RED-FOOTED BOOBY *Sula sula*

Other: *ʻA* monotypic

non-breeding visitor, indigenous

Red-footed Boobies inhabit tropical oceans around the world. They breed widely across the tropical Pacific on islands from Indonesia and Australia E to Mexico and the Galapagos, including Johnston and Wake atolls (Amerson and Shelton 1976, Rauzon et al. 2008), and range widely throughout tropical oceans when not breeding (Marchant and Higgins 1990, Schreiber et al. 1996, AOU 1998, CBRC 2007). In the Hawaiian Islands they breed in modest numbers from Kure to O'ahu and are fairly common visitors along the coasts of all the Southeastern Islands. In the Southeastern Islands they breed year-round (e.g., Richardson and Fisher 1950) whereas in the Northwestern Islands breeding is more confined to the spring and summer months. See Nelson (1978) and Schreiber et al. (1996) for information on the natural history of Red-footed Booby.

Red-footed Boobies breed on all *Northwestern Hawaiian Islands* except ***Gardner Pinnacles*** (where it is a regular visitor in small numbers), with an overall population estimate during the 1980-2000s of 7,450 breeding pairs (Table). Estimated population size was largest on ***French Frigate***, followed by ***Nihoa***, ***Kure***, ***Necker***, ***Midway***, ***Lisianski***, ***Laysan***, and ***Pearl and Hermes*** (Table). Information on the history of the species and data on breeding phenology for each Northwestern Island, compiled as part of the POBSP, can be found in the Atoll Research Bulletins for each breeding locality (see Seabird Page). As with other seabirds, populations were decimated on Midway (and probably other Northwestern Islands) during the 1890s by feather hunters and castaways (Munro *in* Hadden 1941), and were reduced on Laysan and Lisianski during the early1900s due to loss of vegetation from rabbits, but these problems have been largely mitigated and populations have since recovered.

In the *Southeastern Hawaiian Islands*, an estimated total of 4,950 pairs bred during the 1980-2000s (Table). Well-established breeding colonies occurred on Kaula Rock (estimated 250-350 breeding pairs) and on Lehua Islet (1300-1500 pairs) off ***Ni'ihau*** (Fisher 1951, Richardson 1963, VanderWerf 2007). They have also been suspected of breeding on Ni'ihau proper (Perkins 1903, Fisher 1951) but subsequent information is not available. On ***Kaua'i*** they breed in Kilauea Point NWR on steep vegetated slopes E of the point, where they have increased in past decades, from 60-75 pairs in 1963 (Richardson and Bowles 1964) to 400-600 pairs in the 1980s (Byrd and Zeillemaker 1981, Harrison 1990), to >2000 pairs in the 2000s. This increase is reflected in numbers of adults counted during the Kapa'a Christmas Bird Count (Graph).

On ***O'ahu*** they breed on Mokapu Peninsula (slopes of Ulupau Crater) and on Mokumanu Islet off the peninsula (Northwood 1940a). A booby, probably Red-footed, is present in the fossil record of Ulupau Head, indicating presence and possible breeding here for at least 200,000 years (James 1987). On Mokumanu, Richardson and Fisher (1950) during 14 trips in 1946-1948 found a maximum of 200 nests estimated on 23 Feb 1947. Nesting was recorded through 1995 but by 2000 Red-footed Boobies had ceased breeding on Mokumanu due to the weakening, by prolonged drought, of sturdy bushes required for nesting (HDFW 2006). The colony subsequently reformed, with 20 nests

recorded in 2003, 150 in 2004, and 160 on 28 Feb 2006 (HDFW 2006), and 200 or more in 2007-2008. The colony in Ulupau Crater (on the KMAC military base) apparently formed in the mid-1940s during World War II. On 4 Jan 1947 the colony had an estimated 100 nests (*E* 7:55) and 400-500 birds were estimated in the colony in 1947-1948 (Richardson and Fisher 1950; *E* 8:41 *et seq*.). By the 1980s the colony held about 1000 nests during peak breeding periods, although (for unknown reasons) the nest count dropped to 550 nests and below in 2003-2008. The decline may have related, in part, to birds recolonizing Mokumanu (HDFW 2006). Christmas Bird Count data indicate a fluctuating population but no significant trend (Graph).

Red-footed Boobies range commonly in waters around Kaua'i and O'ahu where they feed in association with sub-surface schools of tuna (Hebshi et al. 2008). Small numbers are frequently observed passing by close to shore or a few miles offshore, occasionally mixing with other seabirds in feeding flocks. They are commonly seen along the southeastern coast of O'ahu, commuting to and from the breeding colonies; at least 240 Red-footed Boobies were found stranded on O'ahu in 1990-2003 and turned into the SLP rehabilitation facility. They rarely range to other Southeastern Islands with about 25 reports through the 2000s from coastal and offshore waters of ***Molokai***, ***Maui***, ***Lana'i***, and ***Hawai'i I***. There is one report of a storm-driven bird at Hawai'i Volcanoes NP in 1959 (Dunmire 1961).

Farther *at sea* King (1970) recorded 1082 Red-footed Boobies during monthly surveys E and S of the Southeastern Islands, virtually all within 90 km of O'ahu. They were found on all surveys Mar 1964-Jun 1965 with no significant seasonal peaks. Rowlett (2002) recorded them on 68 of 93 observing days around the Hawaiian Islands in Aug-Nov 2002, most of them on the 15 days observing within 110 km of breeding colonies; beyond this, daily counts were <10 birds on all but 6 days. Highest daily counts were 420 near O'ahu and 286 near 275 km SW of Nihoa. Only one Red-footed Booby was recorded in 15 observing days east of Maui and Hawai'i, and Spear (1999) recorded only one in 144 hrs of transect surveys S and SE of Hawai'i.

Worldwide, adult Red-footed Boobies occur in various dark, intermediate, and light plumage morphs. The light morph predominates Hawaiian colonies, although juveniles of all morphs are dark, which has led to some confusion. Occasional dark-morph adults (pale brown with white tails) have been recorded on nests in breeding colonies; e.g., one on French Frigate in 1988 (HRBP 0868-0870), two in Feb 1989 and 4 in Jul 1994 among ~1000 nests at the Mokapu Peninsula, O'ahu, colony and one in 1999-2002 among ~2000 nests of the Kilauea Point, Kaua'i, colony. Both morphs have been considered to belong to a widespread Pacific subspecies, "*S.s. rubripes*", but we here follow Pyle (2008) and consider the species monotypic.

Acronyms and Abbreviations

Literature cited

Citation: Pyle, R.L., and P. Pyle. 2009. The Birds of the Hawaiian Islands: Occurrence, History, Distribution, and Status. B.P. Bishop Museum, Honolulu, HI, U.S.A. Version 1 (31 December 2009) http://hbs.bishopmuseum.org/birds/rlp-monograph/