

# FORK-TAILED STORM-PETREL

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## TAXONOMY

**Scientific name:** *Oceanodroma furcata* (Gmelin, 1789)

**Common name:** Fork-tailed Storm-petrel

**Family:** Hydrobatidae

**Taxonomic comments:** Two subspecies recognized: *Oceanodroma furcata furcata* and *O. f. plumbea* (Gabrielson and Lincoln 1959). Differences are morphological, behavioral and geographic: *O. f. furcata* occurs farther north, is slightly larger, lighter in coloration and may feed closer to shore. *O. f. plumbea*, the southern race, is smaller, darker and more gregarious (Boersma and Silva 2001).



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## DESCRIPTION

**Basic description:** A medium-sized storm-petrel.

### General description:

Medium-sized storm-petrel. Sexually monomorphic in plumage and general morphology. No seasonal or age-related plumage variability. Bluish or pearl-gray color, fading to white on chin, throat and under tail coverts. Forehead and ear patches darker grey to brownish. Tail shallowly forked; black webbed feet and bill (Gabrielson and Lincoln 1959). See Naveen (1981) for detailed information on storm-petrel identification.

**Length (cm):** 20-22

**Weight (g):** 55

### Reproduction:

Colonial nesters. Monogamous, with a clutch consisting of one egg (Boersma et al. 1980). Eggs laid in burrows with little to no nest material. Onset of egg laying variable between years; begins late April or May to June-July in northeastern Pacific (Alaska, Oregon; Boersma et al. 1980, Terres 1980). Incubation lasts 37-68 days (average 50). Both parents incubate egg and feed chick. Young fledge at 51-65 days (average 60; Boersma et al. 1980).

### Ecology:

Mainly pelagic; spends up to 8 months a year at sea. Nocturnalism and burrow-nesting are considered adaptations for avoiding avian predators; remote island nesting avoids mammalian predation (Lack 1968, Boersma and Groom 1993). Reproductive adaptations to variable and unpredictable weather and food resources include low incubation temperature, tolerance by eggs and chicks to parental neglect, and variable interannual growth rates (Boersma 1986a, Boersma and Parrish 1998, Boersma and Silva 2001). Chicks may go into torpor between irregular or consistently small feedings (during which

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growth nearly ceases), but grow faster when food loads are larger and more reliable (Boersma 1986a). They regurgitate oil as an anti-predator strategy (Boersma 1981).

### **Migration:**

Not highly migratory; disperses from breeding grounds to adjacent deeper waters (except for resident populations in California; Crossin 1974, Harrison 1982). Between April and June birds congregate over continental shelf and slope within 75-150 km of known colonies (Harrison 1982).

### **Food:**

Surface feeder. Feeds on small fishes, nectonic crustaceans, amphipods, copepods, euphausiids, decapods and squid (Boersma and Silva 2001). Relies on olfaction when foraging (Hutchinson and Wenzel 1980). When chicks hatch, adults switch from consuming primarily crustaceans and amphipods to fishes (Boersma and Silva 2001). During winter wave been observed in the Bering Sea skimming the surface for traces of oil from wounded seals or whales (Bent 1922). Extended nestling period, slow growth and frequent chick starvation suggest food is limited for populations breeding on the Barren Islands, Gulf of Alaska (Boersma et al. 1980). Food quality and quantity impact chick growth and peak weight (Boersma and Parrish 1998).

### **Phenology:**

Feeds day and night. Mainly nocturnal activity around breeding colonies (Manuwal and Boersma 1978, Spendelow and Patton 1988).

### **Habitat:**

Pelagic. Nests on offshore islands of restricted access; no records of mainland breeding (Boersma and Silva 2001). Primary nesting habitat is subarctic maritime tundra (Boersma and Silva 2001). Uses burrows excavated by other species (e.g., Tufted Puffin), digs own burrow, or uses sites in natural rock or cliff cavities. Nests in both soil and rocky slope habitats in Alaska, but seems to prefer rocky areas in California and Oregon.

Prior to egg-laying, birds congregate over continental shelf within 75 km of breeding colonies (Harrison 1982). Outside breeding season birds observed mostly in deep oceanic waters (Crossin 1974, Harrison 1982).

## **STATUS**

**Global rank:** G5 (20Nov1996)

**Global rank reasons:**

Secure - widespread and abundant.

**State rank:** S5B, S5N (23Jun2006)

**State rank reasons:**

Widespread coastal distribution; habitat protected throughout breeding range. Alaska population approximately 3.6 million birds; trend is stable to increasing since predator removal programs were initiated at breeding colonies. Mammals introduced to breeding

islands remain a significant threat; also susceptible to marine pollution, human disturbance and changes in food supply.

## DISTRIBUTION AND ABUNDANCE

### **Range:**

#### **Global range:**

*Breeding:* North Pacific from southern Alaska south along west coast of North America to islets off northern California, and from Commander south to Kurile Islands. At sea, from western Alaska south through Bering Sea and North Pacific coastally to central California, and to Hawaii, Marcus Islands, Japan. Most abundant in northern parts of range; offshore islands of Alaska, especially the eastern Aleutians, contain the core of species' breeding distribution. Currently, they are rare off California coast (NatureServe 2006).

*Non-breeding:* Little known; birds appear to disperse to deeper water near breeding grounds. Often associated with continental shelf break (Boersma and Silva 2001).

#### **State range:**

*Breeding:* Offshore islands of Alaska, especially the eastern Aleutians, contain the core of the species' breeding distribution. *O. f. furcata* breeds in the Aleutians, the Alaska Peninsula, and the Gulf of Alaska; *O. f. plumbea* breeds from Sitka south (Gabrielson and Lincoln 1959, Boersma and Silva 2001).

*Non-breeding:* Deeper water adjacent to breeding grounds (Boersma and Silva 2001).

### **Abundance:**

#### **Global abundance:**

The second most abundant storm-petrel breeding in the North Pacific (Boersma and Groom 1993). Global population estimate is 5 to 10 million individuals (Boersma and Groom 1993). Probably fewer than 10,000 individuals nest along Pacific coast from Washington to California; three largest nesting colonies are on Carroll Island and Middle and East Bodelteh Islands. An estimated 3.6 million occur in Alaska (Boersma and Silva 2001); 300,000 to 1,300,000 in British Columbia, and more than 100,000 in Russia (Boersma and Groom 1993).

#### **State abundance:**

Approximately 3.6 million individuals (Boersma and Silva 2001). The North Pacific Seabird Colony Database reports 131 colonies with a total of nearly 3,200,000 birds recorded during surveys (USFWS 2006).

### **Trends:**

#### **Global trend:**

Stable or increasing since mid-1970s (Dragoo et al. 2004). In Alaska, many Aleutian Island colonies were extirpated by introduced foxes in the early 1900s but re-established after fox removal and have been increasing since 1982 (Lensink 1984).

**State trend:**

Many Aleutian Island colonies were extirpated by introduced foxes in the early 1900s but re-established after fox removal and have been increasing since 1982 (Lensink 1984). Predator removal and associated re-establishment of colonies once extirpated by foxes suggests populations may have increased significantly in recent decades (Lensink 1984). Storm-petrel populations (Fork-tailed and Leach's, *Oceanodroma leucorhoa*, combined) have increased by 9.3% annually at Aiktak Island since 1990 and 7.4% annually at St. Lazaria since 1993; colonies monitored on Buldir and Ulak Islands did not exhibit significant trends (Dragoo et al. 2004).

## EXISTING PROTECTION

**Global protection:**

Most nesting habitat protected within federal conservation system units. The northwest Pacific region of Russia has six established Natural Reserves that include a marine component: Dalnevostochny Morskoy, Lasovsky, Sikhote-Alinsky Biosphere, Kurilsky, Kronotsky Biosphere, and Dzhugdzhursky. Only one of these (Dalnevostochny Morskoy, or the Far Eastern Marine Reserve) is a specialized marine Natural Reserve. Three (Dzhugdzhursky, Sikhote-Alinsky and Kronotsky NR) include both marine and terrestrial areas while two (Kurilsky and Lazovsky Reserves) have buffer zones which extend to the marine environment (Simard 1995). Under treaties with Canada, Mexico, Japan and Russia, seabirds of the U.S. are protected from exploitations (Lensink 1984). Some nesting areas are protected by the U.S. National Wildlife Refuge System.

**State protection:**

Most Alaska colonies are protected within the Alaska Maritime National Wildlife Refuge (Lensink 1984).

## CHALLENGES

**Global challenges:**

*Predation:* Accidental or intentional introduction of predatory mammals to breeding islands is the most significant threat. Introductions of domestic cats and dogs, rats, mongooses, river otters and other ground predators on offshore nesting islands have decimated many populations (Quinlan 1983, Brown and Nettleship 1984). Even mice can kill adult storm-petrels (Sibley 2001). Some colonies in California destroyed by cats (Everett and Anderson 1991). Introduced foxes exterminated colonies on some islands in Alaska (Lensink 1984). Cattle, sheep and horses trample burrows and erode hillsides. Breeders also vulnerable to avian predators: gulls, jaegers, skuas, owls, hawks and corvids (Watanuki 1986, Sibley 2001). Increasing numbers of predatory gulls in the last century because of food available at landfills and dumps have probably impacted storm-petrel populations (Sibley 2001).

*Pesticides and pollution:* Ingestion of weathered crude oil did not affect chick growth, perhaps because normal diet contains n-hexanes similar to oil; long-term impacts of oil ingestion on survival and reproductive success unknown (Boersma et al. 1988). High

concentrations of organochlorine pesticides such as DDE and polychlorinated biphenyls (PCBs) have been found in eggs and adult tissue, but impact is unknown; significant egg-shell thinning has not been documented (Ohlendorf et al. 1978, Henny et al. 1982, Boersma 1986b). Plastics commonly ingested but may be expelled when birds regurgitate (Boersma 1981).

*Human disturbance:* May be disturbed by campers, researchers, and aircraft bombing/testing (Buckley and Buckley 1984). Adults will desert nest if handled frequently (Boersma et al. 1980). At sea, attracted to lights from boats and may collide (Bent 1922).

*Climate change:* Shifts in oceanic circulation patterns which alter food supplies and distribution have recently been tied to climatic changes. A possible example of impact is reduction by 90 % of Sooty Shearwaters (*Puffinus griseus*) in the eastern North Pacific over the last 20 years (Sibley 2001). On the Barren Islands, chicks grew faster in the 1970s and 80s than in the 1990s, and Boersma and Parrish (1998) present evidence that chick growth is adjusted to changing resource availability, suggesting even small climate changes can impact demographics.

**State challenges:**

Introduction of predatory mammals (especially rats) to breeding islands is the most significant threat. Increased soil erosion and the collapse of nesting burrows by humans or large mammals is of concern. Hoofed animals introduced to some islands have also caused soil compaction, removed vegetation, and increased erosion (USFWS 2006). Other concerns include changes in local prey abundance as a result of climatic changes (Meehan et al. 1998); contamination as a result of oil pollution (e.g., bilge dumping and light oiling from fishing vessels) and spills; and human disturbance at nesting burrows causing adults to abandon their nests if handled (Boersma et al. 1980, Buckley and Buckley 1984). Increasing populations of gulls (i.e. artificial concentrations near garbage dumps) and other predators such as eagles and falcons will also likely impact survival of adults and lower reproductive success (Boersma pers. comm.).

## **RESEARCH AND INVENTORY NEEDS**

**Global research needs:**

Studies needed of survival to breeding age, pre-breeding behavior and distribution, population genetics, hormones and metabolic rates, as well as pelagic distribution and abundance.

**State research needs:**

Evaluate level of re-establishment on islands where predators have been removed and continue removal on remaining islands. Information on survival, food habits, and habitat use in winter range also needed.

**Global inventory needs:**

Little known about winter range or how distribution differs by sex, age or breeding status (Boersma and Silva 2001). Comparisons among existing census methods, standardized protocols and long-term monitoring sites to determine population trends also needed (Boersma and Groom 1993).

**State inventory needs:**

Complete a nesting inventory and continue current monitoring efforts. Census populations at index locations (e.g., every 3 years for 20 years). Location and extent of winter range needs to be defined.

## **CONSERVATION AND MANAGEMENT NEEDS**

**Global conservation and management needs:**

See State conservation and management needs.

**State conservation and management needs:**

Continue to survey and census colonies. Utilize careful predator management; keep predatory mammals off nesting islands. Prevent disturbance at nesting colonies as well as destruction of habitat (Vermeer et al. 1984). Avoid and remediate oil spills, organochlorines, plastic and other pollution. Locate fish processing plants and landfills far away from breeding colonies to avoid increasing avian predation by gulls and corvids as well as rat introductions from vessels. Research contaminant levels in eggs and ensure compliance with pollution regulations.

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