

STATUS AND OCCURRENCE OF WEDGE-TAILED SHEARWATER *AR DENNA PACIFICA* IN WATERS OF THE NORTHWESTERN COAST OF SOUTH AMERICA

MANUEL MARÍN^{1,2}

¹Natural History Museum of Los Angeles County, Section of Ornithology, 900 Exposition Boulevard, Los Angeles, California, 90007, USA

²Current address: Casilla 15 Melipilla, Chile (mma95@hotmail.com)

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ABSTRACT

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This study examines the distribution of Wedge-tailed Shearwater *Ardenna pacifica* along the northwest coast of South America. The species is well known in tropical waters distant from the coast, but it also appears to be a regular visitor to shelf-break waters off Colombia and northern Ecuador; there is no evidence indicating a similar presence within the exclusive economic zone (EEZ) of Peru, where waters are colder. About 50% of Wedge-tailed Shearwater sightings are associated with dolphins and/or large fish. More than 90% of the nearshore South American records are of pale-phase individuals.

Key words: *Ardenna pacifica*, distribution, eastern Pacific, Exclusive Economic Zone, South American coast, Wedge-tailed Shearwater

INTRODUCTION

The Wedge-tailed Shearwater *Ardenna pacifica* is widespread in the tropical and sub-tropical Pacific and Indian oceans (Murphy 1951, King 1974, Harrison *et al.* 2021). Two well-defined color phases, dark and pale, exist for this species, although intermediate color phases also occur. Dark-phase individuals breed primarily in the south, while light-phase individuals nest north of the Equator (Murphy 1951). Regardless of color phase, the long, thin bill of the Wedge-tailed Shearwater is perceptibly bicolor, contrasting an otherwise grayish bill with the black unguis. However, both Brooke (2004) and Howell (2012) remark that some individuals, particularly in the Indian Ocean, can have a pinkish to horn-colored culmen.

Information on the distribution of the Wedge-tailed Shearwater in the eastern Pacific Ocean comes principally from cruises that were far from the continental South American coast, e.g., King (1974), Pitman (1986). Accordingly, recent summarizing books place the distribution of Wedge-tailed Shearwater far and away from the Colombian, Ecuadorian, and Peruvian exclusive economic zones (EEZ; 200 nautical miles [370 km] away), e.g., Onley & Scofield (2007), Harrison *et al.* (2021). Brooke (2004) and Howell (2012) indicate the occurrence of Wedge-tailed Shearwater closer to the northwestern South American coast, but not within the EEZ of respective South American countries. An exception might be findings from research cruises in the Panama Bight, 1984–1991, some of which were within the EEZ of Colombia and Ecuador, but the exact locations of sightings are lacking (Spear & Ainley 1999). Recent checklists for Colombia (Echeverry-Galvis *et al.* 2022) and Ecuador (Freile *et al.* 2022) consider the Wedge-tailed Shearwater to be a vagrant in those coastal waters. On the South American checklist, Rensen *et al.* (2023) include the Wedge-tailed Shearwater, but this inclusion is based on a single photo for Ecuador by Hasse (2019). Schulenberg *et al.* (2007) classified the species as rare in waters off northern Peru based on a

few sight records. Thus, the species' status and distribution in coastal waters of northwestern South America is still not settled. Here, I review the distribution of the Wedge-tailed Shearwater in the coastal waters of northwestern South America and attempt to clarify its status within the EEZ boundary of respective countries.

METHODS

Observations are reported from seven voyages along the Pacific coast of South America. Four trips were made between Panama Canal, Panama and Valparaíso, Chile on board M/S *Fram*: one trip south to north, 10–23 March 2018, and three trips north to south 06–19 November 2018, 01–17 October 2022, and 28 September–13 October 2023. Three sea voyages also were made between Callao, Peru and Valparaíso, Chile on board M/S *Fram*, 01–08 Nov 2007, 19–25 March 2019, and 25–31 October 2019. Adding to the records obtained on these voyages, I performed extensive literature, museum specimen, and internet database searches (e.g., eBird and iNaturalist). I mention the more relevant papers only, as there are many where information from previous authors is repeated, adding little or no new data. Information such as position, water temperature, and distance from the shoreline was also gathered from vessel instruments, electronic charts, and paper sea charts of the British Admiralty (BA 4008, National Geospatial Imagery IGM 503).

RESULTS AND DISCUSSION

The presence of Wedge-tailed Shearwater in South American waters was first mentioned by Leveque (1964, details below); the first photograph of the species in these waters was provided by Hasse (2019). Subsequently, additional sight records have been reported, mainly on eBird. The following is a discussion of these sight records, from north to south, with additional discussion of some new personal encounters.

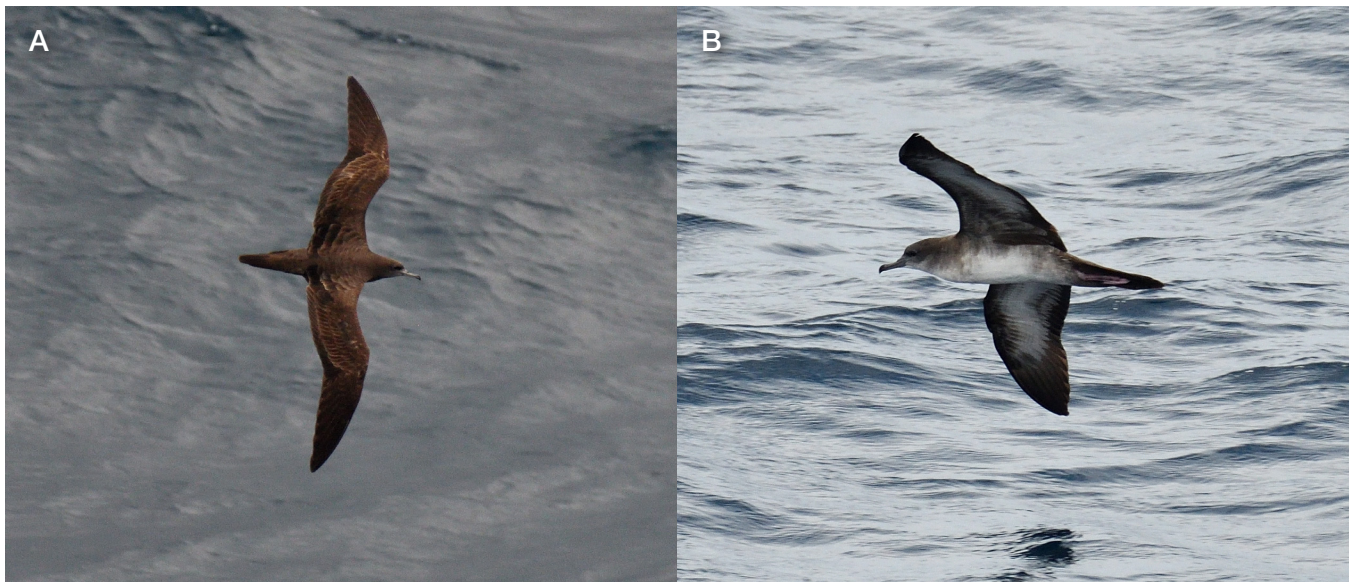


Fig. 1. (A) Dark-phase (note the bicolour culmen) and (B) pale-phase Wedge-tailed Shearwaters *Ardenna pacifica* off Bahia Solano, Chocó, Colombia. (Photos: M. Marín)

Colombia

Wetmore (1965) indicated that Wedge-tailed Shearwater is a casual visitor to the coast of Panama based on two specimens taken by R.C. Murphy and J.G. Correia in waters of southern Darién province. The specimens, one dark and one pale phase (American Museum of Natural History [AMNH] #407736-37), were taken on 05 March 1941 about 5.5 km northwest of Ensenada Guayabo at 07°23'N–78°02'W, about 30 km northwest of the Colombian border. The specimens' tags and catalog entry were labelled as being from Colombia, rather than Panama. This produced confusion and led some authors to refer to them as Colombian records, e.g., Estela *et al.* (2010). Hilty & Brown (1986) mentioned the Panamanian records and correctly indicated that the species should be looked for in pelagic waters off Colombia. Incidentally, Donegan *et al.* (2020), reporting on a sighting of Great Frigatebird *Fregata minor* on 22 March 2018 at 04°49'N–83°43'W, a location that is ~240 km west-northwest of Malpelo Island, included a photo of a Wedge-tailed Shearwater next to a frigatebird. Although incidental, this is likely the first evidence of the Wedge-tailed Shearwater for Colombian waters. On eBird (2023) there are four reports that include photos of Wedge-tailed Shearwater along the northwestern South American coast, taken on 08 January 2020, 28 March 2023, 21 April 2021, and 10 December 2022. All records on eBird are of pale-phase birds, except one intermediate and at least two dark-phase birds from the 08 January 2020 report. Two records reported large rafts associated with dolphins; in the photos, some flocks were composed of at least 40 birds. In addition, in one of the reports, photos indicated association with dolphins or large fish, such as tuna.

On a March 2018 cruise, Wedge-tailed Shearwater were not observed, but following a similar route on 08 November 2018, I encountered this species on three occasions, all solitary, pale-phase birds. In the early morning, I observed two individuals ≤ 500 m from each other at 04°37'N–79°55'W; the sea surface temperature (SST) was 27.7 °C. Later that day, a single bird was sighted at 03°23'N–80°06'W, where SST was 27.4 °C. This second

sighting was 176 km east-southeast of Malpelo Island and 200 km west of mainland Colombia.

On two occasions, in October 2022 and September/October 2023, a similar course was taken between Bahia Solano, Chocó, Colombia to Manta, Manabí, Ecuador. The route varied 37–166 km from the coastline and passed along the border of the continental shelf-break, passing through the eastern border of the Yaquina Trench. Farther south, we crossed several upwelling zones along several banks (e.g., Tumaco Bank). Sea surface temperature fluctuated between 25.0 °C and 27.1 °C, with such variation indicating the upwellings. On the Colombian–Ecuadorian route in 2022, I logged 9 h of observations, during which I observed 47 Wedge-tailed Shearwaters, including one dark-phase individual. In 2023, during 8 h of observations, I encountered 45 birds, including two dark-phase individuals (see Table 1 for main positions).

Ecuador

Wedge-tailed Shearwater presence in Ecuadorian waters was first mentioned by Leveque (1964) who observed 152 birds in eight flocks, ranging 2–50 birds, off the Gulf of Guayaquil on 14 March 1962. Leveque's birds were either intermediate or pale phase. Subsequently, Leveque *et al.* (1966) reported sight records of four birds by PPO Harrison, around Galápagos Islands. However, upon checking the given positions, these sightings were not within the Ecuadorian EEZ (noted also by Wiedenfeld 2006). The first record of three birds on 03 September 1952 was at 01°40'N–86°00'W, which is ~389–407 km east-northeast of San Cristobal Island, Galápagos; the second given position of one bird was at 03°24'N–84°12'W on 23 November 1956. The latter position is ~351 km west of Malpelo Island, Colombia. Coincidentally, this record is not that far from some of the sight records for Colombia mentioned above. Leveque *et al.* (1966) also mention a communication by Eisenmann indicating that Wedge-tailed Shearwater occurs regularly off the northwest coast of South America, but they do not provide further details. In addition, they mention a specimen collected by R. Beck northwest of Galápagos on 07 August 1902 (AMNH #527564). R. Beck in 1902 did a collecting

TABLE 1
Records of Wedge-tailed Shearwater *Ardenna pacifica* for 2022 and 2023, north to south along the Colombian–Ecuadorian Coast

Position	Distance (km) to closest South American shoreline	Water temperature (°C)	Date	No. of birds
05°54'N–77°38'W	37	26.0	02 Oct 2022	5
03°34'N–78°34'W	101	27.0	30 Sep 2023	1
03°15'N–78°58'W	166	25.2	03 Oct 2022	≥ 7
02°58'N–78°50'W	68	27.1	30 Sep 2023	15
02°47'N–79°04'W	64	27.0	30 Sep 2023	17
02°26'N–79°27'W	87	25.0	03 Oct 2022	14–15
02°15'N–79°25'W	64	27.0	30 Sep 2023	5
01°52'N–79°45'W	98	25.0	03 Oct 2022	16–18
01°31'N–79°56'W	122	25.4	03 Oct 2022	1
01°14'N–80°06'W	37	25.4	03 Oct 2022	1

trip to Galápagos Islands, departing from Acapulco, Mexico, visiting Cocos Island, and returning directly to California from Galápagos. However, the collecting route and the actual specimen labels indicate that: (a) the collecting date was mislabeled and should have been 08 July 1902 [a mis-transcription of 7/8/1902] and (b) the collecting position was 11°N–105°W, about 866 km southwest of Acapulco and 459 km east-northeast of Clipperton Island (which is northwest of the Galápagos Islands), far from Ecuadorian EEZ.

Harris (1973) found a partially eaten Wedge-tailed Shearwater specimen in Galápagos on 19 September 1966 and deposited it at the Charles Darwin Research Station (CDRS), but it was subsequently lost (Wiedenfeld 2006). He also indicated that the species is not uncommon in waters between Galápagos and Panama. In this regard, using large observation data sets and collection of some specimens for the Pacific Ocean Biological Survey Program, King (1974) reported the presence of Wedge-tailed Shearwater on or near Malpelo Island in the Colombian EEZ during August and September and west of Galápagos during September, February, and March in the Ecuadorian EEZ. Pitman (1986), on his extensive eastern tropical Pacific surveys, indicated the presence of the species near Malpelo Island and on waters west of Galápagos. Up until the 1990s, all of the available information on the Wedge-tailed Shearwater in Ecuador seems to be based mainly on sight records, except for the missing specimen mentioned above. Curiously, Ridgely & Greenfield (2006) do not mention the species despite their extensive coverage of the Ecuadorian avifauna.

Hasse (2019) published a photograph of a Wedge-tailed Shearwater taken on 23 October 2008, 46 km west off Salinas at 02°30'S, 81°10'W, providing the first evidence of the species for mainland Ecuador. Other observations in the Gulf of Guayaquil area, near the shelf-break, were in September 2013 and December 2014. More recently, on 04 June 2023, D. Brinkhuizen reported Wedge-tailed Shearwaters in the waters of the Galápagos Archipelago (eBird, 2023). Based on these photos, all individuals were pale phase and were present in small numbers. I only observed a single individual of this species in Ecuador near the Colombian border at 01°14'N–80°06'W, within 55 km of the coastline. Hasse (2019) indicated that there are several sight records of Wedge-tailed Shearwater in Ecuador from Chocolata Point, Salinas [Punta Santa Elena], usually solitary or in pairs, for all months of the year, except February, March, and April. However,

in these months the species has been observed in Colombian waters farther north (see above).

Peru

Pitman (1986) reported the Wedge-tailed Shearwater as far south as ~09°S–10°S, but the sighting occurred at least 426 km from the Peruvian coast. There appears to be no museum specimens originating from Peru, which is also mentioned by Schulenberg *et al.* (2007), nor are there any eBird records or other internet database records of sightings within the EEZ of Peru. The only mention of Wedge-tailed Shearwaters are sight records (from an unknown source) in waters west of Piura (Schulenberg *et al.* 2007).

General comments

Most reports of Wedge-tailed Shearwaters are in waters west of the continental shelf of South America. Many reports are of birds more than 370 km off the South American coast, some in Colombian waters, particularly near Malpelo Island or along the Malpelo Ridge (e.g., King 1974, Pitman 1986). King (1974) mention that Wedge-tailed Shearwaters are more solitary when traveling and gregarious when feeding, a statement that seems fitting for the observations in the area. A large number of sightings consist of solitary individuals. However, large numbers and many flocks of 40 or more birds have been observed closer to shore (see above discussion and Table 1). As most birds observed over the Malpelo Ridge were solitary or in pairs, they were most likely moving towards or from the edges of the Yaquina Trench and Banco Tumaco in Colombia. The great majority of reported Wedge-tailed Shearwaters were pale phase with only a few exceptions, and at least one bird was of the intermediate color phase. The largest concentrations of birds were along the shelf-break/shelf-slope, within 37–166 km of the Colombian shore.

The species has been observed close to the South American continent during the period September to April, a time that coincides with the non-breeding period of the Hawaii and Revillagigedo populations *sensu* Murphy (1951). Furthermore, some October individuals were molting the innermost primaries, indicating they were more likely to be northern hemisphere birds. On the other hand, Hasse (2019) indicated that there are sight records from March through January on the Ecuadorian coast off Punta Santa Elena. About

50% of the observations along the Colombian coast were noted feeding in association with dolphins and/or large fish such as tuna. In agreement, Au & Pitman (1988) classified this species as being positively associated with dolphins, and Spear et al. (2007) noted a positive association of the species with tuna, particularly Yellowfin Tuna *Thunnus albacares*.

Most of the records discussed herein are from Colombia, and the Wedge-tailed Shearwater should be considered a regular visitor *contra* Echeverry-Galvis *et al.* (2022). For Ecuador, Wedge-tailed Shearwater is currently considered a vagrant (Freile *et al.* 2022) and should be considered a regular, uncommon visitor. The Ecuador-Colombian records are all in tropical waters ranging 25–27 °C and not in the cool waters of the Humboldt Current. Indeed, Spear & Ainley (2008) did not encounter the Wedge-tailed Shearwater in the colder waters of the Humboldt Current when surveying its avifauna from 1980–1995. Otherwise, the Wedge-tailed Shearwater is, apparently, a regular visitor in warmer waters along the shelf-break of the northern Ecuadorian and Colombian coast.

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