

BACKGROUND INFORMATION

Temporary Closure to Sport Hunting of Brown Bears Kenai National Wildlife Refuge U.S. Fish and Wildlife Service August 29, 2014

The U.S. Fish and Wildlife Service (Service) is proposing a temporary closure to sport hunting of brown bears on the Kenai National Wildlife Refuge (Refuge), pursuant to federal regulations at 50 CFR 36.42. The temporary closure is being implemented as a resource protection measure and to ensure consistency with Refuge establishment purposes. The closure is effective on September 1, 2014, and would remain in effect until May 31, 2015.

Background

In June 2010, U.S. Fish and Wildlife Service and USDA U.S. Forest Service wildlife biologists cooperatively conducted a field study to estimate the brown bear population on a 10,200 km² study area within the Refuge and an adjacent portion of the Chugach National Forest. DNA-based mark-recapture models resulted in an estimate of 428 (95% lognormal CI = 353–539) brown bears on the study area or 42 bears per 1,000 km² (Morton *et al.* 2014).

This density estimate places the Kenai population on the low end of other coastal brown bear populations in Alaska, which range from 191–551 per 1,000 km² (Miller *et al.* 1997). Extrapolation of this density estimate suggests a population of 582 brown bears (95% lognormal CI = 469 - 719) on the Kenai Peninsula in 2010, half of which were females (Morton *et al.* 2014). Based on litter sizes of 38 radio-collared sows in 2010 (Farley 2010), 582 brown bears likely represents 188 adult females, 188 adult males, and 206 dependent young, of which 103 would be males and females each (Morton *et al.* 2014). (*Note: The population estimate of 582 brown bears is slightly lower than a previously reported value from the study of 624 brown bears. The estimate was revised because a recalculation of the available habitat within the study area increased from 9,500 km² to 10,200 km² which decreased the density estimate and, consequently, the extrapolated estimate of the peninsula-wide population.*)

The 2010 density estimate is more than twice the 20 bears per 1,000 km² that was assumed when the Alaska Department of Fish and Game (ADF&G) (in 1993) suggested that the brown bear population on the Kenai Peninsula was 250-300 individuals. These two population estimates cannot be compared to make inferences regarding population growth, as the earlier estimate was arrived at using the collective opinions of several brown bear experts with extensive knowledge of bear densities in Alaska and applying that knowledge to available habitat on the Kenai, whereas the current value is a model-based estimate using empirical data. Data from telemetry studies of brown bears suggest that the Kenai Peninsula brown bear population has been stable to slowly increasing over the past two decades. The only published estimate of the finite rate of growth (λ) for the Kenai brown bear population was 1.0128 (95% CI = 0.9364–1.0588) for 1995–99 (IBBST 2001), approximating an annual growth rate of 1 percent. Farley (recently

presented an updated λ estimate of 1.0451 (95% CI = .9639-1.1216) for 1995–2012 (Farley 2013). The ADF&G reported that demographic data on Kenai brown bears from the 1990s to 2012 suggest a population with an average annual growth rate of up to 3 percent (ADF&G presentation to the Alaska Board of Game, March 2014).

In 2012 and 2013, the Alaska Board of Game liberalized sport hunting regulations for brown bears in Game Management Units (GMU) 7 and 15 on the Kenai Peninsula. Much of GMU 15 and a small portion of GMU 7 lie within the Refuge. A limited-entry permit hunt was replaced by an unlimited registration permit hunt for the fall 2012 season. Regulatory changes which took effect beginning July 1, 2013, included increased season length, allowance of take of brown bears at registered black bear bait stations, increased bag limit to 1 bear per regulatory year (from one bear every 4 years), and changing a previous annual harvest cap based on the total number of reproductive-aged females (10) (Farley 2013) to a total annual mortality that cannot exceed 70 bears year regardless of age or sex. The annual cap will first be applied in 2014 (and was amended to a total cap of 70 human caused mortalities with no more than 17 adult females), and there was no cap in place for the 2013 season. The new regulations are in effect for the 2013-14 and 2014-15 hunting seasons, at which point the Alaska Board of Game's stated intention is to revisit the regulations.

Known human-caused brown bear mortalities on the Kenai Peninsula in 2013 totaled 71 bears (ADF&G unpublished data, 2013) including 46 bears taken during spring and fall hunting seasons, and 25 bears killed through defense of life or property takings, illegal takings, agency kills of problem bears, and vehicle collisions (ADF&G unpublished data, 2013). Known human-caused mortalities in 2013 included 23 adult reproductive age females, representing 32 percent of all known mortalities (ADF&G unpublished data, 2013), or 12 percent of the estimated 188 independent female bears estimated to be in the Kenai population in 2010 (Morton *et al.* 2014). Of 26 radio-collared sows known to be alive in spring 2013, 4 (15.6 percent) were killed (2 hunting, 2 non-hunting) (S. Farley, ADF&G, personal communication). Using demographic data (stable age distribution analysis), State biologists estimated that the number of adult females in the population declined by 18 percent due the 2013 kill (ADF&G presentation to the Alaska Board of Game, March 2014). In contrast, prior to 2013, ADF&G radio telemetry studies of Kenai brown bears documented an annual adult female mortality rate (which combines both natural and human-caused mortality) of less than 8 percent (Farley 2010, 2011). Survival of adult female brown bears is known to be a primary driver of brown bear population dynamics. State biologists reported that all evidence indicates that human-caused mortality in 2013 reversed the Kenai's brown bear population's trajectory and reduced the population (ADF&G presentation to the Alaska Board of Game, March 2014).

To date in 2014, a total of 54 human-caused brown bear mortalities have been documented on the Kenai Peninsula (Alaska Department of Fish and Game, unpublished data). Of these, 52 were taken by hunters during spring (from late April to the end of May). Of the 52 brown bears harvested, 40 (77 percent) were taken over bait. Take of brown bears over bait at registered black bear baiting stations was legal under State of Alaska regulations for the first time in spring 2014, but was not allowed on the Refuge under Federal regulations. The sex and age composition of the harvest included 30 adult males, 5 adult females, 9 sub-adult males and 8 sub-

adult females. Two additional bears (1 adult male and 1 sub-adult female) have been killed in defense of life or property this summer on the Kenai Peninsula.

The Service anticipates that the number of brown bear mortalities will continue to rise in 2014 until the annual cap of 70 bears (or 17 adult females) is reached, at which point the Alaska Department of Fish and Game has announced that it will close the sport hunting season. Hunting under State regulations will resume in spring 2015, including continued harvest of brown bears at registered black bear bait stations.

Documented and projected levels of known human-caused mortality in 2013 and 2014 (~70 in both years and including high adult female mortality in 2013) total approximately 12% of the 2010 estimate of 582 bears annually. Population level impacts are to be expected at these annual levels of adult bear and overall mortality, especially in a species with relatively low reproductive potential.

Available demographic and harvest data on Kenai brown bears and modeling (using Vortex 9.99) by Refuge biologists indicate that hunting mortality of brown bears since 2012 contributed to overall levels of human-caused mortality which are resulting a decline in the population. Modeling suggests that human-caused mortality of Kenai brown bears since 2012 (most (77%) of which is hunting mortality), including a high proportion of female bears and a high number of adult, reproductive-age female bears in 2012 and 2013, has reversed the recent trajectory of the population and resulted in modeled decline of approximately 20 percent. High adult female mortality, particularly in 2013, has also negatively impacted the productivity of this population, and this effect is expected to continue at least several years into the future. Further, the Service believes that expected future harvests in fall 2014 and spring 2015 outside of the Refuge will exacerbate these population level impacts.

Actual human-caused mortality levels are higher than those documented, meaning that population level impacts may be more substantial than those suggested by modeling. Ongoing ADF&G telemetry studies of Kenai brown bears have conclusively shown that some human-caused mortality of marked bears is unreported. In 2013, based on radio telemetry data, State biologists estimated that there may have been an unreported human-caused mortality as high as 28 bears (ADF&G presentation to the Alaska Board of Game, March 2014). This would equal an additional 4.8 percent of the 2010 population estimate of 582 brown bears. Determining sustainable mortality levels for Kenai brown bears must take into account undocumented human-caused mortality, even if this rate can only be estimated.

The Service believes that a more conservative approach to harvest management for Kenai brown bears is scientifically justifiable and warranted due to several factors, and that these considerations are especially germane to ensuring that the Refuge's establishment purposes are met: 1) as a species, brown bears have one of the lowest reproductive potential of any North American mammal; 2) at current population numbers, the Kenai brown bear population remains a relatively small population that is highly sensitive to high adult female and high overall human-caused mortality levels; 3) genetics studies have determined that Kenai brown bears are an isolated population (Jackson *et al.* 2008). This means that immigration from mainland Alaska

will not assist in sustaining the population; 4) the Kenai brown bear population will continue to be strongly influenced by habitat loss and fragmentation and multiple potential sources of human-caused mortality as the human population continue to grow on the Kenai Peninsula and recreation use of public lands increases; and 5) monitoring the status of this bear population is extremely difficult and expensive.

The Service is implementing this Temporary Closure of sport hunting of brown bears on the Refuge as a resource protection measure and to ensure consistency with Refuge establishment purposes. The Service's legal responsibilities on the Refuge include conserving a healthy brown bear population in its natural diversity, ensuring continued opportunity for visitors to hunt, view and photograph brown bears, and maintaining wilderness character in the Congressionally-designated Kenai Wilderness.

Next Steps

The Service is continuing to work with the Alaska Department of Fish & Game and other agencies to assess modeling approaches using available demographic data on Kenai brown bears and to develop a collaborative brown bear harvest management strategy. The Alaska Board of Game will consider proposals for regulatory changes for sport hunting of brown bears at their upcoming March 2015 meeting.

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