Pacific Seabird Group

Dedicated to the Study and Conservation of Pacific Seabirds and their Environment

May 20 2019

Mr. Greg Siekaniec
Regional Director, Alaska Region
1011 E. Tudor Rd.
U.S. Fish and Wildlife Service
Anchorage, AK 99503

Dear Director Siekaniec,

On behalf of the Pacific Seabird Group (PSG), this letter emphasizes renewed concern for the status and viability of the Kittlitz's Murrelet (*Brachyramphus brevirostris*). This is a species with a high percentage (>95%) of its global population that is resident year-round in Alaska (Day et al. 2017), and it is listed as Near Threatened by the International Union for the Conservation of Nature (IUCN). The Fish and Wildlife Conservation Act requires the U.S. Fish and Wildlife Service (hereafter Service) to monitor and assess the status and trends of all bird species, subspecies, and populations. We recognize that lack of funds makes compliance with this requirement impossible, except for a modest number of species; however, the PSG urges you to consider the high level of stewardship responsibility and the increasing vulnerability of the Kittlitz's Murrelet. Moreover, this species was a candidate for listing under the Endangered Species Act for a decade before the Service reached a not-warranted determination in 2013, after which monitoring and research curtailed significantly.

The PSG is an international, non-profit organization that was founded in 1972 to promote the knowledge, study, and conservation of Pacific seabirds. It has a membership drawn from the entire Pacific basin, including Canada, Mexico, Japan, China, Malaysia, Australia, New Zealand, and the USA. Among PSG's members are biologists who have research interests in Pacific seabirds, government officials who manage seabird refuges and populations, and individuals who are interested in marine conservation. PSG members serve as scientific experts and conservation leaders within their local communities, nationally and around the world.

During our most recent annual PSG meeting in Kauai, Hawaii in February 2019, members expressed continued concern for the Kittlitz's Murrelet and discussed new and previously-unpublished information related to its status. Here, we briefly summarize key findings and observations since the not-warranted determination on the population monitoring, distribution, demography, and stressors to the Kittlitz's Murrelet. We follow with recommendations to you based on the best-available science and discussions with PSG members.

<u>Population Monitoring</u>

The 2013 listing decision summarized existing Kittlitz's population size and trend information for seven local study areas and developed a model to capture a general trend for the species overall. The listing identified five factors that make estimating range-wide trends for this species difficult. Given those limitations, the agency developed two models to capture the range-wide trends of this species, both with and without survey years showing unusual results. The models showed the Kittlitz's Murrelet population

declined by roughly 30 percent per annum across multiple populations between 1989 and 2000, after which abundance stabilized.

Surveys and publications produced after the 2013 decision add to our current understanding. Since 2013, population monitoring has continued in several Kittlitz's population centers, including Glacier Bay (37% of range-wide population), lower Cook Inlet (9%), Prince William Sound (4%), Icy Bay (3%), and Yakutat Bay. Glacier Bay is the only location currently monitored annually, and the Service has led a continuous (every 1-4 years) monitoring effort in Prince William Sound since 1989; monitoring in other areas has been opportunistic and intermittent.

Recent surveys in Glacier Bay found no apparent trend from 2009–2018 (Sergeant and Johnson 2018). In lower Cook Inlet, three recent surveys from 2016–2018 added to four surveys conducted in 1996–1999. There was high inter-annual variability among years, and preliminary analyses found densities in 2016 and 2017 were similar to the mean from the 1990's, but 2018 densities were lower; trend analyses have not yet been conducted (M. Arimitsu et al., USGS, *unpubl. data*). Surveys in Kachemak Bay (with a different sampling design than in lower Cook Inlet, above) were conducted in 2003–2005, 2011, and 2016; trend analyses have not been conducted (K. Kuletz, USFWS, *unpubl. data*). In Prince William Sound, at-sea surveys conducted from 1989 to 2016 showed no significant trend in Kittlitz's density (2018 analyses in prep.; Kaler et al. 2018). Recent surveys conducted in Yakutat Bay (2015 and 2016) and Icy Bay (2016 and 2017) add to surveys conducted previously (Yakutat Bay: 2000 and 2009; Icy Bay: 2002–2012); trend analyses using recent surveys have not been conducted for either location (K. Nesvacil, ADF&G, *unpubl. data*). Much of the recent monitoring has been conducted as part of larger efforts and without dedicated funding for Kittlitz's, which has inhibited analyses and distribution of results.

At-sea surveys in a number of other sporadically sampled areas have not been resampled in recent years, including Kenai Fjords, the Malaspina Forelands, the Aleutian Islands, Kodiak, the Alaska Peninsula, the Bering Sea and Russia. To adequately monitor the global status of this vulnerable population, a high priority is to consistently conduct surveys in areas that support a significant percentage of the range-wide population.

Shifts in Distribution

From August to December 2006–2017, offshore surveys in Alaska found Kittlitz's most commonly in the northeastern Chukchi Sea shelves, with lower numbers in the northern Bering Sea (K. Kuletz, USFWS, *unpubl. data*). During the same months in 2018, however, there were almost no Kittlitz's in the Chukchi or Bering seas (K. Kuletz, USFWS, *unpubl. data*). These areas have been assumed to be important post-breeding foraging habitat for Kittlitz's, which raises questions about the forage quality in 2018, as these distribution shifts occurred simultaneously with habitat changes described below (Stressors).

Demography

Kittlitz's Murrelets nest on cliffs and scree slopes, especially those that were recently de-glaciated. In Icy Bay, a glacially influenced area, this species was found to have a low breeding propensity (20% minimum) and moderate nesting success (38% fledging success; Kissling et al. 2015a). Breeding propensity was not measured in non-glacially influenced areas, but average fledging success in those areas was lower: 33% on Adak (R. Kaler and L. Kenney, USFWS, *unpubl. data*), 25% on Kodiak (Knudsen et al. 2017), and 16% on Agattu (R. Kaler and L. Kenney, USFWS, *unpubl. data*;). The difference in nesting success may be due to higher predation in non-glaciated areas. On Adak, 67% of the nests failed, with the leading cause owing to predation of eggs and chicks by primarily Common Raven (*Corvus corax*; R. Kaler and L. Kenney, USFWS, *unpubl. data*). On Kodiak Island, nearly half of the studied nests were depredated, with red fox (*Vulpes vulpes*) responsible for 41 of 44 depredations

(Knudson et al. 2017). Red fox were also documented egg predators in northwestern Alaska, a region with high nest densities but low nesting success (Kissling and Lewis 2016).

In additional to low breeding propensity and nesting success, Kittlitz's appear to have low survival rates. The apparent annual (0.80) and breeding season (0.89) survival of Kittlitz's was lower than expected based on life-history theory (Kissling et al. 2015b). The mortality probability of Kittlitz's was higher in the breeding season than outside the breeding season, suggesting that they experience higher risk of mortality while breeding inshore than while offshore in the non-breeding season (Kissling et al. 2015b). Apparent predation by Peregrine Falcons (*Falco peregrinus*) and Bald Eagles (*Haliaeetus leucocephalus*) was the sole source of breeding season fatality of adult Kittlitz's in Icy Bay, including primarily birds on the water, but also a few birds inland, presumably attending nests (Kissling et al. 2015b).

Stressors

Habitat and climate changes may pose threats to Kittlitz's reproductive success during various stages of breeding. Decisions about whether to breed appeared to be linked to environmental conditions prior to the breeding season (Kissling et al. 2016). After nest initiation, there was a significant negative relationship between ocean temperature and parental attentiveness during the incubation period (Stoner 2016). Given that high attendance rates were needed for the probability of hatch to exceed the probability of nest failure prior to hatching, warming sea surface temperatures could have population-level impacts by reducing attendance and increasing subsequent nest failures (Stoner 2016). After hatching, warming ocean temperatures were associated with prey of lower quantity and quality being delivered to chicks, which was a primary limitation to nesting success in some years (Knudson 2019). Further climate warming, which may adversely affect the availability of high-energy fish, may have disproportionate effects on species such as Kittlitz's that relies upon energy-rich prey (Knudson 2019). Kittlitz's feed primarily on forage fish and zooplankton (Day et al. 2017). Additional threats of climate warming could include the range expansion of terrestrial predators such as red fox, which are particularly devastating to ground-nesting species like Kittlitz's, and whose predation impact likely worsens when warm temperatures increase chick exposure time to predators (Knudson 2019).

There have been recent changes to the habitat of Kittlitz's, as well as diminished prey density and quality. From fall 2013 to fall 2016, the northeastern Pacific Ocean experienced anomalously warm ocean temperatures as part of an unusually strong and persistent marine heat wave (Di Lorenzo & Mantua 2016). On the heels of the heat wave, in the winter of 2015/2016, there were changes in the quality and quantity of forage fish in the Gulf of Alaska (Arimitsu et al. 2018, von Biela et al. 2019), as well as a massive die-off of Common Murres (*Uria aalge*) (Piatt et al. *In prep*). Additionally, there have been extremely low sea ice levels in the Bering and Chukchi seas during the past few years, with 2018 and 2019 being the warmest and lowest in ice cover (Siddon and Zador 2018, ACCAP 2019). The deep cold-water pool that normally forms in the southern Bering Sea was small and very far north in 2018 (Siddon and Zador 2018). Forage fish composition changed, with an increase in herring and a decrease in capelin (Siddon and Zador 2018). Correspondingly, the index of seabird breeding remained below long-term averages, indicating that the seabirds bred later and had poor reproductive success in 2018 (Siddon and Zador 2018).

Harmful algal blooms (HABs) are an emerging global issue with increasing ocean temperatures (Gobler et al. 2017) and appear to represent a current and potentially increasing threat to Kittlitz's. In Alaska, HAB producing phytoplankton species were positively correlated with ocean temperatures (Vandersea et al. 2018), and HAB toxins have been found in various marine mammal (Lefebvre et al. 2016) and seabird (Schoen et al. 2018) species. On Kodiak Island, seven Kittlitz's chick deaths from 2011 to 2012 were attributed to saxitoxin (a paralytic neurotoxin) after chicks were provisioned Pacific sand lance (Shearn-Bochsler et al. 2014). An additional five chick deaths on Kodiak from 2013 to 2014 were similar to those deaths attributed to saxitoxin, with saxitoxin present in stomach contents and liver of chicks, suggesting

that saxitoxin may have been a factor in Kittlitz's chick mortality (Knudson et al. 2017). Recent captive dosing trials have determined a lethal dose for saxitoxin in mallards (R. Dusek, USGS, *unpubl. data*), and the concentrations of saxitoxin measured in Kittlitz's chicks from Kodiak ranged above and below that lethal dose.

Mercury (Hg) is a global contaminant of concern for aquatic species, including seabirds. Kenney et al. (2018) reported Hg concentrations in eggshells, guano, blood, and feathers of Kittlitz's sampled from four locations in Alaska (Adak, Agattu, Icy Bay and Glacier Bay). Mercury concentrations in eggshells, guano, and blood was low compared to other seabird species. However, breast feathers from several individuals (two from Glacier Bay, one from Adak) exhibited concentrations above those associated with impaired reproduction in some other bird species. Further investigation of Hg uptake as a potential threat to Kittlitz's is warranted.

Comments and Recommendations

We understand that the 2013 listing determination was based, in part, on a "lack of sufficient data" linking known and potential threats directly to predicting population viability. In 2009, the PSG hosted a two-day workshop to identify and prioritize information needs for Kittlitz's and prepared a report summarizing the process and outcome (Kissling 2009). Although the report is outdated, many of the information needs identified in it are still relevant today, as most have not been addressed yet. Given the updates described above, we think that long-term monitoring and continued research into factors that affect population viability, especially related to habitat and prey changes, are warranted. The Service has already contributed greatly to our knowledge of Kittlitz's biology through studies on the Kodiak National Wildlife Refuge (NWR), the Alaska Maritime NWR and in Icy Bay, and we recommend that these studies be resurrected as soon as possible. The work on Kodiak NWR has provided the longest continuous measure of breeding success and diet in Alaska (ended after 2016), and it was obtained at a modest cost because field logistics there are comparatively easier than many places in Alaska. In addition, we recommend prioritizing assessing vital rates of Kittlitz's populations in other glaciated landscapes, such as Glacier Bay, which are changing rapidly with global warming.

We also suggest the timely development and implementation of a proactive conservation plan. We recommend a plan that identifies priority areas for monitoring, develops a monitoring protocol that yields precise, unbiased estimates, identifies key research questions to understand important population drivers, and supports peer-reviewed publication of findings. Further, we urge the Service to draft a Species Status Assessment (SSA) for Kittlitz's Murrelet (Smith et al. 2018). The PSG appreciates the scientific rigor, accessibility, opportunity for external involvement, and transparency of the new SSA process recently adopted by the Service.

We want to be sure that you are aware of an upcoming symposium on Kittlitz's and Marbled Murrelets to be held in Anchorage on June 28, 2019. The afternoon symposium, which is entitled "Seabirds on the edge of two worlds: ecology and conservation of *Brachyramphus* murrelets in marine and terrestrial environments", is part of the American Ornithological Society conference. Several PSG members will be presenting their most recent research, some of which is described above, at the symposium.

Lastly, significant populations of Kittlitz's Murrelets occur on lands managed by other agencies (e.g., National Park Service and U.S. Forest Service) and some in occur in Russia. Monitoring and research efforts will require external collaboration and the Service is the appropriate agency to lead this effort. Wherever possible, the PSG would like to assist the Service as it has active members from all of the appropriate state and federal agencies in Alaska and in Russia. Our organization is prepared to assist with development of survey protocols, ranking survey sites, and identifying pertinent research questions, as well as contributing to and reviewing a SSA for this species. I invite you to contact me to discuss how our organization can help.

Sincerely,

Peter J. Hodum

Peter Hodum
Vice-Chair for Conservation

Copies
USFS Acting Regional Forester, Alaska Region (Dave Schmid)
NPS Regional Director, Alaska Region (Bert Frost)
ADF&G Commissioner (Doug Vincent-Lang)
USGS Alaska Science Center Director (Chris Zimmerman)

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