

## **Christmas Shearwater**

*Puffinus nativitatis*

Family: Procellariidae

### **Identification**

Named after Christmas Island where they also breed, this species is sooty black in color with underparts paler than upperparts. The underside of their primaries and tail show a dull silvery flash. They are a slender-bodied shearwater, smaller than their more common wedge-tailed cousins (*Puffinus pacificus*). They have a black bill, grayish-brown feet, and a short, wedge-shaped tail. Sexes and ages are alike in appearance.

They can be distinguished from the dark-morph Wedge-tailed Shearwater by their smaller size, narrower wings, shorter tail, and stiffer, faster wingbeats.

### **Survival and Lifespan**

Little is known about Christmas Shearwater survival. The oldest record is 17 years of age on Laysan.

### **Distribution**

#### ***Breeding (Mar-Nov)***

In the Hawaiian Islands, Christmas Shearwaters breed on offshore islets of the main islands (Kaula off Niihau and Moku Manu off Oahu) and in the Northwest Hawaiian Islands (Nihoa, French Frigate Shoals, Lisianski, Laysan, Pearl and Hermes Reef, Midway, and Kure). Separate populations breed on Johnston Atoll, Ducie and Oeno Islands (Pitcarin Islands), Sala y Gomez (Chile), Motu Nui (Easter Island), and in the Marquesas, Tuamotu, Line, Phoenix, and Austral groups. They occur in higher densities around the Hawaiian Islands during breeding months.

#### ***Marine***

Marine range of the Christmas Shearwater is not well known, but they probably disperse farther south and east during nonbreeding months.

### **Breeding Ecology**

Christmas Shearwaters arrive at the breeding grounds in late February to early March and begin to lay eggs by the end of April. A simple nest is built with small twigs or leaves on the ground under dense vegetation, such as native *naupaka* (*Scaevola sericea*). A single, white egg is laid and both parents participate in all aspects of raising the young. Incubation period ranges from 50 - 54 days and it takes an additional 100 - 115 days for chicks to fledge and depart their breeding grounds by November. In this species, "divorce" appears to occur at a higher frequency than in other seabirds. Age at first breeding is thought to be 4 years of age and birds breed annually thereafter.

### **Feeding and Prey**

- Feeding guild – TUNA BIRD
- Food capture – This shearwater species feeds by surface-seizing and pursuit plunging, although individuals typically do not penetrate far below the surface. They also feeds by dipping, in which individuals pick prey from the sea surface or just beneath it while remaining airborne.
- Foraging range – They are observed most frequently feeding in areas of intermediate to shallow thermocline and intermediate to high chlorophyll in flocks dominated by Juan Fernandez Petrels (*Pterodroma externa*) and Wedge-tailed Shearwaters or Red-footed Boobies (*Sula sula*) and Masked Boobies (*Sula dactylatra*). These flocks are commonly found to feed in tropical waters with both low and high salinity.

- Microhabitat for foraging – Christmas Shearwaters are highly pelagic, consuming prey driven to the surface by schools of predatory fish (e.g., skipjack tuna [*Katsuwonus pelamis*] and spinner [*Stenella longirostris*] and spotted [*S. attenuate*] dolphins) that drive larval forms of fish to the surface.
- Diet – Main foods taken include larval forms of goatfish (Mullidae), mackerel scad (*Decapturs* spp.), flying fish (Exocoetidae), squirrelfish (Holocentridae), and squid (Ommastrephidae) in the 50 - 100 mm range. Among food samples collected from breeding colonies in the Northwest Hawaiian Islands, the most important identifiable prey was squid (Ommastrephidae: *Symmplectoteuthis oualaniensis* and *Hyaloteuthis pelagicus*), goatfishes, and flying fishes. They also eat rudderfish (Kyphosidae) and are known to exploit many food sources.

### Threats and Status

Christmas Shearwaters have been extirpated from west Pacific colonies on Ogasawara Island, Minami Torishima, and Wake Island. There is no fossil record from the Hawaiian Islands but they probably occupied the main islands before extirpation there. Currently, they are still present on offshore islets and most islands in Northwest Hawaiian Islands, although numbers are reduced. Rabbits (*Oryctolagus cuniculus*) introduced in 1903 destroyed native vegetation on Laysan and Lisianski Islands eliminating appropriate nesting habitat and causing steep population declines that have not recovered in spite of rabbit eradication.

The total breeding population in the Hawaiian Islands is estimated at approximately 2,500 - 3,300 pairs. The largest breeding colonies in the archipelago occur at Laysan (1,500 - 2,000 pairs), Lisianski (400 - 600 pairs), Nihoa (200 - 250 pairs), and Midway (200 pairs). The worldwide population is unknown but is likely less than 10,000 breeding pairs.

Main threats to the species include:

- Predation – No terrestrial mammalian predators are native to the Hawaiian Islands, so this species is incapable of defending itself or its nest from mammals such as rats (*Rattus* spp.), cats (*Felis sylvestris*), dogs (*Canis familiaris*), pigs (*Sus scrofa*), and mongooses (*Herpestes auropunctatus*). Predation therefore is a serious threat to adult seabirds and their eggs and chicks. Small Procellariiformes are particularly vulnerable because of their small size, low annual productivity, and lack of effective anti-predator behavior. Although none of these predators occur where shearwaters nest, care needs to be taken to avoid reinvasion.
- Habitat availability – Dense vegetation provides critical shaded and protected nest sites. Many nesting islands in Hawaii have been invaded by non-native vegetation (e.g., Golden-crown Beard, *Verbesina encelioides*), which typically has short growth periods. When the plants die, chicks are exposed to temperature extremes. Larger areas of appropriate nesting habitat will decrease the amount of competition with other surface-nesting species, such as Red-tailed Tropicbird, Wedge-tailed Shearwater, and Brown Noddy, potentially increasing breeding success.
- Fisheries – In Hawaii, overfishing may directly or indirectly harm seabird populations; harvest of Skipjack and Yellowfin Tuna (*Thunnus albacares*) could eliminate predatory fish needed to drive prey species to surface. Also, live bait needed for the fishery, Goatfish (Mullidae), and Mackerel Scad (*Decapturs* spp.) could potentially decrease this species primary prey items. Development of a squid fishery could also impact Christmas Shearwaters

### Selected Readings/References

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