

HAWAIIAN PETREL

Pterodroma sandwichensis

Other: Dark-rumped Petrel (<2002) 'Ua'u, 'Uwa'u

monotypic

breeding visitor, endemic, endangered

Hawaiian Petrel was split from [Galapagos Petrel](#) by the AOU (2002; see [Synonymies](#)) following Tomkins and Milne (1991) and Brown et al. (1997); see also Welch et al. (2011). The combined species was formerly known as "Dark-rumped Petrel *P. phaeopygia*". At this time Hawaiian Petrel thus became an endemic breeding species, nesting in small colonies on most of the Southeastern Hawaiian Islands (Banko 1980a). Genetic and morphometric evidence suggest reduced gene flow between at least three of the four extant populations, possibly resulting in average phenotypic differences as well (Welch et al. 2012 and Wiley et al. 2012, reviewed by Burg and Martin 2012; Judge et al. 2014).

Hawaiian Petrels were first collected by the Knudsens in the 1800s at various locations on Kaua'i (Stejneger 1887, *E* 2:24-27, Banko 1980a). Based on these specimens, Ridgway (in Baird et al. 1884) hesitatingly named it *sandwichensis*, being uncertain whether or not it was conspecific with the Black-capped Petrel (*P. haesitata*) of the Atlantic, until he could compare specimens of the two species side-by-side (Ridgway 1886, 1888). It had earlier been referred to as "*Procellaria alba*" by Bloxam and Dole ([Synonymies](#)), assuming it to be the same as [Phoenix Petrel](#) (*cf.* Loomis 1920). Subfossil records (Olson & James 1982a, Giffin 1993) and reports from the 1800s by other early ornithologists (e.g., Bloxam 1827a, Finsch 1880; *cf.* Henshaw 1902a, Perkins 1903, *E* 2:24-27, *E* 16:46; Munro 1944; Banko 1980a; Simons and Simons 1980) indicate that Hawaiian Petrels occurred abundantly on the *Southeastern Hawaiian Islands* prior to and during Polynesian settlement, with large colonies still extant on most islands at the start of the 20th century. But by the mid part of the century colonies were restricted to high elevations, usually in steep terrain where population sizes have been difficult to estimate (Simons 1984, 1985). Habitat destruction of colony sites and disturbance from mammalian predators were likely the primary reasons for the declines. Richardson and Woodside (1954) estimated populations in the hundreds (possibly the low thousands) in 1949. Based on statistical modeling of pelagic observations in 1980-1994, Spear et al. (1995) estimated 3750-4500 breeding pairs among a total population of 19,000 individuals, but only about 6000 pairs have been estimated based on observations at colony sites documented thus far ([Table](#)).

Birds arrive at colonies in Feb and young fledge in Oct-Nov. When not at breeding colonies Hawaiian Petrels apparently disperse into a wide area of the Pacific, to the SE as far as 125° W, N into the s. Gulf of Alaska, and E regularly as far as the California Coast (Pitman 1986, Spear et al. 1995, CBRC 2007), although our understanding of at-sea distribution has been clouded by difficulty in separating Hawaiian and [Galapagos](#) petrels based on morphology and plumage (Force et al. 2007, Pyle et al. 2011, Howell 2012). Additional information on the biology and historical and current distribution of this species in Hawaii can be found in Banko (1980a), USFWS (1983b), Simons (1983, 1984, 1985), Bartle et al. (1993), Ainley et al. (1995, 1997a), Simons and Hodges (1998), Holmes and Joyce (2009a), and BLI (2016). Banko (1979)

summarized 72 known specimens, the earliest collected at an unspecified location in Apr 1862; at least 10 additional specimens have been accessioned into BPBM since this summary.

On *Kaua'i*, Damon (1931) reported Hawaiian Petrels breeding commonly in Kilohana Crater NW of Lihue. During the 1990-mid 2010s the island-wide breeding population was estimated in the high 100s to 1600 pairs based on numbers of birds flying onshore near dusk, primarily along the N shore of the island (Ainley et al. 1995, 1997a; Day and Cooper 1995, Holmes et al. 2011, Chen 2015); e.g., as many as 900 recorded by radar at Hanalei Bay in one evening (14 Apr 1993), up to 2000 observed flying from shore near sunset off Lumahai Beach 29 May 2012, and dozens to over 100 observed in May-Jun flying over at dusk or staging at sunset off Hanalei, Haena, Kilauea Point, Lihue, Wailua River mouth, Nawiliwili, Poipu, Hanapepe, and Waimea Canyon. Fledglings and occasionally adults are picked up annually in the [SOS](#) program during Oct-Dec along roadsides throughout the island, generally <10 per year from 1979 to the mid-2010s, with peaks of 15-29 in five years during 1990-2009 (Rana Productions 2004; *HFW* 5[4]:9; BPBM 185575, 185716, 185954). Of 305 brought in during 1979-2008, 278 were released and 27 perished (Holmes and Joyce 2009a). Observations of multiple calling birds (e.g., Gon 1988, and 20 in the vicinity of the Mt. Waialeale summit on 2 May 1999) suggested breeding in the central mountains of Kaua'i. During surveys in 2006-2008, colonies were located in the Upper Limahuli Preserve and at Hono a Napali near the ne. coast, and at Kahili-Kapalaoa in the sc. portion of the island (Holmes and Wood 2007, Deringer and Holmes 2009, Holmes and Joyce 2009a). There is little evidence for population change on Kaua'i during the 1980-mid-2010s. In Nov 2015, 10 chicks were translocated to a predator-free fenced-in area at Kilauea Pt NWR, in the hopes that a breeding colony could be established there (*E* 76:33-35). One observed 15 Jul 2004 near Lehua Islet off *Ni'ihau* suggested the possibility of its breeding there (VanderWerf et al. 2007), although there have been no further sightings in several other surveys through the mid-2010s.

Although subfossil bones indicate abundant populations of Hawaiian Petrels prior to European contact, primarily on the Ewa plains, sw. *O'ahu* (Olson and James 1982a, 1982b), no breeding has subsequently been recorded on the island (*E* 2:24). At least 10 individuals found in various localities around O'ahu since 1991 have been turned into SLP for rehabilitation, and the species is seen occasionally during one-day trips from shore (e.g., [HRBP](#) 6126 published *NAB* 65:364). Individuals have also been regularly observed since 1966 during single-day offshore trips in Apr-Oct. On *Moloka'i*, Hawaiian Petrels were commonly observed and confirmed to be breeding in the late 1800s and early 1900s in upper valleys (primarily Pelekunu Valley) and in lowlands including Moku Ho'oniki Islet off the east end of the island (*E* 7:63, 16:46-47, Banko 1980a, Dibben-Young 2016). Bryan (1908, 1914) collected 51 specimens (BPBM 4662 et seq., AMNH 193238-41) at Wailau Valley, Oloku'i Plateau, and Moanui in 1907-1917 (Banko 1979). Anecdotal information indicates large colonies were present historically, which 'darkened the sky' (Munro 1955). More recently, individuals were heard in 1980 in upper Wailau Valley (Simons and Hodges 1998) and radar studies in June 2002 suggested that some Hawaiian Petrels were moving at night into several valleys on the N coast of Moloka'i, E of Kalaupapa Peninsula, but recent breeding has not been confirmed.

Grounded individuals were found near Kanaukakai Harbor 14 Nov 2006 and Kaamola 8 Dec 2007.

Hawaiian Petrels were reported to breed in the northern portion of *Lana'i* in the 1800s (Munro 2007; *E* 2:26). Wings and humeri of five birds killed by cats were collected in Kaiholena Gulch, NE of Lanai City 11 Sep 1896, possibly including BPBM 7186 accessioned in 1926 (Munro *in* Gregory 1927). No subsequent observations were reported from Lana'i until a juvenile was caught, photographed, and released on Munro Trail above Kaiholena 26 Oct 1973 (*E* 35:19). In Jun 1976 and May 1977, 50-100 calling birds were estimated near the crest of Kunoa Gulch, NW of Lana'ihale Peak (Hirai 1978a, 1978b), and up to 100 individuals were recorded at this site during the early 1980s. Four juveniles attracted to bright lights were turned in for rehabilitation in Oct-Nov of 1980-1987 (*e.g.*, *AB* 41:148). In spring 2007 USFWS and University of Hawaii researchers, following up on sightings during the 1970s, discovered a large colony of Hawaiian Petrels breeding in cloud forest of Lana'ihale Peak (*HE* 18[3]:4). Preliminary population estimates for Lana'i were of 2-3,000 pairs, perhaps comparable in size to that on Mt. Haleakala (Chen 2015). Genetic similarity between these birds and specimens from Moloka'i suggest that the population may have dispersed to Lana'i once conditions became unfavorable for breeding on Moloka'i (Welch et al. 2012). Management efforts were taken to control mammalian predators and protect this colony. An interesting leucistic ("lavendar-plumaged") bird found injured in the Palawai Basin 19 Nov 2011 later died ([HRBP](#) 6127-6130; BPBM 185579). On *Kaho'olawe*, Hawaiian Petrels were heard in flight at the island's summit in July 1982 (Conant 1983a) and a nest with chick was reported from Aleale Islet during the summer of 2000.

Banko (1980a) summarizes historical evidence of Hawaiian Petrels breeding on *Maui*, primarily on the western slope of Haleakala crater in Haleakala National Park; see also *E* 12:32, 20:41-42; Richardson (1954a), Richardson and Woodside (1954), and Dunmire (1961). During surveys in 1966, Larson (1967) estimated a population of about 400 pairs restricted to 23 km² along the crater rim above Lelewi, Kalahaku, and Kapalaoa Palis, and during the 1970-1990s the population was estimated at 450-650 breeding pairs and 1,800 individuals (Buxbaum 1972, van Riper and Barbee 1978, Kjargaard 1978, Conant and Stemmermann 1979, Simons 1985, Simons and Hodges 1998). Radar observations suggest that this island-wide estimate might have been low (Cooper and Day 2003, Day et al. 2005), and increased reproductive success in response to predator-control in the colony areas (Scott et al. 1988, Hodges and Nagata 2001, BLI 2016) may have boosted the Haleakala population to 1500 pairs by the 2010s (Chen 2015). During the 2000-early 2010s the W Maui population was estimated at around 100 pairs (Cooper and Day 2003, Chen 2015, BLI 2016). In 2014, mitigation for wind turbine development on Maui resulted in the construction of predator-free enclosures with social attraction playback broadcasts for Hawaiian Petrels at Makamakaole, resulting in flyovers and birds visiting the site by Jul 2015. Beginning in 1953, up to 10 individuals per year have been attracted to bright lights on Maui and recovered or rehabilitated during Aug-Nov (Richardson 1954, Gassman-Duvall et al. 1988; BPBM 6651, 186005).

On *Hawai'i I*, Hawaiian Petrels were first noted by Bloxam (1827; *cf.* Olson and James 1984) and reported to breed abundantly in lava beds between Mauna Loa and Mauna Kea in the 1800s (Henshaw 1902a). Beginning in 1948 (Baldwin and Hubbard 1949) observations of calling, nesting, and recovered individuals have indicated

continued breeding of smaller numbers in this area, near Kilauea Crater and on the se. slopes of Mauna Loa (at 2,400-2,900 m elevation), on Hualalai, and in the N Kohala Mts, perhaps totaling 300 pairs overall (Richardson and Woodside 1954, Eisenmann 1961, van Riper and Barbee 1978, Banko 1980a, Conant 1980a, Hu and Glidden 1997, Hu et al. 2001, Day et al. 2003a, Chen 2015; *E* 21:13; *HFW* 6[1]:8; see also Giffin 1993). On the upper slopes of Mauna Loa they often breed in pits that were apparently constructed by native Polynesians to capture Dark-rumped Petrels; population viability analyses suggest that this population may not persist (Hu et al. 2001). In 2013-2016, a predator-proof fence was completed around 600 acres of high-elevation Hawaiian Petrel colonies in Volcano NP, estimated at 60 pairs when construction of the fence began.

Hawaiian Petrels are often recorded from shore and from research vessels *at sea* around all of the Southeastern Hawaiian Islands (King 1970, Spear et al. 1999, Rowlett 2002, Winship et al. 2016; [HICEAS data](#)), in particular (due in part to extra effort) off the Kona coast of Hawai'i I (Pyle et al. 2011; [CRC data](#); [HRBP](#) 0781-0783, 5617, 5801-5803, 5855-5856, 5908, 6120-6122, 6125 published *NAB* 65:364-365). An analysis of [CRC data](#) indicated them to be fairly common in Apr-Sep (typically 1-6 birds per day) but uncommon to rare throughout Oct-Mar (<0.3 per day), consistent with their breeding seasonality ashore (Pyle et al. 2011). Only a few observations exist west of Ni'ihau, including 7 birds between Kaua'i and Nihoa 19-21 Sep 2010, and the westernmost records and only sightings for *Northwestern Hawaiian Island* waters being one observed 92 km N of Laysan on 28 Aug 2002 (Rowlett 2002; [HICEAS data](#)), and one photographed near Laysan 3 Sep 2011 ([HRBP](#) 6296).

[Acronyms and Abbreviations](#)

[Literature cited](#)

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