7. Research and Monitoring

Synopsis: Kodiak bears have been the subjects of formal research for the past 60 years. Initial research centered on bear-cattle and bear-salmon conflicts. By the 1960s, research had become more holisti cand included studies on feeding habits, reproductive potential, growth rates, movements, and population estimations. In the 1980s and 1990s, research expanded to include most of the representative habitats on Kodiak Island. Routine monitoring, based on research results and harvest reports, allows biologists to track and manage human impacts on bears. New research will fill information gaps and will be needed to address increasing and changing demands for use of the Kodiak bear resource. The Citizens Advisory Committee (CAC) recommends that Alaska Department of Fish & Game (ADF&G) and Kodiak National Wildlife Refuge (KNWR) provide funding and staffing adequate to continue conducting research and monitoring of the Kodiak bear population and its habitat. The first priority should be continued monitoring of the harvest and population trends in established survey areas. The CAC recommends that investigations into aspects of bear harvest and density have highest research priority, followed by habitat studies and bear-human interaction studies. Investigations into bear densities and habitats on Afognak Island should be initiated as soon as possible, followed by similar research on northeastern Kodiak Island.

Prior to any formal research or surveys, Alutiiq residents had a great deal of knowledge about and experience with Kodiak bears on the archipelago. For the past 60 years, Kodiak bears have been subjects of formalized research. Initial research centered on bear-cattle and bear-salmon conflicts. Biologists were interested in discovering the extent of bear predation on these important human food resources and in finding ways to reduce the impact of bears.

By the 1960s, research activities had become holistic, looking into feeding habits, reproductive potential, growth rates, movements, and population estimates. Initially these efforts were centered on Karluk Lake, with some limited work in the Uganik highlands. A plethora of research in the 1980s and 1990s expanded to include most of the representative habitats on Kodiak Island. Improved technology and study designs allowed biologists to expand and refine their understanding of bears and to more accurately estimate the number and density of bears on Kodiak Island.

The end result of the research conducted on Kodiak Island is a more thorough understanding of the population and better management of this important resource. Routine monitoring, based on research results and harvest reports, allows biologists to track and manage human impacts on bears. New research will fill information gaps and will be needed to address increasing and changing demands for the Kodiak bear resource. Future research can also explore the population dynamics, habitat, and density of bears on portions of the archipelago that have not been studied, such as northeastern Kodiak, Afognak, and Shuyak islands.

The 88,000-acre Mount Glottof Research Natural Area (RNA) was designated in 1975 to protect alpine feeding habitat for bears and to provide an area for future research on this bear summer habitat. The area contains key habitat for mountain goats and has high scenic and recreational value. The second-highest mountain on Kodiak Island, Mt. Glottof, is in this area.

7.1 Recommendations for Research and Monitoring

The CAC recommends that ADF&G and KNWR provide funding and staffing adequate to continue conducting research on and monitoring of the Kodiak bear population and its habitat. The first priority should be continued monitoring of the bear harvest and monitoring of population trends in areas that have already been established. Continued monitoring of salmon populations is also important to assess the status of bear food sources.

In addition to their monitoring efforts, agency biologists should expand their knowledge of Kodiak bears. The CAC believes that management-based research should have a higher priority than more esoteric projects. In general, investigations into aspects of bear harvest and density should have highest priority, followed by habitat studies and bear-human interaction studies.

Investigations into bear densities and habitats on Afognak Island should be initiated as soon as possible, followed by similar research on northeastern Kodiak.

7.1.1 Recommendations for Monitoring

The following specific recommendations for monitoring and research activities are listed in relative order of priority (by category) for future biological activities.

- Maintain the current bear-harvest monitoring regime, including permit reports, specimen requirements, and on-island bear sealing.
- Continue monitoring bear density on Kodiak Island and increase survey frequency to at least once every five years for the Aliulik Peninsula, Karluk Lake, Terror Lake, Kiliuda, and Spiridon survey areas.
- Continue monitoring salmon escapement trend data and subsequent species-specific productivity; evaluate salmon harvest strategies for all human user groups (see Appendix F, “Principles and Criteria for Sustainable Salmon Fishing”) (see chapter 3, “Kodiak Bear Habitat”).
- Develop methods to objectively document annual abundance and availability to bears of vegetation in representative habitats on the Kodiak archipelago (see chapter 4, “Harvest Issues”).
- Monitor the bear population carefully on an annual basis to ensure survival of the optimum sex and age distribution of bears.

7.1.2 Recommendations for Future Research

7.1.2.1 Research on Density and Harvest

- Research and monitoring should be done to evaluate the effectiveness of depredation permits in terms of density and harvest calculations (see footnote 16 on page 6-17 for information about depredation permits).
- Assess bear density on Afognak Island and the Kodiak road system with the goal of establishing routine density monitoring in these areas by 2005.
- Determine the optimum percent of adult male bears that should be harvested by hunters in order to maintain genetic diversity and vigor (fitness) in the population, and evaluate existing survival, productivity, harvest, and population data to determine appropriate harvest rates by area, by sex, and by age.
- Work with villagers, remote cabin and lodge residents and owners, and hunters to refine population estimates and to refine unreported bear-kill data in order to maintain a bear population that can sustain a 6 percent annual sport harvest. Include revised estimates in harvest analyses (see chapters 4, "Harvest Issues," and 5, "Redefining Bear-Management Strategy").
- Explore methods to estimate subadult (from weaning to maturity) mortality and dispersal and apply results to existing survival estimates.
- Continue to track the number of bears killed by deer, elk, and goat hunters to minimize such bear mortality and make a serious effort to mitigate this problem through education of big-game hunters on how to avoid dangerous situations involving bears (see chapter 4, "Harvest Issues" and chapter 8, "Education").

7.1.2.2 Research on Habitat

- Kodiak National Wildlife Refuge should detail its management intent for the Mt. Glottof RNA, especially with regard to uses by the public. While the CAC recognizes the importance to bears of the Mt. Glottof RNA, USFWS is urged to continue to allow existing human uses of the area, including hunting, hiking, and trekking. Any future management plans for the area should include substantial public input.
- Delineate types and extent of bear habitat on the Kodiak archipelago using remote-sensing technology and ground truthing.
- Use radiotelemetry data from previous studies to examine habitat preferences by bears on various parts of Kodiak Island (by season and by reproductive status).
- Examine bear use of spruce forests and adjacent habitats by conducting a radiotelemetry study on Afognak Island. Include documentation of bear use of newly cut and regenerating forests.
- Conduct baseline research on Sitka black-tailed deer and mountain goat habitat use and movements using radiotelemetry. Data collected from these investigations, and from data already collected on elk, will be used to focus future research on impacts of these species on bears.

- Develop methods to objectively document annual vegetative abundance and availability to bears in representative habitats on the Kodiak archipelago.
- To minimize snowmachine impact on bears, conduct additional research to provide the facts necessary to identify highly sensitive areas of brown-bear habitat (e.g., denning areas) (see chapter 3, "Kodiak Bear Habitat").
- Identify funding sources to study effects of introduced species on bear habitat and conduct research to determine if a problem exists with introduced species depleting bears' food resources or otherwise damaging bear habitat. When evaluating the results of research on introduced species, social issues (e.g., subsistence hunting) should be considered. Research should be subject to peer review (see chapter 3, "Kodiak Bear Habitat").
- Research the impact on bears of commercial use of salmon berries and blueberries (see chapter 3, "Kodiak Bear Habitat").
- Continue evaluating species-specific salmon escapement levels against drainage-specific bear use of salmon; investigations should emphasize an ecosystem overview (e.g., salmon biologic escapement goal [BEG] rather than bear densities) (see chapter 3, "Kodiak Bear Habitat").

7.1.2.3 Research on Bear-Human Interactions

- Examine bear use, human use, and bear-human interactions in areas of high bear concentration where public use has been established and where regulations limiting public use and access may be considered.
- Compare survival rates, including vulnerability to hunters, of bears that frequent structured bear-viewing sites with those that do not.
- Delineate the movements and survival rates of bears that frequent solid-waste sites and other human-use areas.
- Assess the relationship between quality of visitor experience and different types of bear-viewing operations.
- Evaluate the effectiveness of landfill and on-site human food and garbage management strategies, including public education efforts, and refine efforts to improve their effectiveness.
- Evaluate the effectiveness of bear-safety public education efforts and refine to improve effectiveness.
- Identify areas where hardened[22] fishing campsites would minimize bear-human conflicts (see chapter 3, "Kodiak Bear Habitat").

[22] A "hardened" campsite is one that is designed to minimize negative bear-human interactions. A hardened campsite is strategically located to avoid bear travel corridors. It typically provides bear-resistant food storage options, campsites, and necessary facilities, commensurate with the level of human use, to provide a safe recreational experience.

- Research and monitoring should be done to evaluate the effectiveness, in reduction of bear-human interactions, of depredation permits (see footnote 16 on page 6-17 for information about depredation permits).