RED-LEGGED KITTIWAKE

TAXONOMY

Scientific name: *Rissa brevirostris* (Bruch, 1853)
Common name: Red-legged Kittiwake
Family: Laridae
Taxonomic comments:
Genetic analyses from three principal breeding colonies suggest that Red-legged Kittiwakes probably constitute a single evolutionary significant unit (Patirana et al. 2002).

DESCRIPTION

Basic description: A seabird (gull).

General description:
Adults are mostly white, but the upper surface of wings and back are dark gray; wings are tipped in black. The bill is yellow and has bright red legs and feet. Sexes have similar definitive plumage. Smaller than its closest relative, the Black-legged Kittiwake (*Rissa tridactyla*), but most obvious difference is leg color. During the non-breeding season, has a black "smudge" on each side of head, behind eyes. Young birds also show these black facial marks, along with a grayish-black collar along back of head.

Length (cm): 38
Weight (g): 400

Reproduction:
On the Pribilofs, eggs are laid usually in early to mid-June. Tendency to lay a single clutch egg is well documented (Hunt and Hunt 1977, Byrd and Day 1986, Hatch et al. 1993, Byrd and Williams 1993, Byrd 1994), although there is some record that two eggs were more common historically (Coues 1875, Cullen 1957). Kittiwakes arrive at nesting colonies in mid-to late April; usually begin nesting by early to mid-June; peak in egg laying between June 13 to July 11 (based on 16 seasons of data from the Pribilofs); incubate for ~30 days; hatch between July 7 and August 13 (based on 20 seasons of data from the Pribilofs); chicks attain flight around 37 days old, but continue feeding at the nest for several weeks thereafter (Byrd and Williams 1993, Byrd 1994). Nestlings are semi-precocial. Nests in large colonies. Good reproductive output on St. George Island is correlated with cold winters with more sea ice; a regression model predicts that a 5ºC increase in average winter temperature in the Bering Sea would, on average, result in a 15% reduction in overall reproductive success (Kildaw 1997).

Ecology:
Nest colonies occur on ledges of vertical sea cliffs up to 300 m high. Commonly found nesting in the same sites with Black-legged Kittiwakes and murres (*Uria* spp.). Feeds in surface waters,

sometimes with Black-legged Kittiwakes. Red-legged Kittiwakes have a larger eye than black-legged, a possible adaptation to night feeding when vertically migrating prey become available.

Migration:
Found on site during breeding season from April-Oct.

Phenology:
Feeds nocturnally.

Habitat:
Breeding: Nests on islands on vertical sea cliffs often in association with Black-legged Kittiwakes and murres. Feeds at sea within 150 km of colony. In summer, highest concentrations over deep water, from edge of continental shelf (200 m) to water 2,000 m deep (Byrd and Williams 1993). Nest is made of mosses, grasses and mud (Pough 1957).

Non-breeding: Primarily pelagic. In winter, feed in even deeper water (Byrd and Williams 1993).

STATUS

Global rank: G2G3 (1996-11-27)
Global rank reasons:
Breeding range is restricted to four island groups within the Bering Sea. The population appears to have declined by over 50% in the past twenty years on St. George Island, where over 80% of the population breeds. Reasons for fluctuations in numbers are unclear, but may be related to low marine food productivity. Concern that commercial fishing may have reduced food supply. Poor reproductive output is also of concern. Little is understood about their wintering areas. Colonies nest on steep sea cliffs leaving them vulnerable to severe weather.

State rank: S2S3B, S2N (2004-06-14)
State rank reasons:
Breeding range is restricted to four island groups within the Bering Sea, three of which occur in Alaska. Apparent population decline of over 50% in the past twenty years on St. George Island, where over 80% of the population breeds (Byrd et al. 1997). Reasons for the decline are unclear, but may be related to low marine food productivity. Alaska breeding range protected within Maritime National Wildlife Refuge. Entire population at risk if those colonies are threatened (i.e. introduced predators such as rats from ships as a result of recent harbor construction). Concern that commercial fishing may have reduced food supply. Poor reproductive output is also of concern.

DISTRIBUTION AND ABUNDANCE

Range:
Global range:
Breeding: In Alaska on the Pribilof Islands, Bogoslof Islands, and Buldir Island, and on the Commander Islands, Russia (Hatch et al. 1993, Byrd et al. 1997).

Non-breeding: Extends from south of the Pribilof Islands to the Northern Gulf of Alaska to the Southeast ice edge of the Bering Sea. There is one September record on Admiralty Island in

Southeast Alaska (feeding on salmon) (Siegel-Causey and Meehan 1981). It is believed that breeders from the Commander Islands winter in the Northeast Pacific Ocean; their summer feeding range is unknown (Byrd and Williams 1993).

State range:
Breeding: On St. George, St. Paul, and Otter islands in the Pribilof Island group; Bogoslof and Fire islands in the Bogoslof Island group; and Buldir Island in the western Aleutian chain (Byrd and Williams 1993). Approximately 80 % of Alaska population breeds on St. George Island in the Pribilofs (Byrd et al. 1997). A new Red-legged Kittiwake colony was established at Koniuji Island in 1996 and chicks were observed there for the first time in 2000 (Dragoo et al. 2001, Williams and Byrd 2001); however this colony was almost completely abandoned in 2003 (Barton and Lindquist 2003).

Marine range: In summer, Alaskan breeders found within 120-150 km of nesting sites. Pribilof Island breeders concentrate south of islands near the edge of the continental shelf (Byrd and Williams 1993, Byrd 1994).

Non-breeding: Exact whereabouts not well known. Winter sightings mostly in Gulf of Alaska and near the ice edge in the Bering Sea (Byrd and Williams 1993, Hatch et al. 1993, Byrd 1994).

Abundance:
Global abundance:
Currently less than 170,000 individuals estimated breeding in the Bering Sea (Byrd et al. 1997).

State abundance:
Alaska breeding population currently less than 140,000 (Byrd et al. 1997).

Trends:
Global trend:
Global long-term trend: Historical accounts suggest a substantial reduction in numbers and Alaska breeding distribution in the past 100 years (Hatch et al. 1993). Since the 1970s the population as a whole has declined by as much as 50%. The declines in the Pribilof Islands population account for the majority of the reduction in global population estimates (Byrd 1994).

Global short-term trend: World population estimate based on counts made in the mid-1970s was 260,000 birds, however, changes by early 1990's suggest numbers below 170,000 due to declines in Pribilof Island population (Byrd et al. 1997). Between the mid-1970s and the early 1990s, populations in Pribilof Islands declined on monitored plots by about 50 percent (Byrd and Williams 1993). The Bogoslof Island population may be increasing (Byrd et al. 2001); numbers more than doubled at Buldir Island between mid-1970s and 1992 (4,400 in 1976 to 9,350 in 1992; Byrd 1994). Recent estimates in the Commander Islands (17,000 pairs) suggest numbers may be increasing (Byrd and Williams 1993, Byrd et al. 1997).

State trend:
In 1970s, breeding population was estimated at 222,000 birds; however, changes by early 1990s suggest numbers below 170,000 due to declines in the Pribilof Island population (Byrd 1994, Byrd

et al. 1997). Since mid-1970s, populations on Pribilof Islands (St. George and St. Paul) declined on monitored plots by about 50% (Byrd and Williams 1993). Bogoslof Island population appears stable (Byrd 1994); numbers more than doubled at Buldir Island between mid-1970s and 1992 (4,400 in 1976 to 9,350 in 1992; Byrd 1994). The recently established (1996) colony on Koniuji Island reached a high of 40 individuals in 1998 and stabilized at 15 to 20 birds in 2000, but in 2003 only 7 birds were observed (Barton and Lindquist 2003).

EXISTING PROTECTION

Global protection:
In 1982 the Maritime National Wildlife Refuge (MNWR) expanded to include nesting sites in the Pribilof Islands. The MNWR also includes Bogoslof and Buldir Islands. Public access is restricted in colonies on the Commander Islands due to their endangered status in Russia and the status of the Commander Islands as a Nature Reserve (Byrd and Williams 1993, Byrd 1994). Inaccessible breeding sites further protect this species from human recreational disturbance.

State protection:
In 1982 the Maritime National Wildlife Refuge (MNWR) expanded to include kittiwake nesting sites in the Pribilof Islands. The MNWR also contains the Bogoslof Islands and Buldir Island (Byrd and Williams 1993). Inaccessible breeding sites further protect this species from human recreational disturbance.

CHALLENGES

Global challenges:
The cause of the decline is unclear; little is known about these birds away from breeding sites (Byrd 1994). A decline in food supply due to excessive commercial fishing may be the cause, although little is understood about this phenomenon (Byrd and Williams 1993). Ecological modeling studies predict that warmer winters with less sea ice will result in poorer reproductive output; thus global warming may be a great potential threat (Kildaw 1997). The effects of subsistence hunting and egging on kittiwake populations are unknown. Nest sites typically occur on cliffs, resulting in little human disturbance to breeding birds. No information is available on disease and environmental contamination loads in kittiwakes (Byrd 1994). Breeding areas within the United States are protected within the Alaska Maritime National Wildlife Refuge. Russian breeding sites are protected by an endangered classification, which restricts public access to nesting cliffs (Byrd and Williams 1993). Predatory birds commonly steal chicks and eggs, although adults may also be attacked (Byrd and Williams 1993). Kittiwakes are typically resistant to the effects of floating oil (Piatt et al. 1990, cited in Hatch et al. 1993). Breeding failure (e.g. failure to lay, depressed clutch sizes) suggests the possibility of avian influenza virus (AIV) (Hatch et al. 1993).

State challenges:
Recent harbor construction and other development on the Pribilof Islands could potentially increase the chance of introducing Norway rats to the islands. In response to this threat, a rat prevention/control program is currently underway on the Pribilof Islands to try to prevent the introduction of rats. Nest predation by rats would have a serious negative effect.
Also, see Global challenges.

RESEARCH AND INVENTORY NEEDS

Global research needs:
Research needs include: 1. Continue studies on migration patterns and behavior to gain a better understanding of critical wintering habitat. 2. Further investigate food supply fluctuations which may yield evidence behind population decline. 3. Determine species response to management practices; may demonstrate the need for modifications to ensure maximum effectiveness of practices. 4. Continue population census. 5. Determine effects of fox predation on chicks.

State research needs:
Research needs include: 1. Investigate contaminant loading. 2. Research feeding ecology and processes affecting food availability in the Pribilof Islands. 3. Conduct controlled studies to separate predation and food supply as factors affecting breeding success. 4. Interview local people in the Pribilof Islands to incorporate indigenous peoples' knowledge about population trends. 5. Evaluate magnitude and timing of subsistence harvest in the Pribilof Islands. 6. Continue investigations of environmental processes causing change (Byrd 1989, Hatch et al. 1993, Byrd 1994).

Global inventory needs:
Continue to census population at breeding colonies.

State inventory needs:
Continue population monitoring at breeding colonies. Continue to band and resight banded birds at Buldir and St. George Island to calculate annual adult survival (Hatch et al. 1993, Byrd 1994).

CONSERVATION AND MANAGEMENT NEEDS

Global conservation and management needs:
Continue habitat protection at all four breeding locations. Ensure a buffer zone restricting trawl fishing around breeding sites (this practice has already been implemented on the Pribilof Islands). Russia should continue to protect Red-legged Kittiwakes and their habitat in the Commander Islands, and institute a long-term monitoring program.

State conservation and management needs:
The following conservation measures were recommended by Byrd (1994): 1. The magnitude of subsistence harvest in the Pribilofs should be assessed and work should be done with local people to ensure minimization of human impact on kittiwake populations. 2. Conduct environmental education programs that emphasize the uniqueness of the species. 3. Work cooperatively with other agencies to minimize adverse impacts to Red-legged Kittiwakes from airport operation at St. George. 4. Continue operation of cooperative rat prevention program in the Pribilofs. 5. Have National Marine Fisheries Service (NMFS) observers gather information about fisheries interactions including counts of kittiwakes associated with floating processors.

Recently there has been a proposal to ban trawl fishing around the Pribilof Islands in order to protect kittiwakes.

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