

Spotlight Species Action Plan

Kittlitz's murrelet

Please send comments to:

Greg Balogh

greg_balogh@fws.gov

907/271-2778

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U.S. FISH AND WILDLIFE SERVICE - SPOTLIGHT SPECIES ACTION PLAN

Common Name: Kittlitz's murrelet

Scientific Name: *Brachyramphus brevirostris*

Lead Region: 7

Lead Field Office: Anchorage Fish and Wildlife Field Office

Species Information:

Status: Candidate

Recovery Priority Number or Listing Priority Number: LPN = 2

Recovery Plan or Candidate Assessment Form: Candidate Assessment Form, approved November 2008 (available at http://ecos.fws.gov/docs/candforms_pdf/r7/B0AP_V01.pdf)

Most Recent 5-year Review: None

Other: Candidate status designated May 4, 2004 (69 FR 24876). The International Union for Conservation of Nature and Natural Resources (IUCN) considers Kittlitz's murrelets critically endangered. NatureServe categorizes Kittlitz's murrelets as Globally Imperiled (G2; NatureServe 2005).

Threats: Threats to Kittlitz's murrelets include climate change and deglaciation, petroleum contamination, disturbance by tour boat traffic, by-catch in commercial gillnet fisheries, avian predation, and low recruitment. Marine regime shifts and glacial retreat may be changing forage fish availability. See Appendix A for additional discussion of potential threats.

Target: This species is currently undergoing dramatic declines (see Appendix A). Because the causes for these dramatic declines are unknown, it is not possible to achieve recovery or prevent decline of this species over the next 5 years. Therefore, the 5-year goal of this plan is to reduce the rate of population decline through efforts to reduce fishing by-catch, oil pollution, and vessel disturbance. Improved monitoring and research efforts will be required to determine the causes for Kittlitz's murrelet population declines and impacts of potential threats.

Measure: At-sea surveys of Kittlitz's murrelet provide an index of population abundance. Survey data gathered over the next 5 years will help us determine if our conservation efforts are having a measurable effect upon population trends.

Actions: Increasing recruitment of Kittlitz's murrelet populations cannot be achieved until we expand research efforts to understand the causes of current low levels.

There will be a meeting of the Pacific Seabird Group, Kittlitz's Murrelet Technical Working Group (comprised of Federal and State agencies and University researchers) in October 2010 at which time we hope to generate a list of recovery tasks and associated budget information. In the interim, we will focus our efforts in several areas, as described below.

Reduce oil pollution and the risk of catastrophic spills through oil spill contingency planning. Encourage changes in the routing of the thousands of vessels that travel along the Aleutian Islands to reduce the threat of large ships going aground and breaking up during severe weather. Stage emergency response vessels to help alleviate this threat.

Reduce disturbance to Kittlitz's murrelets through cooperation with the land management entities where murrelets occur (most notably within National and State Parks and National and State Wildlife Refuges along the coast of the Gulf of Alaska)

Determine areas of spatial overlap between Kittlitz's murrelet habitat and higher-risk fishing activities, such as nearshore gillnetting, to target areas for possible fishing restrictions or modifications to gear or fishing techniques. Monitor bird by-catch by commercial fishing, conduct additional research into effective deterrent devices, and target outreach efforts to gillnetters.

Other research needs include climate change investigations to determine possible effects on Kittlitz's murrelets, including extent of glacial retreat, distribution and abundance of prey species, and changes in foraging, breeding, and wintering habitats; and evaluating the influence of human activities on predator species such as peregrine falcon and bald eagle.

Identify responsible parties for the actions:

- Oil spill contingency planning, reducing the threat of oil spills, and evaluating the effects of oil spills: [Joint Federal/ State/ Industry/ Local communities/ NGOs (Non-Governmental Organizations)].
- Effects of human activities, including vessel disturbance [Federal].
- Reduce by-catch of Kittlitz's murrelets [Joint State/ Federal/ Industry, involving Alaska Sea Grant funds and personnel].
- Research [Federal].
 - Health assessment of Kittlitz's murrelets in key population areas: Kachemak Bay, Prince William Sound, Glacier Bay, southern Kenai Peninsula, Icy Bay, and Malaspina Forelands
 - Use fall to spring pelagic surveys (on boats of opportunity) to assess non-breeding habitat needs.
- Climate change investigations [Federal].
- Climate change outreach education [U.S. Fish and Wildlife Service and NGOs (Non-Governmental Organizations)].
- Effects of predator populations [Federal, State]

Estimated costs of these actions: \$3 million

Role of other agencies:

State of Alaska

Because the Kittlitz's murrelet is not listed under the Endangered Species Act at this time, the Alaska Department of Fish and Game retains a primary role in the conservation of this species. The State will be represented on the Kittlitz's Murrelet Technical Committee. We offer the following suggestions where coordinating efforts would facilitate greater conservation:

- Population abundance and trend monitoring of Kittlitz's murrelet populations, including winter distribution and seasonal movements.
- Conduct research related to unsustainably low recruitment rates of Kittlitz's murrelets, as well as lead nesting studies on State lands.
- Developing guidelines for tour boats and recreational boaters to minimize disturbance of murrelets and regulate vessel traffic in certain waters heavily used by Kittlitz's murrelets.
- Develop methods to discourage or reduce predation of murrelets by avian predators, especially in areas where anthropogenic factors have concentrated avian predators.
- Collaborate to increase the monitoring rate of State-managed commercial gillnet fisheries in areas used by Kittlitz's murrelets to quantify and, if warranted, reduce by-catch of Kittlitz's murrelets. Complement research of gear and techniques to reduce by-catch and facilitate implementation of effective gear and/or techniques.

National Park Service

Because nearly half of the at-sea population during the breeding season is in or adjacent to National Park Service (NPS) lands (M. Kissling, U.S. Fish and Wildlife Service, Juneau, *personal communication*), the NPS plays an important role in coordinating nesting studies on NPS lands and studies of Kittlitz's murrelets at sea along the shores of National Parks.

Role of other Endangered Species Act programs: Three FWS field offices will participate in research related to unsustainably low recruitment rates of Kittlitz's murrelets, help develop methods to discourage predation of Kittlitz's murrelets by falcons and eagles, and encourage additional monitoring and enforcement of fisheries that may take Kittlitz's murrelets. Other tasks include:

- Anchorage Fish and Wildlife Field Office: Continue collaborative work with the U.S. Geological Service and National Wildlife Refuges to investigate declining population trends of Kittlitz's murrelets. Continue collaborative work with the Department of Interior and U.S. Coast Guard regarding oil spill contingency planning.
- Fairbanks Fish and Wildlife Field Office: Investigate the Norton Sound and Cape Lisburne nesting population of Kittlitz's murrelets.
- Juneau Fish and Wildlife Field Office: Work with other Federal agencies to reduce recreation and tour boat disturbance in areas that are heavily used by Kittlitz's murrelets.

Role of other U.S. Fish and Wildlife programs: Three programs will help implement this action plan for Kittlitz's murrelets.

- **Migratory Bird Management Program:** Coordinate population abundance and trend monitoring efforts of Kittlitz's murrelets. Provide for research of bird by-catch avoidance gear and techniques for gillnet fisheries. Develop methods to discourage predation of Kittlitz's murrelets by falcons and eagles, especially in areas where they are concentrated by anthropogenic factors.
- **Refuges Program:** Work with the U.S. Coast Guard to minimize Trans-Pacific vessel traffic through passes in the Aleutian Islands and to station emergency assistance vessels at strategic locations to prevent vessel groundings, especially within the National Wildlife Refuge system. Continue collaboration with the U.S. Geological Service to investigate population trends and recruitment of Kittlitz's murrelets.
- **Law enforcement:** Increase enforcement of the Migratory Bird Treaty Act within 12 nautical miles of shore, especially in areas where Kittlitz's murrelets have been taken in gill nets.

Additional funding analysis: At this time, we have limited funding to carry out the recovery tasks outlined in this spotlight species action plan. We have coordinated with partners and leveraged funding to conduct initial research studies on this species. Additional funds would enable us to work with other agencies and organizations to expand our research efforts, as outlined above. In addition, we will continue to pursue funding from our Washington Office to prepare a proposed rule to list this species.

Appendix A – Population Trend and Threat Assessment

Population Trend

Throughout Alaska, Kittlitz's murrelet populations declined as much as 18 % annually during 1989-2000 (Kuletz *et al.* 2003b, McKnight *et al.* 2003, U.S. Fish and Wildlife Service 2004). In Prince William Sound, Kittlitz's murrelet populations declined 84 % and extirpation is predicted there by 2035 (Kuletz *et al.* 2005). Along the coast of the Kenai Fjords, Kittlitz's murrelet populations declined 74 %, including 8.7 % annually between 1986 and 2002 (Van Pelt and Piatt 2003). In Lower Cook Inlet, Kittlitz's murrelet populations declined 13 % per year from 1984 to 2004 (Speckman *et al.* 2005). In Kachemak Bay, Kittlitz's murrelet populations declined 18 % annually and a total of 43 % between the periods of 1988-1999 and 2004-2007 (Kuletz *et al.* 2008). In Glacier Bay, Kittlitz's murrelet populations declined 80 % from 1991-2000 (Robards *et al.* 2003). Similarly, Kittlitz's murrelet populations in the Malaspina Forelands declined as much as 75 % during 1992-2002 (Kissling *et al.* 2005) and 53 % in Icy Bay during 2002-2007 (M. Kissling, *unpublished data*, 2007).

Threat Assessment

Climate change and deglaciation: This species is closely associated with tidewater glaciers and glacial outwash. During the past 50 years, glaciers have been melting at rates that cannot be explained by recent historical trends (Brown *et al.* 1982, Dyurgerov and Meier 2000), likely due to increases in temperature caused by increased concentration of greenhouse gasses in the atmosphere (Crowley 2000, IPCC 2001, Karl and Trenberth 2003, Stott 2003, IPCC 2007).

Kittlitz's murrelets exhibit a strong association to glacially-influenced marine habitats (Kendall and Agler 1998, Kuletz *et al.* 2003a, Robards *et al.* 2003, Van Pelt and Piatt 2003, Van Pelt and Piatt 2005, Agness 2006). Their preference for areas near stable or advancing tidewater glaciers may be related to the diversity and abundance of high energy forage fishes, such as Pacific capelin (*Mallotus villosus*) and Pacific sand lance (*Ammodytes hexapterus*) (Piatt *et al.* 1994, Day *et al.* 2000, Agness 2006, Kissling, *unpublished data*, 2007, Piatt, *unpublished data*, 2008). The distribution and availability of these high energy forage fishes may change as glaciers recede and the physical parameters of marine habitats are modified. In turn, reduced diversity and abundance of high energy forage fishes may reduce the ability of Kittlitz's murrelets to feed young during nesting season and further lower survivorship and recruitment.

In other seabirds, low breeding success is usually related to low food or low quality prey; we hypothesize that reduced availability or quality of prey is contributing to Kittlitz's murrelet decline. Marbled murrelets (*Brachyramphus marmoratus*) use high quality prey for their chicks (Kuletz 2005) and the lack of high quality prey in California was linked to population declines of marbled murrelets there (Becker and Beissinger 2006). In addition, lack of high quality prey was correlated with slow growth rates and low survivorship of Kittlitz's murrelet chicks at Agattu Island (Kaler, *unpublished data*). The availability of high quality prey could be impacted by myriad factors, including climate change and/or other anthropogenic ecosystem disruptions, as well as decadal oceanic oscillation / regime shifts.

Petroleum contamination: Kittlitz's murrelets are vulnerable to direct mortality from oil pollution (King and Sanger 1979). Over 2,700 ship voyages occur through the Aleutians each

year adjacent to Kittlitz's murrelet habitat and are made by vessels that have no State oil spill contingency plans and no State certificate of financial responsibility (NRPGCII 2005). This vessel traffic includes as many as 1,600 voyages by container ships with a typical fuel capacity of 1.8 million gallons of persistent oil, and as many as 30-40 voyages by tank ships that may carry as much as 800 million gallons of oil as cargo and fuel (NRPGCII 2005). Between 1990 and 2005, 415 U.S. vessel casualties were reported, in addition to at least 45 foreign vessel casualties (NRPGCII 2005). Sixteen-percent of Kittlitz's murrelets in Alaska nest on the Aleutian Islands of the Alaska Maritime National Wildlife Refuge adjacent to the great circle shipping route (M. Kissling, U.S. Fish and Wildlife Service, Juneau, *personal communication*). The shortest distance between East Asia and the Canadian-American Pacific Northwest runs through the Bering Sea. As a result, vessels traveling the great circle shipping route between East Asia and the North American West Coast actually pass both north and south of the Aleutian Islands (see Figure 1).



Figure 1. The great circle shipping route between East Asia and the Canadian-American Pacific Northwest (Courtesy of http://benmuse.typepad.com/ben_muse/2007/01/the_great_circl.html).

From 1995 through August 2005, at least 1,923 small fuel spills from vessels resulted in the release of more than 271,700 gallons of petroleum hydrocarbons in Alaska waters (Alaska Department of Environmental Conservation, Anchorage, *unpublished data*, 2005). Ninety percent of those spills occurred in marine habitat within the range of Kittlitz's murrelets (U.S. Fish and Wildlife Service, *unpublished data*). Small oil spills have put specific populations of Kittlitz's murrelet at risk. One example is the 2001 Windy Bay spill in Prince William Sound that released 35,000 gallons of diesel fuel (Kuletz 2001).

Though less common, large oil spills directly impact this species both immediately and over an indefinite period of time. The *Exxon Valdez* spill in March 1989 released nearly 11 million gallons of heavy Alaska crude oil into Prince William Sound, killing an estimated 500 (Kuletz 1996) to more than 1,000 Kittlitz's murrelets (van Vleit and McAllister 1994). These immediate mortality estimates represented as high as 15% of the local population, a proportion that exceeded all other species impacted by this spill. To this day, Kittlitz's murrelets and their prey species may

continue to be detrimentally affected by chronic hydrocarbon contamination from residual oil in Prince William Sound.

Another large spill occurred in December 2004 when the *Selandang Ayu* deposited 504,000 gallons of bunker C and diesel fuel into the nearshore waters of Unalaska, Aleutian Islands, fouling 35 km of shoreline (Alaska Department of Environmental Conservation, Anchorage, *unpublished data*, 2005). Few murrelet carcasses were recovered immediately after the oil spill, probably because of the time of year (U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Anchorage, *unpublished data*). About one-third of all the Kittlitz's murrelets around Unalaska occupied waters that were heavily oiled from this spill (Romano and Piatt, U.S. Geological Service, Anchorage, *unpublished data*) and murrelets were observed in oiled waters (Kuletz 2001, Stehn, U.S. Geological Service, Anchorage, *unpublished data*, 2005).

Disturbance by tour boat traffic: Although this small cryptic seabird is rarely sought out by tour boats and recreational boaters, its preferred tidewater, glacier habitat is a target destination for these boaters (Day *et al.* 1999, Murphy *et al.* 2004). Such vessel activity is increasing in the glaciated fjords of Glacier Bay, Prince William Sound, Kenai Fjords, Yakutat Bay, and lower Cook Inlet/Kachemak Bay, Alaska (Murphy *et al.* 2004, Hoover-Miller *et al.* 2006, Jansen *et al.* 2006, Glacier Bay National Park, *unpublished data*). Furthermore, recreational boating in northern Prince William Sound is projected to increase dramatically over the next 15 years as a result of better access to harbors (Murphy *et al.* 2004). This increased traffic increases the risk of oil contamination and increases the level of disturbance in favored foraging habitats. Such disturbance precludes feeding and increases flushing and diving behaviors. As a result, energetic demands may be increased, as well as predator exposure.

By-catch in commercial gillnet fisheries: Where studies have examined near shore, seabird by-catch within their range, *Brachyramphus* murrelets comprised between 11% and 70% of seabird mortality from gillnets (Wynne *et al.* 1992, Carter *et al.* 1995, Manly *et al.* 2007). We collectively refer to drift netting and set netting as using gillnets and report by-catch percentages because only 2-6% of the fishery is actually sampled. Furthermore, we include marbled murrelets (same *Genus*) because they are more abundant and similar in size, foraging behavior, and habitat use, thus serving as a good proxy for susceptibility of murrelets to gillnet by-catch. Additionally, Kittlitz's murrelets have been caught in commercial gillnet fisheries in Prince William Sound at a disproportionately higher number than marbled murrelets relative to their respective population sizes at the time (Wynne *et al.* 1992, Agler *et al.* 1998, Day *et al.* 1999). Though very uncommon, Kittlitz's murrelets represented 5% during 1990 and 30% during 1991 of murrelet by-catch in Prince William Sound gillnets (Wynne *et al.* 1991, 1992). Kittlitz's murrelets have also been reported as taken in commercial fisheries off Kodiak Island and Yakutat Bay (Manly *et al.* 2007). In Kodiak, the estimated by-catch for Kittlitz's murrelets was 17 (\pm 98) birds per year (Manly *et al.* 2007). At least one Kittlitz's murrelet was taken during the Yakutat study in 2008, but the annual by-catch estimate is not yet available. Melvin *et al.* (1999) described gear types and fishing methods that reduce such by-catch, but regulations requiring the use of by-catch reduction techniques are currently not in place in Alaska.

Avian predation: Peregrine falcons (*Falco peregrinus*) have often been observed perching on vessel superstructures in Glacier Bay and elsewhere. They apparently use the vessels as a watch-post, awaiting murrelets (*Brachyramphus* spp.) and other birds that flush from the water in response to vessel disturbance. The vessel watch-posts provide a means for accessing open water that is otherwise too far from their usual perch sites (K. Kuletz, U.S. Fish and Wildlife Service, Anchorage, *personal communication*). Human activities are enhancing bald eagle populations by

providing reliable sources of food via landfills and shore-based seafood processors, e.g. near Yakutat and Icy Bay (M. Kissling, U.S. Fish and Wildlife Service, Juneau, *personal communication*). In Icy Bay during summers of 2006-2008, avian predators, including bald eagles (*Haliaeetus leucocephalus*), killed 12 of 94 (13%), radio-tagged, Kittlitz's murrelets (M. Kissling, U.S. Fish and Wildlife Service, Juneau, *personal communication*). Peregrine falcons were responsible for 80% of known deaths; of 26 Kittlitz's murrelet remains found beneath eyries and plucking posts, only one included a radio-tag, suggesting that peregrine falcons were not biasing their predation towards radio-tagged individuals (M. Kissling, U.S. Fish and Wildlife Service Juneau, *personal communication*). Current populations of peregrine falcons and bald eagles have increased dramatically in Alaska in recent decades via higher rates of productivity, survivorship, and immigration (Ritchie and Ambrose 1996, Jacobson and Hodges 1999, Ambrose *et al.* 2000, Zwiefelhofer 2007, Anthony *et al.* 2008). Gulls (*Larus* spp.) have also been documented as predators of Kittlitz's murrelet chicks (Kaler *et al.*, *in press*). Photography tourism has also spawned artificially enhanced aggregations of bald eagles, such as was allowed in Homer. These activities may need to be adjusted if local Kittlitz's murrelet populations are being detrimentally affected by avian predation

Low recruitment: Many researchers have reported low juvenile recruitment rates; protection may be necessary to bolster the species' ability to survive and recover (Day and Nigro 1999, M Romano (U.S. Geological Service, Anchorage, *personal communication*), and M Kissling (U.S. Fish and Wildlife Service, Juneau, *personal communication*)). The paucity of juvenile sightings near shore may be because juveniles are difficult to identify, occur at low densities, immediately depart protected waters adjacent to nesting areas, or synchronize their dispersion from brood-rearing areas uncensored (Kuletz, *personal communication*). Low fledging success at nest sites recently reported by both Burkett and Piatt (2008) and Kaler and Kenney (2008) is consistent with low recruitment rates. However, some studied areas have higher recruitment. Densities of adults and juveniles were low between 2004 and 2007 in Kachemak Bay, but the Juvenile:Adult ratios were relatively high there when compared to marbled murrelets, or compared to Kittlitz's murrelets in Prince William Sound and Icy Bay.

Appendix B

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