



WILDLIFE AND GLOBAL WARMING

# Navigating the Arctic Meltdown



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## IVORY GULLS

Arctic lore is rife with the ghosts of doomed voyages and other legends, but the story of a pale seabird disappearing from its icy haunts is no tall tale. The ivory gull is, in fact, literally losing ground as rising temperatures melt its polar sea-ice habitat.

Aerial surveys of ivory gull breeding colonies, bird counts conducted at sea and the observations of local native people all point to a precipitous fall in Canadian populations. A recent aerial survey of nesting ivory gulls documented an 80 percent decline in the number of breeding birds since the 1980s. Surveyors found several of the largest colonies completely extirpated and significantly fewer nesting birds in the remaining colonies. At sea, where the gulls forage and feed in the polar icepack, researchers aboard cruising icebreakers in 2002 saw less than a third of the number of ivory gulls seen in 1993, and no ivory gulls scavenging around polar bear kills on the sea ice. Canadian Inuit communities with firsthand knowledge of this seabird, which shares their isolated homeland, also note a downturn.

These observations alarm conservationists. “[Surveys] showed a really significant decline in the number of birds nesting in Nunavut, which is the only place they nest in Canada,” says Dick Canning, a member of the Commit-

tee on the Status of Endangered Wildlife in Canada. Adds Mark Mallory, a seabird biologist with the Canadian Wildlife Service: “It’s disconcerting that some of these birds—feeding right at the top of the food chain in the marine ecosystem—appear to be declining.”

The decline is especially alarming because the ivory gull, never common to begin with, is one of the least-known seabird species in the world. It met the definition of a rare bird—fewer than 14,000 pairs worldwide—even before global warming started to alter its habitat. The species’ scientific name, *Pagophila eburnea*, comes from Latin words meaning “ice-loving” and “ivory,” and ice is indeed a key foraging and breeding habitat for this snow-white seabird. Ivory gulls scavenge food from the kills of polar bears and other pack-ice-associated mammals and also establish breeding colonies near ice fields and glaciers. With climbing temperatures significantly shrinking Arctic ice, ivory gulls are facing a potential calamity.



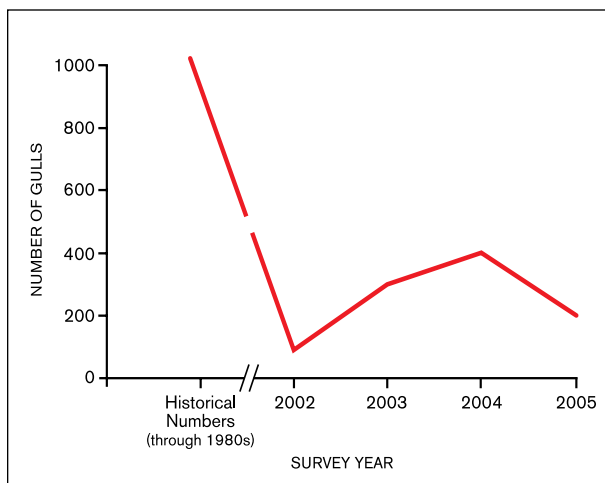
The ivory gull (above) is a medium-sized gull, 16 to 17 inches long. Short-necked and stocky, its body is more like a pigeon's or dove's than a gull's. Ivory gulls nest on nunataks (above, right), outcroppings of barren rock such as these jutting from the ice cap on northern Canada's remote Ellesmere Island.

### A RARE BIRD

In addition to being among the rarest of the rare, the ivory gull is the northernmost-dwelling seabird. It inhabits remote islands and coastal areas of Alaska, Canada, Greenland, Norway and Russia, foraging on beaches, gravel banks near glaciers and at the ocean surface, especially along the edges of the ice. On beaches, ivory gulls sometimes follow receding waves to catch small invertebrates and fish. They forage extensively in waters near ice floes, where nutrient runoff and upwelling make the waters productive and reduced light levels under the ice drive prey closer to the surface. Around floes, the gulls find a diversity of prey including lanternfish, walleye pollock, squid, juvenile arctic cod, mollusks and other invertebrates.

### Ivory Gull Breeding Populations on Canadian Arctic Islands

SOURCES: GEORGE 2006, GILCHRIST ET AL. 2005 (SEE REFERENCES)



The number of ivory gulls breeding in Canada has plunged since the 1980s, a decline that coincides with the shrinking of the ice fields and glaciers that keep Arctic foxes and other predators away from their nests.

These seabirds do much of their foraging at night. In their winter range, which is mostly near or above the Arctic Circle, light levels are continuously low and bioluminescent lanternfish are a particularly important food source. During summer, ivory gulls add lemmings and other small mammals to their menu. They also scavenge animals killed by polar bears and by Inuit hunters; large carrion sources can attract flocks of 50 to 100 birds. Opportunistic feeders, these gulls will also eat dung, blood from wounded animals and garbage near human settlements.

Sometimes ivory gulls follow gray whales and seals, which can churn up small prey during feeding dives. When feeding at sea, ivories hover above the water and make shallow dives to retrieve prey, seldom submerging completely or swimming for long durations. They rarely dive at all if the air temperature is cold enough to potentially freeze their feet or wings.

In April and May, these polar nomads depart their wintering range on the sea ice and migrate back to breeding sites, typically five to 25 miles inland on rocky islands 1,300 to 3,300 feet above sea level. There they settle in small breeding colonies, select a depression or niche to nest in along limestone ridges or on nunataks (small outcrops of barren rock and scree surrounded by glaciers). Ivory gulls will also nest on flat ground if there are sufficient boulders and crevices to shelter them from predators such as Arctic foxes, snowy owls and gyrfalcons. The male and female build the nest together, using moss, dried grasses, seaweed, driftwood, lichens and feathers. Clutch size is small, generally one or two eggs, which both parents take turns incubating. The eggs hatch within 24 to 26 days; the young fledge 30 to 35 days later. In September, the gulls start leaving their breeding grounds for their winter range.

Given their rarity and a natural history that includes nomadic travels, remote habitats and widely scattered breeding popula-

tions, ivory gulls are difficult to study. However, we have learned enough about the species to know that it is in steep decline.

### WARMING TRENDS

In the early 1970s, aerial surveys of wintering habitats in Canada and Greenland gave extrapolated (and perhaps overly generous) estimates of as many as 35,000 birds. More recent surveys suggest the population has since dropped dramatically. A global population estimate in 1996 amounted to only 12,500 pairs. Estimates from aerial and ground surveys from the eastern Canadian high Arctic indicate that by 2002, the population in Canada dropped by 75 percent from 1993, and by 85 percent from the 1980s when the Canadian population was about 2,400 birds. Many of the largest known ivory gull colonies were completely abandoned. Researchers found only 83 nesting birds in 2002 and 306 in 2003, and concluded that the ivory gull had seen “one of the greatest population declines ever detected for a bird species in North America.” The latest survey by the Canadian Wildlife Service in 2005 found just 200 ivory gulls, a population drop of 90 percent. “If that continues,” says Dick Canning of the Canadian committee on endangered wildlife, “they’ll be toast.”

Further evidence of decline comes from Inuit communities near the gulls’ migratory routes and breeding colonies, which also reported fewer ivory gulls. At some garbage dumps where the gulls were once prevalent, locals now see only other gull species and ravens.

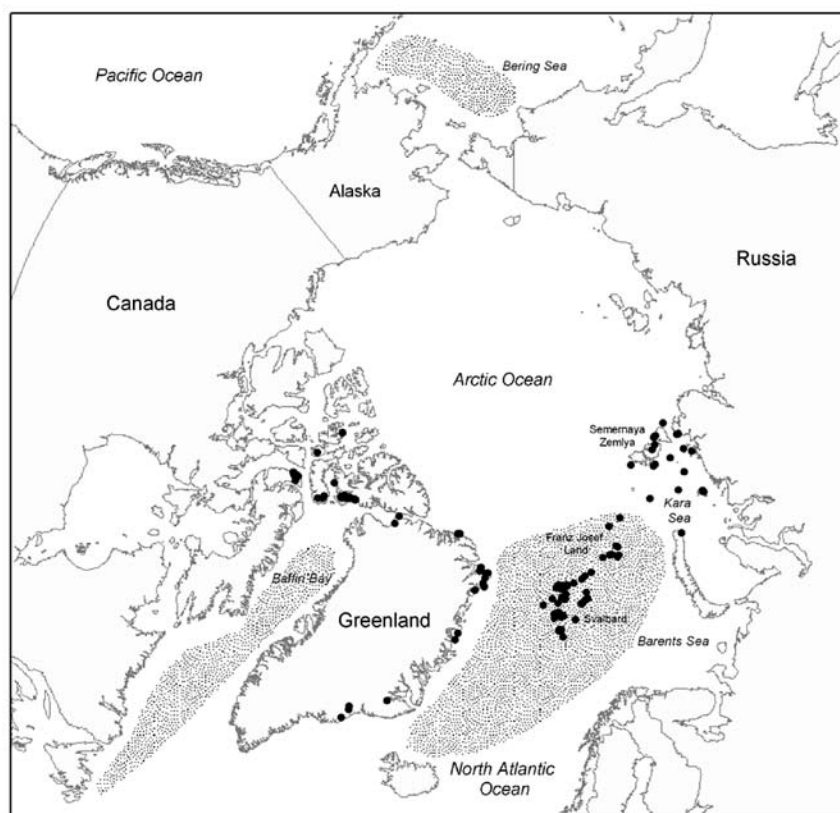
In 2006, the World Conservation Union (IUCN) designated the ivory gull “near threatened,” and Canada listed it as a “species of special concern” under its Species at Risk Act. Additional threats to the gull include exposure to oil and toxic pollutants, noise and disturbance from drilling and mining near breeding colonies and predators attracted by the refuse from human settlements. Subsistence hunting may be another factor in the bird’s decline, although the species is not widely hunted by the Inuit. However, given their remarkable dependence on the pack-ice ecosystem, climate change poses the most serious threat to ivory gulls.

Ivory gull habitat is clearly vanishing. The sea-ice pack is thinning, disappearing or moving farther offshore, leaving the gulls with much less of the sea-ice edges they need to survive. Like other swimming birds, ivory gulls are capable of resting on water, but the pack ice allows them to roost close to their preferred foraging sites without suffering extreme heat loss from lengthy immersion in frigid waters.

The ice fields and glaciers that protect isolated, inland ivory gull breeding colonies from Arctic foxes and other predators are also shrinking—15 percent to 20 percent since the 1960s. Without these icy barriers to safeguard them from predation at a critical stage of their life cycle, ivory gulls are abandoning long-established breeding colonies.

The effects of climate change on other Arctic animals further compounds the problems faced by ivory gulls. For example, although experts differ on the extent to which the gulls depend on polar bear kills for scavenging, some of their food supply undoubtedly comes from this bear, which the

### Ivory Gull Breeding Distribution and Wintering Range



Ivory gull breeding colonies (large dots on map) are found on the rocky cliffs and shores of the high Arctic near the edge of the northern arctic ice pack. The gulls typically spend most of the winter at sea off the ice-pack areas of the Arctic Ocean (stippled areas on map). Individual birds occasionally stray as far south as Virginia and North Carolina, but, for the most part, ivory gulls are rarely far from pack ice.

U.S. government recently proposed for listing as threatened under the Endangered Species Act. The decline of the polar bear, an important Arctic ecosystem predator, could further stress the ivory gull.

### PREPARING FOR THE MELTDOWN

To save the ivory gull's Arctic habitat, we must act now to reduce the emission of greenhouse gases. In addition, we can take other important steps to help the ivory gull navigate a looming bottleneck of complex threats posed by climate change.

- **Conduct more research on ivory gull populations, ecology and trends.** Given the alarming trends documented in Canada, it is critically important to know what is happening to the world's other ivory gull colonies, particularly those in Russia and Norway, where even the most basic research and monitoring has been lacking in recent years. Although bird research in the high Arctic is expensive, not to mention dangerous, we must secure international research funding for the coordinated ivory gull monitoring surveys so urgently needed in Canada, Greenland, Norway and Russia.
- **Educate hunters to prevent accidental and illegal shooting of ivory gulls.** Researchers studying banded ivory gulls found that 90 percent of recovered bands

came from birds shot in Greenland or Nunavut, where only Inuit peoples have the legal right to hunt ivory gulls. Although the Inuit rarely pursue ivory gulls actively, researchers suspect that ivory gulls are often mistaken for other more common birds. Canada and Greenland should continue to support public education programs to reduce accidental and illegal shooting of ivory gulls and increase law enforcement efforts as necessary.

- **Fully protect ivory gull breeding colonies and habitat.** Nesting ivory gulls are highly sensitive to human intrusion. Development, pollution, recreation and even tourism can cause problems for these gulls and should be minimized in areas close to breeding colonies. Oil and mineral exploration operations on islands that support ivory gulls, or could support them, should take steps to minimize impacts on the birds. Land and resource managers should also conserve potential nesting habitat near colonies and buffer it from disturbances, especially from noisy ATVs, low-flying aircraft, motorboats and the shipping traffic that retreating summer ice allows. Trash, which can attract scavengers and predators that might not otherwise be a threat, should be carefully handled around ivory gull breeding colonies. Key nests and entire colonies may even need special protection from predators.

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