Tristram's Storm-petrel
Oceanodroma tristrami
Other: Sooty Storm-petrel
Family*:* Hydrobatidae
IUCN Listing: Near threatened

Identification
The Tristram's Storm-petrel is one of the largest of all storm petrels. It is mostly sooty-brown with a distinct bluish or grayish cast in fresh plumage. They have conspicuous pale wingbars across upper wing coverts, which extend to the leading edge of the wing at the carpal joint. They are relatively long winged, with a long, deeply notched blackish tail. Their flight is described as strong, with steep-banked arcs and glides interspersed with fluttery wingbeats.

This species can be confused with several other dark shearwaters (*Puffinus* sp.) and petrels, as well as the Brown Noddy (*Anous stolidus*). Tristram's can be distinguished from the dark morph of Wedge-tailed Shearwater (*Puffinus pacificus*), and Christmas Shearwater (*P. nativitatis*) by their much smaller size, shorter bill, erratic flight, and pale band across the wings. The Brown Noddy is similar in shape and coloration, but they lack the pale bar on the upperwings and have a longer, pointed bill. Bulwer's Petrels (*Bulweria bulwerii*) are larger with longer tails that are distinctly wedge-shaped, not notched. Their deeply notched tail distinguishes them from Band-rumped Storm-petrels (*O. castro*) along with their dark rump.

Survival and Lifespan
Little information is available; however, storm-petrels are generally long-lived for their relatively small body size. Many storm-petrel species live to 15 -20 years of age or older as evidenced by one 36 year old Leach's Storm-Petrel (*Oceanodroma leucorhoa*).

Distribution
***Breeding* (Oct - Jun)**
The total population inhabits the central Pacific west to Japan. It breeds on the Northwest Hawaiian Islands (Necker, Nihoa, French Frigate Shoals, Laysan, Pearl and Hermes Reef, Midway, Kure, and possibly Lisianski) and on Volcano and southern Izu Islands.

Marine
There is relatively little known on movements during the non-breeding season. They are rarely observed in Northwestern Hawaiian Islands outside of the breeding season. Most detections occur between the Hawaiian Archipelago and main islands of Japan and northward. Temperatures of surface water in areas of sightings ranged from 11ºC to 26ºC.

Breeding Ecology
In the Northwest Hawaiian Islands Tristram's Storm-petrels nest on flat and raised sandy atolls, as well as on cliffs or rocky volcanic islands (Nihoa and Necker). Nests are placed in recesses in rocks, under piles of mined guano, or burrows that they excavate under vegetation. On Laysan nesting is confined to mixed vegetation (*Eragrostis variabilis* grass, *Ipomea pes caprae* (morning glory) or *Sicyos* spp. (cucurbit), and bare sand) that extended around the perimeter of a lake basin in center of island. Individuals first arrive in mid-October and are numerous by mid-November, with first eggs laid in December and most eggs laid by February. Nestlings fledge by June. There is little information on parental care of egg or young. Like most storm petrels, age at first breeding is likely three to five years.

Feeding and Prey
- Feeding guild – NOCTURNAL PETREL

- Food capture –Tristram's storm-petrels feed by dipping prey from the ocean's surface on the wing, often pattering the water with their feet. They feed mostly at night, based on when items

found in their diet are available at the ocean's surface. Some daytime feeding is also possible.

- Foraging Distribution – Catches prey at or just below surface of the sea. Seen feeding at oilslicks, from whale (Cetacea) and seal (Pinnipedia) carcasses

- Microhabitat for foraging – Forages alone or with conspecifics, and typically forages at night.

- Diet – Their diet consists mostly of crustaceans, small squid and octopus. Ten adult stomach samples collected from Laysan and Nihoa contained (by average volume): 23% fish (Sternoptychidae, unidentified spp.), 28.8% squid (unidentified), 11.9% coelenterates (Velellidae), 10.1% unidentified remains, 10% common seabird tick (Argasidae), 5% various crustaceans (0.1% Euphausiacea, 1.3% Amphipoda, 1.7% Isopoda, 1.5% shrimp, 0.4% unidentified), 1.4% insects (1.1% Gerridae, 0.3% Lepidoptera). The lengths of 7 prey species averaged 11 mm.

Threats and Status

In Hawaii, breeding colonies are estimated at less than 10,000 pairs, with the largest populations occurring on Nihoa (2,000 - 3,000 pairs), Laysan (500 - 2,000 pairs), and Pearl and Hermes Reef (1,000 - 2,000 pairs). However, the secretive habits of this species combined with the remoteness and/or inaccessibility of their breeding sites makes population estimates difficult and likely inaccurate. The worldwide population is unknown.

Main threats to the species include:

- Predators – Adults and nests of burrowing and ground-nesting species are extremely vulnerable to predation by introduced mammals (e.g., rats, cats, dogs). Rat invasion (*Rattus* spp.) on Midway and Kure resulted in their extirpation from both atolls. Since the eradication of rats from Midway in 1996, individuals have been mistnetted but nesting has not been documented. On Kure, the first Tristram's chick following rat eradication in 2001 was discovered in 2006. Great care needs to be taken to prevent reinvasion.

- Invasive species – Non-native plants, specifically golden crown-beard (*Verbesina encelioides*) and sandbur (*Cenchrus echinatus*), degrade nesting habitat by providing poor soil stabilization. Habitat restoration projects on Midway and Laysan are attempting to remove alien vegetation and to encourage native species. Introduced big-headed ants (*Pheidole megacephala*) at Kure may cause nestling mortality, but also facilitate the destruction of native vegetation by a nonnative scale insect.

Selected Readings

Division of Forestry and Wildlife (DOFAW). 2005. Hawaii's Comprehensive Wildlife Conservation Strategy. Div. Of Forestry and Wildlife, Dept. of Land and Natural Resources, Honolulu, HI. www.state.hi.us/dlnr/dofaw/cwcs/process_strategy.htm

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Olson, S.L. and James, H.F. 1982. Prodromus of the fossil avifauna of the Hawaiian Islands. *Smithsonian Contributions to Zoology* No. 365.

Pratt, H.D., P. L. Bruner, and D. G. Berrett. 1987. The Birds of Hawaii and the Tropical Pacific. Princeton University Press, Princeton, NJ.

Slotterback, J. W. 2002. Band-rumped Storm-Petrel (*Oceanodroma castro*) and Tristram's Storm-Petrel (*Oceanodroma tristrami*). *In* The Birds of North America, No. 673 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.