



December 13, 2013

Andy Loranger
Refuge Manager
U.S. Fish and Wildlife Service
Kenai National Wildlife Refuge
PO Box 2139
Soldotna, AK 99669

Via e-mail to kenai@fws.gov

RE: Kenai Peninsula brown bear conservation measures

Dear Mr. Loranger,

On behalf of the Center for Biological Diversity (Center) and our more than 625,000 supporters in Alaska and throughout the United States, we submit the following comments in support of Kenai Peninsula brown bear conservation measures. The Center is a non-profit environmental organization that uses science, policy and law to advocate for the conservation and recovery of species on the brink of extinction and the habitats they need to survive. We support a long-term ban on all sport hunting for Kenai Peninsula brown bears on the Kenai National Wildlife Refuge (Refuge), due to the dramatically increased sport and defense of life and property (DLP) deaths of Kenai Peninsula brown bears this year both on and off Refuge lands. The Center strongly opposes the Alaska Board of Game's (BOG) continued use of non-science-based predator control measures to direct management strategies for Kenai Peninsula brown bears. As long as BOG continues to enact predator control measures that put the Kenai Peninsula brown bear at risk of extinction, the Fish and Wildlife Service has a duty to ban sport hunting and enact measures to reduce DLP and illegal killings on the Refuge.

We are especially concerned with the status of the Kenai Peninsula brown bear due to its isolation from other populations of Alaska brown bears (Farley et al. 2001, Farley 2005). DNA analyses show that the Kenai Peninsula brown bear is genetically less diverse than mainland Alaska brown bears and does not interbreed with mainland bears (Jackson et al. 2008, Talbot et al. 2009). The Kenai Peninsula brown bear inhabits an area of Alaska with unique and rapidly increasing anthropogenic stresses, resulting in high rates of human-caused mortality including illegal and unreported killings (Miller and Schoen 2002, Zulueta 2012, Morton 2013). Stressors on Kenai Peninsula brown bears include rapid human population expansion and accompanying residential and commercial development, increased recreational and tourist pressure from both consumptive and non-consumptive users, logging, displacement from salmon streams by human fishers, and the many impacts of rising anthropogenic greenhouse gas emissions (Farley et al.

2001, Suring et al. 2006a, Graves et al. 2007, Zulueta 2012). Climate change and ocean acidification may further stress the habitat, hibernation patterns, and feeding ecology of brown bears due to shifts in the timing and productivity of salmon runs (Hilderbrand et al. 1999, Bryant 2009), widespread spruce-beetle infestations (Berg et al. 2006, Suring et al. 2006b), and disruptive climatic and ecological conditions (Klein et al. 2005, Wolken et al. 2011).

The comments below address past and current management of the Kenai Peninsula brown bear population, the anthropogenic stressors on this population, the demographics, trends, and viability analyses of this population, the extinction risks to this population, evidence of genetic isolation, and the potential for Endangered Species Act protections. Taken together, the evidence shows not only that the Fish and Wildlife Service's temporary sport hunting ban was warranted, but that the Service must immediately move forward with long-term protections for the bears.

Management of Kenai Peninsula Brown Bears

The Kenai Peninsula is a popular tourist destination, and the resident human population has been rapidly increasing by about 10,000 people every ten years. The Kenai is the second fastest growing area of Alaska. Both human recreation and population growth have been identified as major conservation concerns for the Kenai Peninsula brown bear, resulting in various conservation strategy proposals and measures by the Alaska Department of Fish and Game (ADF&G) and federal agencies.

In 1998, ADF&G listed the Kenai Peninsula brown bear as a “population of special concern,” warranting special management measures to help ensure its continued survival (ADF&G 2000). This listing identifies a population that “is vulnerable to significant decline due to low numbers, restricted distribution, dependence on limited habitat resources, or sensitivity to environmental disturbance” (ADF&G 2000). The Kenai Peninsula brown bear specifically meets the standards as “an isolated population in an area experiencing steady human population growth and increased human activity” (ADF&G 2000).¹

Also in the late 1990s, in response to public concern about salvage logging and expanding roads on the Kenai, ADF&G, federal agencies and representatives of private interests on the Kenai formed a stakeholder group and the Kenai Brown Bear Conservation Strategy was finalized and approved in 2000 (ADF&G 2000). All recommendations contained in the document were developed by consensus, with the recognition that conservation measures were necessary at that time to avoid a future conservation crisis (Schoen and Miller 2002). State and Federal agencies formed the Interagency Brown Bear Study Team which developed the 2001 Conservation Assessment of the Kenai Peninsula Brown Bear (Farley et al. 2001). Both documents laid a

¹ In 2011, Alaska eliminated the “population of special concern” list. The bears' status is footnoted in Appendix 7 of the Alaska State Wildlife Action Plan (Morton et al. 2013).

foundation for conserving the Kenai Peninsula brown bear population through proactive action and research efforts.

BOG's recent actions are in stark contrast to the collaboration among federal agencies, state agencies, non-profit environmental groups, and local stakeholders that was once a hallmark of Kenai Peninsula brown bear management (ADF&G 2000). In 2013, BOG substantially relaxed hunting regulations on the Kenai. It began allowing a general registration hunt, with an extended season from September 1 to May 31. It increased the bag limit from one bear every four years to one bear per year, and it put no cap on the number of bears that could be killed. Starting in 2014, there will be a 70-bear cap with no separate cap on females, and hunters will be allowed to kill bears at bait stations (Alaska Board of Game 2013).

In 2013, there were at least 70 human-caused mortalities in the Kenai Peninsula brown bear population, with roughly 45 of these bears killed from sport hunting. This is a jump from 32 bears killed in the sport hunt of 2012, and a major increase from an average of 11.3 bears killed in sport hunts annually from 1973 through 2011 (Morton 2013). Of the bears killed in 2013, 54% (38) were killed on federal lands, with 37% (26) of those bears killed on the Refuge. Especially troublesome were the deaths of 24 adult female bears, including 19% (5) of GPS-collared sows. On the Refuge, 10 adult sows were killed, which is roughly 42% of total sow mortality. The small Kenai Peninsula brown bear population is especially sensitive to adult female mortality, and brown bears have the lowest reproductive rate of any large North American mammal.

BOG has repeatedly refused to exclude Refuge lands from its predator control measures, despite requests by the Fish and Wildlife Service to work toward a solution (e.g., Loranger 2013). BOG has adopted measures designed to increase the harvest of bears, with the intent of increasing moose and other ungulate populations in Game Management Units 7 and 15 (Alaska Board of Game 2012). Even more Kenai Peninsula brown bears may be killed in 2014 when, for the first time in the history of the Kenai, hunters will be allowed to kill brown bears over bait. Despite a 70-bear cap on harvest as of 2014, BOG has put no limits to the number of female bears killed, and DLP and illegal kills are difficult to monitor (Suring and Del Frate 2002, Zulueta 2012, Alaska Board of Game 2013, US Forest Service 2013). Thus it is likely the number of bears killed, and more importantly, the number of adult female bears killed, will exceed that required to maintain population viability (Kovach et al. 2006).

Long-term Population Trends and Extinction Risk

Population Estimate

The Kenai Peninsula is heavily forested, making aerial surveys impossible. There was therefore no accurate population estimate for Kenai Peninsula brown bears before 2010. A 2010 collaborative study between the U.S. Forest Service and the Fish and Wildlife Service used a

combination of non-invasive DNA sampling and information on radio-collared bears to estimate Kenai Peninsula Brown bear abundance. This study estimated that 428 brown bears were present on the Kenai National Wildlife Refuge and Chugach National Forest, with 624 bears on the entire Kenai Peninsula. Based on known demographic parameters, this translates to roughly 200 adult females, 200 adult males, and 224 dependent young (Morton et al. 2013). There is no information on whether the population is increasing, decreasing, or stable.

Prior Kenai Peninsula brown bear population estimates were not empirically based and were likely inaccurate. Based on calculations using the bear density in the Susitna area of 20 bears per 1,000 km², Jacobs estimated the Kenai Peninsula brown bear population at 150 to 250 bears in 1989 (Jacobs 1989, Farley 2005). ADF&G subsequently increased the estimate to 277, based on a larger area of suitable bear habitat (Del Frate 1993). These estimates should carry no weight for management purposes because they were based on a completely separate population, and bear densities can vary greatly among populations (Miller and Schoen 2002, Morton et al. 2013).

Population Viability of the Kenai Peninsula Brown Bear

Recent analysis shows that BOG's current hunting regulations threaten the long-term viability of the Kenai Peninsula brown bear. Population viability analysis (PVA) is the most common tool used to determine the probability that a population will go extinct within a certain amount of time.² (Boitani and Powell 2012). A PVA is an especially useful tool to determine a sustainable yearly mortality quota for a population such as the Kenai Peninsula brown bear, where anthropogenic factors play a large role in the number of bears killed each year, the animals are difficult to accurately census, and where the population faces additional stressors due to reduced genetic variability (Chesser et al. 1993, Traill et al. 2010).

Populations prone to extinction are generally characterized by large body size, large home ranges, low densities, low recruitment rates, and limited dispersal—all attributes of the Kenai Peninsula brown bear population (Woodroffe 2001, Morton et al. 2013). For such populations, human-caused habitat degradation and fragmentation and restricted immigration or emigration exacerbate the risks of demographic stochasticity, disease, and inbreeding and genetic drift (Laikre et al. 1996, Frankham 1998, O'Grady et al. 2006, Boitani and Powell 2012). Extinction risks for Kenai Peninsula brown bear are amplified by high levels of human-caused mortality,

² The PVA process is widely accepted as the most scientifically valid means by which to establish a long-term conservation plan for a species. The International Union for Conservation of Nature (IUCN) recommends quantitative analyses using PVAs for Red List conservation status assessments when adequate data is available. The Fish and Wildlife Service routinely uses PVAs to determine extinction risk of a species.

including legal hunting, DLP, illegal killings, and road kill (Suring et al. 1998, Suring and Del Frate 2002, Morton 2013, Morton et al. 2013).

Based on input and output parameters developed by Farley (2013), Morton (2013) calculated the population trend of Kenai Peninsula brown bears using a reproducible, scientifically-based PVA. The scientists inputted empirical data from the 2010 population census and from long-term studies on the bears to determine the future population trajectory of Kenai Peninsula brown bears under the current regulatory framework and various levels of human-caused mortality of adult female bears.

The model showed that if human-caused mortality of adult female bears on federal lands continues at the rates recorded in 2013 in which 12% (24) of adult females were killed, half (12) of which were on Federal lands, this raises the probability of extinction on Federal lands over 25 years to 33% (Morton 2013). Further, continued human-caused mortality at 2013 levels through the year 2015 will lower the Kenai Peninsula brown bear population to less than 500 bears, at which point the population loses evolutionary viability (Traill et al. 2010, Flather et al. 2011, Morton 2013).

Human-caused disturbance and range-contraction is a significant factor leading to the extinction of a population, and these factors are rapidly increasing on the Kenai, increasing the relative risks of low population size (Channell and Lomolino 2000, Boitani and Powell 2012). Human activity and development may especially impact the most important group for population viability of the Kenai Peninsula brown bear—females with young. For example, females with cubs modify their movements based on perceived risk, assuming subdominant status and frequenting less productive salmon streams when risks increase (Suring et al. 2006a).

From the oral testimony at the Anchorage hearing on November 21 and BOG's recent regulations that resulted in the unprecedented killing of 70 Kenai Peninsula brown bears in 2013, it is clear that BOG determines its predator-control-based harvest parameters for brown bears independent of any scientific basis. Instead, the process is politically driven, and not intended to maintain a viable population of Kenai Peninsula brown bears. Former ADF&G biologist John Schoen and former Alaska governor Tony Knowles wrote of the regulations approved by BOG in 2013: "It is almost unconceivable that these extreme changes will not lead to overharvest of Kenai Brown Bear" (Knowles and Schoen 2013). Scientific analysis using the best empirical data and models available confirms that BOG's regulations could quickly push Kenai Peninsula brown bears below the viability threshold.

Genetic Isolation of the Kenai Peninsula Brown Bear

Evidence of Genetic Isolation

The Kenai Peninsula brown bear population is exceptionally susceptible to rapid decline due to almost complete isolation from mainland brown bear populations through a combination of geographic and anthropogenic factors. Since the end of the last ice age, the 24,300 km² Kenai Peninsula has been separated from the Alaska mainland by a 16 km-wide isthmus of ice, rock, and mountains, effectively restricting bear emigration or immigration to very low numbers. More modern impediments to movement through this narrow strip of land include two communities, two airstrips, 13 km of roads, two campgrounds, railroad tracks, a 30 km long lake, and several glaciers (Farley 2005). Combined, these factors create a functional barrier to brown bear movement and connectivity between the Kenai Peninsula and the Alaska mainland.

Studies to date support the genetic isolation of the Kenai Peninsula brown bear population. Microsatellite and mitochondrial DNA analysis showed that the Kenai Peninsula brown bears are less genetically diverse than mainland Alaska brown bears, and that the Kenai Peninsula brown bears do not breed with bears from the Alaska mainland (Jackson et al. 2008, Talbot and Farley 2009).

Research on other species on the Kenai also indicates little genetic exchange between the peninsula and the mainland. A study evaluating the population structure of Kenai Peninsula black bears found evidence of genetic isolation (Robinson et al. 2007). Wolves also appear to be isolated. Of the approximately 250 gray wolves marked on the Kenai Peninsula over the past 20 years, only five made documented moves off the Kenai Peninsula. Marked wolves from mainland Alaska have never made documented moves onto the Kenai Peninsula (Farley 2005). Because gray wolves tend to more easily disperse over longer distances than brown bears, this means that brown bear emigration or immigration to and from the Kenai Peninsula is likely minimal. Mainland bears thus do not serve as a natural source of recruitment or genetic diversity for the Kenai Peninsula brown bear population. This isolation places the Kenai Peninsula brown bears at risk of extinction, not only due to genetic factors including genetic drift and inbreeding, but also because a loss of genetic diversity reduces a population's ability to evolve and adapt to climate change (Visser 2008).

Endangered Species Act

The Kenai Peninsula population of brown bears may qualify as a distinct population segment (DPS) of brown bears, which means it would be eligible for protection under the Endangered

Species Act (ESA). If BOG continues to allow high numbers of Kenai bears to be killed, ESA protections will likely be necessary to prevent the extinction of the population.

In order to qualify as a DPS under the ESA, a population must be both discrete from, and significant to, the species as a whole. Specifically, a vertebrate population segment may be considered discrete if it “is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors (quantitative measures of genetic or morphological discontinuity may provide evidence of this separation).”³ The definition of DPS does not require complete reproductive isolation in order to determine that a population is markedly separated from other populations, and allows for a limited interchange among population segments considered to be discrete. In order for a population to qualify as significant, there must be evidence that: (1) a loss of the population would result in a significant gap in the range of the taxon, and (2) the population differs markedly from other populations of the species in its genetic characteristics (Rosen 2007). The Greater Yellowstone population of grizzly bears is an example of a brown bear population that has been classified as a DPS.

The Kenai Peninsula brown bear meets the discreteness criteria because it is markedly separate from mainland Alaska brown bears, with very little genetic exchange between mainland bears and Kenai bears, and because there is low genetic diversity within the population. The Kenai Peninsula brown bear also meets two of the significance criteria of a DPS. Loss of Kenai Peninsula brown bears would result in a significant gap in the range of the taxon, and several genetic studies have confirmed less genetic variability within the Kenai Peninsula brown bear population, with evidence of little or no interbreeding with other brown bear populations.

Thus, the Kenai Peninsula brown bear may warrant listing under the Endangered Species Act. Unless BOG takes immediate measures to reduce Kenai Peninsula brown bear take and develop a comprehensive, science-based management plan, protecting the bears under the ESA may be the only way to ensure the bears survive the combined threats of human activity, habitat degradation, and climate change. Regardless of ESA status, the Fish and Wildlife Service can and should slow the decline of Kenai Peninsula brown bears by enacting rigorous protections on Refuge lands.

Conclusion

We fully support the Fish and Wildlife Service’s emergency closure to sport brown bear hunting on the Kenai National Wildlife Refuge. We urge the Service to indefinitely close the Refuge to all sport hunting of brown bears and enact measures to reduce defense of life and property and illegal killings on the Refuge. No sport hunting of Kenai Peninsula brown bears should be

³ Policy Regarding the Recognition of Distinct Vertebrate Population Segments under the Endangered Species Act, 61 Fed. Reg. 4722 (Feb. 7, 1996).

allowed on the Refuge unless and until the Alaska Board of Game enacts hunting regulations that protect the viability of the species.

Thank you for your commitment to the long-term population viability of the Kenai Peninsula brown bear. We appreciate the opportunity to comment on this important issue.

Sincerely,

Kiersten Lippmann

A handwritten signature in cursive script that reads "Kiersten Lippmann". The signature is written in black ink on a light-colored background.

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