# NORTHERN FULMAR - FULMARUS GLACIALIS

**Taxonomy**: Kingdom: Animalia Phylum: Chordata Class: Aves Order: Procellariiformes Family: Procellariidae Genus: Fulmarus Species: F. glacialis

**Habitat**:

*Biomes*: Breeds on steep sea cliffs. Winters at sea from ice-covered northern waters to temperate zones. Pelagic; generally remains tens to hundreds of kilometers offshore during migration. Ice-covered regions in high-arctic zone through low-arctic and temperate boreal zones; scant movement into cool subtropical waters. Ranges widely over deep, cold waters in low-arctic regions, often showing clear preference for shelf break habitats.

**Distribution**:

*In US*: Alaska, British Columbia, arctic and e. Canada. 4 colony sites identified in North America-half in Alaska. ive small colonies found in Newfoundland and Labrador, but the majority of the North American population of Atlantic fulmars breeds at 11 colonies in the e. Canadian Arctic above 65°N.

*In Other Countries*: Russia, Greenland, Norway, Germany, France, Britain, and Ireland

*Holistic Description*: A gull-like relative of albatrosses and shearwaters, the Northern Fulmar is a bird of the northern oceans. It breeds in a few dozen scattered locations off Alaska and Canada, but is more abundant and widespread elsewhere in the northern hemisphere, especially in the northeast Atlantic.

*Species Richness*: 3 SUBSPECIES

*Population Dynamic*: Population at colonies in North America estimated at 1.5 – 2 million individuals, about 80% in Alaska, 20% in Canadian Arctic, and <0.01% in British Columbia, Newfoundland, and Labrado. Roughly 25% of total population consists of pre-breeding birds (ages 0–3 yr) that do not visit colonies or contribute to census totals. Atlantic population has expanded dramatically in range and number during last 200+ yr, mainly in boreal zone: Iceland, Faeroes, Britain, and n. European mainland.

**Evolution and Systematics**:

*Evolution*: Record sparse. Fulmarus miocaenus Howard, 1984, on basis of complete humerus from middle Miocene of California, was smaller than living Fulmarus species; Fulmarus hammeri Howard, 1968, described from a partial carpometacarpus of late Miocene age in California, was larger than extant forms.

*Systematics*: Broad geographic variation in plumage polymorphism and bill length size is well documented. Three subspecies, following Jouanin and Mougin (1979). Although some authorities have questioned the existence of two subspecies in the Atlantic Ocean (e.g., Cramp and Simmons 1977, van Franeker 1986), Salomonsen (1965) and Van Franeker and Wattel (1982) argued that northern (high arctic) and southern (low arctic) populations could be diagnosed. Size varies between sexes, with females averaging smaller (Van Franeker and Wattel 1982), so subspecific comparisons must be made with properly sexed birds. Apparent divergence in genetic barcode led Kerr et al. (2007) to suggest that Atlantic and Pacific taxa are distinct species.

*Number of Species*: 3 SUBSPECIES

*Number of Genera*: 3 SUBSPECIES

**Physical Characteristics**:

*Size and Length*: Length: 15.3-19.7 in (39-50 cm) Weight: 15.9-35.3 oz (450-1000 g)

*Wingspan*: 39.4-44.1 in (100-112 cm)

*Coloration*: Medium-sized seabird; gull-sized. Shaped like a gull, glides like a shearwater. Moderately long, rounded wings. Short, stout, pale bill. Short, rounded tail. Small dark patch in front of eye. Morphs vary from white to dark gray. Lighter morph whitish or light-gray on back and upper wings, with white head and neck. Darker morph uniformly gray.

*General Body Features*: Stocky gull-like seabird with a thick neck and a bull-headed appearance. Flies like a tank with stiff wingbeats. Varies in color from dark gray to nearly white. Note gray rump and tail on light morph birds. This bird is darker gray than other light morph birds in the Atlantic.

*Special Features of the Body*: The northern fulmar is a bird often studied for its arctic adaptations, such as its two colour phases. The light phase, characterized by a white body with grey wings, tail, and rump, increases in prominence with increased latitude. This may represent an adaptation for conserving heat, as white plumage warms the bird by reflecting the heat radiated by its body back to its skin.

*Special Features of the Head and Sensory Organs*: Well-developed sense of smell inferred from anatomical evidence (Bang 1966) and demonstrated in controlled field trials. Attracted to food-related odors at sea (fish oils and squid homogenate), exhibiting characteristic flight pattern for detection and guidance to source

*Dentition*: Lamellae/Beak/Gizzard

*Special Features of the Limbs and Digits*: NONE
*Any Special Internal Anatomy*: CHECK OTHER ALBATROSS
*Sexual Dimorphisms*: Wing, tarsus, and culmen average longer in males than in females.
*Differences Between Juvenile Stage and Adult*: Adults and immature inseparable except by dissection

**Behavior**:

*Diurnal, Nocturnal, or Crepuscular*: Diurnal
*Activity*: Takes food while swimming or plunging at surface of water.
*Locomotion*: Legs set far back; birds at rest crouch on tarsi. Shuffling gait, sometimes assisted by hooking or grasping with bill, for added purchase on steep terrain. Birds at colonies make deft use of up-currents along cliff faces, performing agile turns, stalls, and hovering while surveying terrain and activities of conspecifics on the ground. Airspace within a few hundred meters of a large colony typically the scene of myriad fulmars soaring in wide circles, individuals repeatedly approaching favored ledges, occasionally alighting. Flight over ocean consists of alternating glides and stiff-winged flapping, birds rarely rising more than a few meters above wave crests. In windy conditions, dynamic, or slope, soaring is used; ocean waves are the slopes and general direction of movement is across wind as well as downwind. Highly buoyant, generally languid swimmers at surface; able to submerge and propel using half-folded wings, but rarely do so.
*Communication and Perception*: Many patterns, ritualized and non-ritualized, described. Eleven patterns described in birds competing over discarded fish and scraps of offal at sea—"wing-raising," "rushing," "breast-to-breast" confrontation, physical fighting, and others—apparently on a scale of agonistic intensity. At breeding sites, site owners use cackling displays as first defense, sometimes reinforced by lunge toward intruder, who usually bolts immediately. Escalation provokes spitting behavior
*Home Range*: Nest sites normally are 1–2 m apart; those <1 m apart are usually separated by projecting rock or other physical obstruction.
*Degree of Sociality*: Highly gregarious when breeding; also at sea in presence of concentrated food sources. At colonies, frequently engages in Visiting, a characteristic form of social interaction involving directed approach of one bird (visitor) to within 0.5 m of another individual or pair (host) at a nest site.
*Level of Aggression*: Time spent in agonistic interactions decreases from arrival at colony (25%) through prelaying, incubation and chick-rearing (<10%; Mallory and Forbes 2008). Fighting over ownership of nest sites rare, but can be vigorous and protracted once initiated. Rivals may become locked together and tumble to water below. In a 25-min conflict between 2 birds observed below cliffs at St. George I., AK, "dominant bird would peck at the eyes, head and neck of the other... holding its opponent under water for periods lasting up to 4 min and averaging 2.5 min"; loser eventually drowned. More often, disputes settled in favor of established site-holders by communicative displays, including threatened or actual oil-spitting.
*Migration*: Pelagic dispersal; often no true directed migrations, although high-arctic birds clearly migrate to and from breeding areas in response to freeze-up and break-up of sea ice cover in their breeding areas (Mallory et al. 2008a). Likewise, birds breeding on the Semidi Islands, AK, migrate seasonally between nesting grounds in the western Gulf of Alaska and waters of the California Current off Washington, Oregon, and California.

**Predators**:

*Predators*: Gulls, Common Raven, Corvids, Bald Eagle, Steller's Sea Eagle, White-tailed Sea Eagle, Peregrine Falcon, Arctic Fox, Red Fox, Stoats/Ermines
*Anti-Predator Defenses*: Well-aimed, highly deterrent ejection of stomach oil is principal response of chicks and adults to approach of predators. At least 20 other species of birds (raptors, crows, owls, herons, gulls, passerines) believed or known to have been killed by contamination with fulmar oil.

**Diet and Nutrition**:

*Adult Diet*: Fish, squid, zooplankton, offal from fishing and whaling vessels, and other animal matter found at sea. Offal includes fish refuse (livers, entrails, and whole fish discarded by trawlers and factory ships), as well as remains of whales, walruses (Odobenus rosmarus), and seals, especially blubber. North Atlantic fulmars feeding in southern part of range rely more on fisheries offal than do birds feeding farther north.
*Juvenile Diet*: There are no records of juveniles getting/taking in different food, as they are fed by their parents.
*Special Adaptations for Getting Prey*: Obtains food by dipping, surface-seizing, surface-plunging, pursuit-diving, and scavenging; apparently unable to pick up prey while on the wing. Prey (mesopelagic fish, squid, and crustaceans available in surface waters only at night) and daily activity patterns (evening departures, morning arrivals at colonies) indicate importance of nighttime foraging, at least at lower latitudes. Night feeding directly observed in Bering Sea. Well-developed sense of

smell inferred from anatomical evidence and demonstrated in controlled field trials. Attracted to food-related odors at sea (fish oils and squid homogenate), exhibiting characteristic flight pattern for detection and guidance to source.

**Reproduction**:

*Mode of Reproduction*: Monogamous

*Mating System*: Fulmars reach sexual maturity anywhere between 6 and 12 years of age. They are monogamous and the pairs will generally return to the same nesting location every year. Breeding season begins in May. However the females are able to store sperm in specialized glands so they do not technically become pregnant for a number of weeks after mating. Fulmars create their nests on cliff sides. The nests are really just bare rock or at most a depression or scrape lined with a bit of grasses or seaweed. One egg is laid. The incubation lasts about 50 days with the parents taking turns staying with the egg. Once the egg hatches the hatchling is fed by the parents for about 2 weeks. Fledging occurs about 70 days after hatching.

*Mating Season*: May through July

*Courtship*: Principal displays observed between mated birds include Cackle Head-Shaking and allopreening. Former initiated by either sex, but almost immediately becomes mutual display, both birds with outstretched necks uttering soft cackle. Male waves neck slowly about its base vertically, horizontally, diagonally; female shakes head side to side, her bill darting between male's open mandibles. Entire display lasts up to 20 s, may be repeated, apparently spontaneously, at intervals of 1–2 min on days of peak attendance in pre-laying period, and also occurs when a bird joins mate at site or after an intruder has been driven from territory. Allopreening entails mutual grooming of head, nape, and upper breast feathers, continuing up to several minutes once initiated, active and passive roles reversing several times during a bout.

*Territoriality*: As far as is known, limited to defense of permanent nest site used for courtship, mating, incubation, and care of young. Territory around nest scrape apparently includes airspace within about 1 m of nest.

*Mating*: Copulation protracted, rarely lasting <1 min, sometimes ≥6–8 min. After mounting, male arches neck over female's head, shakes head rapidly from side to side, bill pointed downward. Female mostly passive, but cooperation to the extent of rotating tail and allowing cloacal contact is essential for successful copulation. No special pre- or postcopulatory displays. Pairs mate apparently only on land, at or very near nest site.

*Nesting*: The nests are really just bare rock or at most a depression or scrape lined with a bit of grasses or seaweed. One egg is laid. The incubation lasts about 50 days with the parents taking turns staying with the egg. Once the egg hatches the hatchling is fed by the parents for about 2 weeks. Fledging occurs about 70 days after hatching. NEST IS A SCRAPE ON BARE ROCK OR PEBBLES.

*Egg-Laying*: Clutch Size: 1 egg Egg Shape: Sub Elliptical Egg Length: 71.0 mm Egg Width: 49.7mm Egg Mass: 98.1 g Egg Color: White, often becoming heavily soil stained during incubation. Egg Texture: Dull and Rough Incubation Period: 47-49 days

*Hatching and Incubation/Gestation*: Downy and helpless, eyes open. Semialtricial, nidicolous. Down bluish gray to white; bill and legs gray, changing to black during first week.

*Development*: Chicks gain ability to thermoregulate at 3–6 d. Chick growth does not appear to be determined by delivery rates of prey, but rate and patterns of chick development (e.g., faster development of pectoral muscles and plumage) influenced by internal resource allocation.

*Parental Care*: By both parents; continuous for first 10–16 d. While one parent broods, other is generally away from colony foraging. Both parents feed chicks, beginning <24 h after chicks hatch. Although last 2 wk of prefledging development are marked by declining body mass, chicks commonly are fed until 3–5 d before fledging, some receiving food on the day before they go to sea.

*Lifespan*: Up to 40 years in the wild.

**Conservation**:

*Official Federal Status*: Least Concern

*Special Statuses in Individual States*: NONE

*Threats*: There is no immediate threat to Northern Fulmars, but high local density of breeding populations may make the species vulnerable to catastrophic changes in food supply or other environmental conditions. The North American Waterbird Conservation Plan estimates a continental population of 2.1 million breeders, rates them a 10 out of 20 on the Continental Concern Score, and lists them as a Species of Moderate Concern. They are not listed on the 2014 State of the Birds Report.

*Conservation Efforts*: ^^^^^^

**Extra Facts**:

1. The Northern Fulmar is one of the longest-lived birds. Data from one study indicate a mean adult life span of about 32 years. In Scotland, several Northern Fulmars banded as adults in 1951 were still breeding in 1990, at ages likely greater than 50 years.

2. The Northern Fulmar begins breeding at an exceptionally old age. Most do not breed until they are at least 8 to 10 years old; one study found an individual that started breeding at age 20.
3. The Northern Fulmar is well known among commercial fishermen for its avid scavenging of offal thrown from whaling and fishing boats.
4. The population of Northern Fulmars in the northeast Atlantic has dramatically increased over the past 250 years. Once only one colony was found in northern Iceland, and none off the Faeroes or the British Isles. Now hundreds of colonies exist across all the coasts of these islands. It is unclear whether this change has resulted from natural oceanographic changes, from increased food availability from fishing vessels, or from some other factor.
5. The Northern Fulmar can dive to a depth of at least 3 meters (10 feet).
6. The oldest recorded Northern Fulmar was at least 19 years, 1 month old when it was found in Nunavut.

**Notable Species**:

1. F. g. glacialis – (Linnaeus, 1761): the nominate race, which breeds in the high Arctic regions of the North Atlantic
2. F. g. auduboni – Bonaparte, 1857: breeds in the low Arctic and boreal regions of the North Atlantic
3. F. g. rodgersii – Cassin, 1862: breeds on the coast of eastern Siberia and the Alaskan Peninsula