

Kittlitz's Murrelet - a Glacier Bird in Retreat

by Kathy Kuletz, updated May 3, 2004

A small diving bird related to puffins, murrelets, and auklets (the alcids), the Kittlitz's murrelet is one of the rarest seabirds in North America. Most of the world's population occurs in Alaska's waters, migrating between winter offshore and summer inshore regions. Lower numbers are scattered along the coast of eastern Russia. Determining the size of the world population of Kittlitz's murrelets is complicated by remote geographic areas, limited data, and indications of rapid decline. Today's best estimates range from 9,000 to 25,000 birds.

The size of this variance isn't surprising, because Kittlitz's murrelet is also one of the least known of seabirds. Only 25 nests have been found, and only one of those was observed through a complete season. What we do know of the bird's breeding distribution has largely been extrapolated from the murrelet's presence at sea. The species' winter range is even less well known, but the small seabirds appear to scatter in mid-shelf waters offshore, and occasionally near shore in a few Southcoastal Alaska locations. The main breeding locations for Kittlitz's murrelets are around the lower Kenai Peninsula, Prince William Sound, Glacier Bay, and along the "Lost Coast" between the Bering Glacier and Palma Bay (near Brady Glacier) in Southeast Alaska. These areas are believed to support most of the existing population of the species. In fact, the bird's association with such ancient ice flows has earned it the nickname, "Glacier Murrelet."

Kittlitz's murrelets are one of three species in the *Brachyramphus* genus. These murrelets differ from 98% of all other seabirds in that they don't nest colonially. Rather, they are solitary nesters that rely on camouflage and stealthy behavior to avoid predation. A sister-species, the more abundant and widespread marbled murrelet, nests primarily in old-growth conifers from Alaska to northern California. The Kittlitz's murrelet differs from the marbled in that it apparently nests exclusively on bare rocky ground. A single egg is laid, usually at the base of a large rock on a steep slope. In summer the murrelet wears its breeding plumage, light-colored with tawny or grey streaking, which is perfect for concealing itself in the open among talus and scree. (This coloration also makes the birds difficult to spot amongst the scattered broken ice common in areas where they often forage.) In winter, this murrelet wears plumage similar to that of other alcids, having a dark back and white belly.

In most of its range, the Kittlitz's murrelet seems to nest in rugged mountains near glaciers or in previously glaciated areas, sometimes up to 75 km inland. It usually forages near tidewater glaciers and outflows of glacial streams, although it is also found in waters far from glacial influence in the northern Bering Sea. Kittlitz's murrelets feed on forage fish such as Pacific sand lance, capelin and juvenile herring; and zooplankton, especially euphausiids, (small, shrimp-like crustaceans).

Because it is difficult to find nests, at-sea surveys have provided the best means of monitoring trends in abundance. Reliable trend data for Kittlitz's murrelets are currently available only for Prince William Sound, Kenai Fjords, Malaspina Forelands and Glacier Bay, but fortunately these areas harbor a large proportion of the breeding population. Unfortunately, population studies

from all four of these sites show steep declines in the numbers of Kittlitz's murrelets. In Prince William Sound, for example, a 1972 survey estimated the population at approximately 63,000 birds. The next count didn't occur until 1989, when the estimate was about 6,400 birds. A steady decline continued through the most recent survey in 2000, when the estimated population hovered near 1,000 birds. This represents an 84% decrease since 1989 (when populations were apparently already dramatically depleted), equivalent to 18 % decline per year. In the Kenai Fjords, Kittlitz's murrelets have declined 83% since 1976, a 6.9% per annum change. Along the Malaspina Forelands (north of Yakutat Bay), Kittlitz's declined by at least 38%, and perhaps as much as 75%, between 1992 and 2002. In Glacier Bay, murrelet studies suggest a decline between 1991 and 1999 of about 60%, again a rate of approximately 8% per year

Such marine surveys have their limitations, however, particularly in the case of Kittlitz's murrelets, which are rare and, when they are found, tend to cluster. If one such group is missed, many birds will not be counted, and this lowers the precision of population estimates. Additionally, observers sometimes lump marbled and Kittlitz's murrelets, because it's difficult to distinguish between them. Nonetheless, the downward population trends have been consistent across all areas, and the magnitude of the apparent decline has alarmed Service biologists and the public alike.

The Service was petitioned to list the Kittlitz's murrelet as endangered under the Endangered Species Act. Even before the petition was received, however, biologists had been gearing up to increase our knowledge about the abundance and distribution of these seabirds. In 2001 the Migratory Bird Management (MBM) and the Anchorage Fish and Wildlife Field Office began work on a status assessment report, and in 2002 they drafted a candidate assessment form (a first step in the listing process) for the Kittlitz's murrelet.

During the summer of 2001, the Anchorage Fish and Wildlife Field Office funded a study to survey Prince William Sound for these birds, and to conduct a pilot study on the potential effects of boat traffic on this species. I headed a crew that surveyed the sound specifically for Kittlitz's murrelets. We used 25 ft. whalers, occasionally relying on a support vessel for fuel and lodging in remote areas. Our study targeted 17 fjords and bays where Kittlitz's murrelets were found in the past or that had appropriate habitat. This meant going (often very slowly and carefully!) into ice-choked inner fjords that have only recently been charted. From this survey we estimated that there were about 2,000 Kittlitz's murrelets in Prince William Sound, but nearly 76 % of this population was found in just two fjords in the northwest, and another 22 % in three other fjords. With one relatively minor exception, the fjords that contained Kittlitz's murrelets were surrounded by advancing or stable glaciers. Fjords that no longer had Kittlitz's murrelets had receding glaciers, or no direct glacial input.

It has been speculated that the decline in Kittlitz's murrelets is related to the retreat of tidewater glaciers. Most glaciers in Alaska, including many of those surrounding Glacier Bay and Prince William Sound, have been receding since the turn of the century. The recent survey in the sound appears to support this theory. Exactly how glacier retreat might affect murrelets is unknown. However, studies in other regions have recorded low biological productivity in fjords with receding glaciers, as a result of increased sedimentation and lowered salinity. This could result in fewer forage fish for the murrelets, while sedimentation might reduce the birds' ability to catch

prey. These are all untested hypotheses, of course, and we must continue to obtain basic information about Kittlitz's murrelet habitat, foraging behavior, and food requirements to increase our understanding of these birds and improve our ability to determine the reasons for their population decline.

In addition to the global climate impacts on fjord habitats, Kittlitz's murrelets may have also been affected by changes in their available prey species, due to changes in the greater marine environment. We can't monitor reproductive success of Kittlitz's murrelets as we do when studying other seabirds, but some researchers have reported seeing few juvenile birds at sea, and speculate that lack of food has led to poor reproduction for this murrelet. It's possible that murrelets are also affected by marine vessel traffic, or even, perhaps, by helicopter flights in alpine nesting areas. The primary breeding areas for Kittlitz's murrelets - the Kenai Fjords, Prince William Sound, Yakutat and Glacier Bay - are all experiencing increases in tour operations. The preferred habitats of Kittlitz's are also prime destinations for tour and cruise ships, increasing the potential for disturbance or associated forms of impact.

At least two sources of human-caused mortality for Kittlitz's murrelets have been identified, although their impacts at the population level are not known. These include gillnet fisheries and oil spills. Being small-bodied, nearshore divers, these birds do sometimes get caught in gillnets and drown. The same traits make them highly susceptible to oil spills. Relative to their population, high numbers of Kittlitz's murrelets were killed by the 1989 *Exxon Valdez* spill. Smaller accidents can also be damaging to local concentrations of Kittlitz's murrelets. In 1999, a tour boat went aground in a bay adjacent to Glacier Bay, and, in 2001, two commercial fishing vessels sank and released fuel in northern PWS, near areas used by Kittlitz's murrelets. As vessel traffic increases in Alaska's nearshore waters, such events, while not individually catastrophic for the species, could have cumulative impacts on local murrelet populations.

The Service will continue to study Kittlitz's murrelets in Alaska. Currently planned activities include population surveys in high priority areas and research on the effects of boat disturbance on Kittlitz's murrelets. In 2002 and 2003, Service Migratory Bird Management in Anchorage assisted Southeast Alaska Ecological Services in conducting population surveys along the "Lost Coast," in cooperation with Wrangell-St. Elias National Park and Glacier Bay National Park personnel. This provided population estimates for sections of the outer coast, and trend data along the Malaspina Forelands between 1992 and 2002. The latter survey included an intensive survey of Icy Bay, 80 km north of Yakutat Bay. Icy Bay was found to have an unusually high density of Kittlitz's murrelets, with an estimated population of about 2,200, equivalent to the populations of Prince William Sound or Glacier Bay. This region may provide a new area of focus for future efforts to learn more about these birds, and has increased interest in conducting surveys in 2003 along the outer coast between Cape Suckling (near Bering Glacier) and Palma Bay (near Brady Glacier). These areas are remote, vast, and exposed to violent Gulf weather, making surveys difficult, dangerous and expensive to conduct.

The U. S. Geological Survey - Biological Resources Division (USGS-BRD) conducted surveys in the Kenai Fjords in 2002, the Alaska Peninsula in 2003, and will survey portions of the Aleutian Islands in 2004. USGS will also continue to study Kittlitz's murrelet foraging and breeding biology, and evaluate the effects of vessel disturbance in Glacier Bay. In addition,

USFWS will begin studies in Prince William Sound and Kachemak Bay in 2004, to improve our understanding of population abundance, habitat use, chronology, productivity, and foraging biology.

We still lack basic information on life history characteristics for Kittlitz's murrelets, but they likely share some traits common to seabirds, such as long life and low reproductive potential. If so, these attributes would make their populations very sensitive to adult mortality. Kittlitz's murrelets also have many unique characteristics which have enabled them to survive global climate changes since the Pleistocene. Their association with glacially affected waters may make them one of the better barometers of climate change, and of the effects of these changes on life in our sub-arctic oceans.

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