB at San Benedicto shows what most likely is that species, which has a distinctive shape. The screen-grab image (Supplementary material: File S3) shows 2 large individuals (the species reaches at least 45 cm TL) near a rock on sand adjacent to rocky reef. The more strongly colored individual in the background was swimming rapidly to-and-from around the other individual. Based on this single observation we class *O. cantharina* as a non-resident.

Pareques sp. See endemics section B.

Platax teira. The native range of this species is restricted to the Indo-West Pacific, with its nearest population about 7,000 km from Mexico. In 2023 a single large adult was photographed at Cabo Pulmo, southeastern Baja, the first record of this species in the TEP. Subsequently, in 2024 and 2025, juveniles and multiple adults have been photographed at various sites scattered along 1,000 km of the southern Mexican mainland coast (Medina-Rosas & Moreno-López, 2025; Petatán-Ramírez et al., 2025). An adult was photographed on the west coast of Socorro in May 2025 and another on the east coast in June 2025 (Supplementary material: File S4). Subsequently an adult was photographed at Roca Partida in December 2025 (Supplementary material: File S2). Because these single, solitary adults provide the only records to date of this species in the RNP we include it as a non-resident. The sudden appearance of adults at very small, isolated locations such as Roca Partida indicates that they, like juveniles, can disperse pelagically, most likely associated with flotsam.

Priacanthus alalaua and *Heteropriacanthus carolinus*. *Priacanthus alalaua* is known from the Hawaiian Islands, Guam and Japan as well as the RNP, plus Alijos Rocks, Guadalupe and southwestern Baja California (Hashimoto & Motomura, 2025; Starnes, 1988). Fish in the RNP, where it is a resident, reach a larger size and occur in shallower water than this species at Hawaii (Fitch & Crooke, 1984; Starnes, 1988). *Heteropriacanthus carolinus* is an Indo-Pacific priacanthid found throughout most of the TEP, including all the oceanic islands, and is a common resident in shallow water in the RNP. The similarity in general body shape and reddish coloration of these 2 species likely will make them difficult to distinguish in underwater images of live individuals that are not high quality closeups. Morphological differences in the preoperculum that distinguish between these 2 species are indicated in File S9.

Pristigenys serrula. The occurrence of this species at the RNP derives from 3 sources. Starnes (1988) noted it as "recorded" there but provided no more information. Del Moral-Flores et al. (2016) and Fourriére et al. (2016) cited secondary sources (Castro-Aguirre & Balart, 2002; Robertson & Allen, 2006, 2015), that likely were based on Starnes (1988). Fourriére et al. (2016) also referred to an occurrence in FishBase, an MNHN record from a problematic database that has been entirely excluded (see comments below about unaccepted databases). Hollarsmith et al. (2020) recorded 2 observations of single individuals at depths of 76-84 m at Clarion, but none at San Benedicto or Socorro. We have included a screen-grab image from that study at Clarion (Supplementary material: File S1). Although these are the only records of this species it ranges down to 250 m depth and is usually found at depths below scuba activity and likely is an RNP resident.

Prognathodes falcifer. This species has a highly distinctive form and color pattern that differs from all other chaetodontids in the northern TEP and allows ready recognition. Fourriére et al. (2016) recorded observations between 1994-1998 and 2010. Hollarsmith et al. (2020) recorded it 12 times at Clarion, San Benedicto and Socorro in 2018 and we include 2 screen-grab images from videos used in that study (Supplementary material: Files S1, S4). Video taken by Ayala-Bocos et al. (2015) at Roca Partida and San Benedicto (Supplementary material: Files S2, S3) shows it to be common at depth. Hence, we regard it as a resident.

Pronotogrammus multifasciatus. This deep-reef species (depth range 40-400 m) is known from California to northern Peru and all the oceanic islands except Clipperton. The only museum specimen was a juvenile collected in 1897, which has been lost from CAS. The UNESCO eDNA project that sampled in 2023 recorded several thousand reads of 2 ASVs of 16S (100% confidence)

at each of Clarion, San Benedicto and Socorro. We accept the reliability of the species assingnment for that gene because *P. multifasciatus* is the only member of its genus in the TEP. Due to the abundance of such reads of a species unlikely to be accessible to shallow collecting at the 3 major islands we class it as a resident.

Rypticus courtenayi. See endemics section A.

Scomber australasicus and *Scomber japonicus*. *Scomber australasicus*, which is genetically distinct from *S. japonicus* (Catanese et al., 2010) evidently has a resident population in the RNP with numerous individuals sampled there over more than 2 decades. There are also a few records in the southwestern Gulf of California. A global phylogeny of *Scomber* based on mtDNA by Scoles et al. (1998) showed no differentiation of the RNP population from those elsewhere in the Pacific, indicating that the RNP population is unlikely to be endemic. In contrast, the only RNP records available for *S. japonicus* are CAS specimens collected in 1925, 3 from Clarion and 1 from Socorro. The fact that so few *S. japonicus* were collected almost 100 years ago, and none since then, indicates it is not resident in the RNP.

Scorpaena afuerae. The 2 records of this deep-reef species (depth range 35-100 m) in the RNP are from videos obtained from a submersible at Roca Partida by Ayala-Bocos et al. (2015) and by an ROV at Socorro by CS-O in 2016. We have identified these as *S. afuerae* based on those fish having a red body with their pelvic fins and the inner surface of their pectoral fins being white with large red spots (Supplementary material: Files S2, S4). This color pattern is only seen in S. *afuerae* among all the known species of *Scorpaena* in the TEP. We tentatively class this species as a resident, based on these 2 records.

Scorpaenodes xyris. This small reef-dwelling scorpaenid, which was described from Baja specimens by Jordan and Gilbert (1892), is common at all 4 RNP islands. A genetic study by Bernal-Hernández et al. (2024) found that while all 44 individuals from the RNP belong to a local mitochondrial lineage, 3 fish from that lineage occur in the Cortés province, 2 in the Panamic province (central Mexico to Peru), and 2 at Clipperton Island. As a result, the RNP population has only a small degree of isolation (0.3% separation) from the other populations.

Selene peruviana. There are a few old records of this benthopelagic, conspicuous and readily recognizable species: 1 from Socorro in 1959, now at CMNFI, which confirmed that identification, another from Socorro at collected in 1972 SIO (collection location uncertain) and 4 at USNM (Albatross 1889 specimens, confirmed identification, excluded from use due to incomplete collection data). We class this species as an RNP non-resident.

Seriola dorsalis. *Seriola dorsalis*, a large, conspicuous, readily recognizable jack, is a north Pacific species recently split from what was once regarded as a globally distributed species, *Seriola lalandi* (Martinez-Takeshita et al., 2015). Before the 2023 eDNA study the only primary-source record was a 2012-2013 observation listed by Fourriére et al. (2016). That eDNA study produced a very small number of reads of CO1 and several thousand reads of 16S from the 3 main RNP islands, with 100% assignment to *S. lalandi*. Based on those genetic data we record it as present, but without a resident population.

Serranus aequidens. *Serranus aequidens* is a deep-living species (depth range 75-500 m) that would be unlikely to appear in shallow water collections. In addition to 2 USNM specimens collected at Socorro in 1934, whose identity was confirmed by our re-examination, a small number of reads of CO1 with 100% assignment to *S. aequidens* were obtained at Clarion by the 2023 eDNA research. At present we regard its population status in the RNP as uncertain.

Serranus socorroensis. See endemics section A.

Stegastes flavilatus, *Stegastes rectifraenum* and *Stegastes acapulcoensis*. The 5 species of *Stegastes* for which there are museum collection records in the RNP can be distinguished by various combinations of the number of soft rays of the dorsal, anal and pectoral fins plus the number of lower gill-rakers on the first gill arch, as well as species-specific coloration of live and recently collected individuals (Allen & Woods, 1980). Jordan and McGregor (1899), who made the earliest collections of *Stegastes* in the RNP, from Clarion, San Benedicto and Socorro, identified them as *S. flavilatus* and *S. rectifraenum*. Subsequently, Heller and Snodgrass (1903) included those authors specimens of both species as *Stegastes redemptus* when they described that species. Ricker (1959) noted that those preserved specimens lacked color that could have been useful for identifying them.

GBIF contains information about UBC specimens named *S. flavilatus* and *S. rectifraenum* that were made at Clarion and Socorro between 1957-1963 by P.A. Larkin and colleagues. Those include multiple lots involving numerous individuals of both entities, some of which were transferred to CMNFI. Our examination of 13 individuals in the 1957-1963 CMNFI collection labelled *S. flavilatus* shows that all were misidentified *S. redemptus*. In addition, our examination of 20 individuals in 6 lots from Clarion and Socorro between 1959-1963 that were labelled *S. rectifraenum* shows that 18 were correctly identified and 2 were misidentified *Stegastes leucorus*. Those UBC collections produced only 1 individual named *S. redemptus* from Clarion in 1963, and 2 lots of 3 individuals from Socorro in 1962-1963, i.e., at the end of that multi-

year collecting effort. However, 2 UBC lots comprising 35 individuals of *S. redemptus*, but including no *S. flavilatus* or *S. rectifraenum*, were obtained from Socorro in 1954 by a different collector (M.A. Newman). We confirmed the identification of 22 of those *S. redemptus* from 4 collection lots. Collections made between 1925-1955, that are deposited in other museums, also include numerous *S. redemptus* from both those islands, but no *S. flavilatus* or *S. rectifraenum*: 4 lots at LACM and FMNH collected at Clarion, together with 48 lots of 82 individuals, including 1 lot of 32 fish, at CAS. Collections between 1925 and 1955 of *S. redemptus*, but no *S. flavilatus* or *S. rectifraenum*, at Socorro include 17 individuals at CAS, 29 individuals in 3 lots at LACM in 1971-1973 and 3 individuals at SIO during 1956-1973. Thus, collecting efforts by different museums at different times in the mid-20th century at the 2 largest islands in the RNP produced very different numbers of *S. rectifraenum* as well as an abundance of *S. redemptus*. Castañeda-Beltrán (1988) collected 9 individuals he identified as *S. rectifraenum* from Clarion, and visually recorded many individuals under that name as well but made no mention of observing or collecting either *S. flavilatus* or *S. redemptus*, which suggests those fish were misidentified. There is a 2007 observation record of *S. rectifraenum* in Fourriére et al. (2016), but no information about what life stage it involved. Those authors also list LACM as a source of specimens of *S. rectifraenum*. However, there are no specimens of that species from the RNP in the LACM catalog.

Since the mid-20th century the only vouchered records of *S. flavilatus* have been an iNaturalist image of a juvenile *S. flavilatus* at Socorro in 2007, our observations of multiple small juveniles (but no adults or large juveniles) of *S. flavilatus* at San Benedicto in 2022 and our collection of a juvenile *S. flavilatus* at Clarion in 2022. We also observed multiple small juveniles of what could have been either *S. acapulcoensis* or *S. rectifraenum* (small juveniles of these 2 species have identical coloration) at San Benedicto. DNA barcoding produced 100% matches of the sequences of 2 of those that we collected to *S. acapulcoensis*, although we recognize that *S. rectifraenum* and *S. acapulcoensis* are closely related and broadly share an mtDNA lineage. In contrast, in 2022 we observed and photographed many *S. redemptus* ranging in size from juveniles to large adults at Clarion, San Benedicto, and Socorro. Given the known misidentification of *S. flavilatus* from mid-20th century collecting events and that adults of only *S. redemptus* and *S. leucorus* have been collected and observed over more than 50 y, we conclude that the only resident *Stegastes* species in the RNP are those 2 species, which are both common there (Supplementary material: Files S1-S4). However, juvenile *S. flavilatus* and *S. acapulcoensis* occasionally recruit there from the mainland but do not establish resident populations. We class *S. acapulcoensis*, *S. flavilatus*, and S. *rectifraenum* as non-residents.

Stegastes leucorus. See endemics section D.

Stegastes redemptus. See endemics section A.

Stethojulis bandanensis. This transpacific wrasse is the only member of its genus in the TEP. ODD collected 2 individuals of this species at Socorro in 2015 and six at Clarion in 2016, which are housed at CPUM. These represent the only museum records. Single individuals were photographed at San Benedicto and Socorro in 2022, and there are iNaturalist images of 4 single individuals taken at Socorro in 2007, 2023, 2024, and 2025. The 2023 eDNA expedition produced 51 reads of 2 CO1 ASVs (99-100% name assignment confidence) at Socorro and San Benedicto. Because this species has no records prior to 2007 and so few individuals have been observed, we do not regard it as having a resident population.

Thalassoma virens. See endemics section D.

Tomicodon absitus and *Tomicodon* sp. See endemics sections A and B, respectively.

Tylosurus fodiator. This species, which is endemic to the TEP, extends from the Gulf of California to Ecuador and all the offshore islands, except Clipperton. While there are RNP museum records from the early to mid-20th century, the numbers of individuals involved are low. A single individual was seen and photographed during the 2022 expedition and AAB recorded none at any island between 2012-2024. There are iNaturalist images from 2020, 2021, 2024, and 2025 at Socorro, and one from 2024 at Clarion. However, most such images are of fish at a distance, making certain identification difficult. It is large, conspicuous and easy to catch by hook and line. The 2023 eDNA sampling produced 66 reads of CO1 (100% species assignment to *Tylosurus crocodilus (*of which *T. fodiator* was, until recently, classed as a subspecies) at Clarion and San Benedicto. Due to the combination of the paucity of collecting and photographic records and the eDNA data we class it as an uncertain resident in the RNP.

Tylosurus melanotus. This Indo-Pacific species, another large member of the genus, is known from the Gulf of California to Colombia, plus all the offshore islands except the Galápagos. Collette and Banford (2001) stated that *T. melanotus* replaces *Tylosurus pacificus* at the Revillagigedos and other offshore islands in the TEP, although only *T. pacificus* is known from the Galápagos as a vagrant (Victor, Grove et al., 2024). There are 2 RNP collection records of single individuals collected at Socorro. The 1952 specimen initially cataloged in USNM as *T. pacificus* was examined by Collette and Banford (2001) and reidentified as *T. melanotus*. LACM also has a specimen identified as *T. pacificus*, collected at

Socorro in 1955, which our re-examination showed to be a misidentified *T. melanotus*. Del Moral-Flores et al. (2016) and Fourriére et al. (2016) recorded both *T. pacificus* and *T. melanotus* at the RNP, citing both LACM and USNM as sources of the *T. pacificus* record but not providing a primary source for *T. melanotus*. The 2023 eDNA sampling produced 64 reads of CO1 with 100% species assignment to *Tylosurus acus*, of which *T. melanotus* was previously classed as a subspecies, at all 4 islands. Due to the paucity of (old) museum records combined with the few recent eDNA data, we class it as an uncertain resident in the RNP.

Xyrichtys sp. See endemics section B.

Unaccepted databases and species

Two rejected databases: *i)* a database at the USNM from the Albatross 1889 Expedition. In February-April 1889 the USS Albatross collected fishes in Pacific Mexico, including Guadalupe Island, Alijos Rocks, the Revillagigedo Islands, the Gulf of California and the Pacific coast of Baja California (Tanner, 1889). Fishes were sampled at 3 Revillagigedo islands between March 4-11, Clarion for 1.25 days, then Socorro for 2.5 days and finally San Benedicto for less than 1 day. Specimens from that expedition are in the collections of the USNM and MCZ. The MCZ collection is relatively small, with no obvious errors. However, the USNM collection was evidently assembled in pieces at different times, as indicated by large variation in catalog numbers, and various records have vague collection dates. The 131-series of catalog numbers in particular has a relatively large number of location errors and vague collection dates (no date, or 1889 without a day and month date, or March 1889 rather than the known collection dates at the RNP islands). That 131-series also includes 3 ariid catfishes supposedly obtained at Clarion: *Ariopsis* sp., *Notarius insculptus*, and *Notarius troschelii*. Members of this family are egg-brooders, do not have a pelagic juvenile phase that would enable oceanic dispersal and lack confirmed records from any of the TEP offshore islands. Further, *N. insculptus* is restricted to Panama and Colombia and the specimens of these 3 species apparently came from a single collection in Panama or Colombia, which were visited by the Albatross on a different cruise to that at the RNP. Because ariids are not reef-associated fishes in the TEP they are not included among the unaccepted group of such species considered here. This case provides an example of the degree of unreliability of the 131-series dataset, which is why we excluded from the accepted species list all species for which 131-series records represent the sole RNP record: *Chaetodipterus zonatus*, *Chloroscombrus orqueta*, *C. platophrys*, *Eucinostomus argenteus*, and *Symphurus leeorum*. The 131-series records also include *Diplectrum euryplectrum*, which, since the LACM 1939 record of that species is also erroneous, is also excluded from the accepted species list. In addition, we also discounted 131-series records for *Caranx sexfasciatus*, *Caulolatilus princeps*, *O. cantharina*, and *S. peruviana*, all of which have more recent records that we regard as validated and, hence, retain them as members of the RNP fauna. Based on known or likely erroneous location records from the Albatross USNM collection for species with various non-131-series catalog numbers we also excluded *Orthopristis chalceus* (known from mainland Mexico), *Mugil thoburni* (a Galápagos endemic; Durand & Borsa, 2015; Victor, Grove et al., 2024), *Centropyge bicolor/= Holacanthus bicolor/= Holacanthus mesoleucus* (an Indo-West Pacific species recorded in the USNM ledger as from St Lucia), *Sebastes carnatus* (a temperate NE Pacific species), *S. peruviana* (identification confirmed, but incomplete collection data) and *Guentheridia formosa* (from Panama in the ledger; a species restricted to the mainland between El Salvador and Ecuador). Finally, 2 USNM Albatross-collection specimens labelled *Carcharhinus plumbeus* that we examined are both newborn size and lack complete data on collection dates. Because *Carcharhinus* species are notoriously difficult to identify at that stage of development and there are no other validated records of this species in the TEP the RNP record of this species is not accepted. Location errors are not uncommon in 19th century and early 20th century collections from expeditions that visited multiple, widely dispersed sites, which were then divided between collections in different institutions then, much later, reassembled in one museum. These including errors related to the Galápagos fish fauna arising from the 1888 Albatross expedition to the Galápagos, Colombia and Panama (Victor, Grove et al., 2024). *ii)* A Muséum National d'Histoire Naturelle, Paris (MNHN) database. There is 1 database in GBIF that we excluded entirely, which is from the Muséum National d'Histoire Naturelle, Paris (MNHN). This, which is geolocated in GBIF at 20º N latitude, -110º W longitude, at the northeastern corner of the RNP, has been cited as support for some fish occurrences in the RNP by Del Moral-Flores et al. (2016) and Fourriére et al. (2016). It is a compendium of records of 71 species with collection dates between 1867 and 1999 that, in GBIF, includes the statement that it is from the "Baie de Californie", i.e., the Gulf of California. For some species listed in that database collecting locations in that Gulf are actually included, e.g., Espíritu Santo Island for *Syacium ovale*. It also includes records of west Atlantic and Indo-west Pacific species. Incorrectly georeferencing alone makes it irrelevant to RNP occurrences. That database includes records we

reject for 15 accepted species and 6 unaccepted species (Tables 2, Supplementary material: Table S1).

Assessments leading to non-acceptance of species in the RNP fauna

Our assessments of the 364 reef-associated fishes that potentially are members of the RNP fauna indicate that there are erroneous records of 121 species in 87 genera, 54 families, eliminating 33% of the assessed species, 19% of the assessed genera and 16% of the assessed families (Table 2). Of those 121 species, 46 were misidentified or were unidentifiable and 4 were synonymized with other species also included by both 2016 inventories. Further, 37 lacked vouchers, acceptance of their records in the "two 2016 inventories" having been based on secondary sources (Bautista-Romero et al., 1994; Castro-Aguirre & Balart, 2002; Robertson & Allen, 2006, 2015) and lacked verifiable primary-source data (specimens, images or reliable observations). For 45 species review of location data showed that their records were not from within the RNP, while in 22 species all specimens were lost, permanently precluding assessment and 2 species were represented solely by pelagic larvae collected well offshore, and hence were not accepted. Finally, 40 of the 121 species had multiple issues relating to their rejection, e.g., misidentification plus unreliable location data. Of those 121 species 32 were not mentioned by either of the "two 2016 inventories", 50 had been accepted by both and another 11 accepted on one inventory but not mentioned by the other. In addition, 8 species were accepted on one inventory but rejected on the other and only 3 species had been rejected in both inventories. Re-examination of museum specimens during the assessment process established that in 45 cases, involving 28 species from 8 museums, those specimens were misidentified accepted species.

CPUM is the only Mexican museum or research collection from which we have examined RNP specimens to verify their identification and metadata. Fricke et al. (2024) provide comprehensive information on species occurrences in Mexican ichthyological collections in their checklist of Mexican fishes. They list Mexican collections for some of the reef-associated species in the Castro-Aguirre and Balart (2002) checklist that we included in Table 2 (and Table 3) here, but do not indicate whether those collections contain specimens from the RNP of those species: *Carcharhinus brachyurus*, *Carcharhinus leucas*, *Aetobatus laticeps*, *Mobula mobular*, *Muraena argus*, *Uropterygius polystictus*, *Serranus psittacinus*, *Gnathanodon speciosus*, *Nematistius pectoralis*, *Abudefduf declivifrons*, *Halichoeres dispilus*, and *Labrisomus multiporosus*. If any of those collections include RNP specimens those should be examined to verify identities and collection metadata.

Species accounts of selected unaccepted species

Below are species accounts of 18 unaccepted species that expand on the reasons for their rejection summarized in Table 2.

Acanthurus achilles. The only record of this species in the RNP is an unpublished grey literature report by Chan (1974), which was accepted by Del Moral-Flores et al. (2016) but not mentioned by Fourriére et al. (2016). That account demonstrated an obvious lack of familiarity with RNP fishes as most species were only identified to genus. It described *A. achilles* as common at San Benedicto and in Hawaii but did not mention *Acanthurus nigricans*, which is common at both the RNP and the Hawaiian Is. Other records in that article likely represent confusion of names, including multiple records of *E. analogus* (as grouper) but no mention of the common *E. clippertonensis* (as *E. labriformis* since this publication preceded the description of *E. clippertonensis)* and of *F. longirostris* (a Hawaiian species) but not *F. flavissimus*. Hence, we attribute this report of *A. achilles* to misidentification and regard it as erroneous. Although there are a few validated records of *A. achilles* from Clipperton and Baja California, there is no evidence of a resident population in the TEP.

Carcharhinus leucas. The only record of this species in the RNP is a single juvenile *Carcharhinus* collected in 1982 by Castañeda-Beltrán (1988) at Clarion and recorded as *C. leucas*. Becerril-García et al. (2020) cited Castañeda-Beltrán as doubtful and do not include *C. leucas* in their curated inventory of RNP elasmobranchs. Juveniles of morphologically similar *Carcharhinus* species can be hard to identify, the very short description of the individual collected by Castañeda-Beltrán (1988) is not definitive for *C. leucas* and could represent any of several other *Carcharhinus* species known from the RNP. Hence, this record of *C. leucas* at the Revillagigedo Islands is not accepted.

Carcharhinus melanopterus. The specimen collected in Socorro in 1959 that was deposited in the UBC collection under this name has been destroyed. However, there are confirmed records of this species at Cocos Is. (Fourriére et al., 2017) so it is possible that this record in the RNP is correct. We record its presence in the RNP as unaccepted as there is no way to resolve whether or not the UBC specimen was correctly identified.

Gobiesox aethus. Briggs (1951) described *G. aethus* based on a single specimen from Clarion and to date it, along with *G. canidens*, has been regarded as an endemic (Del Moral-Flores et al., 2016; Fourriére et al., 2016). Torres-Hernández et al. (2022) assessed DNA barcode

Table 2
List of unaccepted species of the reef-associated fish fauna previously recorded as present at the Revillagigedo National Park.

Family	Recorded identification	Name authority	Correct identification	Fourr.	DMF	Problems	Data and sources relating to problems
Acanthuridae	*Acanthurus achilles*#	Shaw, 1803		-	Yes	ID, voucher	Chan74: grey literature, many identification issues
	Prionurus punctatus	Gill, 1862	*P. laticlavius*	Yes	Yes	synonym	Ld19: synonym; both species recorded by Fourr & DMF
Aetobatidae	*Aetobatus narinari*	Gill, 1865		Yes	Yes	voucher	BG20: no evidence; TEP form now named *A. laticeps*
Anthiadidae	*Acanthistius pictus*	(Tschudi, 1846)		-	-	lost, location	UBC: specimen lost; Peruvian species
Apogonidae	*Apogon dovii*	Günther, 1861		Yes	Yes	voucher, location	No primary source; southern TEP species
	Apogon guadalupensis	Osborn & Nichols, 1917	*A. atricaudus*	Yes	Yes	synonym	Lea22: synonym; both species recorded by Fourr & DMF
Atherinopsidae	*Atherinops affinis*	(Ayres, 1860)		Doubt	-	voucher	No primary source
Balistidae	*Melichthys vidua*	(Richardson, 1845)		Yes	Yes	ID	DMF: cite Rick, which does not mention *M. vidua*
	Sufflamen fraenatum#	(Latreille, 1804)	*S. verres*#	-	Reject	ID	J&M; USNM*
	Xanthichthys auromarginatus#	(Bennett, 1832)	*Sufflamen verres*#	-	-	ID	Giddens: DRR reviewed video to identify*
	Xanthichthys lineopunctatus#	(Hollard, 1854)	*X. mento*#	-	Yes	ID	SIO*; CUMV*; MCZ*; CAS (lost); UBC
	Xanthichthys ringens	(Linnaeus, 1758)	*X. mento*#	-	-	ID, location	CMNFI*; Atlantic species
Belonidae	*Tylosurus pacificus*#	(Steindachner, 1876)	*T. melanotus*#	Yes	Yes	ID	USNM*; LACM*; C&B2001: ID*
Carangidae	*Chloroscombrus orqueta*#	Jordan & Gilbert, 1883		Yes	Yes	location	Albatross 1889: USNM*, unreliable location
	Decapterus punctatus	(Cuvier, 1829)	*D. muroadsi*	-	Reject	ID, location	CMNFI*; Atlantic species; DMF: inferred is *D. muroadsi*
	Euprepocaranx dorsalis	(Gill, 1863)	*Alectes ciliaris*#	Yes	Yes	ID	LACM*; *E. dorsalis* is name change from *Carangoides otrynter*
	Gnathanodon speciosus	(Forsskål, 1775)		-	Yes	voucher	No primary source
	Hemicaranx zelotes	Gilbert, 1898		Yes	-	voucher	No primary source
Carcharhinidae	*Carcharhinus acronotus*	(Poey, 1860)		-	-	lost, location	UBC: lost; Atlantic species
	Carcharhinus brachyurus	(Günther, 1870)	*C. falciformis*	Yes	Yes	ID, lost	LACM*; CSLB*; UBC: specimen lost; BG20: not mentioned

Table 2. Continued.

Family	Recorded identification	Name authority	Correct identification	Fourr.	DMF	Problems	Data and sources relating to problems
	Carcharhinus leucas#	(Muller & Henle, 1839)		Yes	Yes	ID	CB88: description vague; BG20: not accepted
	Carcharhinus melanopterus#	(Quoy & Gaimard, 1824)		-	-	lost	UBC: specimen lost; present at Isla del Coco
	Carcharhinus perezii	(Poey, 1876)		-	-	lost, location	UBC: specimen lost; Atlantic species
	Carcharhinus plumbeus#	(Nardo, 1827)		Doubt	-	ID	B-G: unconfirmed; Albatross 1889: USNM - identification unreliable
Chaenopsidae	*Acanthemblemaria crockeri*#	Beebe & Tee-Van, 1938	*A. mangognatha**#	-	-	update	SIO*; UBC*; records precede description of *A. mangognatha*
	Acanthemblemaria hancock#i	Myers & Reid, 1936	*A. mangognatha**#	Doubt	-	update, location	Rick; H&R*; southern TEP species; records precede description of *A. mangognatha*
	Acanthemblemaria macrospilus$	Brock, 1940	*A. mangognatha**#	Doubt	-	update	CAS*; SIO*; records precede description of *A. mangognatha*
Chaetodontidae	*Chaetodon meyeri*	Bloch & Schneider, 1801		Yes	Yes	voucher	No primary source
	Forcipiger longirostris#	(Brousonnet, 1782)	*F. flavissimus*#	Yes	Reject	ID	CMNFI*; SIO*; CAS
Cirrhitidae	*Oxycirrhites typus*	Bleeker, 1857		Yes	Yes	voucher	No primary source
Clinidae	*Heterclinus tristis*	(Klunzinger, 1872)	*Axoclinus multicinctus*#	-	-	ID, location	UBC*: genus endemic to Southwest Pacific correct identification per R. Rosenblatt;
Congridae	*Ariosoma gilberti*	(Ogilby, 1898)	*A. hemiaspidus*	Yes	Yes	larvae	SIO*: larvae
	Heteroconger digueti	(Pellegrin, 1923)		Yes	Yes	lost	CAS: lost; no other primary sources
Cyclopsettidae	*Citharichthys xanthostigma*	Gilbert, 1891	*C. platophrys*#	Doubt	Yes	ID, location	Albatross 1889: USNM*, location unclear
	Citharichthys gilberti	Jenkins & Evermann, 1889	*Citharichthys* sp.#	Yes	Yes	ID, larvae	SIO*: larvae collected well offshore, fin-ray counts not of *C. gilberti*; LACM*: small, unidentifiable to species
	Syacium latifrons	(Jordan & Gilbert, 1882)		Doubt	-	voucher	No primary source
Cynoglossidae	*Symphurus leeorum*	Jordan & Bollman, 1890		Yes	-	location	USNM: location doubtful

Table 2. Continued.

Family	Recorded identification	Name authority	Correct identification	Fourr.	DMF	Problems	Data and sources relating to problems
Diodontidae	*Diodon eydouxii*	Brissout de Barneville, 1846		Yes	Yes	voucher	No primary source
Dussumieridae	*Etrumeus acuminatus*	Gilbert, 1890		Yes	-	voucher	B-R94: grey literature, unconfirmed
Echeneidae	*Remora albescens*	(Temminck & Schlegel, 1850)		Yes	Yes	lost, voucher	CAS: lost; no other primary sources
Embiotocidae	*Embiotoca jacksoni*	Agassiz, 1853		Doubt	-	location	CAS*: San Benito (Baja), not San Benedicto
Epinephelidae	*Alphestes multiguttatus*	(Günther, 1867)		Yes	Yes	voucher	CAB; no primary source
	Epinephelus quinquefasciatus	(Bocourt, 1868)		Yes	Yes	lost, ID, voucher	SIO*: lost & too small to reliably identify to species; no voucher
	Hyporthodus niphobles	Gilbert & Starks in Gilbert, 1897		Yes	Yes	location	SIO: outside RNP
	Mycteroperca jordani	(Jenkins & Evermann, 1889)		Yes	Yes	voucher	No primary source
	Mycteroperca prionura	Rosenblatt & Zahuranec, 1967	*Epinephelus labriformis#*	Yes	-	ID	LACM*
	Mycteroperca sp.		*E. labriformis#*	-	-	ID	LACM*
Ephippidae	*Chaetodipterus zonatus#*	(Girard, 1858)		Yes	Yes	location	Albatross 1889: USNM*, ID correct but location unclear
Fistulariidae	*Fistularia petimba*	Lacepede, 1803	*F. commersonii*	-	-	ID, location	LACM*; UBC; DMF suggest *F. corneta*; pantropical except for TEP
Gerreidae	*Diapterus brevirostris*	Sauvage, 1879		Yes	Yes	voucher	no primary source
	Diapterus sp.			-	-	ID, location	USNM*: unidentifiable, location suspect
	Eucinostomus argenteus#	Baird & Girard, 1855		-	-	location	Albatross 1889: USNM, location Panama; west Atlantic species
	Eucinostomus gracilis	(Gill, 1862)		-	-	location	UBC: location = Tres Marías Is.
Ginglyostomidae	*Ginglymostoma unami*	Del Moral-Flores et al., 2015		-	-	voucher	BG20: no evidence; MNHN: Gulf of California; no primary source
Girellidae	*Girella nigricans*	(Ayres, 1860)		Yes	Yes	lost, voucher	CAS: lost; no other primary sources
Gobiesocidae	*Arcos* sp.		*Tomicodon* sp.#	-	-	ID	UBC*: small, unidentifiable to species

Table 2. Continued.

Family	Recorded identification	Name authority	Correct identification	Fourr.	DMF	Problems	Data and sources relating to problems
	Gobiesox aethus#	(Briggs, 1951)	*G. canidens*#	Yes	Yes	ID	ODDDNA: only *G. canidens* present
	Gobiesox adustus#	Jordan & Gilbert, 1882	*G. canidens*#	Yes	Yes	ID	ODDDNA: only *G. canidens* present
	Tomicodon eos	(Jordan & Gilbert, 1882)		Yes	Reject	voucher	SIO: not in catalog; no primary source
	Tomicodon zebra	(Jordan & Gilbert, 1882)		Yes	Yes	voucher	SIO: not in catalog; no primary source
Gobiidae	*Barbulifer pantherinus*	(Pellegrin, 1901)		-	Reject	location	MNHN: Gulf of California; no primary source
	Lythrypnus pulchellus#	Ginsburg, 1938	*L. insularis*#	Yes	Yes	update	Records precede *L. insularis* description
	Lythrypnus rhizophora#	(Heller & Snodgrass, 1903)	*L. insularis*#	Doubt	reject	update, location	Records precede *L. insularis* description; *L. rhizophora* is southern TEP species
	Lythrypnus zebra#	(Gilbert, 1890)	*L. insularis*#	Yes	Yes	update	Records precede *L. insularis* description
Grammistidae	*Rypticus bicolor*	Valenciennes, 1846	*R. courtenayi*#	Doubt	Reject	ID, lost	CMNFI*; SIO*; CAS: lost
	Rypticus saponaceus	(Bloch & Schneider, 1801)	*R. courtenayi*#?	-	Reject	location	DMF: misidentified *R. courtenayi*; Atlantic species; MNHN: Gulf of California
Haemulidae	*Anisotremus surinamensis*	(Bloch, 1791)	*A. perezponcedeleoni*#	-	-	ID, location	UBC*; West Atlantic species
	Orthopristis chalcea	(Günther, 1864)		Yes	Reject	location	Albatross 1889: USNM*, unreliable location
Kyphosidae	*Kyphosus lutescens*#	(Jordan & Gilbert, 1882)	*K. sectatrix*#	-	Yes	synonym	K&C13,16: synonym; ODDDNA supports synonym
Labridae (Labrinae)	*Bodianus pulcher*	(Ayres, 1854)		-	-	lost, location	CAS: lost, location error – San Benito is in Baja
	Halichoeres chierchiae#	Di Caporiacco, 1947	*H. nicholsi*?#	Yes	Yes	Voucher, ID	No voucher; ID = *H. nicholsi*?
	Halichoeres dispilus#	(Günther, 1864)	*H. insularis*?#	Yes	Yes	Voucher, ID	No voucher; ID = *H. insularis?*
	Halichoeres melanotis#	(Gilbert, 1890)	*H. sanchezi*#	Yes	Yes	voucher, ID	SIO: not in catalog; ID = *H. sanchezi* (sister species)
	Halichoeres semicinctus	(Ayres, 1859)	*H. insularis*#	Doubt	-	ID, lost	LACM*; CAS: lost
	Thalassoma lutescens	(Lay & Bennett, 1839)	*T. grammaticum*	Yes	Reject	ID	*T. lutescens* in TEP = misidentified *T. grammaticum*
(Scarinae)	*Nicholsina denticulata*#	(Evermann & Radcliffe, 1917)	*Calotomus carolinus*	Yes	Yes	ID, voucher	USNM*; CMNFI*; CPUM*; CC10: no voucher

Table 2. Continued.

Family	Recorded identification	Name authority	Correct identification	Fourr.	DMF	Problems	Data and sources relating to problems
	Scarus perrico	Jordan & Gilbert, 1882	*S. compressus?*	Yes	Yes	voucher, location	SIO: not in catalog; MNHN: Gulf of California; no primary source
Labrisomidae	*Labrisomus multiporosus*	Hubbs, 1953	*L. socorroensis#*	Yes	Yes	ID	UBC: in catalog as *L. socorroensis*
	Labrisoums xanti#	Gill, 1869	*L. socorroensis#*	Yes	Yes	ID	LACM*: *L. socorroensis*
	Malacoctenus margaritae#	(Fowler, 1944)	*Labrisomus?*	Yes	Yes	ID, voucher	CC10; DMF; no voucher, = juvenile *Labrisomus*?
Lutjanidae	*Lutjanus novemfasciatus*	Gill, 1862		-	-	ID	H20 video: unidentifiable; VL not mentioned
Mobulidae	*Mobula mobular*	(Bonaterre, 1788)		Doubt	Yes	voucher	BG20: no evidence; synonym of *M. mobular*
Mugilidae	*Mugil curema#*	Valenciennes, 1836	*M. setosus*	Yes	Yes	synonym	Br19: TEP population is synonym; both species listed by Fourr & DMF
	Mugil thoburni#	(Jordan & Starks, 1896)		-	Yes	location	Albatross 1889: USNM - location Galápagos; a Galápagos endemic
Mullidae	*Pseudupeneus grandisquamis*	(Gill, 1863)	*Mulloidichthys dentatus*	Yes	Yes	ID	SIO*
Muraenidae	*Enchelynassa canina*	(Quoy & Gaimard, 1824)	*Gymnothorax* sp.	-	-	ID	CPUM*
	Gymnothorax mordax	(Ayres, 1859)	*G. flavimarginatus?#*	-	-	ID, voucher	CB88: identification undecided; *G. flavimarginatus* & *G. mordax* coloration similar
	Gymnothorax undulatus	(Lacepède, 1803)		Yes	Yes	voucher	B&R: no mention; no primary source
	Muraena argus			Yes	Yes	voucher	No primary source
	Muraena clepsydra			Yes	Yes	voucher	No primary source
	Uropterygius marmoratus	(Lacepede, 1803)	*U. macrocephalus*	-	-	ID, location	CMNFI*; *U. marmoratus*; Indo-west Pacific, not known from TEP
	Uropterygius polystictus	Myers & Wade, 1941		Yes	Yes	voucher	CAB; no primary source
	Uropterygius versutus	Bussing, 1991		Yes	Yes	voucher	B91: no mention; no primary source
Nematistiidae	*Nematistius pectoralis*	Gill, 1862		Yes	Yes	location	MNHN: Gulf of California; no primary source
Ophichthidae	*Myrichthys tigrinus*	Girard, 1859	*M. pantostigmius#*	-	Yes	ID, location	SIO*; LACM*; *M. tigrinus* rename is *M. xystrurus;* MNHN: Gulf of California

Table 2. Continued.

Family	Recorded identification	Name authority	Correct identification	Fourr.	DMF	Problems	Data and sources relating to problems
Opistognathidae	*Opistognathus punctatus*	Peters, 1869		Yes	Yes	location	SIO: outside study area
	Opistognathus rhomaleus	Jordan & Gilbert, 1881		Yes	Yes	location	SIO: specimen = aquarium eggs, vague location
	Opistognathus rosenblatti	Allen & Robertson, 1991		Yes	Yes	location	SIO: location suspect
Oplegnathidae	*Oplegnathus insignis*	(Kner, 1867)		-	Reject	location	DMF: no source; Galápagos/Peru species
Ostraciidae	*Acanthostracion notacanthus*	(Bleeker, 1863)		-	-	location, lost	CAS: lost; Atlantic species
Polynemidae	*Polydactylus approximans*	(Lay & Bennett, 1839)		-	Reject	voucher	DMF: no source
	Polydactylus opercularis	(Gill, 1863)		-	-	lost	CAS: lost
Pomacanthidae	*Centropyge bicolor*	(Bloch, 1787)	*Chaetodontoplus mesoleucus*	-	-	location	Albatross 1889: USNM, Indo-west Pacific species, ledger says St. Lucia
Pomacentridae	*Abudefduf concolor*	(Gill, 1862)	*Abudefduf declivifrons*	Doubt	Reject	location, lost	CAS: lost; southern TEP species; *A. declivifrons* occurs in Mexico
	Chromis limbaughi			Yes	Yes	voucher, lost	CAS: lost; no primary source
	Chromis punctipinnis	(Cooper, 1863)		-	-	location	J&M: NHMUK location = San Benito (Baja), not San Benedicto
	Hypsypops rubicundus	(Girard, 1854)		Yes	Yes	voucher, lost	CAS: lost; no primary source
Sciaenidae	*Cynoscion xanthulus*	Jordan & Gilbert, 1882		Yes	Reject	location	LACM: mainland site
	Roncador stearnsii	(Steindachner, 1875)		-	-	location	CAS: location = Baja
Scorpaenidae	*Scorpaena tierrae*	Hildebrand, 1946	*S. mystes*	-	-	ID, location	UBC*; Peruvian species.
	Scorpaena sp.			-	-	ID	LACM*: too small for reliable identification
	Scorpaenopsis gibbosa	(Bloch & Schneider, 1801)		-	-	location, lost	CAS: lost; Indian Ocean endemic
	Sebastes carnatus	(Jordan & Gilbert, 1880)		-	Reject	location	Albatross 1889: USNM, temperate NE Pacific species, location unreliable

Table 2. Continued.

Family	Recorded identification	Name authority	Correct identification	Fourr.	DMF	Problems	Data and sources relating to problems
Serranidae	*Diplectrum euryplectrum*	Jordan & Bollmann, 1890	*Serranidae*	Yes	Yes	ID, lost, location	LACM*: too small for reliable identification; Albatross 1889: USNM, specimens lost, location unreliable
	Serranus psittacinus#	Valenciennes, 1846	*S socorroensis*#	-	Yes	ID	S&H: predates description of *S. socorroensis*
Sparidae	*Calamus brachysomus*	(Lockington, 1880)		-	-	voucher	no primary source
Sphyraenidae	*Sphyraena argentea*	Girard, 1854		Yes	Yes	lost, ID	SIO: lost, too small for reliable identification
Syngnathidae	*Syngnathus* sp.		*Bryx veleronis*#	-	-	ID	LACM*
Synodontidae	*Synodus hoshinonus*	Tanaka, 1917		-	-	lost, location	CAS: lost; Indo-west Pacific species
Tetraodontidae	*Guentheridia formosa*	(Günther, 1870)		Yes	Reject	location	Albatross 1889: USNM: location = Panama
Triglidae	*Prionotus albirostris*	Jordan & Bollman, 1890		Doubt	-	voucher	No primary source

Recorded name: original name in database or publication; for species name# see text for further information. Correct identification: name of reidentified species; name? indicates suggested identification. Fourr.: yes indicates species accepted by Fourriére et al. (2016); doubt = doubtfully present, not included in their inventory; confirm? = presence unconfirmed, not included in their inventory. DMF: yes indicates species accepted by Del Moral-Flores et al. (2016), reject indicates they rejected occurrence. Problem: reasons for rejection - location = records are outside RNP; synonym = recent synonymization; ID = misidentification; larvae = specimens are larvae, no benthic stage individuals known in RNP; lost = museum specimens lost, no other vouchers available; voucher = no known voucher (i.e., confirmed specimens, reliable observations by professional ichthyologists, observations by authors, images); update = name not changed in museum databases following taxonomic update. Data and sources relating to problems: * indicates specimen identification checked by source museum; no primary source —only secondary sources of data available; TEP —Tropical Eastern Pacific. Primary Literature Sources: A-A21 = Acevedo-Álvarez et al. (2021); B91 = Bussing (1991); BG20 = Becerril-García et al. (2020); B&R = Böhlke and Randall (2000); Br19 = Britzke et al. (2019); CB88 = Castañeda-Beltrán (1988); CC10 = Chávez-Comparan et al. (2010); Chan74 = Chan (1974); C&B2001 = Collette and Banford (2001); Daw85 = Dawson (1985); DMF = Del Moral-Flores et al. (2016); Fourr. = Fourriére et al 2016; Giddens = Giddens et al. (2019); H20 = Hollarsmith et al. (2020); H&R = Hastings and Robertson (1999); J&M = Jordan and McGregor (1899); K&C13,16 = Knudsen and Clements (2013), (2016); Lea22 = Lea et al. (2022); Ld19 = Ludt et al. (2019); P&A = Pietch and Arnold (2020); Rick = Ricker (1959); S&H = Snodgrass and Heller (1905); VL = Velasco-Lozano et al. (2020); DNA: dna sequences by ODD, BF &/or BV. Primary Museum Sources: CAS = California Academy of Sciences (note: some losses can be attributed to effects of the 1906 earthquake and fire at San Francisco); CMNFI = Canadian Museum of Nature Fish Collection (Ottawa); CPUM: Colección de Peces de la Universidad Michoacana de San Nicolás de Hidalgo; CSLB: California State University, Long Beach Fish specimens; CUMV = Cornell University Museum of Vertebrates, Fish Collection; LACM = Natural History Museum of Los Angeles County; MNHN = Muséum National d'Histoire Naturelle, Paris (see comments about this collection in text); MCZ = Museum of Comparative Zoology, Cambridge; NHMUK = Natural History Museum, London; SIO = Scripps Institution of Oceanography, Marine Vertebrate Collection; UBC = University of British Columbia, Cowen Vertebrate Collection (Beaty Biodiversity Museum); USNM = National Museum of Natural History, Smithsonian Institution.

sequences of 6 specimens from Clarion and 19 from Socorro as part of a phylogeographic study of the widely distributed *Gobiesox adustus*. Sampling of additional individuals has brought the total number of CO1 sequences from the RNP to 45 and indicates that only 1 species, an endemic, is present there. Since the description of *G. canidens* preceded that of *G. aethus* by Briggs (1951), the likely name of the RNP endemic population is *G. canidens* and *G. aethus* is a synonym.

Halichoeres chierchiae, *Halichoeres dispilus*, and *Halichoeres melanotis*. Juveniles of these 3 species, which are very common inhabitants on mainland reefs, resemble, respectively, juveniles of the Revillagigedos form of *H. nicholsi* and the Revillagigedo endemics *H. insularis* and *H. sanchezi*. Given that the records of all 3 in the RNP are based entirely on unvouchered observations of each species, misidentification is a reasonable explanation for all 3 cases and they likely represent invalid records.

Kyphosus lutescens. This species was named by Jordan and Gilbert (1892) based on a single, all-yellow specimen collected at Socorro. Recently it was synonymized with *K. sectatrix*, a pantropical species, by Knudsen and Clements (2013, 2016) based on morphological comparisons. However, Del Moral-Flores et al. (2016) included *K. lutescens* as an RNP endemic and rejected K. *sectatrix* in their inventory. In contrast, Fourriére et al. (2016) included only *K. sectatrix* in their inventory. Coloration of RNP specimens varies from all-yellow to all white to all-grey, with many fish showing intermediate patterns with varying degrees of 2 or 3 colors on different parts of the body (Supplementary material: Files S1-S4; iNaturalist images; Robertson & Allen, 2024; Valencia-Méndez et al., 2018). Similar local color variation is known in other populations of *K. sectatrix* elsewhere in the Indo-Pacific. In addition, newly available DNA barcodes of yellow and grey morphs from the RNP by ODD (unpublished data) show that they belong to a single haplogroup and support Knudsen and Clement's (2016) conclusion that *K. lutescens* is a synonym of *K. sectatrix*. In the eastern Pacific *K sectatrix* occurs not only at the Revillagigedos, but also Baja California, the Galápagos, Isla del Coco, Roca Alijos and Guadalupe Island.

Labrisomus xanti. See comments about *L. socorroensis* in endemics section.

Malacoctenus margaritae. The only record of this labrisomid species is from Chávez-Comparan (2010), who did not mention observing any other species of labrisomids. Del Moral-Flores et al. (2016) pointed out that this species is a southern TEP species occurring on the mainland from Costa Rica southwards and proposed that what Chávez-Comparan (2010) saw could have been *Malacoctenus mexicanus*, which occurs on the Mexican mainland. Fourriére et al. (2016) also referred to this record as *M. mexicanus*. We suggest that more likely it was either a juvenile *Labrisomus* or even *E. exsul*. In the absence of vouchers confirming otherwise we exclude *M. margaritae/mexicanus* from the accepted species set.

Mugil curema. See *M. setosus* in accepted section.

Mugil thoburni. This species was described in 1896, from specimens collected in the Galápagos and currently is regarded as a Galápagos endemic (Victor, Grove et al., 2024). Both Del Moral-Flores et al. (2016) and Fourriére et al. (2016) recorded it in the RNP, based on a USNM record that is from a collection with many erroneous location records (see above) and thus is not considered a validated record.

Nicholsina denticulate. The few records of this species in the RNP consist of specimens deposited in CMNFI (2 individuals collected in 1968) and USNM (3 individuals collected in 1994), plus observations by Chávez-Comparan (2010) and 4 possible individuals collected at Socorro by ODD. Reexamination of those 2 sets of museum specimens, supported by DNA results of the 4 ODD fish (unpublished data), show that they are all *Calotomus carolinus*. Thus, the only remaining potential records of *N. denticulata* are from observations, and Chávez-Comparan (2010) listed neither species as common. Young individuals of both species have very similar forms and mottled brownish camouflage coloration and can easily be confused, while IP individuals are also quite similar in form and color. Only the TP males of those 2 species are readily distinguishable by color patterns (Robertson & Allen, 2024). Given the fact that the museum specimens were incorrectly identified we think that misidentification is also likely with those observational records. We only observed and photographed *C. carolinus* at the RNP in 2022 and the only photographs in iNaturalist are of *C. carolinus* (n = 37 taken between 2017 and 2025). Hence, we list *N. denticulata* as part of the non-accepted group.

Serranus psittacinus. See *S. socorroensis* in endemics section.

Sufflamen fraenatum. Del Moral-Flores et al. (2016) suggested that specimens of *S. fraenatum* from the TEP represent misidentified *Sufflamen verres*, which is common throughout the region and the RNP. Specimens named *S. fraenatum* (*Balistes capistratus* and *Pachynathus capistratus* are synonyms) were collected at Clarion and Socorro in 1897 by Jordan and McGregor (1898). However, in which museum Jordan and McGregor's specimens are housed is not clear. The USNM has specimens of *B. capistratus* renamed as *S. verres*, that were collected at Socorro and Clarion in by the Albatross expedition of 1883-1889, i.e., before *S. verres* was described in 1904. GBIF also lists 5 museum records from the Gulf of

California and the Galápagos, but only the latter postdates the description of *S. verres*. Reexamination of specimen data for a 1957 Seckenburg Museum "*S. fraenatum*" from the Galápagos showed that it had already been reidentified as *S. verres*. We agree with Del Moral-Flores et al. (2016) that the *S. fraenatum* records from the RNP are misidentified S. *verres*. Although Palacios-Morales et al. (2014) identified a juvenile *Sufflamen* collected on the southern coast of Mexico as *S. fraenatum*, the color pattern of that individual resembles that of juvenile *S. verres* rather than juvenile *S. fraenaum* and genetic reassessment (by ODD, unpublished data) shows that it is indeed an *S. verres*. Hence, there is no convincing evidence of any occurrences of *S. fraenatum* in the TEP. However, that species is distributed throughout the Indo-Central Pacific, including isolated islands and archipelagos, indicating a strong capability for dispersal. It occurs at all major island groups on the western edge of the East Pacific Barrier, including the Line Islands, which is the most likely location to dispatch propagules of transpacific migrants towards the TEP on the equatorial countercurrent. Hence, it does have the geographic and biological potential to be a transpacific migrant to the TEP and might well be recorded there in the future.

Tylosurus pacificus. Del Moral-Flores et al. (2016) and Fourriére et al. (2016) recorded *T. melanotus* and *T. pacificus* in the RNP. The *T. pacificus* records are based on misidentified *T. melanotus* (see account of *T. melanotus* among accepted species).

Xanthichthys lineopunctatus and *Xanthichthys auromarginatus*. *Xanthichthys mento* was described from a specimen from Clarion by Jordan and Gilbert (1882), who made no mention of *X. lineopunctatus*, which has a generally similar color pattern to *X. mento*. Records labelled as *X. lineopunctatus* from the RNP, collected in the mid-20th century, still exist in several museums. Our reexaminations of such specimens from SIO, MCZ and CUMV now shows that they are *X. mento*. In any case, *X. lineopunctatus* is an Indo-west Pacific species, with its nearest population 11,000 + km from the Americas (Matsuura, 2022), so is highly unlikely to occur in the TEP. However, 3 other species of *Xanthichthys*: *X. auromarginatus*, *Xanthichthys caeruleolineatus* and *Xanthichthys greenei*, do occur at the Line Islands on the western edge of the East Pacific Barrier and *X. caeruleolineatus* occurs as a vagrant at Cocos and Galápagos. Giddens et al. (2019) recorded deep-living fishes using dropcams in the RNP and other offshore islands in the TEP. Inspection by DRR of a relatively low-quality image from a video that they identified as *X. auromarginatus* that was kindly provided by J. Giddens indicates it was a *S. verres* and not a *Xanthichthys* species. Review of an RNP specimen labelled *Xanthichthys ringens*, an Atlantic species, in CMNFI, also showed that it is *X. mento*. The only species we have observed or collected in the RNP between 2012-2025 is *X. mento*, which is very common at all 4 islands, and there are numerous records of this species in the RNP from the 1940s to the present, including many iNaturalist images. Based on this information we conclude that the only species in the RNP, and elsewhere in the TEP, are *X. mento* as a resident, and *X. caeruleolineatus* as a vagrant at southern sites in the TEP.

Species whose presence in the RNP requires confirmation

In addition, there are 9 potential occurrences in need of confirmation through more robust voucher data (see Table 3).

Pseudobalistes naufragium. The only record of this species in the RNP is an observation by Chávez-Comparan et al. (2010), who did not list it among the common species they observed. They also did not record the life stage of the individual(s) observed. While adults of *P. naufragium* usually are readily distinguishable from adults of *Balistes polylepis,* another plain colored balistid that is common and found throughout the RNP, the juveniles of those 2 species can appear quite similar. Hence, without a voucher, the record of *P. naufragium* is listed as unresolved.

Strongylura exilis. There are several records of this species in the RNP. Three needlefishes identified as *S. exilis* in the UBC catalog that were collected both during and shortly after the 1954-1958 activity discussed by Ricker (1959) that subsequently were transferred to CMNFI were reexamined and identified as *Platybelone pterura*. There is a 1925 CAS record from Clarion, but the specimen has been lost and there is no other information about it in the CAS online catalog. A specimen relating to the 1946 record in the SIO database, of a synonym, *Tylosurus stolzmanni*, cannot be located and the record has been removed from the catalog. Castañeda-Beltrán (1988) collected 2 needlefishes from Clarion in 1982 that he named *S. exilis* and recorded that they ranged between 83 to 100 cm TL. Although *S. exilis* is known to reach a maximum size of 91cm TL (Love et al., 2021), 2 other belonids confirmed from the RNP that reach 100 cm are *T. crocodilus* and *T. melanotus*, either of which might have been named as *S. exilis* by Castañeda-Beltrán (1988). It should also be noted that there has been confusion about the application of correct genus names to TEP *Tylosurus* and *Strongylura* species collected during the 20th century that are in various museum collections: e.g., *Tylosurus exilis* (CAS), *Strongylura fodiator* (UBC), *T. stolzmanni* (SIO), and *Strongylura galapagensis* (ANSP), the last a synonym of *T. pacificus*. Given the absence of confirmed

Table 3

List of nine species whose status as possible members of the reef-associated fish fauna the Revillagigedo National Park (RNP) requires confirmation.

Family	Problem	Scientific name	Name authority	Fourriére et al., 2016	Del Moral-Flores et al., 2016	Sources of information about problems
Balistidae	Voucher	*Pseudobalistes naufragium*#	(Jordan & Starks, 1895)	Yes	Yes	CC10: observation – possible misidentification
Belonidae	ID, lost, source	*Strongylura exilis*#	(Girard, 1854)	Yes	Yes	CB88: possible misidentification; CMNFI*: misidentified *Platybelone pterura*; CAS: lost; SIO: unlocatable
Carangidae	eDNA only	*Decapterus macrosoma*	Bleeker, 1851			eDNA: 14r CO1
Carapidae	ID, location	*Echiodon exsilium*#	Petit, 1934			SIO: misidentified as *Carapus mourlani*, location suspect
Chanidae	eDNA only	*Chanos chanos*	(Fabricius, 1775)			eDNA: 21r CO1; MNHN is Gulf of California
Congridae	location	*Gorgasia punctata*#	Meek & Hildebrand, 1923			SIO: location suspect
Opistognathidae	location	*Opistognathus fossoris*#	Bussing & Lavenberg, 2003			SIO: location suspect
Paralichthyidae	eDNA only	*Paralichthys californicus*	(Ayres, 1859)			eDNA: 21r CO1, 735r 16S
Scombridae	ID	*Sarda chilensis*#	(Cuvier, 1832)	Yes	Yes	UBC: not in UBC online database

Problem: location = records may be outside RNP; ID = uncertain identification; Source = no primary source data; Voucher = no known voucher (specimen, DNA or image); Fourriére et al., 2016 and Del Moral-Flores et al., 2016: indicates if species listed as accepted by those authors. Species name#: see text for further information. Sources of information: Literature: CB88 = Castañeda-Beltrán (1988); CC10 = Chávez-Comparan et al. (2010); Rick59 = Ricker (1959). Museums: CMNFI = Canadian Museum of Nature Fish Collection (Ottawa); CAS = California Academy of Sciences (note: some losses from this museum can be attributed to effects of the 1906 earthquake and fire at San Francisco); SIO = Scripps Institution of Oceanography, Marine Vertebrate Collection; UBC = Beaty Biodiversity Museum; eDNA: 2023 UNESCO eDNA survey: eDNA: r = number of reads of CO1 and 16S ASVs.

records, the confusion about identifications and names of needlefish specimens and a lack of putative records since 1982, we consider the occurrence of *S. exilis* in the RNP to be unresolved.

Echiodon exsilium, Gorgasia punctata and *Opistognathus fossoris.* The records of these 3 species, which are known to occur in the Gulf of California and the mainland Mexican coast, come from a single small lot of 4 species obtained by A. Kerstitch (University of Arizona) that, according to the SIO catalog, was collected at Clarion on June 1, 1993. That specimen lot, initially in the University of Arizona collection, was later moved to SIO. When they were reexamined by author BF the identities of *G. punctata* and *O. fossoris* were confirmed but the *E. exsilium* was found to have been misidentified as *Carapus mourlani*. The only other species collected by Kerstitch during 1993 listed in the SIO catalog is a different lot of 2 *Pontinus vaughani*, also collected on June 1, but, according to the SIO catalog, "doubtfully obtained at La Paz", southern Baja. If Kerstitch collected fish at the Revillagigedo islands in 1993, it seems likely that there would be more than 1 small lot containing 3

species for which there are no other records in the RNP. Given this conflicting information about the June 1 collecting location and the lack of information about other fish specimens collected by Kerstitch from currently unknown locations during 1993, we regard these 3 sole-source records as requiring confirmation.

Sarda chilensis. Del Moral-Flores cited Ricker (1959) as the source of the only record of this species in the RNP. Ricker (1959) indicated that a specimen collected at Socorro was deposited in the UBC collection. However, the UBC online database in GBIF (UBC database, GBIF) does not contain any records of this species from the RNP.

Fricke et al. (2024) list Mexican collections for 4 of the species included in Table 3: *P. naufragium*, *S. exilis*, *E. exsilium*, and *S. chilensis.* If any of those collections include RNP specimens of those species, they should be examined to verify identities and collection metadata.

Using the UNESCO eDNA study we added 3 species not previously recorded from the RNP to the "requiring confirmation" group, due to the potential for eDNA to be derived from larvae rather than adults and to relatively low numbers of reads of ASVs of CO1 for each of those species: *Decapterus macrosoma* (the 2 other members of the genus found in the TEP were also detected by eDNA from the RNP, as well as by other voucher information), *Chanos chanos* (a monospecific family), and *Paralichthys californicus* (whose GenBank reference sequence we determined is correct). *Decapterus macrosoma* is known from the Galápagos and *C. chanos* from all the other TEP oceanic islands. *Paralichthys californicus* occurs on the Pacific coast of Baja as far south as Magdalena Bay and its larvae could be occasionally swept to the RNP by the southerly flow of the California Current.

Endemism of the RNP reef-associated fish fauna

Fourriére et al. (2016) listed 12 species as RNP endemics, while Del Moral-Flores et al. (2016) listed 23. Information presented in the species accounts below indicate that while 12 of the species mentioned by both 2016 inventories are validate endemics, 4 more mentioned only by Del Moral-Flores et al. (2016) are also endemics, and another 7 species, one of them included on both inventories and another only on the Del Moral-Flores et al. (2016) inventory, are probable endemics. In addition, another 3 species (one of them on the Del Moral-Flores et al. (2016) inventory as an endemic) are potential endemics (Table 4). However, we disagree with the listing of 7 other species as endemics in one or both 2016 inventories, as explained in the species accounts of unaccepted endemics, below. In combination our investigations indicate that there are 16 described and named endemics, another 7 probable endemics, only 2 of them named, and 4 potential endemics (see Table 4 and species accounts below). Those included some species that have been recorded from the mainland but evidently lack self-sustaining populations there.

Named endemic species accounts

Acanthemblemaria mangognatha. There are no records of this species, described by Hastings and Robertson (1999) as a Revillagigedo endemic, from anywhere in the TEP other than the RNP. Museum specimen records of 3 mainland congeners, *Acanthemblemaria crockeri*, *Acanthemblemaria hancocki*, and *Acanthemblemaria macrospilus*, at the RNP all predate that description. None of them were accepted by Del Moral-Flores et al. (2016) or Fourriére et al. (2016) and specimens of each have been shown to be *A. mangognatha* (Hastings & Robertson, 1999; our own specimen reviews).

Anisotremus perezponcedeleoni. The RNP population previously known as *Anisotremus interruptus* was described as an RNP endemic, *A. perezponcedeleoni*, by Acevedo-Álvarez et al. (2021), who used both morphological and genetic data to arrive at that conclusion.

Axoclinus multicinctus and *Enneanectes exsul.* These are 2 small, cryptobenthic triplefins. *A. multicinctus* was described by Allen and Robertson (1992c) and *E. exsul* by Rosenblatt et al. (2013). Those are the only 2 tripterygiids currently known from the RNP and recorded there since 2000. Records from the 1950s and 1960s of *Axoclinus carminalis*, *Axoclinus lucillae*, *Axoclinus* sp., *Enneanectes sexmaculatus* (= *A. carminalis*) and *Enneapterygius* sp. (a genus that does not occur in the neotropics) have not been curated since being deposited under those names in UBC and most likely are of either or both *A. multicinctus and E. exsul* as there are no records of any other tripterygiids being collected in the RNP since those UBC collections. The same applies to the 1925 CAS collection of "*Tripterygion dubius*" in the RNP, a species name that does not appear in Eschmeyer's Catalog of Fishes (Fricke et al., 2026) from a genus that does not occur in the Americas.

Dactyloscopus insulatus. This Revillagigedos endemic species, which is known from all 3 main islands in the RNP, was described as an endemic subspecies of *Dactyloscopus pectoralis* by Dawson (1975) and subsequently raised to the species level by Hastings and Springer (2009). There are no records of this species from anywhere in the TEP other than the RNP and no other members of the genus have recorded from the RNP. We obtained images and specimens at Socorro in 2022.

Gobiesox canidens. Briggs (1951) described 2 species of *Gobiesox* from the RNP: *G. aethus,* based on a single specimen from Clarion, and *G. canidens*, based on 5 specimens from Socorro. To date both species have been regarded as endemics (Del Moral-Flores et al., 2016;

Table 4

Known, probable and potential endemic reef-associated fishes of the Revillagigedo National Park based on the results of the present study.

Family	Species	Endemic Status	Known from	Fourriére et. al. (2016): accepted endemic	Del Moral-Flores et al. (2016): accepted endemic
Blenniidae	*Hypsoblennius proteus*	Known	B, C, P, S	Yes	Yes
Chaenopsidae	*Acanthemblemaria mangognatha*	Known	B, C, S	Yes	Yes
Dactyloscopidae	*Dactyloscopus insulatus*	Known	B, C, S	Yes	Yes
Gobiesocidae	*Gobiesox canidens*	Known	C, P, S, (B?)	Yes	Yes
	Tomicodon absitus	Known	B, P, S	Yes	Yes
	Tomicodon sp.	Probable	C	New data	New data
Gobiidae	*Bathygobius ramosus longipinnis*	Probable	C, S, (B?)	No	Yes
	Chriolepis sp.	Probable	B, C, S	New data	New data
	Coryphopterus urospilus	Potential	B, C, S	New data	New data
	Lythrypnus cf. *dalli*	Probable	C	New data	New data
	Lythrypnus insularis	Known	B, C, S	Yes	Yes
Haemulidae	*Anisotremus perezponcedeleoni*	Known	B, C, P, S	New data	New data
Labridae	*Halichoeres insularis*	Known	B, C, P, S	No	Yes
	Halichoeres nicholsi	Probable	B, C, S	New data	New data
	Halichoeres sanchezi	Known	B, S	New data	New data
	Xyrichtys sp.	Probable	C, S, (B & P?)	Yes	Yes
Labrisomidae	*Labrisomus socorroensis*	Known	B, C, S	Yes	Yes
Pomacanthidae	*Holacanthus clarionensis*	Known	B, C, P, S	No	Yes
Pomacentridae	*Stegastes redemptus*	Known	B, C, S	No	Yes
Sciaenidae	*Pareques* sp.	Probable	B, C, S	New data	New data
Serranidae	*Rypticus courtenayi*	Known	B, C, P, S	Yes	Yes
	Serranus socorroensis	Known	B, C, P, S	Yes	Yes
Soleidae	*Aseraggodes herrei*	Potential	B, C, S	No	No
Syngnathidae	*Bryx clarionensis*	Potential	C, S, (B?)	No	Yes
Trypterigiidae	*Axoclinus multicinctus*	Known	B, C, S	Yes	Yes
	Enneanectes exsul	Known	B, C, S	Yes	Yes

Islands are San Benedicto (B), Clarion (C), Roca Partida (P) and Socorro (S). Species accounts in text discuss data relating to endemism for all species listed. New data: data relating to endemism presented here became available after publication of the two 2016 checklists.

Fourriére et al., 2016; Fricke et al., 2024, 2026). Torres-Hernández et al. (2022) examined genetic relationships among populations of *G. adustus* (Jordan & Gilbert, 1882), assessing DNA barcode sequences of 155 individuals across the great majority of its geographic range, from Baja California to Ecuador and Isla del Coco, and including 6 specimens from Clarion and 19 from Socorro. The Revillagigedo haplotypes formed a single haplogroup segregated by a *p*-distance of 2.6% from the Baja California haplogroup, the nearest other haplogroup, and there are no mainland haplotypes in the RNP. Subsequent sampling of additional individuals has brought the total number of sequences from the RNP to 45 and reinforces earlier indications that only 1 haplogroup and species is present there. A more comprehensive, integrative taxonomic analysis of the Revillagigedo population will be presented by ETH at a later stage. *Gobiesox canidens* is the likely name of the RNP endemic population since its description preceded that of *G. aethus* in Briggs (1951). Images show that fish from the RNP resemble *G. adustus* in coloration, a dark brown fish with thin pale blue-white irregular lines crossing the head and running longitudinally along the body (Supplementary material: Files S1, S4, and G. adustus color)

Halichoeres insularis. This species was described by Allen and Robertson (1992a) from specimens collected at Socorro in 1991. It is now known to also occur at Clarion and San Benedicto. While Del Moral-Flores et al. (2016) accepted this species as an endemic, Fourriére et al. (2016) did not, without explanation. This was likely due to supposed records from Alijos Rocks and Guadalupe Island indicated by Robertson and Allen (2015). Those were predicated on the assumption that a photo of a terminal phase male taken at Guadalupe (Guadalupe Halichoeres) was in fact *H. insularis*. However, during the 2022 expedition DRR searched for but was unable to find any TPs like that from Guadalupe, despite the superabundance of *H. insularis* in the RNP (aggregations of scores to hundreds of individuals were common at all 3 major islands). The only color phases seen in 2022 were those described by Allen and Robertson (1992a). Hence, we conclude that there is another, as yet undescribed species of *Halichoeres* related to *H. insularis* at Guadalupe and perhaps Alijos Rocks. Based on that we treat *H. insularis* as an RNP endemic. The taxonomic status of the Guadalupe population remains to be investigated.

Halichoeres sanchezi. This distinctively colored species was recently described as a new endemic wrasse from the RNP, currently known only from San Benedicto and Socorro (Victor, Frable et al., 2024) and nowhere else in the TEP. *Halichoeres melanotis* is the sister of *H. sanchezi* and reports of the former in the RNP made before 2024 most likely actually refer to *H. sanchezi.*

Holacanthus clarionensis. This species was listed as an endemic by Del Moral-Flores et al. (2016), but not by Fourriére et al. (2016). It is common at all 4 Revillagigedo islands, where photographs of aggregations of scores of individuals are easily obtained. Records on the mainland are scattered from southern Mexico to the central Gulf of California, along southwestern Baja up to Cedros Island and at Guadalupe Island. As of December 2024, GBIF had 26 primary-source records from the mainland, from 1959 to the present; those include 12 photographs from iNaturalist. AME&CJE photographed single fish at Cabo Pulmo and Cabo San Lucas in 2021-2022. All photographic records from sites other than the RNP are of single isolated adults. The similarly sized sister of *H. clarionensis, H. passer*, can live up to 20 years (Fernández-Rivera et al., 2016) and mainland records of *H. clarionensis* that have accumulated over the past 85 y most likely refer to single, long-lived isolated waifs rather than members of a self-maintaining mainland population. Hence, we regard *H. clarionensis* as a Revillagigedos endemic. We include an image of a likely hybrid of *H. passer X H. clarionensis* (Supplementary material: File S7) collected at Socorro during the 2022 expedition. Coauthor AAB obtained an image (video screengrab) of another such hybrid at Socorro in 2024.

Hypsoblennius proteus. This species was described by Krejsa (1960) as endemic to the RNP, based on 37 specimens in 4 museums from all 4 RNP islands. He compared those to 217 specimens of *Hypsoblennius brevipinnis* from sites scattered throughout Baja California and the Gulf of California, Cocos, Panama, Colombia, Ecuador, Peru and the Galápagos. He did not mention finding *H. proteus* anywhere except the RNP or finding *H. brevipinnis* in the RNP. As noted by both 2016 inventories, *H. proteus* is endemic to the RNP and the only member of its genus known from there.

Labrisomus socorroensis. This species was described as an RNP endemic by Hubbs (1953), based on 2 specimens collected at Socorro. Hubbs noted its similarity to *L. xanti*, including in the structure of its (preserved) color pattern and distinguished the 2 based on patterns of scalation on the side of the head. Hubbs (1953) also examined 559 *L. xanti* and described *L. multiporosus*, based on 253 specimens, without mentioning the occurrence of either species in the RNP. A LACM specimen from Clarion collected in 1971 that was listed as *L. xanti* was reexamined and reidentified as *L. socorroensis*. As of January 2026, there are 9 images of live *Labrisomus* from Socorro in iNaturalist, 7 labelled *L. xanti* and 2 labelled *L. socorroensis*. The Ricker (1959) specimen recorded as *L. multiporosus* with a UBC number

is listed in the UBC catalog as *L. socorroensis*, and all of that museum's specimens of *Labrisomus* from the RNP are listed as *L. socorroensis* (see GBIF).

ODD (unpublished data) DNA barcoded 28 individuals of *Labrisomus* from the RNP; 25 of those belong to a haplogroup composed solely of RNP fish, separated from a haplogroup containing mainland *L. xanti* by a *p*-distance of 0.6%. In addition, 2 RNP specimens have haplotypes found in the *L. xanti* haplogroup. There are various scenarios that could explain the existence of a few "*L. xanti*" haplotypes in the RNP, including its presence there as vagrants, hybridization with its close relative, *L. socorroensis*, and an early stage of speciation by *L. socorroensis* (see Craig et al., 2006 for a detailed discussion of a similar situation in *Epinephelus clippertonensis*). Until this situation is examined in greater depth, involving morphology and other genes, we suggest that *L. socorroensis* should be regarded as endemic to the RNP and the presence of *L. xanti* as unresolved.

Lythrypnus insularis. Both Del Moral-Flores et al. (2016) and Fourriére et al. (2016) listed this species among the RNP endemics. Bussing (1990) described this species from 54 specimens collected at Clarion and 33 collected at Socorro, and this is the only member of the genus he noted as occurring in the RNP. RNP records of congeners (*Lythrypnus sp*., *Lythrypnus pulchellus*, *Lythrypnus rhizophora*, and *Lythrypnus zebra*) in the collections of LACM, SIO and CAS from the RNP all refer to fish collected in 1925, 1953, 1955, 1959, 1970 and 1971 and named as such long before Bussing's description. A few records from 1971 were reidentified as *L. insularis* after Bussing's description of that species. *Lythrypnus insularis* has not been recorded anywhere other than at the RNP. In 2022 we collected 7 *L. insularis* from Socorro, 27 from Clarion and 1 from San Benedicto. DNA barcodes of 7 *L. insularis* from Socorro and 15 from Clarion collected in 2022 by ODD (unpublished data) show only 1 species present, with a suggestion of some separation of the Socorro and Clarion populations. Del Moral-Flores et al. (2016) and Fourriére et al. (2016) both recorded *L. pulchellus* and *L. zebra* as present in the RNP. However, given the lack of records of either of those species since 1971 when the *L. insularis* specimens described by Bussing (1990) were collected, we conclude that *L. insularis* is the only named species among that group that is present in the RNP. A limited number of DNA barcodes of *L. pulchellus*, *L. rhizophora*, and *L. zebra* as well as a large sample of *L. insularis* from Socorro and Clarion indicate distinct separation of the RNP populations, and that differences between *L. insularis* and the 3 others vary from 7.5% for *L. rhizophora* to 10.3% for *L. pulchellus* and 15.3% for *L. zebra*. The 2022 specimens and photographs of 50 + different individuals show the same basic, although variable, color pattern: body reddish anteriorly shading to dark grey posteriorly with 13-14 long thin, dark-edged iridescent vertical blue bars; head reddish to golden with varying degrees of red to gold spotting on side and lower part of head (lower spots with dark centers in some fish), with thin, dark-edge blue cross bars on nape and cheeks; iris reddish to gold; fins vary from transparent to grey, the unpaired fins darkest.

Rypticus courtenayi. This species was described as an RNP endemic by McCarthy (1979), in a paper reviewing the taxonomic status of the 3 TEP species: *Rypticus bicolor*, *R. courtenayi*, and *Rypticus nigripinnis*. McCarthy based his description of *R. courtenayi* on 80 specimens he examined from Clarion, San Benedicto and Socorro. He also examined 237 specimens of *R. bicolor* and 203 of *R. nigripinnis* and made no mention of either species at the RNP. Guimares (1999), in his review of the genus, also considered *R. courtenayi* to be the only species in the RNP. Major distinguishing features of the 3 species include the number of dorsal-fin spines, patterns of pores on the head and jaws, shape of the chin and color pattern. Five museum collections (LACM, USNM, SIO, CMNFC and CAS) from the RNP that predate McCarthy's paper have specimens labelled as either *R. bicolor* (or its synomym *Rypticus xanti*) or *R. nigripinnis*. Only 1 (adult) among those specimens from LACM, CMNFI and SIO that were in an identifiable state has morphology consistent with *R. nigripinnis* rather than *R. courtenayi*. Prior to 2022 ODD obtained 12 specimens from the RNP, plus specimens of *R. bicolor* (n = 36) and *R. nigripinnis* (n = 7) from the mainland, Cocos, Galápagos and Clipperton. DNA barcodes (ODD unpublished data) clearly separate those 3 species into 3 haplogroups, with *p*-distances = 1.7% separating *R. courtenayi* from *R. bicolor* and 4.9% separating *R. courtenayi* from *R. nigripinnis*. During the 2022 expedition 2 juveniles were collected from Roca Partida. Although head pore patterns of those 2 were of the *R. nigripinnis* type their DNA barcodes clustered with those of *R. courtenayi*, indicating that differences in pore patterns described by McCarthy (1979) are not definitive for juveniles. The haplotype of 1 individual in a sample of 14 *Rypticus* from Clipperton also clustered with the *R. courtenayi* haplogroup, the remainder with *R. bicolor*. This was the only non-RNP *R. courtenayi* to be recorded either in museum collections or identified by DNA barcodes outside the RNP. The combination of morphology of McCarthy's large sample of RNP fish and these DNA results strongly indicate that *R. courtenayi* is an RNP endemic, with occasional waifs reaching Clipperton Island and occasional waifs of *R. nigripinnis* reaching the Revillagigedo islands.

Serranus socorroensis. There are no records of *S. socorroensis* which was described from 5 Socorro specimens by Allen and Robertson (1992b) anywhere in the TEP other than the RNP. There are records of 2 other *Serranus* species from the RNP: *S. psittacinus* (as *Prionodes fasciatus*) by Snodgrass and Heller (1905), who simply mentioned it as occurring in those islands, without further comment or reference to a specimen; and a USNM record (USNM 94027) of *S. aequidens* from Socorro, which was cited by Fourriére et al. (2016). Our reexamination of that USNM specimen confirms that identification. Castro-Aguirre and Balart (2002) included *S. psittacinus* in the Revillagigedos fauna, citing Snodgrass and Heller (1905), as did Del Moral-Flores et al. (2016). Since there are no voucher specimens or other records of *S. psittacinus* from the Revillagigedos, and the structure of its color pattern resembles that of *S. socorroensis*, which was described long after Snodgrass and Heller's paper, Heller and Snodgrass's record most likely refers to *S. socorroensis*. We conclude that, at present, *S. socorroensis* and *S. aequidens* represent the only 2 confirmed species of *Serranus* known from the RNP islands, the former as an endemic.

Stegastes redemptus. This species is known from all Revillagigedo islands except Roca Partida. There are a few mainland records from southern Baja California: 5 in GBIF between 1960-2018, a photograph of a juvenile at Baja California taken in 2018 on iNaturalist, and photographs of a single individual taken at Ventana by CJE & AME in 2021. Hence, we conclude that the few mainland records are of single, isolated waifs, that there is no established population anywhere other than the RNP and that it is endemic to that park.

Tomicodon absitus. Briggs (1955) described *T. absitus* from 11 specimens collected at Socorro. This was considered to be the sole endemic member of the genus in the RNP by Del Moral-Flores et al. (2016), Fourriére et al. (2016), and Fricke et al. (2026). DNA barcoding of Revillagigedo specimens of the genus by ODD (unpublished data) shows that there are 2 haplogroups separated by a *p*-distance of 19.5%, 1 at Socorro (n = 22) and the other at Clarion (n = 52). Three other *Tomicodon* species have been recorded at the RNP at various times: *Tomicodon eos*, *Tomicodon petersii*, and *Tomicodon zebra*. The sequences of the 2 Revillagigedos lineages do not cluster with the sequences of the latter 2 of those 3 (Torres-Hernández et al., 2022), or with sequences of 3 other species of *Tomicodon* that occur in mainland Mexico but have not been recorded at the RNP, *Tomicodon boehlkei*, *Tomicodon humeralis*, and *Tomicodon myersi*. There are no sequences available for *T. eos* for comparison. The only possible validated record of those 6 non-endemic species in the Revillagigedos is of *T. petersii*, an LACM specimen from Socorro identified by Briggs (1955). These results indicate that there are 2 endemic *Tomicodon* species at the Revillagigedos, *T. absitus* at Socorro (and probably San Benedicto and Roca Partida) and *Tomicodon* sp., an undescribed species, from Clarion and that waifs of *T. petersii* may occasionally manage to recruit to the RNP. A more comprehensive, integrative taxonomic analysis of the 2 Revillagigedo populations will be presented by ETH at a later stage.

Probable endemic species accounts

Bathygobius ramosus longipinnis. This cryptobenthic species, which lives in intertidal habitat, was described as a subspecies endemic to the RNP by Ginsburg (1947). Del Moral-Flores et al. (2016) included it as an endemic subspecies, while Fourriére et al. (2016) referred to it simply as *B. ramosus*, which occurs on the mainland from the Gulf of California to Peru. However, Miller and Stefani (2001), which was cited in neither 2016 inventory, regarded it as a valid subspecies, based on morphological comparisons, but also noted similarities with the population at the Tres Marías Islands, in the mouth of the Gulf of California. ODD collected 15 individuals at both Clarion and Socorro, as well as substantial numbers of individuals from mainland sites throughout the rest of *B. ramosus* range, between Baja California and Ecuador. Together the Clarion and Socorro populations represent a very well-defined CO1 haplogroup (ODD unpublished data) that is well separated (by 3.6%) from *B. ramosus* haplogroups on the mainland. This indicates that the RNP population, with no other haplogroups present there, most likely is endemic. Although information is lacking on the genetic relationship of the Tres Marías population to those in the RNP and the mainland it seems unlikely that it will be closely allied to the RNP population, since the Tres Marías are much closer to the mainland (< 90 km) than to the RNP (500 km). The Galápagos and Clipperton are populated by other members of the genus (Miller & Stefani, 2001), while *B. ramosus* also occurs at Isla del Coco (Fourriére et al., 2017: ODD unpublished CO1 data).

Chriolepis sp. Neither 2016 inventory mentions any *Chriolepis* from the RNP. This undescribed cryptobenthic species was collected at Clarion and San Benedicto by the 2022 expedition and at San Benedicto in 2023 by ODD. There is an SIO collection of 39 specimens of *Chriolepis* from Clarion in 1955, by R. Rosenblatt et al., who labeled it *Chriolepis* n. sp. There also are LACM records of a *Chriolepis* sp. collected in 1939 (n = 8) and 1971 (n = 6) from Clarion and Socorro, but those specimens are listed in the catalog as lost, so are not included here. Findley (1983) examined the LACM specimens and concluded that

those from the RNP likely represent an endemic but did not describe and name it because the specimens were so small. No other members of the genus have been recorded from the RNP. A description of this probable endemic species is in preparation by OV-M.

Halichoeres nicholsi. *Halichoeres nicholsi* was described by Jordan and Gilbert (1882), from a single specimen collected at Socorro in 1880 by the USS Hassler and named after the captain of the ship during that cruise. Subsequently 5 other names were synonymized with *H. nicholsi* by Bussing (1987): *Halichoeres sellifer* Gilbert, 1890 from Clarion, *Halichoeres macgregori* from Panama Gilbert and Starks 1904, and 3 from the Galápagos: *Halichoeres maculosus* Clark, 1936, *Halichoeres stictus* and *Halichoeres stigmasepia*, both by Fowler (1944). There are consistent, pronounced coloration differences between all 3 color phases (juvenile, IP adult, TP adult) of the RNP population and those phases from populations on the mainland between Mexico and Ecuador and at the Galápagos (Supplementary material: File S10). These color differences are evident in underwater photos from Clarion, San Benedicto and Socorro (mainly from the 2022 expedition, with 40 others from iNaturalist) as well as many iNaturalist images from the mainland and Galápagos, plus some taken on the mainland in 2023, and at Galápagos in 2024 by AME and CJE: juveniles in the RNP almost invariably (35 of 38 individuals) have red-brown dark markings on a white body, while those from the mainland and Galápagos (and 1 from the Revillagigedos) typically have blackish to chocolate-brown dark markings on a white background (n = 78), and rarely red-brown markings (n = 3). IP adults from the mainland have white and yellow bodies with a blackish mid-lateral stripe along the body and a strong black vertical bar above that stripe under the center of the spinous dorsal fin (n = 187). Those from the RNP invariably (n = 32) have reddish brown bodies and fins, with or without a poorly developed dark vertical bar under the spinous dorsal fin. All terminal phase individuals at the RNP (n = 25) have a pale bluish-white body with an indistinct grey bar at mid-body and a large yellow patch covering the cheek and operculum. Terminal phase fish from the mainland also have bluish-white bodies, plus a broad black bar on the upper 2/3 of the body under the center of the spinous dorsal fin, with a yellow blotch at the front edge of that bar, and blue spots on the cheeks. Only 1 of 124 TPs from the mainland, at Cabo San Lucas, had a color pattern intermediate between those 2 TP color patterns, the remaining 123 exhibited the non-Revillagigedo pattern.

DNA barcoding by ODD (unpublished data) shows that the 27 specimens from Socorro and Clarion form 1 haplogroup and 37 fish from the mainland plus 27 from Galápagos form another, although those 2 haplogroups only differ by a *p*-distance of 0.23%. Evolutionary change in color patterns seems to proceed more rapidly than change in mtDNA genetic markers (Craig et al., 2006) and, in labrids, color differences are often the most pronounced morphological features separating sister species. The consistent, marked differences in coloration (morphology) between those 2 groups, in combination with that small genetic difference, indicates that the Revillagigedo population is a local endemic, named *H. nicholsi*.

Lythrypnus cf *dalli*. This species was discovered and collected at Clarion Is. during the 2022 expedition. Based on its color pattern it is a close relative of *Lythrypnus dalli*, which has not been recorded in the RNP, although there are some differences in color patterns between the 2 (Supplementary material: File S11). A limited number of DNA barcodes of this species differ by 3.5% from barcodes of *L. dalli* from Peru and 2.7 % from barcodes from each of the allopatric populations of *L. dalli* found in California/northern Baja California and in the Gulf of California (ODD and BV, unpublished data), which are known to be well separated genetically (Bernardi et al., 2003). These genetic and morphological differences support the view that the Clarion population likely is an RNP endemic.

Pareques sp. There are 5 species of *Pareques* currently known from the TEP, 4 named and 1 undescribed (Chao, 1995). They include 3 with very similarly colored plain brown adults: *Pareques viola* from mainland Nicaragua to Peru, *Pareques perissa*, endemic to the Galápagos islands, and an undescribed species (*Pareques* species A; see Robertson & Allen, 2024) from mainland Mexico. The coloration of adults of the *Pareques* sp. in the RNP is very similar to that of adults of both *P. viola* and *P.* species A. from mainland Mexico. In his review of the TEP members of the genus McPhail (1963) only dealt with *P. viola* among those 3, which he considered to occur in mainland Mexico and the RNP as well as the southern TEP. DNA barcodes of 2 specimens from San Benedicto (from BOLD) and 2 from Clarion (collected by the 2022 expedition) differ by 4.82%, on average, from *P. viola* and 10.1% from *P.* species A, with *P. viola* differing by 9.5% from *P.* species A (see also the molecular phylogeny based on CO1 in Carvalho-Filho et al., 2022). This result is surprising in that the sister to the RNP population is far more distant from the archipelago (2,800 km) than is the population of *P.* species A., in Mexico (400 km), although this geographic relationship parallels those seen in *B. clarionensis* and *A. herrei*. Based on these levels of genetic difference among those *Pareques* populations we class the RNP population as probably endemic to those islands.

Tomicodon sp. See species account for *T. absitus* in endemics section. This species, found only at Clarion, is genetically highly divergent (*p*-distance separation 19.5%) from *T. absitus* at Socorro.

Xyrichtys sp. A. The evidence for the presence of this species (Robertson & Allen, 2024) are relatively low-quality photographs of live individuals at Socorro, some from the 1980s and others, by author CC, from 2015. Examination of specimens are essential for confirming the taxonomic identity and status of this species vis a vis RNP endemism. Both 2016 inventories regarded it as an RNP endemic and here we consider that it likely is an undescribed endemic species.

Potential RNP endemics species accounts

Aseraggodes herrei. This small, highly cryptic, sand-living flatfish was described from a single specimen collected in the Galápagos. There evidently is a population in the RNP as it has been collected at Clarion, 3 specimens in 1971, LACM, and Socorro, 2 specimens in 1977, SIO; plus 5 specimens taken at Clarion by the 2022 expedition. ODD and students collected 2 at Clarion and 1 at San Benedicto during their multiyear collecting activity. This species is evidently largely restricted to living at the offshore islands and is also known from the Galápagos, Cocos and Malpelo, a minimum of 2,800 km from Socorro. Single SIO specimens collected in each of 1961 and 1977 at the southeast tip of Baja California might represent waifs from the RNP population. Given the great distance separating those northern and southern TEP populations it is possible that they are sufficiently genetically isolated to represent separate species, with the northern one endemic to the RNP.

Bryx clarionensis. *Bryx veleronis* was described by Herald (1940) based on 10 specimens collected in the Galápagos (holotype location) in 1938, and 18 individuals obtained at Clarion in 1934, the latter apparently collected by benthic trawl. Subsequently, *B. clarionensis* was described by Fritsche (1980) from 8 specimens dip-netted at a nightlight at southeast Clarion in 1955. He compared those specimens with 7 of the Clarion specimens of the same size range that Herald used to describe *B. veleronis* and separated the 2 groups based on the lengths of their snouts relative to head length: distinctly longer in *B. clarionensis* than in *B. veleronis,* with no intergradation. He included both species in the RNP fauna. Dawson (1985) synonymized *B. clarionensis* with *B. veleronis*, stating: "The recently described *B. clarionensis*, based on planktonic specimens and distinguished only be a somewhat longer snout, is here considered conspecific with *B. veleronis*". While Fourriére et al. (2016) included only *B. veleronis* in their RNP inventory, Del Moral-Flores et al. (2016) listed both species, with *B. clarionensis* as an RNP endemic.

We collected 30 specimens of *Bryx* during the 2022 expedition by dipnet at a nightlight at southeastern Clarion, where Fritzsche's (1955) specimens were collected. The range of absolute snout lengths in a sample of 9 of those 2022 fish was much wider than reported by Fritsche for both species at Clarion, with intergradation of sizes rather than a dichotomy that he used to separate them. The DNA barcodes of 8 of those fish include 3 closely related haplotypes (0.3% separation; see Bryx), with the individuals with the shortest and longest snouts having the same haplotype. These results support Dawson's (1985) conclusion that there is only 1 species in the RNP and here we follow that publication, which is the most recent general review of the taxonomy of TEP pipefishes, in calling that population *B. veleronis* with *B. clarionensis* as a synonym.

Herald (1940) noted that the 18 Clarion *B. veleronis* he examined had more dorsal-fin rays (25-28) than the 13 fish from the Galápagos, Costa Rica and Colombia (21-24), while Fritsche (1955) recorded that the 8 *B. clarionensis* from Clarion also had 25-28 dorsal fin rays. However, dorsal fin rays of the 9 2022 fish ranged from 23 to 26, demonstrating some overlap between the RNP population (by 4 of 35 individuals) and those from the southern TEP. Outside the RNP *B. veleronis* is known only from mainland Costa Rica to Colombia and the southern oceanic islands (Cocos, Galápagos and Malpelo, but not Clipperton). Hence the RNP population may well be sufficiently isolated from those other populations (by ~ 2,800 km or more) to represent an endemic species, called *B. clarionensis*. Since genetic data from those southern populations of *B. veleronis* currently are lacking, the status of the population in the RNP remains to be resolved.

Coryphopterus urospilus. This species, the only member of this neotropical genus in the TEP, is widely distributed throughout the region, from southern Baja California and the Gulf of California to Peru, and all the offshore islands except Clipperton. It is common at the 3 major islands of the RNP. ODD (unpublished data) DNA barcoded 31 individuals from the RNP, as part of a region-wide study. Twenty-five of those belong to a haplogroup restricted to the RNP, with that population separated by an average of 0.6% from other haplogroups found on the mainland and the Galápagos.

Species not accepted as RNP endemics

We reviewed data available for 6 species considered to be RNP endemics by Del Moral-Flores et al. (2016), one more considered endemic in both 2016 inventories and one that is abundant throughout the RNP islands and

much less common on the mainland that was not included among the endemics in either 2016 inventory. The species accounts of those 8 below indicate why we concluded that none are RNP endemics.

Doryrhamphus paulus. *Doryrhamphus paulus* was described by Frische (1980) from specimens collected in the RNP, who used the name *D. melanopleura* (type locality eastern Indian Ocean, described in 1858) for the population in the remainder of the TEP and the rest of the Indo-Pacific. Dawson (1981) in turn called the RNP population *Doryrhamphus excisus paulus*, using *Doryrhamphus excisus excisus* for the population in the rest of the TEP and much of the Indo-Pacific. Del Moral-Flores et al. (2016) referred to *D. paulus* as an endemic RNP species, while Fourriére et al. (2016) included it as a non-endemic subspecies of *Doryrhamphus excisus*. The west and central Pacific populations most recently reverted to the name *D. melanopleura*, which is also used for non-RNP populations in the TEP by Fricke et al. (2026). DNA sequencing (CytB) of 27 specimens by ODD (unpublished data) from the RNP, plus 50 elsewhere in Mexico, Costa Rica, Ecuador and the Galápagos shows that there are 3 discrete haplogroups in the TEP (Lessios & Robertson, 2006). While 1 haplogroup includes the great majority of RNP specimens, a few individuals from another major haplogroup also occur in the RNP and more than 1/3 of the Galápagos population also belongs to that "RNP" haplogroup. Thus, while there is evidence of partial isolation of the RNP population, the level of haplotype sharing with the Galápagos indicates that there likely is no RNP endemic population. To complicate matters further, *Doryrhamphus californiensis* (Gill, 1862) was described from Baja after *D. melanopleura* but before *D. paulus* and may be either a synonym of *D. melanopleura* (Frische, 1980) or taxonomically valid (Stiller et al., 2022). Until this complex taxonomic situation in the TEP is formally resolved by further study, we refer to the entire TEP population as *D. melanopleura*.

Epinephelus clippertonensis. *Epinephelus clippertonensis* was listed as a Revillagigedos endemic by Del Moral-Flores et al. (2016) but not Fourriére et al. (2016). However, while it is common in the RNP it also has a resident population at Clipperton Island, its type locality, and likely one at southern Baja as well. Hence it is not endemic to the RNP.

Gobiesox aethus. See species account in unaccepted-species section.

Halichoeres adustus. This species was described by Gilbert (1890) based on 3 specimens collected at Socorro in 1889. It was listed as an RNP endemic by Del Moral-Flores et al. (2016) but not Fourriére et al. (2016). However, since it is also known from the mainland between the mouth of the Gulf of California and Colombia, as well as Isla del Coco and the Galápagos (Bussing, 1987; Victor, Grove et al., 2024), there is no evidence that the RNP population is endemic. Interestingly, this species appears to be relatively rare in the RNP, with a single individual photographed during the 2022 expedition, with only 2 images in iNaturalist from 2025, and 1 taken by AAB in 2025. There also are very few museum specimens. Hence, we consider its residency status in the RNP to be uncertain.

Kyphosus lutescens. See species account in unaccepted-species section.

Myrichthys pantostigmius. Although Del Moral-Flores et al. (2016), but not Fourriére et al. (2016), included this among the RNP endemics, it is also common enough at Clipperton to be listed as a resident there by Allen and Robertson (1997). Hence, it is not a Revillagigedos endemic. *Myrichthys pantostigmius* is the only member of the genus with a confirmed presence in the RNP, while reports of *Myrichthys xystrurus* (as *Myrichthys tigrinus*) are misidentifications of that species.

Stegastes leucorus. Neither Del Moral-Flores et al. (2016) nor Fourriére et al. (2016) list this species, which is the most common member of its genus throughout the RNP, as an endemic. Other members of its clade are endemics at other TEP offshore islands: *Stegastes baldwini* at Clipperton and *Stegastes beebei* at the Galápagos, Cocos and Malpelo. The latter also has scattered isolated mainland records between Costa Rica and Peru. *Stegastes leucorus* has the largest and most widespread set of mainland records of any potential Revillagigedo endemic, with about 60 primary source records in GBIF, scattered from southern Mexico to southern California. Author CS-O has observed multiple small aggregations of 4-5 adults and also juveniles in the Cabo San Lucas area, which indicates that there likely is a small self-sustaining population on the mainland. Hence, we do not regard it as endemic to the RNP.

Thalassoma virens. This is another species that was also listed as a Revillagigedos endemic by Del Moral-Flores et al. (2016) but not Fourriére et al. (2016). However, Allen and Robertson (1997) recorded it as a resident at Clipperton, and it also occurs around the tip of the Baja Peninsula (Victor et al., 2001). Hence it is not endemic to the RNP.

Deep-reef species. Species of reef-associated fishes in the Greater Caribbean that are mostly or entirely restricted to mesophotic, and greater depths represent about 15% of the regional reef-associated fauna there, and include regional endemics (Robertson et al., 2022). There is information on such species for Cocos and Galápagos, which have had the most intensive taxonomic research

involving deep-reef fishes of any sites in the TEP. Table 5 provides a list about 16 such species in the RNP, none of which are endemic to the archipelago.

Discussion

Accepted species

The assessments made of 364 potential members of the RNP reef-associated fish fauna indicate that only 234 (64.3%) are validated members, a number that is lower by ~ 12% than the number of the same set of taxa accepted by the "two 2016 inventories". Among that set of 234 species, 187 are known from Clarion, 126 from Roca Partida, 160 from San Benedicto and 201 from Socorro. These numbers contrast to the number of reef-associated species (178, 155 of which are in our accepted group) listed by Castro-Aguirre and Balart (2002) and numbers of (all types of) species they listed at the 3 main islands: 80 for Clarion, 15 for San Benedicto and 111 for Socorro. All of the reef-associated fishes included in that 2002 checklist are also included in the 2016 inventories and among the species assessed here. The numbers arrived at here also represent substantial increases in the number of species listed by the 2016 inventories: 3.3% more than all (reef-associated and non-reef) species listed for Clarion by Del Moral-Flores et al. (2016) (Fourriére et al. [2016] did not provide individual island data), 98% more at Roca Partida and 26% more at San Benedicto. Although the number in Socorro is 6.5% less than the total number in Del Moral-Flores et al. (2016) that is due to a combination of the abundance there of non-reef species and our rejection of various species they listed as part of the fauna (2016) (see below). That list accepted only 155 of the 201 reef-associated fishes (i.e., 22.9% fewer) we include with validated records from Socorro.

Among the 19 accepted species not mentioned in both 2016 inventories, only 3 (*P. multifasciatus*, *Diplobatis ommata*, and the probable endemic *Chriolepis* sp.) had been collected prior to the publication of those inventories, while all the others are more recent additions. Those 19 include 7 species added by the 2022 expedition that were not in either 2016 inventory and represent new additions to the fauna: *C. alepidota*, *Gymnothorax verillii*, *Lutjanus aratus*, *O. clippertonensis*, and *T. purpureum*, plus 1 new endemic (*H. sanchezi*) and 1 probable endemic (*L.* cf. *dalli*. at Clarion). Three of those represent new residents: *O. clippertonensis* and the 2 endemics.

Analyses of the functional structure of reef-fish faunas based on simple faunal inventories typically include all members of the fauna (e.g., Bender et al., 2017; Dubuc et al., 2023; Ferrari et al., 2023; Palacios-Salgado et al., 2019). We suggest that at this "occurrence" level the most appropriate set of species for functional-structure analyses is the residents, although local inventories often do not provide information on residency. Residents represent the ecologically important sector of the fauna and non-residents are too rare as individuals to have an ecological impact on the residents or other elements of the local ecosystem. The residents among the accepted set for the RNP differ from those in the 2 2016 checklists. Three species in 3 genera have been removed (*G. aethus*, *K. lutescens*, and *Prionurus punctatus*) and 10 species in 10 genera added: *O. clippertonensis*, *P. multifasciatus*, *D. ommata*, *Quassiremus evionthas*, *S. afuerae*, and *C. janthinoptera*, plus 4 new actual or probable endemics *Tomicodon* sp., *Chriolepis* sp., *L.* cf. *dalli*, and *H. sanchezi*. However, the effects of that change in this small percentage (< 5%) of residents on the functional structure of the fish assemblage would be much smaller than the effects of the removal of ~ 20% non-residents from the assemblage. The results of functional analyses would also have differed without the removal of the unaccepted third of the species from a wide diversity of genera and families that we assessed (see below) or the rejection of 20.4-22.1% of the species accepted by the 2 2016 checklists (see below).

Photographic database

Species with photographs represent 59-75% of those known from each island and images from various sources presented here document 77.4% of the 234 accepted species. This represents a solid start to more complete documentation of the fauna using taxonomically diagnostic images, which unequivocally demonstrate occurrence, and, in some cases, provide information about population status. Those numbers also demonstrate the value that citizen scientist contributions can make to research on faunal inventories, some as coauthors of this paper and others as depositors of taxonomically useful images in iNaturalist.

Unaccepted species

Our assessments of the 364 reef-associated fishes that potentially are members of the RNP fauna indicate that there are erroneous records of 121 (33.2%) of the assessed species, 19% of the assessed genera and 18% of the assessed families (Table 2). Those errors are due to a variety of reasons, with most arising from misidentification or inability to identify (38.0%), a lack of vouchers (30.6%) or incorrect location data (37.2%). Loss of museum specimens in 18.0% of those species means that their occurrence is unresolvable using existing information. Multiple types of problems were present in 33.1% of those species. Of those 121 species, 27 were

Table 5
Deep-living reef-associated bony fishes from the Revillagigedo National Park recorded by various sources

Family	Species	Habitat	Resident	Fourriére et al. (2016)	Del Moral-Flores et al. (2016)	Aburto-Oropeza et al. (2017)	Giddens et al. (2019)	Hollarsmith et al. (2020)	This study
Chaetodontidae	*Prognathodes falcifer*	Open reef	Yes	Yes	Yes			Live image	Live image
Congridae	*Paraconger similis*	Soft bottom	uncertain	Yes	Yes				Confirmed
Cyclopsettidae	*Citharichthys* sp.	Soft bottom	uncertain	New data	New data				Live image
Epinephelidae	*Hyporthodus cifuentesi*	Open reef	Yes	Yes	Yes	Yes	Yes	Live image	Live image
Holocentridae	*Pristigenys serrula*	Open reef	Yes	Yes	Yes			Live image	Live image
Latilidae	*Caulolatilus affinis*	Reef & sand	uncertain	Yes	Yes				Confirmed
Latilidae	*Caulolatilus princeps*	Reef & sand	uncertain	Yes	Yes		Yes		Accepted
Lutjanidae	*Lutjanus peru*	Open reef	Yes	Yes	Yes	Yes	Yes		Live image
Ophidiidae	*Brotula ordwayi*	Reef	Yes	Yes	Yes				Live image
Pomacentridae	*Chromis alta*	Open reef	Yes	Yes	Yes			Live image	Live image
Priacanthidae	*Cookeolus japonicus*	Open reef	Yes	Yes	Yes				Confirmed
Priacanthidae	*Priacanthus alalaua*	Open reef	Yes	Yes	Yes				Confirmed
Serranidae	*Serranus aequidens*	Soft bottom	uncertain	Yes	Not listed				Confirmed
Scorpaenidae	*Pontinus vaughani*	Open reef	Yes	Yes	Yes				Live image
Scorpaenidae	*Scorpaena afuerae*	Reef & sand	Yes	New data	New data				Live image
Triglidae	*Bellator loxias*	Soft bottom	No	Yes	Yes				Accepted

Publication columns: yes = listed in each publication; new data = occurrence documented after 2016; live image = video image. This study: live image included here; confirmed = occurrence confirmed by examination of specimens, confirmed by eDNA; accepted = reliable published taxonomic account.

included in the 2002 checklist, 32 were not mentioned in either of the "two 2016 inventories", 52 had been accepted by both and another 13 accepted in one 2016 inventory but not by the other. Eight species were accepted on one 2016 inventory but rejected on the other and only 3 species had been rejected on both those inventories. Re-examination of museum specimens of 72 species showed that 38% of those species had been misidentified or, in a few cases, were unidentifiable, in some species involving multiple individuals from multiple museums. Those misidentified and unidentifiable cases involved older records of specimens collected in the 19th to mid-20th century, highlighting the necessity to physically review specimens in older collections. Reviewing metadata of old collections is also important, as experience with the 1889 Albatross collections has shown. The level of rejection of potential members of the RNP fauna is distinctly higher than in other studies of fish faunas that culled erroneous and unsupported records (Borg et al., 2023; Mundy, 2005; Mundy et al., 2010; Victor, Grove et. al., 2024). This reflects the relative importance of the previously unassessed inventory of old records that have been found to be erroneous in the present case. However, among those 121 excluded species are a number whose proximity to the RNP on mainland Mexico could allow them to recruit to the RNP and be included as validated members of the fauna in the future.

Endemic species and the endemism rate

The "two 2016 inventories" and the present study differ in terms of how many species they regard as endemics or probable endemics and which species those are, due to a combination of factors. Those include new information about the genetics and morphology of species

long known from the RNP (*A. perezponcedeleoni*, *H. nicholsi*, *B. ramosus*, *Pareques* sp.), the recent discovery of new additions to the RNP fauna (*H. sanchezi*, *L.* cf *dalli*, *Tomicodon* sp.), synonymization (*G. aethus* and *K. lutescens*), rediscovery of an unnoticed, probably endemic species (*Chriolepis* species) and the presence (*E. clippertonensis*, *H. adustus*, *M. pantostigmius*, and *T. virens*) or absence *(L. insularis*, *H. clarionensis*, *S. redemptus*) of resident populations of species outside as well as inside the RNP. The 3 main islands have similarly high numbers of endemics and probable endemics. Most actual and probable endemics are present at more than 1 of the main islands and are present at Clarion as well as the eastern islands (Table 4). All but 2 species are present at multiple islands, with 2 likely restricted to Clarion and another 2 restricted to multiple eastern islands, a reflection of the fact that Clarion is as isolated from the main eastern islands as they are from Baja California.

Fourriére et al. (2016) estimated the reef-fish endemism rate to be 5.5% of 235 species or 4.8% of the expanded reef-fish inventory of 271 from that paper that includes various other taxa and ecotypes that we included as reef-associated, as did Fourriére et al. (2017) for Cocos. Del Moral-Flores et al. (2016) in turn estimated 7.1% of the 366 species of all types that they regarded as validated, equivalent to 9.8% of the 268 species of those that are reef-associated. However, they overestimated the number of endemics (see above) and taking that into account reduces their endemism rates to 4.9% and 6.7% respectively. Other estimates of RNP endemism rates include 9-10% of a fauna of ~ 100 species by Briggs (1974) and 8% of 212 species by Robertson and Cramer (2009), and Briggs and Bowen (2013). The 16 named endemics plus 7 probable endemics identified here produce an estimate of 9.8% of the entire 234- member reef-associated assemblage accepted here. However, endemics have evolved in response to local, long-term conditions in the RNP, including the persistent presence in abundance of other residents. Since at any time non-residents are present in very small numbers and, that presence often is transient, that group of species is ecologically irrelevant to the community-level evolutionary processes involved in the development of endemics. Hence, we suggest that the most relevant part of the assemblage for determining the endemism rate is the resident species. Our data indicate that the endemism rate of known endemics is 8.5-9.6% of the residents, and 12.2-13.9% of the residents if probable endemics are included.

Two other TEP offshore islands have comparably comprehensive data about endemism rates: Cocos Island and the Galápagos. For Cocos, 13 species of endemics represent 3.7% of the entire reef-associated fauna of 355 species (Fourriére et al., 2017; who do not present information on the residency of species in their inventory). For the Galápagos, 43 endemics represent 10.2% of the entire reef-associated fauna of 432 species and 12.2% of the members of that fauna that are residents (Victor, Grove et al., 2024). However, while the rate of endemism in the RNP is similar to that of the current estimate for the Galápagos, we think the RNP rate will rise further as more research is done on the integrative taxonomy of members of the RNP fauna and may also do so for Cocos and Galápagos with more such research there as well.

Deep-reef fishes in the RNP

Such fishes are members of typical reef-fish families that have depth ranges restricted largely or entirely to mesophotic and greater depths that are below normal scuba limits (Baldwin et al., 2018; Pinheiro et al., 2019). In the Greater Caribbean intensive sampling with crewed submersibles has shown that deep-reef fishes constitute substantial proportions of both regional and (well-studied) local faunas (Robertson et al., 2022). A total of 16 such species are currently known from the RNP. They include 14 species listed by the "two 2016 inventories" plus 2 recently found through examination of images collected by a submersible (by ABB) and BRUVS (by CAS-O) in 2016. The 15 of those that are named represent 6.3% of the accepted species, 10 are residents and none are endemics. In contrast, at Cocos Island, 46 (13.0%) of the 355 reef-associated fishes (Fourriére et al., 2017) and the Galápagos, 59 (13.7%) of 432 reef-associated fishes are deep-living species (Victor, Grove et al., 2024). In both cases they include endemics (3 at Cocos and 6 at the Galápagos) as well as other residents. Those 2 sites have a much longer history of more intensive taxonomic research on their deep faunas than does the RNP. To date there has been no research specifically aimed at thoroughly documenting the deep-reef fish fauna of the RNP, particularly any small, cryptic species like those that feature in the deep-reef faunas of Cocos and the Galápagos. Hence, it is quite probable that more research will yield not only more deep-reef additions to the RNP fauna, but also more (deep) endemics.

How many valid reef-associated fishes are known from the RNP?

Fourriére et al. (2016) accepted as validated 235 species of reef fishes, plus another 36 species they did not class as reef fishes but which we include in that group. Fourriére et al. (2017) also included as reef fishes in their inventory of Cocos Island reef fishes only part of the set of species we class here as reef-associated. Fourriére et al. (2016) discounted only 13 species as doubtful or unconfirmed. Our assessment agrees with their 13 discounts but does

not accept 5 of the species they did accept. Thus, among the 271 species Fourriére et al. (2016) included in their checklist (of both reef and non-reef fishes) we accept as validated only 213, 78.6% of those they accepted and 91.0% of those we accept as validated. Del Moral-Flores et al. (2016) in turn accepted only 210 (89.7%) of the 234 species of reef fishes we included as validated, accepted another 58 species we rejected, and discounted a further 17 species we also did not accept. Thus, the net number of species among the 268 included that are also included in our set of accepted species is 78.9% of those they accepted. Neither of those "two 2016 inventories" mentioned another 37 species that we assessed but did not accept or 19 other species that we did accept and only one of those 2 inventories accepted another 6 species that we also accepted.

Our assessment indicates that there are validated records for 234 reef-associated fishes and that we do not accept records of another 121 species for various reasons. This set of validated species is 16-17% smaller than the sets of species included in the "two 2016 inventories", but ~ 11% larger than numbers of such species in those inventories that we regard as validated.

Most previous sampling in the RNP has been directed at rocky reefs in shallow (scuba depth or intertidal) water. However, that sampling failed to find a substantial number of species that use that habitat and were collected and photographed subsequently to the publication of the 2016 inventories. There are 16 species of deep-living reef fishes currently known from the RNP (Table 5). These, which include both hard-reef species and those living in sand habitat, constitute 6.8% of the reef-associated fishes in the RNP fauna as currently known. The relative abundance of such deep-reef fishes is distinctly higher at other TEP offshore islands with much better sampled deep habitats, 13% of those at Cocos (Fourriére et al., 2017) and 14.7% at Galápagos (Victor, Grove et al., 2024). In addition, while the former both have deep-living endemics, none are currently known from the RNP.

Insufficient collecting attention has been directed at RNP habitats other than rocky reefs, including sand and rubble bottoms in both shallow (scuba-depth) areas as well as deep-reef hard-bottom and sand-rubble habitats. Rhodolith beds are a pantropical habitat often found associated with reefs and are known to support diverse faunas of reef-associated fishes (Anderson et al., 2023). In the TEP t rhodolith beds occur from Mexico to Panama on the mainland, as well as Cocos, the Galápagos and the RNP (Diaz-Licona et al., 2025). Using a small ROV, Hollarsmith et al. (2020) found extensive rhodolith beds at Clarion at 40-80 m, in which they recorded 25 species of reef fishes, with habitat variation produced by differing fleshy algal assemblages associated with those beds at different parts of the island. A recent study of shallow (2-25m depth) rhodolith beds at Cocos Island (Diaz-Licona et al., 2025) listed 37 species of reef fishes living in them. Sampling effort, particularly towards small cryptobenthic species, should be directed at that habitat at all the RNP islands. To date, most research has been focused on the 3 eastern islands of the RNP, due to their greater accessibility. Additional field and laboratory research on integrative taxonomy needs to be made to compare and contrast the faunas of the eastern islands (Roca Partida, San Benedicto and Socorro) with that of Clarion. Given the existence of endemics restricted to either Clarion or the eastern islands, further work on documenting the Clarion fauna likely would yield additional species and local endemics. Due to these sampling biases, we think that there are more, quite possibly substantially more, unknown reef-associated fishes in the RNP that more extensive sampling of such habitats would reveal, including the discovery of deep-living endemics.

Concluding remarks

There are 2 aspects to the construction of this new inventory of RNP reef-associated fishes: reassessment of existing information and the addition of new information. The assessment of the potential inventory of RNP reef-associated fishes described here produced marked changes in the validated inventory, with non-acceptance of 1/3 of the potential members of the fauna that were indicated by old information. This demonstrates that detailed examination of the variety of primary sources of data is essential for producing reliable inventories and culling erroneous and unsupported records. Grey literature reports and ichthyological publications that do not provide details of, or assess the validity of, voucher information and simply recycle previously published information only tend to produce inflated, unreliable inventories. Our analysis has shown how common unsupported records can become in inventories. Older museum records, particularly those from research programs that collected at multiple locations scattered over a region on multiple occasions, can have significant error rates due to a lack of rigorous record keeping, loss of original associated metadata and fragmentation and transfers of parts of old collections among different collections at different times. Misidentifications of specimens in old collections reflect the lack of the range of reliable information that is now available: comprehensive taxonomic studies that are identifiable through Fricke et al. (2026); comprehensive online databases from museums that provide details about their specimens and their provenance; and museum curators who have the time to check identification of

specimens and their provenance metadata; and diving imagery produced by citizen scientists, such as those from RNP activity by iNaturalist contributors and by members of the 2022 expedition. Participation of citizen-scientist photographers in expeditions and as coauthors of arising publications to which they make significant contributions will provide recognition of the value of their efforts (Mason et al., 2025).

Expanding the base of such information through recent field and laboratory research and analyses has also made significant contributions to understanding what species are in the RNP and what their status is with respect to residency and insular endemism. Citizen scientists who contribute images, for example to iNaturalist, have made and will continue to make invaluable contributions to that effort. New genetic evaluations of individuals and populations of reef-associated fishes in the RNP that we reported and the first results of eDNA studies have demonstrated their utility for additions to the inventory through species identification and assessment of the level and geographic pattern of endemism within the RNP as well as between the RNP and the mainland and elsewhere in the TEP. The isolation of Clarion from the eastern islands of the RNP, which has resulted in it being under-sampled during this century, has produced some microendemics, as demonstrated by the few genetic data mentioned above. The number of members of the fauna, including endemics, newly recorded by a single, short expedition in 2022 clearly demonstrates that there is much still to learn.

Fourriere et al. (2016) statistically estimated the size of the RNP reef-fish fauna, and concluded that it was well documented, with only ~ 9 species likely present in addition to the 235 they listed. However, assessments of those 235 species led to us including only 177 of them in the group of accepted species presented here, to which we added 21 species not mentioned in their study, 7 of them newly discovered during the 2022 expedition, plus 36 species that Fourriere et al. (2016) listed as non-reef types. Further research likely will show that some of the 121 species that we did not accept due to data inadequacies and some of the 9 species requiring confirmation are valid members of the fauna. In addition, there are reasons to believe that other species of reef-associated fishes await discovery in the RNP. There are sampling deficits of particular habitats (e.g., rhodolith beds and other deep-reef habitats, which could be sampled by technical divers); comprehensive review of various ROV, BRUV and submersible videos of shallow and deep reef fishes is lacking; there have been highly uneven sampling efforts directed at different ecotypes of fishes at different times during the past 125 years (e.g., no use of ichthyocides to collect hidden cryptobenthic species in subtidal areas for many decades); and there has been much less comprehensive sampling at Clarion than at the eastern islands. Many species currently accepted as part of the RNP fauna evidently are vagrants. Ocean currents that impinge on the archipelago carry fish recruits there from Baja California, the Mexican mainland and southern parts of the TEP, as well as the central Pacific. The influx of currently undocumented vagrants can be expected to continue indefinitely, gradually increasing the number of species confirmed at the RNP. While the present size of the RNP fauna undoubtedly is larger than the 234 species documented here, the question of how much larger would best be addressed through research aimed at an array of sampling gaps and at genetic relations among populations of broad range of species found at both Clarion and the eastern islands of the RNP.

Acknowledgements

Thanks to Dora María Sierra Palma (owner of the Liveaboard, Quino El Guardián, which supported the 2022 expedition), Susan Long of Mexicanliveaboards.com and the crew of the Quino El Guardián during that expedition. H. J. Walker, P. A. Hastings, and J. M. Kim provided help with specimen identification and analyses of museum records at SIO; D. Catania assisted regarding the existence of specimens at CAS, N. Bailly identified some UBC specimens and facilitated loans of others to the LACM for review. C. Lowe helped with the identification of shark specimens at Long Beach Museum, D. Long with identifications of elasmobranchs and A. Driskell (USNM) for help with DNA data. Arturo Ayala-Bocos would like to thank the Undersea Hunter Deep Sea submersible and its pilot, Diana Benito, for sharing some videos used here. Angélica Tamayo provided the image of *P. teira* she took at Socorro in 2025, and Jordan Hollarsmith shared images from her RNP ROV study. Various people helped obtain the permission to collect during the 2022 expedition: Alberto Tirado Arámburo, Universidad Autónoma de Baja California Sur (UABCS); Gustavo Cruz Chávez, UABCS; Everardo Mariano Meléndez (Conanp); Josué Melesio Tiscareño Villorin (Conanp); Luz Eréndida Frías Hernández (Conanp) and Georgina Guadalupe Villavicencio Rousseau (Conanp). The Mexican Navy provided generous logistical support for collecting activities of the research group of ODD at Socorro and Clarion islands between 2015-2023, ODD extends a special thanks to all the people from Universidad Michoacana de San Nicolás de Hidalgo who helped with fieldwork between 2015-2023. Samples were collected under the permits SGPA/DGVS/02920/15 of 18

March 2015 and its extension SGPA/DGVS/12333/15 of 28 October 2015 granted to JEMG and PPF/DGOPA-035/15, PPF/DGOPA-065/21, PPF/DGOPA-085/22, and SGPA/DGVS/005723/18 to ODD. Collections and photography during the 2022 expedition were done under permit PPF/DGOPA-099/22 to Carlos Armando Sánchez Ortiz. We thank a reviewer for useful comments on the ms.

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