

Status and Occurrence of Flesh-footed Shearwater (*Ardenna carneipes*) in British Columbia.

By Rick Toochin and Louis Haviland. Revised: January 2017.

Introduction and Distribution

The Flesh-footed Shearwater (*Ardenna carneipes*) is a trans-equatorial migrant that breeds in the Southern Hemisphere on St Paul Island in the French Southern Territories, Lord Howe Island off Australia, islands off south-west mainland Australia, South Australia at two isolated colonies, and islands off North and South Islands of New Zealand (Onley and Scofield 2007). This species is active on eggs at their nesting colonies during the months of November and December (Onley and Scofield 2007). The Flesh-footed Shearwater mainly occurs in the subtropics over continental shelves and slopes, and occasionally in inshore waters (Onley and Scofield). Individuals also pass through the tropics and over deeper waters when on migration to the North Pacific and Indian Oceans (Brooke 2004). The majority of the population migrates to the Northern Hemisphere between May and September and returns to the Southern Hemisphere in August (Onley and Scofield 2007). Individuals have been recorded over waters of 12.9–22.9°C in the south-western Pacific Ocean (Reid *et al.* 2002) and over waters of 11–16°C in the northern Pacific Ocean (Reid 2010, Reid *et al.* 2013b). Pairs breed on islands in burrows on sloping ground in coastal forest, scrubland, or grassland (Powell *et al.* 2007). Nests consist of enlarged chambers at the end of burrows of 1-3 metres in length, with the entrance often covered by plant material (Waugh *et al.* 2014). Brooke (2004) estimated the global population to number > c. 650,000 individuals, but this has recently been revised following the identification of a number of significant errors in the historical literature, as well as recent population surveys. Overall, the current global population is substantially smaller than previously thought, comprising only around 74,000 breeding pairs (Lavers 2015). In Australia, the Lord Howe Island population was previously estimated at 20,000 - 40,000 breeding pairs in 1978 (Fullagar and Disney 1981) and 17,462 breeding pairs in 2003 (Priddel *et al.* 2006). More recently, the population was estimated to be 16,267 pairs in 2009, representing a decline in the number of pairs since 2003 of 6.8% (Reid *et al.* 2013a). In New Zealand, Robertson and Bell (1984) estimated the Flesh-footed Shearwater breeding population at 50,000-100,000 pairs in 1983, while Taylor (2000) considered the population to be somewhat smaller at 25,000-50,000 pairs in 2000. Recent surveys suggest the population is closer to 10,000-15,000 pairs (Baker *et al.* 2010, Waugh *et al.* 2013). The Western Australian population was recently changed in category from Least Concern to Vulnerable (DPaW 2015). Following the revision of the breeding population size, the species was recently changed in category to Near Threatened in Australia (Garnett *et al.* 2011) and to “Nationally Vulnerable” in New Zealand (Robertson *et al.* 2013).

In the non-breeding season, which is summer in the Northern Hemisphere, the Flesh-footed Shearwater ranges north through the Indian Ocean and west to the southern tip of Africa, and

through the western Pacific Ocean to the seas off Japan (mostly in June), Russia, Korea, and as far north as the Bering Sea and Gulf of Alaska (mostly in July) (Kessel and Gibson 1978, del Hoyo *et al.* 1992, West 2008, Rayner *et al.* 2011, Reid *et al.* 2013b, Bond and Lavers 2015). The Flesh-footed Shearwater occurs annually in the waters off the west coast of North America, with small numbers of birds reported by pelagic bird tours and research vessels each year from May through October and sometimes into December, from British Columbia, south to California, and even as far south as the pelagic waters off Western Mexico (Campbell *et al.* 1990a, Wahl *et al.* 2005, Kenyon *et al.* 2009, Howell and Webb 2010).

Identification and Similar Species

The identification of the Flesh-footed Shearwater is fairly straight forward and is covered in all standard North American Field Guides. The Flesh-footed Shearwater is a medium-large sized species, measuring 43 cm in length, with a wingspan of 104 cm, and weighing 620 grams (Sibley 2000, Dunn and Alderfer 2011). In the context of British Columbia, the Flesh-footed Shearwater is very similar in size to the common, Sooty Shearwater, which measures 43 cm in length, with a wingspan of 101 cm, and weighs 780 grams (Sibley 2000, Dunn and Alderfer 2011). The Flesh-footed Shearwater is closely related to, and believed by some authorities to be conspecific to the larger and paler, Pink-footed Shearwater (Everett and Pitman 1993, Wahl *et al.* 2005). The Pink-footed Shearwater measures 19 cm in length, with a wingspan of 109 cm, and weighs 720 grams (Sibley 2000, Dunn and Alderfer 2011). The Flesh-footed Shearwater flies with a leisurely flight pattern of “flap-flap-glide” “flap-flap-glide”. The flight style is much more leisurely than other large dark shearwaters, and recalls “*Procellaria*” petrels (Onley and Scofield 2007).

Overall, the Flesh-footed Shearwater is a dark brown (Sibley 2000, Dunn and Alderfer 2011). Freshly moulted birds and juveniles may look black (Onley and Scofield 2007). In all ages, this species has pale reflective feathers on the underside of the flight feathers, that when seen from a distance, in strong light, gives the appearance of paler under-wings (Onley and Scofield 2007).

The head appears more rounded with a small forehead joining a pale, flesh-pink, stout, comparatively long, heavy bill (Onley and Scofield 2007). The wings are long and broad with slightly rounded wing tips (Sibley 2000, Onley and Scofield 2007). The tail is long and round-ended (Onley and Scofield 2007). The pale feet are rarely visible, and are usually tucked up into the belly feathers (Onley and Scofield 2007).

With proper views, observers should be able to identify this species from other dark shearwaters in the pelagic waters off the British Columbia coast.

Occurrence and Documentation

In British Columbia, the Flesh-footed Shearwater was first recorded off the coast in 1937 (Martin 1942). This species is recorded in the near shore pelagic waters off the British Columbia coast in 90 to 180 depth contours (Campbell *et al.* 1990a). The Flesh-footed Shearwater is a rare, but annually recorded species off British Columbia, with records occurring from May to December (Harrison 1983). The numbers of birds found varies from year to year, but the main movement of this species off British Columbia, most likely occurs in mid-summer (Campbell *et al.* 1990a). The Flesh-footed Shearwater is attracted to factory ships and commercial fishing vessels, and will dive to offal that is thrown overboard (Campbell *et al.* 1990a). Historical records include flocks of 25 birds on June 10, 1948, 50-60 birds on June 13, 1948, and flocks up to 30 birds found in early July 1946, off the Goose Group banks (Martin and Myres 1969). Though these historical numbers seem high by today's standards, the decline of the Flesh-footed Shearwater numbers recorded today is likely a reflection of mortality from overfishing in the recent past. From the 1950s to early 1990s, several thousand Flesh-footed Shearwaters, numbers are estimated at 6000-8 000 birds, may have been killed annually in the North Pacific from the salmon gillnet fisheries (Barbraud *et al.* 2014). Since the early 1990's, gillnet fishing has been prohibited throughout the world's fishing fleets, but it will likely take many decades for the numbers of this species to recover (DeGange *et al.* 1993). As a result of these past discretions, the Flesh-footed Shearwater has become a very difficult species to find in the pelagic waters of British Columbia and it is far more expected to find 1-3 birds, if at all, on any given pelagic trip or research vessel during a given day or excursion (J. Fenneman Pers. Comm.). There are of course exceptions to this rule, which was the case on September 28, 2008, when 15 birds were photographed and recorded on Swiftsure Banks, off the west coast of Vancouver Island, amongst 1000's of Pink-footed and Sooty Shearwaters (R. Toochin Pers. Obs.). There are no records of the Flesh-footed Shearwater for the Strait of Georgia, but there are a couple for the western portion of the Juan de Fuca Strait, including a bird found by Bill Tweit on May 29, 2004 (Cecile 2004c) and a recent sighting of a single bird on September 6, 2009, well observed through telescopes, by multiple observers off the Sheringham Lighthouse in Shirley (R. Toochin Pers. Obs.). This bird was present with several hundred Pink-footed Shearwaters that were feeding in the Juan de Fuca Strait (R. Toochin Pers. Obs.). Though there are not many records for the waters off Haida Gwaii, the Flesh-footed Shearwater is considered a rare, but regular species in Hecate Strait, with at least 1 summer sighting each year reported (P. Hamel Pers. Comm.). There is no guaranteed place to find this species in British Columbian pelagic waters, however, regular pelagic trips offshore should eventually produce this most sought after and elusive shearwater species.



Figure 1: Flesh-footed Shearwater, 1 of 15 found at Swiftsure Banks, off the west coast of Vancouver Island on September 28, 2008. Photo © Don Cecile.



Figure 2: Flesh-footed Shearwater, 1 of 15 found at Swiftsure Banks, off the west coast of Vancouver Island on September 28, 2008. Photo © Don Cecile.



Figure 3: Flesh-footed Shearwater, 1 of 15 (left) sitting on the water with a Pink-footed Shearwater (right) found at Swiftsure Banks, off the west coast of Vancouver Island on September 28, 2008. Photo © Don Cecile.



Figure 4: Pink-footed Shearwater, 1 of 1000s found at Swiftsure Banks, off the west coast of Vancouver Island on September 28, 2008. Photo © Michael Ashbee.



Figure 5: Pink-footed Shearwater, 1 of 1000s found at Swiftsure Banks, off the west coast of Vancouver Island on September 28, 2008. Photo © Michael Ashbee.



Figure 6: Pink-footed Shearwater, 1 of 1000s found at Swiftsure Banks, off the west coast of Vancouver Island on September 28, 2008. Photo © Don Cecile.

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