



WILDLIFE AND GLOBAL WARMING

Navigating the Arctic Meltdown



KITTLITZ'S MURRELETS

Kittlitz's murrelet is a master of camouflage. For mating season, this small bird goes from high-contrast black and white to drab and speckled—the better to blend into its bleak breeding grounds on the rocky slopes of coastal Alaska and Siberia. In fact, nesting Kittlitz's murrelets are so well-camouflaged and prefer such rough terrain, few nests have been found. Now global warming threatens to make this little-known, glacier-dependent seabird even harder to find.

Kittlitz's murrelet has an affinity for glaciers unique among seabirds. Nesting high on the rocky slopes of coastal Alaska, this Arctic diving bird feeds almost exclusively in the productive waters where glaciers meet the sea and food is plentiful. As our planet warms, however, these glaciers are melting and retreating, disrupting the productivity of the waters where these birds feed. Meanwhile, Kittlitz's murrelet populations are plummeting. In Alaska's Prince William Sound, for example, Kittlitz's murrelet numbers dropped 97 percent between 1972 and 2001. Although several factors contributed to this decline, global warming is emerging as one of the most serious threats to these ice-dependent birds.

A GLACIAL SPECIALIST

About the size of a robin, Kittlitz's murrelet is one of the smaller members of the avian family that also includes auks and puffins. It nests within a few miles of coastal glaciers amid ice and snow on the steep, rocky mountains 1,000 to 3,000 feet above sea level. The nest is typically a small scraped-out area on a slope of loose rock, generally situated just down slope from a boulder large enough to offer some protection from wind and falling rocks. The female lays a single egg, which both parents take turns incubating for about 30 days. Parents also share in the feeding of the chick, caring for it until it is ready to leave the nest at roughly 25 days. At this stage, the chick is still not a strong flyer, and



© NIEBRUGGE IMAGES

A Kittlitz's murrelet in breeding plumage in the high Arctic. These robin-sized seabirds have large eyes that help them spot krill and small fish in the murky waters where glaciers meet the sea. These murrelets also nest near coastal glaciers, scraping out small depressions in loose rock on steep slopes in which the female lays a single egg. Their drab breeding plumage helps the birds blend into their rocky nesting grounds.

many young murrelets probably flutter downhill to nearby glacial streams or rivers and float downstream to the sea.

At sea, Kittlitz's murrelets find plenty to eat in the productive waters around stable or advancing tidewater glaciers. Phytoplankton grows on the underside of this ice, and fish, krill and other tiny invertebrates amass to graze on it, often becoming trapped in currents around the glaciers. A study showed that the diet of Kittlitz's murrelets is about 30 percent krill and other small crustaceans and 70 percent small fish including capelin, herring, sand lance and some sand fish.

Most seabirds ignore this rich source of food at glacier's edge and forage farther away in waters unclouded by the sediments that limit visibility near glaciers. Kittlitz's murrelets, however, have proportionally larger eyes than other Arctic seabirds, and scientists believe this is an adaptation that allows them to locate food in cloudy waters around tidewater glaciers and thus to occupy a marine niche with few competitors.

Regrettably, global warming is hastening the retreat of tidewater glaciers, and ebbing glaciers don't offer the same advantages as stable or advancing ones. Retreating glaciers cause excessive sedimentation, and even Kittlitz's murrelets have a tough time finding prey in extremely silty waters. The

melting ice also infuses the sea with fresh water, decreasing salinity and further hampering productivity. Between the very poor visibility and the reduction in phytoplankton and other food organisms, Kittlitz's murrelets are rare in areas where glaciers are retreating.

WARMING TRENDS

The accelerated warming in the Arctic is melting the glaciers that Kittlitz's murrelets rely on for their survival. As global warming moves tidewater glaciers inland, the results will be increasingly disastrous for these little birds. In Prince William Sound alone, only a few glaciers in the high coastal mountains of the northwest corner are still stable or advancing. This area is the last stronghold of the Kittlitz's murrelet in the sound; the bird has all but disappeared from the glaciers that are retreating in most of the rest of the area.

In the 1970s, Kittlitz's murrelets were described as "common" with an estimated 63,000 birds in Prince William Sound and more than 100,000 in the broader northern Gulf of Alaska. A 1989 survey found 6,400 birds in the sound, and a 2001 survey counted 1,969 birds—a 97 percent drop in 30 years and an annual decrease of 18 to 24 percent during the 1990s. Similar downward trends were found in

“THE FATE OF THE KITTLITZ’S MURRELET MAY HINGE ON THE FATE OF ALASKA’S GLACIERS, AND THEREFORE KITTLITZ’S MAY BE AMONG THE WORLD’S FIRST AVIAN SPECIES TO SUCCUMB TO THE EFFECTS OF RISING GLOBAL TEMPERATURES.”

**- JOHN F. PIATT, U.S. GEOLOGICAL SURVEY, AND
KATHY KULETZ, U.S. FISH AND WILDLIFE SERVICE,
FROM THE ARCTIC WARBLER, SPRING 2005**

Glacier Bay, where populations dropped 89 percent between 1991 and 2000, and on the Kenai Peninsula, which posted an 83 percent decline from 1976 to 2002. By all counts, Kittlitz’s murrelet population numbers are falling rapidly. This relatively sudden and alarming downturn in populations prompted the World Conservation Union (IUCN) to grant the species “critically endangered” status on its Red List of imperiled animals.

Global warming is not solely to blame. Recreation-related disturbances—such as the ships and helicopters that carry glacier-viewing tourists—disrupt feeding and nesting Kittlitz’s murrelets. And as marine diving birds they are highly vulnerable to oil spills and fishing nets.

Like other diving seabirds, Kittlitz’s murrelets spend much of the time between dives for food resting on the surface. This habit and the bird’s nearshore marine habitat factored into the Kittlitz’s murrelet’s score of 88 on the 100-point Oiling Vulnerability Index, one of the highest scores of any bird in Alaska. Indeed, between 3 and 10 percent of the world population of Kittlitz’s murrelets succumbed when the *Exxon Valdez* spilled 11 million gallons of oil into Prince William Sound in 1989. With its low reproductive rate—one egg per nest per year at best—the species recovers very slowly from population declines.

The species’ natural diving behavior to escape predators and disturbances makes Kittlitz’s murrelets especially susceptible to entanglement in nearshore gill-nets set in rivers and fjords to catch salmon during the spawning season. In Prince William Sound, two of the four fishing districts are located in or near Kittlitz’s murrelet habitats. Gill-net fishing for salmon in the sound peaks in July, August and September, a period when young Kittlitz’s murrelets, still unable to fly well, are arriving from their nesting grounds, and adults are molting and not able to fly at all. In one study, Kittlitz’s murrelets accounted for 30 percent of the murrelets killed in nearshore

salmon gill-nets, even though they only represented 7 percent of the murrelet population at the time (marbled murrelets are also found in the area).

Federal biologists John Piatt and Kathy Kuletz report, “The fate of Kittlitz’s murrelet likely hinges on the fate of Alaska’s glaciers. Impacts of human activities, such as bycatch in nets and mortality from oil spills, will likely hasten their decline.”

PREPARING FOR THE MELTDOWN

To preserve what remains of Kittlitz’s murrelet habitat, we must act now to reduce the emission of greenhouse gases to slow or stop the major driver of global warming. We must also take other important steps to help this glacial specialist survive the complex threats and compounded impacts that climate change presents.

- Extend legal protections.** Although several conservation groups petitioned for Endangered Species Act protection for Kittlitz’s murrelet in 2001, the U.S. Fish and Wildlife Service has yet to elevate this species to a high-priority candidate for listing. The service should revisit the status of this murrelet and take action to protect it.



Global warming is melting the glaciers on which the murrelets depend. The bird's numbers have dropped by 97 percent in some parts of Alaska.

- **Reduce mortality in fisheries bycatch.** The use of nearshore salmon gill-nets should be re-evaluated in fjords with advancing and stable glaciers and in fjords and bays adjacent to Kittlitz's murrelet nesting areas, particularly in the summer when young are fledging and adults are molting.
- **Maintain strict policies to prevent another *Exxon Valdez* disaster.** The *Exxon Valdez* oil spill alone wiped out a significant proportion of the world population of Kittlitz's murrelets. Oil tankers still depart daily from the Alaska pipeline terminus in Valdez, in the northeast corner of Prince William Sound. A 2005 *Seattle Post-Intelligencer* report warned that "efforts to reduce crew work hours, crack down on alcohol use and improve tug escorts are being evaded or undermined." Stringent safety measures must be rigorously enforced to avoid an accident that could push Kittlitz's murrelet closer to the edge.
- **Accelerate research on basic ecology and human impacts on the species.** More information about Kittlitz's murrelet is needed to mitigate other potential threats and help the species adapt to climate change. Two immediate research priorities are 1) gaining a better understanding of the bird's wintering ecology, including location, feeding requirements and behavior; and 2) assessing the impacts of recreation, especially helicopter tours and glacier-viewing ship traffic, on behavior, feeding and nesting success. Financial support should be provided for state and federal biologists to pursue these research topics, which are critical to the effective management and long-term survival of this murrelet species.

REFERENCES

- BirdLife International. Kittlitz's Murrelet Species Fact Sheet (2006). http://www.birdlife.org/datazone/search/species_search.html?action=SpecHTMDetails.asp&sid=3310&m=0. Internet; accessed 27 April 2007.
- Day, Robert H., Katherine J. Kuletz and Debra A. Nigro. Kittlitz's Murrelet (*Brachyramphus brevirostris*). *The Birds of North America*, No. 435. (A Poole and F. Gill, eds.) 2000: The Birds of North America, Inc., Philadelphia, PA.
- Day, Robert H., Alexander K. Prichard and Debora A. Nigro. "Ecological Specialization And Overlap Of *Brachyramphus* Murrelets In Prince William Sound, Alaska." *The Auk* 120, no. 3 (2003): 680-699.
- Kuletz, Katherine J., Shawn W. Stephensen, David B. Irons, Elizabeth A. Labunski and Karen M. Brenneman. "Changes in Distribution and Abundance of Kittlitz's Murrelets (*Brachyramphus brevirostris*) relative to Glacial Recession in Prince William Sound, Alaska." *Marine Ornithology* 31 (2003): 133-140.
- Kuletz, Kathy, Elizabeth Labunski and Scott Pegau. "Are Kittlitz's Murrelets Reproducing, and If Not, Why?" The Wildlife Society Conference, September 2006.
- Nalder, Eric. "Safety Lapses Plague Oil Tankers." *Seattle Post-Intelligencer*, March 22, 2005.
- Nations, Chris and Bryan Manley. Modeling Population Trend in Kittlitz's Murrelet (Appendix to Candidate Form). Western EcoSystems Technology, June 2002.
- Piatt, John and Kathy Kuletz. "Decline of the Glacier Murrelet: Fate of a Pleistocene Relict in the Age of Global Warming." The Wildlife Society Conference, September 2006.
- Piatt, John and Kathy Kuletz. "Farewell to the Glacier Murrelet?" *The Arctic Warbler* 11, no. 1 (2005): 1-3.
- U.S. Fish and Wildlife Service. "Endangered and Threatened Wildlife, and Plants; Review of Native Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions." *Federal Register* 71 no. 176 (2006): 53755-53835.
- Van Pelt, Thomas I. and John F. Piatt. "Population Status of Kittlitz's and Marbled Murrelets and Surveys for Other Marine Bird and Mammal Species in the Kenai Fjords Area, Alaska. Annual Report to the U.S. Fish and Wildlife Service, May 2003.



DEFENDERS OF WILDLIFE

1130 17th Street, N.W. | Washington, D.C. 20036 | 202-682-9400
www.defenders.org