

A REVIEW OF RECORDS OF THE BLACK-CAPPED PETREL *PTERODROMA HASITATA* IN THE CARIBBEAN SEA

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ABSTRACT

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The Black-capped Petrel *Pterodroma hasitata* is a pelagic seabird with a dangerously small population size. Remaining breeding sites are threatened by habitat loss, introduced predators, and direct harvesting. The species likely also faces several threats at sea, but because knowledge of its distribution range and ecology is meagre at best, it is challenging to take concerted action to improve its conservation status. The species is currently known to breed only on Hispaniola (in the northern Caribbean Sea), but most at-sea observations are from the Florida Current and the Gulf Stream off the southeastern coast of the USA. Within the Caribbean Sea, observations are scarce. We compiled a database of at-sea sightings of Black-capped Petrels in the Caribbean Sea from 1953 to 2018 by thoroughly reviewing published and unpublished records (Appendix 1); here, we add to the literature 12 new records from a research cruise conducted in February 2018 across the Caribbean Sea. Our database was augmented with recently published information from three birds that were fitted with tracking devices. Based on the collected information, we argue that the existing distribution maps of Black-capped Petrels need adjustments. We show that Black-capped Petrels have been recorded throughout the central parts of the Caribbean, from the known breeding sites in the north down to coastal waters off Panama, Colombia, and Venezuela. However, the birds probably forage only in small parts of the Caribbean Sea (i.e., the coastal upwelling zones off Hispaniola and Cuba in the north and off the South American mainland in the south). The waters in between (i.e., in the central Caribbean Sea) appear to be mainly used as a corridor, while the eastern and western parts are unimportant. This indicates that certain hotspots within the Caribbean Sea may be more important to this endangered species than previously thought.

Key words: Black-capped Petrel, diabolite, at-sea distribution, Caribbean Sea

INTRODUCTION

The Black-capped Petrel *Pterodroma hasitata* is an Endangered pelagic seabird (BirdLife International 2018) whose breeding distribution is not well known. The species is endemic to at least one island in the northern Caribbean Sea. Historically, it bred on several islands from Hispaniola to Martinique (Goetz *et al.* 2012) and possibly in Cuba (Ruíz 1998), but it has suffered from human exploitation since pre-Columbian times (van Halewijn & Norton 1984). It was thought to be on the brink of extinction in the early 20th century (Bent 1922, Murphy 1936), but several breeding colonies were discovered in steep, mountainous terrain in Haiti in the early 1960s (Wingate 1964). Confirmed breeding is restricted to Hispaniola, in both Haiti and the Dominican Republic (four known colonies; USFWS 2018). However, the species may also breed in Dominica, where a grounded bird with a brood patch was found in 2007 (Scofield *et al.* 2010). Brown (2015) mentions two different adults that were found in the Roseau Valley below Morne Micotrin, “indicating the potential presence of a nesting population”. Radar surveys yielded 968 Black-capped Petrel-like “targets” (i.e., petrel-like birds) flying over the island in January (breeding season) 2015, and eight birds were visually observed flying over Dominica (Brown 2015). Furthermore, the combination of nearshore sightings at sea, observations of birds flying over land, and the presence of potentially suitable breeding habitat in inaccessible mountain peaks

indicates that the species might also breed in Cuba. However, the possibility that these birds are, in fact, breeding in Hispaniola cannot be excluded yet (USFWS 2018). Congregations of birds have been recorded in the breeding season feeding just off the southern coastline of Cuba, in an area of upwelling (Lee & Vina 1993, Goetz *et al.* 2012). Both in Cuba and Dominica, active nests have yet to be found, but searching for nests is extremely difficult in the remote, inaccessible, steep, mountainous breeding habitat of this species. It seems unlikely that Black-capped Petrels are still breeding in Guadeloupe and Martinique, where birds have been over-harvested (Bent 1922) and remaining breeding colonies were destroyed by various geological events (earthquakes, landslides, volcanic eruptions; USFWS 2018). Former breeding habitats are now degraded by deforestation and birds have not been found breeding for more than 100 years on either island (USFWS 2018). However, the species still frequents the waters around these presumed former breeding sites (van Halewijn & Norton 1984, Levesque & Yésou 2005, Goetz *et al.* 2012, Simons *et al.* 2013, BirdLife International 2018) and searches for nesting birds are ongoing (e.g., Wheeler 2018).

Black-capped Petrels have only rarely been sighted in the Caribbean Sea. They are predominantly seen further north: in the Florida Current and the Gulf Stream off the southeastern USA, with stragglers reaching Canada, northwestern Africa, and southwestern

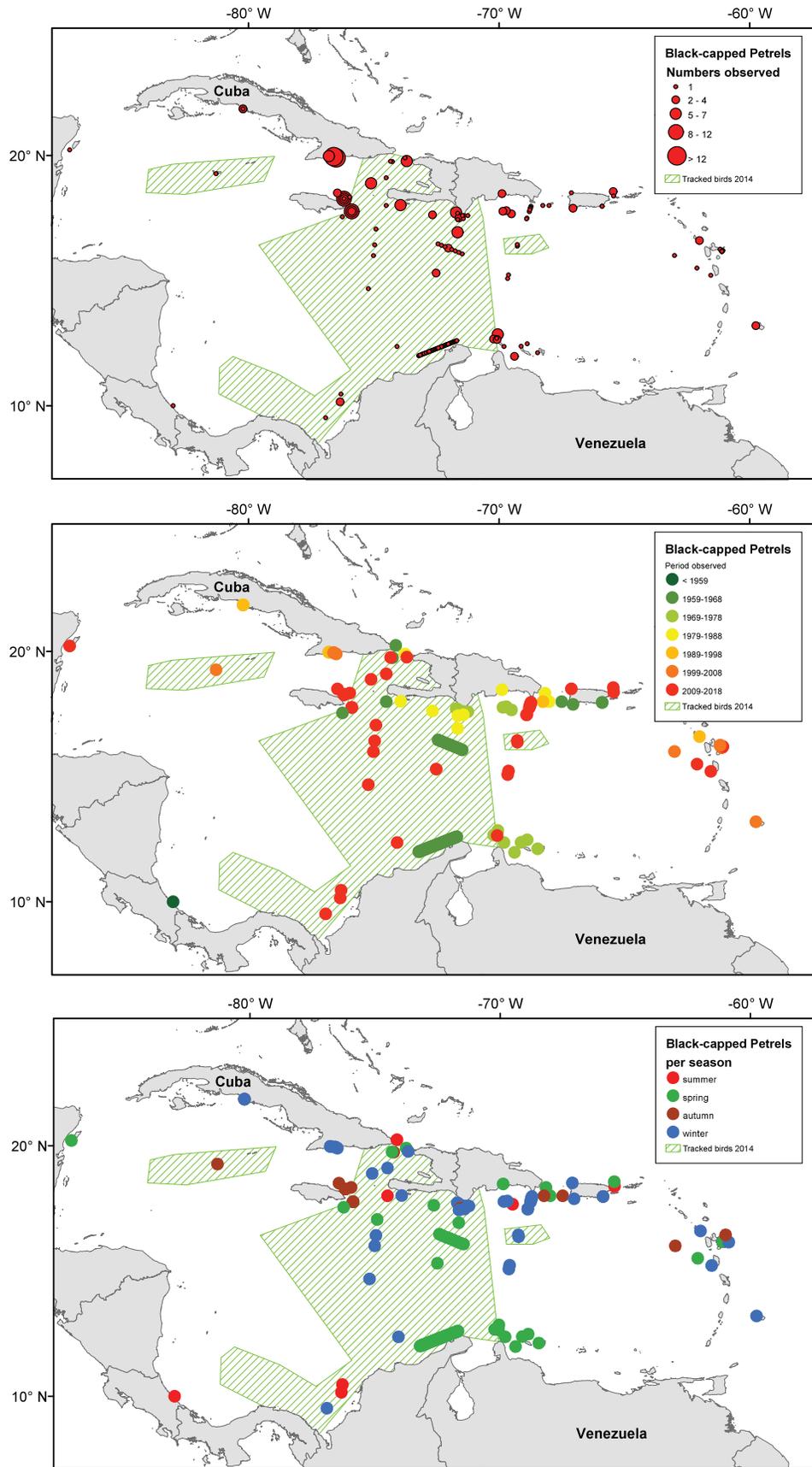


Fig. 1. Plots of all records found of Black-capped Petrels in the Caribbean Sea by numbers per sighting (top), by decade (middle), and by season (bottom). Summer: June–August, autumn: September–November, winter: December–February, spring: March–May. See Appendix 1 for further details.

Europe (Brooke 2004, Simons *et al.* 2013, Flood & Williams 2018). Their at-sea distribution range, the relationship between distribution and oceanography, the timing of occurrence, and the plumage variation of Black-capped Petrels off the east coast of the USA are documented from at-sea surveys and pelagic trips for birders (Haney 1987, Howell & Patteson 2008, Simons *et al.* 2013). General distribution maps appear to rely heavily on the data collected off the east coast of the USA and on the present and historical breeding ranges.

Knowledge of the at-sea distribution within the Caribbean Sea is scant and based on few published records. Distribution maps in standard reference works vary considerably (e.g., compare Harrison 1983, del Hoyo *et al.* 1992, Raffaele *et al.* 1998, Brooke 2004, Farnsworth 2010, Simons *et al.* 2013, BirdLife International 2018, USFWS 2018). However, most sources agree that the distribution is mainly confined to waters east of 80°W and that the species is rare or absent in the southernmost parts of the Caribbean. Recent data from three satellite-tracked breeding birds showed regular commuting between Hispaniola and waters off Venezuela and Colombia (Jodice *et al.* 2015).

Following a research cruise across the Caribbean Sea in February 2018, during which we recorded 12 Black-capped Petrels, we compiled all earlier records that we could trace to provide an updated distribution map of the species in the Caribbean Sea. This review was prompted by the poor conservation status of the Black-capped Petrel and the relative lack of knowledge on the distribution of the species in the Caribbean Sea.

STUDY AREA AND METHODS

We searched for records of Black-capped Petrels in the Caribbean Sea in the literature and via the internet. Our main sources were *Sea Swallow* (the journal of the Royal Naval Birdwatching Society), the eBird database (eBird 2017), and unpublished reports that were sent

to us by other observers, including student reports and field notes. For mapping purposes, descriptions of positions such as “just out of sight of Dominican Republic when leaving the Mona Passage to the south” were translated to latitude/longitude positions using Google Earth. Duplicates were removed and bulk records (e.g., 40 birds seen between two latitude/longitude positions in one day while on transit from Curaçao to the Panama Canal (Mörzer Bruyns 1967)) were placed equidistantly between the beginning and end of such transects.

Our own cruise track ran from Aruba across the Caribbean Sea to the coastal waters off the southeastern tip of the Dominican Republic, then on to St. Maarten (04–11 February 2018). Seabirds and other megafauna were recorded within a 300 m wide strip on the side of the vessel that offered the best viewing conditions. In addition to these strip counts, all birds seen within a 180° scan ahead (port to starboard) were recorded (see Tasker *et al.* 1984). The observation platform was situated along the ship’s centerline on the top of the bridge, nine metres above sea level; this offered an unobstructed view forward and to both sides. Counts were conducted during daylight hours when the ship was steaming at speeds of 5.6 ± 1.2 knots (10.3 ± 2.3 km/h). The total distance covered was 293 nautical miles (542 km) over 52.7 hours. Birds were not actively attracted to the vessel (e.g., by chumming), and the ship did not deviate from its track to approach birds that were sighted.

RESULTS

The first record of a Black-capped Petrel in the Caribbean Sea concerned a bird that was presumably blown off course towards the coast of Costa Rica in the southwestern Caribbean by a hurricane on 14 August 1953 (Stiles & Skutch 1989). From the 1960s to the 1980s, birds were reported by naval and merchant ships’ officers to the *Sea Swallow* administrator, starting with 40 birds seen on 01 May 1962 in the south-central Caribbean Sea by Capt. Mörzer Bruyns (1967) while in transit from Curaçao to the Panama Canal (Fig. 1, Appendix 1). Additional sightings in the southern Caribbean

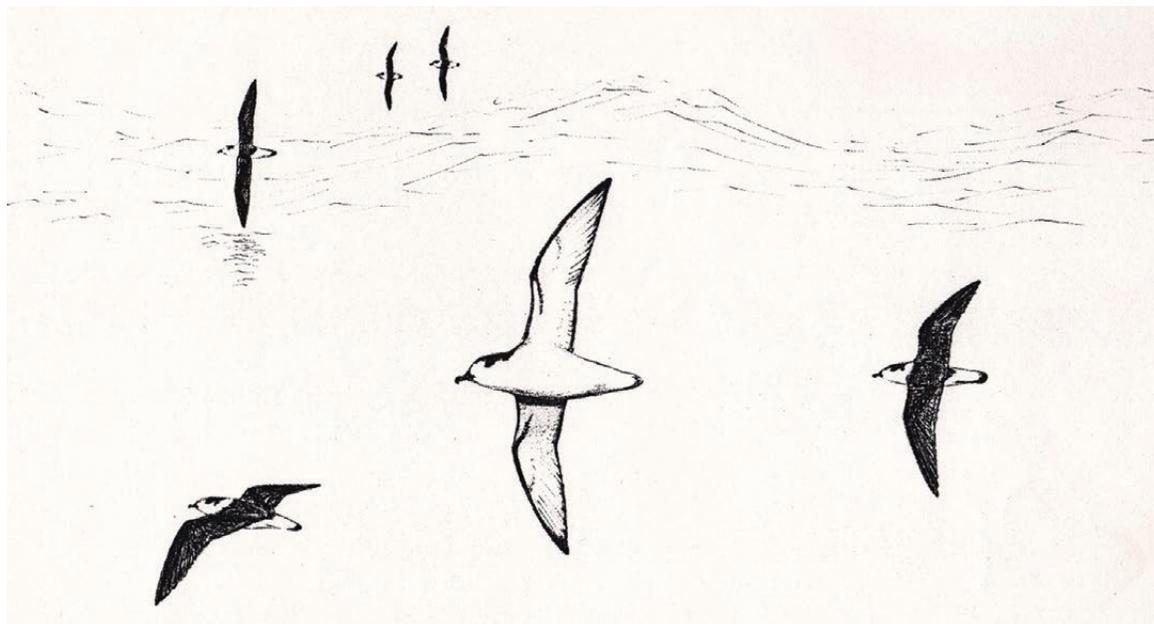


Fig. 2. A field sketch of Black-capped Petrels in the northern Caribbean Sea off Hispaniola, drawn by Käthy Meeth-Kühr, 03 December 1977. Käthy was married to Piet Meeth, director of the Nedlloyd shipping company in Rotterdam. Both were avid birdwatchers with a special interest in (rare) seabirds, and as pensioners, the couple made several long sea voyages (Voous 1995).

were made in April–May 1970 by van Halewijn (1972), who sighted 15 birds near Aruba, Curaçao, and Bonaire on seven occasions (see Appendix 1 for details on dates and positions of sightings).

Most records come from the northern and central Caribbean (Figs. 1, 2), rather close to known and possible breeding colonies. Relatively large numbers of birds were recorded in Windward Passage (between Cuba and Haiti) and Mona Passage (between the Dominican Republic and Puerto Rico), both of which are frequently used by ships heading to or from the Panama Canal. Six birds were collected at sea on 28 January 1977 in waters with coastal upwelling off (Punta) La Bruja, Sierra Maestra in southeastern Cuba (~76.5°W). According to local fishermen interviewed in January 1992, “the sounds [of birds calling] occurred [here] every night during the winter”. Fifteen years later, “hundreds” of birds (based on vocalisations at night) were present in the same waters on 20 and 21 January 1992 (Lee & Vina 1993). On 23 February 2004, 40 birds were noted vocalising on the water in the same area (Goetz *et al.* 2012). Slightly farther west, off Uvero (~76.6°W), Norton *et al.* (2004) reported similar observations of 25 birds on 09 February 2004 and 46 birds on 24 February 2004. Still further west along the coast of southern Cuba (~80.2°W), Ruíz (1998) reported vocalising birds in nearshore waters at the mouth of the River Yaguanabo in November 1976, February 1982, and January 1990. On this last occasion, one bird was shot from a small boat but was lost at sea; however, a rather freshly dead but scavenged corpse of a female Black-capped Petrel was found on the beach the next morning.

In November 2009, between one and twelve birds were attracted to a small vessel during nine successful chumming sessions off eastern Jamaica (Shirihai *et al.* 2010). This confirmed the only previous record of a Black-capped Petrel in this area (in December 1979; Douglas & Zonfrillo 1997). In January and February 2004, three Black-capped Petrels (and another four unidentified *Pterodroma* from the January–March period that were “most likely this species”) were seen passing by eastern Guadeloupe during 380 hours of year-round land-based seawatching (2001–2004; Levesque 2005, Levesque & Yesou 2005). Continued seawatching from Guadeloupe produced 10 more Black-capped Petrel sightings between 2005 and 2008: six between October and January and four between March and May (eBird 2017; Levesque & Yésou 2018). This contrasts with results of aerial surveys from 04 February to 05 March 2008 around St. Maarten/St. Martin, St. Barthélémy, Guadeloupe, and Martinique, which produced no sightings of Black-capped Petrels (Van Canneyt *et al.* 2009).

Recent records of Black-capped Petrels in the southern and central Caribbean Sea are restricted to three birds seen in association with killer whales *Orcinus orca* near Aruba on 14 April 2011 (Luksenburg & Sangster 2013) and seven birds seen in nearshore Colombian waters (five birds in June 2014 and two birds in January 2015; Digby *et al.* 2015). In addition, our own sightings comprise 12 single birds, seen 06–08 February 2018, between 15°N and 18°N and between 68°W and 70°W. Only one of these birds observed in 2018 was seen swimming; all others were flying, without any indication of foraging behaviour. All collected data are summarised in Appendix 1.

Jodice *et al.* (2015) satellite-tagged three Black-capped Petrels that were breeding on the Sierra de Bahoruco in the Dominican Republic. These birds were found to commute between their

breeding colony and continental shelf waters off northern South America during the chick-rearing period (April–July 2014). These coastal waters off Venezuela, Colombia, and Panama are known for regional seasonal upwelling, which results in enhanced productivity from January to June (Castellanos *et al.* 2002; Paramo *et al.* 2003, 2011; Rueda-Roa & Muller-Karger 2013; Villamizar & Cervigón 2017). The tracking data corroborated the earlier records of birds seen across the Caribbean by Mörzer Bruyns (1967), van Halewijn (1972), Luksenburg & Sangster (2013), and Digby *et al.* (2015). One of the tagged birds flew further west than any visually recorded bird in the Caribbean Sea, except for one seen off Costa Rica in August 1953 and one observed in nearshore Mexican waters in April 2011 (Simons *et al.* 2013). These two apparent outliers (Fig. 1) would now seem more fitting in the light of the tagging results of Jodice *et al.* (2015) and recent sightings in the Gulf of Mexico (Gleason 2017, USFWS 2018, Wheeler 2019).

Seasonality

In coastal waters within the northern Caribbean Sea, Black-capped Petrels have been observed in all four seasons (Fig. 1). No observations are known from the northeastern Caribbean in summer, though there are records from these parts in all other seasons. In the southern Caribbean, Black-capped Petrels have not been recorded in autumn, when coastal upwelling and biological productivity are at an annual minimum (Rueda-Roa & Muller-Karger 2013), but they have been observed in this region during all three other seasons, when coastal upwelling is prominent. Black-capped Petrels have been recorded in the southern Caribbean both in the breeding season (see Jodice *et al.* 2015) and at other times of the year, but only when upwelling occurs.

Negative records

Negative records (i.e., seabird watches during which no Black-capped Petrels are seen) that have been reported to eBird are depicted at <https://ebird.org/map/bkcpet?neg=true> (accessed 29 May 2019). Considerable effort with only negative records is shown for both the western and eastern Caribbean Sea, indicating that the positive records (Fig. 1) in the central Caribbean Sea are not just due to lack of effort in other parts. Negative records for the northeastern Caribbean Sea can be found in Postma & Nijkamp (1996), Keith & Ward (1997), Keith & Keith (2005), and Van Canneyt *et al.* (2009); records for the southwest in Naranjo (1979), Hilty & Brown (1986), and Ridgely & Gwynne (1989); and records for the central and southeastern parts of the Caribbean Sea in Poppe (1974), Murphy (2002), Buckley *et al.* (2009, excepting one record near Barbados), French (2012), and Geelhoed *et al.* (2014).

Adjacent waters

Black-capped Petrels are mostly seen in Atlantic Gulf Stream waters north of the Caribbean Sea, particularly off the southeastern USA (Haney 1987, White 2004, Howell & Patteson 2008, Simons *et al.* 2013). Anywhere else, the species is rare or absent. In the Gulf of Mexico, the species was considered very rare (eBird 2017), but recent surveys for the Gulf of Mexico Marine Assessment Program for Protected Species (GoMMAPPS) revealed a more prominent presence than previously known (Gleason 2017, Wheeler 2019). In the Atlantic Ocean east of the West Indies, only one credible record exists: two birds were seen just southwest of Barbados in early 2003 (Norton *et al.* 2003). Despite at-sea surveys, the species

is unrecorded in waters off Trinidad & Tobago, Guyana, Suriname, French Guiana, and northeastern Brazil (F. Hayes pers. comm.; de Boer *et al.* 2014; eBird 2017; Willems *et al.* 2017; Lepage 2018a, 2018b, 2018c). Though records are often claimed (and copied from earlier claims) from northeastern Brazilian waters, these are questionable (Piacentini *et al.* 2015). In the Atlantic at large, only a few stragglers have been reported (Brooke 2004, Simons *et al.* 2013, Flood & Williams 2018).

DISCUSSION

Our overview shows that birds have been recorded over the central parts of the Caribbean Sea, from coastal waters off southeastern Cuba and Hispaniola south to Panama, Colombia, and Venezuela. In the northeastern part of the Caribbean Sea, the distribution continues from Hispaniola along the chain of islands down to Dominica and possibly further, given the single observation just southwest of Barbados in early 2003. However, there are few records from the western and the eastern Caribbean Sea. In particular, the waters east of Curaçao, including the upwelling areas off Isla Margarita, northeastern Venezuela, and Trinidad and Tobago, have been relatively well surveyed (van Halewijn 1972, Poppe 1974, Murphy 2002), but Black-capped Petrels were never seen. Claims of birds seen even further southeast are doubtful at best (Piacentini *et al.* 2015). We therefore conclude that, given the amount of effort and only negative results in the eastern and western Caribbean Sea, the range of Black-capped Petrels appears to be confined to the central third of the Caribbean Sea.

The collected sightings and tagging data show that the existing distribution maps of Black-capped Petrels need adjustments. Published maps either show no Black-capped Petrels in the entire southern half of the Caribbean Sea (e.g., Harrison 1983, del Hoyo *et al.* 1992, Farnsworth 2010), or they miss the coastal upwelling waters off the South American mainland (Brooke 2004, Simons *et al.* 2013, BirdLife International 2018). The most recent distribution map published by the US Fish and Wildlife Service (USFWS 2018) incorporates the new insights from the tracking data. However, it still leaves the nearshore waters off Venezuela, Colombia, and Panama blank while showing the entire eastern Caribbean Sea and parts of the Atlantic Ocean east of the southeastern Caribbean islands as regular Black-capped Petrel range. More emphasis is needed on the coastal upwelling zone in the southern Caribbean Sea, while the central Caribbean Sea should be shown as merely a commuting lane for Black-capped Petrels.

Most at-sea sight records of Black-capped Petrels in the Caribbean Sea appear to be of birds passing through. Except for the Luksenburg & Sangster (2013) record of three individuals associated with killer whales hunting near Aruba, at-sea observers (including ourselves) never reported feeding behaviour. Recent work with satellite-tracked breeding birds (Jodice *et al.* 2015) indicated that Black-capped Petrels cross the Caribbean Sea swiftly, heading for presumed feeding areas in the seasonally highly productive coastal waters off western Venezuela, Colombia, and Panama. However, exactly how the birds exploit these coastal waters and which prey they target remains unknown. Dedicated vessel-based surveys of these presumed foraging areas that cover the prey and the feeding behaviour of Black-capped Petrels synoptically, would be the next logical step to get a complete picture of the conservation value of the upwelling zone in the southern Caribbean Sea for Black-capped Petrels. Additionally,

more birds should be satellite tagged, to provide a better picture of the full range of the species in the Caribbean Sea and to find any ecological hotspots worthy of special protection (see Soanes *et al.* 2016, American Bird Conservancy 2019).

The poor conservation status of the Black-capped Petrel should be an incentive for such studies: the species has a small and declining population size, and it is threatened at its remaining breeding sites by habitat loss, introduced predators, direct harvesting, collisions with man-made structures, and light pollution (DeNovelis 2011, Goetz *et al.* 2012, Simons *et al.* 2013, BirdLife International 2018, USFWS 2018). The species is at risk while at sea as well, through the increasing incidence of hurricanes and the weakening of upwelling systems due to climate change (Hass *et al.* 2012, Villamizar & Cervigón 2017); poor supervision of offshore mining and shipping operations that results in frequent oil spills; other pollutants, such as mercury or plastics (USFWS 2018); and competition for resources from fisheries (Lindop *et al.* 2015). Identifying key at-sea feeding areas, understanding how Black-capped Petrels exploit the resources within these sites, and protecting these areas are of fundamental importance to save the species from extinction.

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