Kodiak Archipelago Bear Conservation and Management Plan

photo by Jennifer Fogle,
Shot In The Dark

February 2002

This conservation and management plan is dedicated to the bears of the Kodiak archipelago.

State of Alaska
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Kodiak Archipelago Bear Conservation and Management Plan

Developed for the Kodiak archipelago by the Citizens Advisory Committee

Left to right: Tom Panamaroff, representing Native large-land owners; Dave Kubiak, representing commercial fishing; Dick Rohrer, representing guides; Pam Foreman, representing tourism; Kizhuyak the bear, silently representing Kodiak bears; Bettye Plyler, representing citizens-at-large; Charles Dorman, representing agriculturalists and ranchers; Richard Carstens, representing resident sportsmen; Dave Cline, representing the Kodiak Brown Bear Trust; Wallace Fields, representing commercial fishing (setnetters); Rolan Ruoss, representing air taxi operators; Barbara Rudio, representing conservationists. Not present for photo: Jeff Peterson, representing Native villages; Hank Pennington and Tom Walker, representing commercial wildlife photographers.

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February 2002

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Acknowledgments

The Citizens Advisory Committee that developed this bear conservation and management plan for the Kodiak archipelago wishes to thank all those who participated in the process:

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Dean Andrew
Tony Azuyak
Wade and Sherry Ball
Vic G. Barnes, Jr.
Wayne Biessel
Joe Black
Tim Booch
Kevin Brennan
Bill Burton
Paul Chervnak
Sam Christianson
John Crye
Tina Cunning
Brigid Dodge
Harry Dodge
Dan Dorman
Duane Dvorak
Darrel Farman
Fishery Industrial Technology Center (and Ginny Bailey)
Mike Getman
Barrie Gilbert
Will Haag
Sven Haakansen, Sr.
Sven Haakansen, Jr.
Peter Hagelis
Willy Hall
Dick Hensel
Pat Holmes
Jeff Hughes
Davey Jones
Paul Joslin
Mark P. Kinney
Naomi Klouda
KMXT (and Janelle Everett)
Kodiak College (and Barbara Stevens)
Kodiak Daily Mirror
Kodiak Fisheries Research Center (and Bonnie Nesheim)
Kodiak Regional Aquaculture Association
Karen L. Lew
Cliff Lobaugh
Todd Logan
Cindi Loker
Larry Malloy
Leslie Marcucella
Jim McCullough
Doris Mensch
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Capt. E. Darrell Nelson
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Arnold A. "Ole" Olsen
Peter Olsen
Dee Dee Pearson
Charlie Powers
Bill Pyle
William A. Quirk, III
Ken Rice
Sam Rohrer
Lt. Joanna Roop
John W. Schoen
Steve Schuck
Len Schwarz
Robert Stovall
Omar Stratman
Becky Strauch
Norm Sutliff
Bruce Talbott
Steve Trickett
Larry Van Daele
Bob Wagner
Reggie Ward
Greg Wilker

and the many people who provided comments on the draft plan

Summary of the Kodiak Archipelago Bear Conservation and Management Plan

Stable or increasing Kodiak bear populations provide opportunities for multiple recreational experiences throughout the Kodiak archipelago, including on the Kodiak National Wildlife Refuge (KNWR). Through existing and creative management practices, these activities can be compatible and nonexclusive. However, opportunities for using Kodiak bears are *not* unlimited, and the cumulative effects of too many people using the resource can reduce those opportunities for all.

Although Kodiak bears are recognized as a valuable resource to the community, they are also sometimes viewed as competitors and predators by cattlemen and commercial fishermen; as nuisances to anglers and deer hunters; and as potential threats to human life. The history of how people and bears have lived together on the Kodiak archipelago is a reflection of local, national, and international influences and attitudes. This history also highlights the fact that, with understanding and tolerance, people can coexist with a healthy population of the world's largest bears.

The best available scientific information indicates that, although the Kodiak bear population is being sustained at a healthy level, human pressures on the bears and their habitat have increased in the last 100 years throughout the Kodiak archipelago. Road construction, clearcut logging, cattle ranching, and commercial, residential, recreational, and industrial developments are altering bear habitat. Meanwhile, increasing human activity in bear country is leading to escalating bear-human interactions through hunting, fishing, viewing, and other forms of wildland recreation. Such interactions may result in the displacement of bears or, in the worst case, in defense of life or property (DLP) bear mortalities.

The purchase of lands and conservation easements from private and public entities within KNWR and in other strategic locations across the Kodiak archipelago was a dominant habitat-protection activity during the 1990s. Funding for these efforts was derived from civil and criminal settlements associated with the *Exxon Valdez* oil spill, from the Land and Water Conservation Fund, and from private organizations, principally the Kodiak Brown Bear Trust and The Conservation Fund.

By 2000, nearly 290,000 acres of valuable wildlife habitat on the refuge and more than 100,000 acres of habitat for the Alaska State Park System on Shuyak and Afognak islands had been purchased. These purchases from willing sellers provided additional management of key habitats, provided public access, and reduced the potential of habitat infringement through developments in remote areas. Opportunities for habitat acquisition remain and should be pursued.

Private and public resource managers have taken a number of positive measures to address concerns about Kodiak bears and their habitat. In 2000, the Alaska Department of Fish and Game (ADF&G), in response to the public's interest in Kodiak bears, spearheaded a public process to develop a bear-management plan for the Kodiak archipelago.

Such a plan was needed because of increased demand for diverse recreational opportunities and the need to minimize negative bear-human interactions. Those who live, work, and recreate in proximity to these bears needed to come together and produce a management plan reflecting current research in bear biology, habitat, and behavior while recognizing both traditional and contemporary uses of the resource. The purpose of the plan is to recommend measures to help ensure the sustainability of the Kodiak bear population, to respond to the public's desire for uses of this wildlife resource, and to address public safety concerns.

Although the population of bears on the Kodiak archipelago is presently healthy and its habitat generally well protected, no management plan had been formalized in the past. Because management of the bears and their habitat is a shared responsibility of ADF&G and the U.S. Fish & Wildlife Service (USFWS), which manages KNWR, it was essential that these two agencies pool their resources to work with the public in developing such a document.

Other government agencies–local, state, and federal–also needed to be involved in and committed to the plan's development if it was to be implemented. The public's involvement with, in fact its ownership of, the plan was considered crucial to the planning process. The final management plan needed to reflect the public's desires and concerns for continued use of and coexistence with bears if it was to have credibility and validity. Thus, a combination of public involvement and government commitment were the keys to the success of developing a bear-management plan for the Kodiak archipelago. (The public process designed for development of the plan is detailed in chapter 1, "Introduction.")

Recognizing responsibility for quality resource management justifies development and prompt implementation of a Kodiak bear-management plan. The healthy status of the Kodiak bear population is quite phenomenal when compared to most brown or grizzly bears elsewhere in the world. Many have been driven to extinction (California and Great Plains grizzlies), are listed as threatened (Rocky Mountain West), seriously depleted (parts of Russian Far East), or are of growing scientific concern to the extent that hunting seasons have been closed (British Columbia). Only in the remoter parts of Alaska, northern Canada, and Russia do healthy populations remain. Kodiak bears have among the highest population densities. Achieving this plan's proactive goals will ensure the health of the Kodiak bear population into perpetuity.

To provide background information so that the Citizens Advisory Committee (CAC) could make recommendations for the conservation and management of Kodiak archipelago bears, the chapters of this plan, each of which covers a different subject area, include introductory text information to provide bases for the recommendations that follow the issues (and that are also collected and placed in chapter 9, "Recommendations"). To set the stage, chapter 2 deals with the biology, history, and management of Kodiak bears prior to January 2001, when this plan began to be developed.

Kodiak bears live throughout most of the Kodiak archipelago and use virtually all available habitats from the coast to alpine regions. The archipelago is considered high-quality bear habitat, containing ample food, water, cover, and space. While vegetation is a prominent part of the bears' diet, salmon is the most important source of protein for most Kodiak bears. Currently, the human population and related human development have had minimal impacts on bear habitat.

Potential threats include seasonal human use of inland and coastal areas, future developments (e.g., road and energy development) and related problems (e.g., oil spills) and natural occurrences (e.g., reduction in salmon stocks). Kodiak bears are adaptable.

Bear habitat and bear-human relationship are intimately intertwined; if people are not willing to make an effort to live around bears, large expanses of wilderness areas where people rarely go are necessary for sustainable bear populations. With this information in mind, the CAC makes a number of recommendations to protect bear habitat on the archipelago. These recommendations cover the following subject areas: land use, acquisition, and planning; activities on Afognak Island; minimizing habitat degradation; road building in bear habitat; motorized access; bear-use areas; human activities in bear habitat; introduced species; and salmon as a part of bear habitat.

Residents and visitors harvest a variety of fish, wildlife, and plant resources on the Kodiak archipelago, and all of these harvest activities are interrelated with bears. Management of the harvest of Kodiak bears is currently based primarily on population assessments and regulation of sport hunting. With a healthy population of bears on the archipelago, the emphasis has been on maintaining a stable bear population that will sustain an annual harvest of 150 bears, composed of at least 60 percent males. Subsistence harvest of bears is presently managed by the U.S. Fish & Wildlife Service. Subsistence hunting permits are allocated each year with one in Akhiok, one in Karluk, three in Larsen Bay, two in Old Harbor, two in Ouzinkie, and two in Port Lions. Sport hunting of bears in Game Management Unit 8 (Kodiak archipelago) is regulated by a complex system involving drawing hunts and registration hunts. Nonresident bear hunters are required to use a guide; big-game hunting services provide significant economic resources to the people living on the archipelago. Other resource extraction, including deer hunting, elk hunting, commercial fishing, sport fishing, and harvest of berries and other plants, also directly impacts bear populations. The CAC makes recommendations on a number of harvest issues, including the following: management of bear-harvest activities, subsistence use of bears, sport hunting, guiding, other resource-extraction activities, and regulations and their enforcement.

Management objectives for bears on the Kodiak archipelago currently are based on harvest figures. ADF&G biologists, however, make management decisions and harvest recommendations based on both biological carrying capacity and wildlife-acceptance capacity[1]. At present, the total bear population on the Kodiak archipelago is stable and can be sustained at this high level by the natural habitat. Habitat in different areas is capable of sustaining different bear densities. Although the entire Kodiak archipelago is high-quality bear habitat, there are areas where human development and residence take precedence. Thus, biological carrying capacity and wildlife-acceptance capacity may be different. With this awareness, the CAC recommends a shift to managing the bear population by density rather than by harvest alone. To do this, biologists need accurate data on bear populations and habitat carrying capacities. The CAC also recommends reducing, through liberalized sport hunting seasons in the spring and issuance of appropriate depredation permits, the bear population along the road system of northeastern Kodiak Island by 10-20 percent below the current estimated level.

1 reflects the maximum wildlife population level in an area that is acceptable to people (Decker and Purdy 1988)

There are a variety of situations in which bears and humans interact: killing of bears in defense of life or property; solid-waste management and storage of human and pet food; livestock ranching; bear-viewing activities; public-use and remote cabins in bear habitat; other recreational activities in bear habitat, etc. The CAC thoroughly discussed the issues involving bear-human interactions and made recommendations that can have a significant impact on the future management of Kodiak bears.

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 activities evolved into a more holistic approach, looking into 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 the Kodiak bear resource. The CAC recommends that ADF&G and Kodiak National Wildlife Refuge 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 a variety of monitoring and research activities be continued or initiated.

The CAC believes that the widespread dissemination of accurate, fact-based information concerning Kodiak bears is essential for conserving bears and their habitat on the Kodiak archipelago. The primary objectives of current Kodiak bear-education efforts are to reduce negative bear-human interactions and to increase appreciation for and understanding of bears and their habitat. The CAC examined a number of ways to enhance the current educational effort by establishing educational programs that provide accurate information resulting in continued conservation and management of Kodiak bears. The key to any educational effort is cooperation and commitment by all concerned to provide science-based, accurate information in order to cultivate a well-informed public. Those who live, work, and recreate on the Kodiak archipelago need clear and useful information about bears in order to build understanding of bear behavior and to minimize negative bear-human interactions. In addition, with understanding and preparation, people can avoid bear encounters and respond wisely when they do occur. The CAC makes recommendations on the development and dissemination of educational and public outreach materials. These recommendations regard the following subjects: general user education, hunter education, off-road vehicle user education, angler education, U.S. Coast Guard education, economic incentives and land management, village and rural residents, and funding for education efforts.

All the recommendations made by the CAC on all subjects are compiled in chapter 9, “Recommendations,” with cross-references to the specific chapter (and, thus, subject matter and background information) from which they evolved.

A series of appendices affords the reader with definitions of abbreviations, acronyms, and terms used in this document as well as more specific information regarding certain subjects.

Public Review and Comment on this Plan

A public-review draft of the *Kodiak Archipelago Bear Conservation and Management Plan* was distributed to the public, presented at a series of public meetings from mid-May through the end of October 2001, and posted on the project's Web site[2] to allow the public to review the plan and to provide comments that were incorporated by the CAC in December 2001 and that are reflected in this final plan. After this final version of the plan is published, strategies for implementing the recommendations herein will be developed (see chapter 1, "Introduction," for more information about the process about implementing the recommendations). Final implementation is contingent on the standard policy processes of each agency or governing body.

[2] http://www.state.ak.us/adfg/wildlife/geninfo/planning/kodiakbb.htm

1. Introduction

Kodiak—The name conjures up images of mystery, grandeur, and power. An integral part of that mystique is the Kodiak bear (*Ursus arctos middendorffi*). Kodiak bears are valued locally and worldwide as a symbol of what is great about Alaska's indigenous wildlife. Kodiak bears generate income for the tourism industry, hunting and viewing guides, wildlife photographers, and many other businesses. Further, stable or increasing bear populations provide multiple recreational opportunities throughout the Kodiak archipelago, including on the Kodiak National Wildlife Refuge (KNWR). It is assumed that, through existing and creative management practices, these activities can be managed compatibly and nonexclusively. However, opportunities for using Kodiak bears are *not* unlimited, and the cumulative effects of too many people using the resource can reduce those opportunities for all. Above all, there is a desire as well as a need to ensure that Kodiak bears will be available for future generations to use and enjoy.

Although Kodiak bears are recognized as a valuable resource to the community, they are also sometimes viewed as competitors and predators by some cattlemen and commercial fishermen; as nuisances to anglers and deer hunters; and as potential threats to human safety or life. The history of how people and bears have lived together on the Kodiak archipelago is a reflection of local, national, and international influences and attitudes. This history also highlights the fact that, with understanding and tolerance, people can coexist with a healthy population of the world's largest bears.

1.1 The Reason for a Management Plan

Although the best available scientific information indicates the Kodiak bear population is being sustained at a healthy level, human pressures on bears and their habitat, throughout the Kodiak archipelago, have increased in the last 100 years. Road construction; clearcut logging; livestock ranching; and commercial, residential, recreational, and industrial developments are altering bear habitat. Meanwhile, increasing human activity in bear country is leading to increasing bear-human interaction through hunting, fishing, viewing, and other forms of wildland recreation. Such interactions may result in the displacement of bears or, in some cases, in bear mortality in defense of life or property (DLP).

The purchase of lands and conservation easements from private and public entities within KNWR and in other strategic locations across the Kodiak archipelago was a dominant habitat-protection activity during the 1990s. Funding for these efforts was derived from civil and criminal settlements associated with the *Exxon Valdez* oil spill, from the Land and Water Conservation Fund, and from private organizations, principally the Kodiak Brown Bear Trust and The Conservation Fund.

By 2000, nearly 290,000 acres of valuable wildlife habitat on the refuge and more than 100,000 acres of habitat for the Alaska State Park System on Shuyak and Afognak islands had been purchased. These purchases from willing sellers provided additional management of key habitats, provided public access, and reduced the potential of habitat infringement through developments in remote areas. Opportunities for habitat acquisition continue to exist and should be pursued.

Private and public resource managers have taken a number of positive measures to address these concerns about Kodiak bears and their habitat. In 2000, the Alaska Department of Fish and Game (ADF&G), in response to the public's interest in Kodiak bears, spearheaded a public process to develop a bear-management plan for the Kodiak archipelago.

Those who live, work, and recreate in proximity to these bears came together and produced this management plan, which reflects current research in bear biology, habitat, and behavior while recognizing both traditional and contemporary uses of the resource. The purpose of this plan is to recommend measures to help ensure the sustainability of the Kodiak bear population, to respond to the public's desire for uses of this wildlife resource, and to address public safety concerns.

Although the population of bears on the Kodiak archipelago is presently healthy and its habitat generally well protected, a management plan had not previously been formalized. Because management of bears and their habitat is a shared responsibility of ADF&G and the U.S. Fish & Wildlife Service (USFWS), which manages KNWR, these two agencies pooled their resources to work with the public in developing this plan.

Other government agencies—local, state, and federal—also were involved in and committed to the plan's development and to ensuring that it be fully implemented. The public's involvement with, in fact its ownership of, the plan was considered crucial to the planning process; such a plan needs to reflect the public's desires and concerns for continued use of and coexistence with bears if it is to have credibility and validity. (The public process designed for development of this plan is detailed in section 1.4.)

Recognizing a responsibility for quality resource management justifies development and prompt implementation of a Kodiak bear-management plan. The healthy status of the Kodiak bear population is quite phenomenal when compared to most brown or grizzly bears elsewhere in the world. Many have been driven to extinction (California and Great Plains grizzlies), are listed as threatened (Rocky Mountain West), are seriously depleted (parts of Russian Far East), or are of growing scientific concern to the extent that hunting seasons have been closed (British Columbia). Only in the remoter parts of Alaska, northern Canada, and Russia do healthy populations remain. None of these bears in other populations, however, can compare in physical size to the Kodiak bears, which have among the highest population densities. Achieving this plan's proactive goals will ensure the health of the Kodiak bear population into perpetuity.

1.2 Goals of this Plan

The *Kodiak Archipelago Bear Conservation and Management Plan* is intended to provide to the resource- and land-management agencies guidance regarding planning and regulatory decisions for Kodiak bears (see section 1.4.2). It is intended to be a dynamic document that allows for reasonable flexibility in management and thus is subject to change in ensuing years. In developing this plan, the Citizens Advisory Committee (CAC) (see section 1.4.1) recognized the need to build on the successful ADF&G and USFWS sustainable hunting policies currently in place in order to achieve the following goals:

- design the best brown-bear conservation and management strategy in the world
- address major threats to the well-being of Kodiak bears and their habitat

- address social, economic, and cultural concerns regarding bears and bear management
- ensure that a healthy and secure population of bears is maintained throughout the Kodiak archipelago
- ensure that important bear habitat is protected
- mitigate potential conflicts among interest and user groups
- ensure the continuation of opportunities for public use and enjoyment of Kodiak bears and their wildland habitats on the Kodiak archipelago

Although the recommendations made by the CAC and included in this plan are based on scientific information provided by qualified wildlife biologists, the plan itself is not intended as a scientific report and does not adhere to conventional scientific reporting styles, citations, and the like.

The recommendations included in this plan are intended to be consistent with state and federal laws, rules, and regulations. In cases where this is not so, the CAC has recommended appropriate changes to state or federal laws, rules, and regulations, which would have to be promulgated by the appropriate state or federal agencies through standard planning, review, and management processes.

In some instances, recommendations made by the CAC will entail increased agency capabilities, such as staffing, funding, or enforcement. Finding the means of meeting these increased needs will be part of the implementation strategies developed by the Intergovernmental Planning Group (IPG) (see section 1.4.2).

This plan recognizes and honors all terms of conservation easements negotiated with Native land owners. Recommendations in this plan incorporate respect for private property rights while recognizing that private land owners have responsibilities to adhere to applicable laws in the conservation of bears and their habitat.

1.3 Background

Many factors influence the development of a management plan for bears on the Kodiak archipelago: the geography and climate, the wildlife, and the people who live, work, and play there.

1.3.1 The Kodiak Archipelago

One of the primary reasons for the success of the Kodiak bear population is the quality of the habitat on which it depends (see also chapter 3, “Kodiak Bear Habitat”). A major reason the Kodiak archipelago supports one of the highest density of bears in the world is the biological productivity of this ecosystem. The high density of bears is due in part to the diverse and abundant favored bear foods (including plants, berries, and salmon), the fact that most of the archipelago is undisturbed by permanent human development, and the intensively managed and regulated bear-hunting regime that is in place.

The Kodiak archipelago is located in southcentral Alaska, 252 miles southwest of the city of Anchorage. The archipelago's three main islands (Kodiak, Afognak, and Shuyak) and numerous smaller islands encompass about 5,000 square miles, stretching 150 miles from north to south and 40 miles from east to west (see Figure 1-1). The archipelago is in a geologic uplift zone, and the present landscape has been sculpted by extensive glacial activity. Kodiak Island has numerous mountains with elevations greater than 3,000 ft along its central spine, with the highest being Koniag Peak at 4,470 ft. The southwestern portion of Kodiak Island and neighboring islands have more moderate terrain, and Shuyak Island has only slight relief. The coastline of the island group is typified by rugged headlands, rock outcroppings, gravel- and boulder-strewn beaches, and intertidal flats. Deep and narrow bays, with numerous branching arms and islets, are abundant.

The region has a cool, maritime climate characterized by overcast skies, fog, windstorms, and moderate to heavy precipitation. Summer temperatures average between 50° and 60º F and seldom exceed 75º F. Winter temperatures average in the low 20s (F) and rarely drop below 0º F. Precipitation occurs primarily as rain near sea level and as snow at high elevations from October through April. Annual precipitation varies widely among years and specific sites, but usually ranges from 40 to 80 in. Consistent winds of 30–60 mph are common.

Northern islands of the archipelago, including the northeastern portion of Kodiak Island, are forested with extensive stands of Sitka spruce. On Kodiak Island, the forest edge is slowly advancing southward. Large areas of forestland on Afognak and Kodiak islands have been commercially harvested. A diversity of habitat types occurs throughout the remainder of the archipelago, with shrub-grass-forb complexes predominant throughout lowland (less than 500 ft) and mid-slope (to 1,500 ft) areas. Representative species are Sitka alder, salmonberry, European red elder, willows, ericaceous shrubs (heath), sedges, bluejoint grass, ferns, fireweed, and cow parsnip. Cottonwood and willow communities are common along stream bottoms. Extensive areas of regularly spaced hummocks (1–4 ft tall) are abundant on southwestern Kodiak Island. Vegetation in upland (above 1,500 ft) areas is composed of various mixtures of low willow, heath, sedge, grass, and forbs.

The brown bear is one of six indigenous mammals that inhabit the Kodiak archipelago, the others being red fox, river otter, short-tailed weasel, little brown bat, and tundra vole. Introduced mammals include Sitka black-tailed deer, Roosevelt elk, mountain goat, reindeer, snowshoe hare, beaver, and red squirrel. Marine mammals such as harbor seals, Steller sea lions, sea otters, porpoises, and whales are common along the coast. Some 123 bird species are common on the archipelago, and 114 additional species have visited at one time or another.

The City of Kodiak, on the northeastern corner of Kodiak Island, is one of the nation's major fishing ports. Five species of Pacific salmon spawn in rivers and streams on the archipelago. Dolly Varden trout are widely distributed throughout the area, and rainbow trout are found in many watersheds. Summer salmon fisheries are a main ingredient of a diverse, year-round commercial fishery participated in by residents in every community on the archipelago, a popular sport fishery, and the subsistence lifestyle of a number of archipelago residents. These salmon also are a mainstay in the diet of most Kodiak bears.

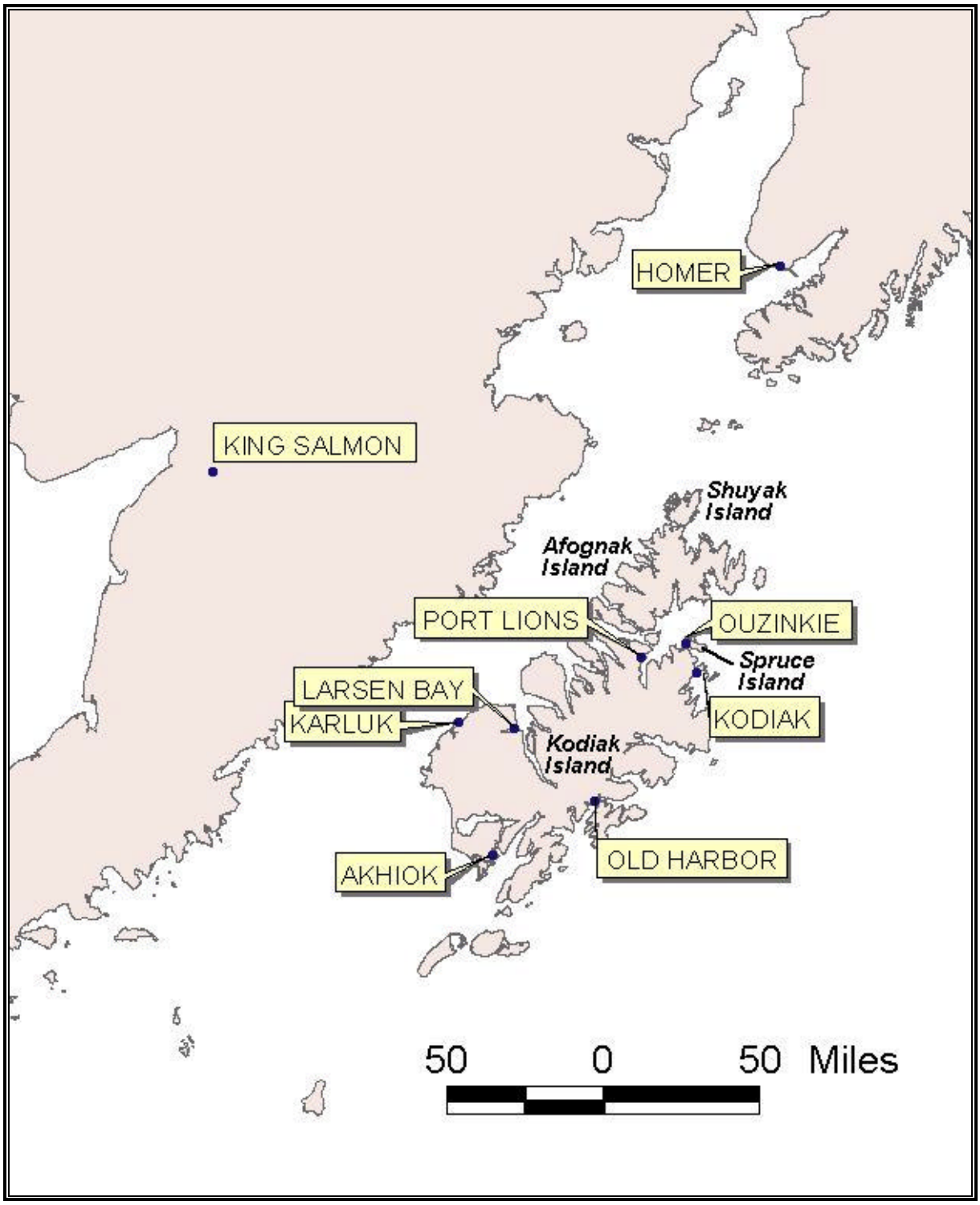

Figure 1-1. Kodiak archipelago

1.3.2 The Archipelago's Residents

The archipelago is also home for about 14,000 people, all residing in coastal areas. The City of Kodiak and associated road-connected communities include almost 13,000 people, with most of the remainder of the population residing in one of the six villages (see Figure 1-1) on Kodiak Island and nearby Spruce Island. During the summer, the human population increases dramatically and disperses throughout coastal areas. Remote cabins and lodges are used in support of commercial fishing and recreational activities. Human use of inland areas is usually transient, with the exception of Afognak Island where extensive year-round logging has been conducted for the past 25 years.

Kodiak bears contribute to Kodiak's economy by providing hunting, viewing, and other opportunities to enjoy wildlife and recreational pursuits in a natural setting. Along with Kodiak's commercial and sport fisheries, these activities contribute to every aspect of the area's economy, including tourism, lodging, transportation, and related professions such as guiding, charter boat operations, and air taxi operations. In fact, most businesses and jobs in Kodiak benefit directly or indirectly from the conservation of Kodiak bears and their habitat.

Bears also are responsible for economic losses to livestock ranchers, campers, and home owners, and bear-human interactions can result in destruction of private property and bear DLP mortality.

Kodiak's balanced ecosystem, of which people are an integral part, forms the baseline from which this management plan was designed. The plan is not intended to seek remedies for a threatened bear population; rather, it is an analysis of a successful coexistence between people and bears and an attempt to improve on that situation to accommodate shifts in human uses of bears. It also suggests ways to reduce bear-human conflicts in a mutually beneficial manner in the face of anticipated increases in human activities and related impacts on the archipelago.

1.4 Plan-Development Process

Development of this *Kodiak Archipelago Bear Conservation and Management Plan* was part of a four-phase process:

- Qualitative Research through review of background materials and interviews with citizens to better understand the relevant issues
- Creation of a Citizens Advisory Committee charged with developing a plan for the management of bears on the Kodiak archipelago
- Public Outreach efforts to involve the general public in review and further development of the management plan
- Implementation by an intergovernmental planning group charged with implementing the recommendations outlined in the plan

1.4.1 Citizens Advisory Committee

To ensure that this plan reflects the experience, needs, and desires of the public concerned with the future of Kodiak bears, the members of the CAC were selected to represent 12 key interests involved with Kodiak bear conservation and management:

- agriculturalists and ranchers
- air taxi operators
- citizens at large
- commercial fishing
- commercial wildlife photographers
- conservationists
- guides
- Native large-land owners
- Native villages
- resident sportsmen
- the Kodiak Brown Bear Trust
- tourism

1.4.2 Intergovernmental Planning Group

Representatives of state, federal, and local agencies having management and regulatory authority came together as the Intergovernmental Planning Group (IPG) to appoint members of the CAC, to develop a charter (see Appendix Q) for the CAC, and to develop and coordinate a strategy for implementing the recommendations of the CAC.

Although final implementation is contingent on the standard policy processes of each agency or entity, IPG members will work together to facilitate the implementation of the recommendations from the *Kodiak Archipelago Bear Conservation and Management Plan*. The IPG comprises representatives from the following agencies:

- Koniag, Inc.
- U.S. Fish & Wildlife Service (USFWS)
- Alaska Department of Fish and Game (ADF&G)
- Kodiak Island Borough (KIB)
- City of Kodiak
- U.S. Coast Guard (USCG)
- Alaska Department of Natural Resources (ADNR), including the Alaska State Park System

- the tribal and/or city governments of the six rural villages on the Kodiak archipelago:
  - Akhiok
  - Karluk
  - Larsen Bay
  - Old Harbor
  - Ouzinkie
  - Port Lions

1.4.3 Kodiak National Wildlife Refuge Comprehensive Conservation Plan

One objective of the process was to work with USFWS and help provide extensive citizen input to its planning process on KNWR, which comprises a major portion of Kodiak bear habitat. At the time ADF&G was designing the public process for developing the *Kodiak Archipelago Bear Conservation and Management Plan,* USFWS was undertaking an update of its Comprehensive Conservation Plan (CCP) (U.S. Fish & Wildlife Service 1987) for the refuge.

USFWS is cooperating with ADF&G and has agreed to incorporate the recommendations of the *Kodiak Archipelago Bear Conservation and Management Plan* into one or more of its alternatives for management on KNWR.

1.4.4 Public Outreach

Because public acceptance of the plan is critical to its success, those involved with the Kodiak bear-management planning process were committed to an extensive public outreach program. All CAC meetings were open to the public, with opportunities set aside during working sessions and on some evenings for the public to ask questions and provide input. CAC members developed avenues of communicating with their constituencies to ensure concerns were addressed in development of the plan. Information about the plan's development, summaries of CAC meetings, announcements of upcoming CAC and public meetings, and the means for various interest groups to contact CAC members were published on the ADF&G Web site. Further, a newsletter was published and distributed (as well as posted on the Web site), and information was regularly provided directly to print and broadcast media.

1.4.5 Follow-up on Implementation of Recommendations

The CAC, and members of the public participating in the process, devoted significant time and effort to the creation of this plan. Although the process for developing this management plan incorporates a means by which the recommendations will be implemented (see section 1.4.2), the CAC recognizes the need for an ongoing team to work with agencies not only to help implement these recommendations, but also to provide input consistent with this plan on issues that may arise in the future regarding Kodiak bears and their habitat. The intention is to maintain the continuity of the CAC process to work toward consensus among members representing diverse citizen groups and interests.

To that end, the CAC has requested formation of the Kodiak Unified Bear Subcommittee (KUBS), a local group consisting of representatives of a similar mix of public interests as those included in the CAC plus the addition of a single representative for each of the following interests:

- Kodiak Fish and Game Advisory Committee
- bear-viewing guides
- small property/lodge owners
- sport-fishing guides

KUBS would make recommendations to appropriate government agencies and boards concerning other Kodiak bear conservation and management issues. KUBS is envisioned as either an independent citizens advisory group that will secure its own funding or as a recognized subcommittee of the Kodiak Fish and Game Advisory Committee.

One of the items that might involve KUBS is working with ADF&G, and USFWS to identify areas where there may need to be restrictions on camping and other recreational activities because of the potential displacement of bears (see chapter 3, "Kodiak Bear Habitat").

1.5 Organization of the Plan

To facilitate discussion and development of recommendations, the plan is laid out as follows:

Summary

1. Introduction
2. Biology, History, and Management of Kodiak Bears
3. Kodiak Bear Habitat
4. Harvest Issues
5. Redefining Bear-Management Strategy
6. Bear-Human Interactions
7. Research and Monitoring
8. Education
9. Recommendations
10. Resources

Appendices

Within each chapter, a number of related subjects may be discussed and the background explained. After each of these subject discussions, the CAC's recommendations on that subject are listed.

There are numerous instances where a recommendation may appear in more than one chapter. This is particularly true for recommendations involving educational efforts. For

instance, a recommendation about providing educational materials for anglers might appear in both the discussion about sport fishing and in the chapter on education. Or, a recommendation regarding the need for research on bear habitat may appear in the chapter on habitat as well as in the chapter on research and monitoring. Further, all recommendations are compiled in chapter 9, "Recommendations," with cross-references to the chapters containing background information.

It was the intention of the CAC that each chapter be as comprehensive as possible and provide cross-references to related material in other chapters, consequently the reader will find instances of what appears to be duplication of information or recommendations.

2. Biology, History, and Management of Kodiak Bears

2.1 Biology

Bears on Kodiak have long been recognized as the largest in the world. An adult male can stand more than 10 ft tall when on his hind legs and 5 ft when on all four legs. Kodiak bears weigh as much as 1,300 lbs. Females are about 20 percent smaller and 30 percent lighter than males. The oldest known wild Kodiak bear was a 35-year old sow. The oldest boar was 27 yr old.

Cubs are born in the den during January or February. Weighing less than a pound at birth and with little hair and closed eyes, they suckle for several months, emerging from the den in May or June and weighing 15–20 lbs. Typical litter sizes are two to three cubs, and most cubs stay with their mothers for three years. More than 25 percent of the cubs die before they leave their mothers, with cannibalism by adult bears (predominantly males) being one of the major causes of death. Bears that have recently left their mothers have high rates of mortality. These subadult bears (three to five years of age) are also the ones most likely to come into conflict with people.

Kodiak bears become sexually mature at five years and can continue to produce cubs throughout their lives. The average interval between litters is about four years. Mating season is during May and June. Kodiak bears are serially monogamous (having one partner at a time) and stay together for a couple of days to a couple of weeks during mating. As soon as the egg is fertilized and divides, it enters a state of suspended animation until autumn when it finally implants on the uterine wall and begins to grow again.

Although Kodiak bears are often referred to as carnivores, they are technically omnivores (using a variety of foods). They actually spend more time eating grass, plants, and berries than they do eating meat. Fish are an important part of their diets, but few Kodiak bears expend the time or effort necessary to chase and kill mammals. Bears use the most nutritious parts of their food to maximize weight gain. Grass and forbs are only used while bears are rapidly growing in the spring and early summer. Brains, flesh, and eggs are preferred parts of the salmon. Internal organs of deer, elk, and cattle are eaten first when one of these animals is killed or scavenged. Berries are used most often when they are ripe and sugars in the berries are at the highest level.

Kodiak bears begin entering their dens in late October. Pregnant sows are the first to go to den; males are the last. Males begin emerging from their dens in early April, while sows with new cubs may stay in dens until late June. Some males may forego denning, staying active all winter.

Bears do not defend territories, but they do have traditional areas that they use each year (home ranges). They are naturally diurnal (active during the day), but when faced with competition for food or space, they adopt a more nocturnal (active at night) behavior. Because of the rich variety of foods available, Kodiak bears have some of the smallest home ranges of any bear population. Although generally solitary in nature, Kodiak bears often occur in large groups

in areas of concentrated feeding. Because of this, they have developed a complex language and social structure. Only one person has been killed by a bear on Kodiak in the past 70 years, and about once each year a bear injures a person.

2.1.1 Kodiak Bear Research

During the past 40 years, biologists have learned much about Kodiak bears. In the early 1960s, biologists began gathering baseline biological information on bears (Troyer 1962). As they refined methods of capturing and marking bears (Troyer et al. 1962) and incorporating radio telemetry in 1967 (Berns and Hensel 1972), biologists became more efficient at estimating bear movements and density. Their studies also provided the first objective data on sex and age ratios (Troyer and Hensel 1969), reproduction (Erickson et al. 1968; Hensel et al. 1969), litter sizes (Troyer and Hensel 1964), behavior (Troyer and Hensel 1964), cannibalism (Troyer and Hensel 1962), dentition (Troyer and Hensel 1969), and denning (Lentfer et al. 1972).

During the 1980s and 1990s, there was another surge of baseline and applied bear research on Kodiak. Extensive use of radiotelemetry on bears living near Terror Lake (Smith and Van Daele 1990), on southwest Kodiak Island (Barnes 1990), on the Aliulik Peninsula (Barnes and Smith 1997), and on the Spiridon Peninsula revealed denning, feeding, movement, and reproductive history patterns. Lip tattoos and ear tags were applied to 401 bears between 1982 and 1997 to investigate mortality rates and movements of bears that were not radio-collared (Smith and Van Daele 1990). Perhaps the most significant result of this massive amount of research was development of an objective method of measuring bear population densities and trends on specific parts of Kodiak Island (Barnes et al. 1988).

2.2 History

Kodiak's geologic character is not conducive to preserving fossil evidence, so there is no way to confirm how long bears have been on the islands. Kodiak bears have, however, been isolated from other bear populations since the last ice age (about 12,000 years ago) and during that time have developed into a unique subspecies: *Ursus arctos middendorffi*. A detailed account of the history of bears on Kodiak can be found in the monograph *The History of Bears on the Kodiak Archipelago* (VanDaele 2002). The following historical information is excerpted from that document.

2.2.1 Alutiiq People

Humans first arrived on the islands approximately 7,500–8,000 years ago, and paleontologic evidence of Kodiak bears is found in some of the oldest midden sites of these ancient Alutiiq people. At that time, the Alutiit hunted bears, using their meat for food, hides for clothing and bedding, intestines for rainproof parkas, long bones for tools, and teeth for adornment. Because of the spiritual relationship between the bear and the Alutiit, skulls were left in the field. Because it was the only large land mammal on the archipelago available, the bear was an important subsistence food for the Alutiit.

Bears were usually stalked by groups of two or three hunters armed with bows and arrows. The bear arrow was about 32 in. long and had a barbed bone point 7 in. long with an inserted end blade of slate. If the bear attacked, the hunters defended themselves with spears. Archeologists

suspect that there were 65 villages and about 8,000 people on the archipelago by the early 1700s (Clark 1968). Fetishes and other artistic renditions of bears occur in archaeological sites on Kodiak as old as 2,500 years. Myths and traditional stories about bears are common in all Alaska Native traditions, and those recorded from the Alutiit are similar to stories told by Yup'ik elders in western Alaska and by Alutiiq elders. The main themes of the myths revolve around the similarity between bears and humans, including the ability of bears to change into people and vice versa, and the mystical nature of bears because of their proximity to the spirit world.

2.2.2 Russian Occupation and American Acquisition

Russia's Bering expedition bypassed Kodiak in 1741, but in 1784, Russians actually landed on the island. Soon thereafter a flood of independent trappers and Russian entrepreneurs came to the area to capitalize on the abundant fur resources. Bear hides were considered a "minor fur" and sold for about the same price as river otter pelts ($10 each). The number of bears harvested increased substantially when sea otter populations declined. After the United States acquired Alaska as a territory in 1867, bear harvests on Kodiak increased, peaking at as many as 250 bears per year. When commercial fishing activities increased in the late 1880s, and canneries proliferated throughout the archipelago, bears were viewed as competitors for the salmon resource and were routinely shot when seen on streams or coasts.

2.2.3 First Conservation Efforts

Around the turn of the last century, sportsmen and scientists recognized the Kodiak bear as the largest in the world. They also voiced their concern that bear populations were overharvested and were suffering the fate of other well-known big game animals around the world. One of the nation's first conservation organizations to address these concerns was the Boon and Crockett Club; the group lobbied for federal legislation to enforce wildlife regulations. The Game and Wild Bird Preservation and Disposition Act of 1900, also known as the Lacey Act, set the foundation for the first legal protection of much of America's wildlife, including Kodiak bears. The bears also benefited from laws designed to protect salmon from increasing harvests, including establishment of the Afognak Island Forest and Fish Culture Reserve in 1892.

2.2.4 Volcanic Eruption

Kodiak's ecosystem changed suddenly and drastically on June 6, 1912, when Mount Katmai (*Novarupta*) erupted. A series of three major eruptions blew six cubic miles of the mountain into the air, depositing as much as a foot of ash on Afognak Island and on northern Kodiak Island. Winds drifted the ash, and rains washed it into lakes, completely filling some lakes that were as deep as five feet. Residents reported that many animals, including bears, were blinded and made bold by hunger. Salmon-spawning was seriously impacted; a few salmon, however, were still able to return during the summer and were available for bears. Vegetation was quick to recover, and the ash was credited with increasing productivity of grass, shrubs, and especially spruce in later years. While the eruption had a major impact on the bears on the northern islands, it was not detrimental to the entire population.

2.2.5 Harvest Regulations

Professional interest in guided Kodiak bear hunts, and a concern for unregulated resource use in frontier lands such as Alaska, prompted the territorial government's newly established Alaska Game Commission to abolish commercial bear hunting (selling the hides) on the archipelago in 1925. A limit of three harvested bears per year was established, and, in 1926, bear harvesting was prohibited during the summer months, except for in defense of life or property (DLP). The new regulations limiting harvest to three bears per hunter applied to the Alutiit as well. The Commission also required that any nonresident hunter in Alaska be accompanied in the field by a registered big-game guide. As professional guiding was implemented along with other hunting regulations, many guides became successful because of Native knowledge and experience in guiding.

At about the same time, the commission, in conjunction with local Kodiak sportsmen's groups, took an active role in increasing the diversity of the archipelago's wildlife by importing Sitka black-tailed deer, Roosevelt elk, muskrat, beaver, mountain goats, and snowshoe hares. In 1932, the commission prohibited bear hunting on Afognak Island, and for the next eight years that island was managed as a bear sanctuary.

2.2.6 Conflicts with Cattle

The impacts of the new regulations seemed to restore bear populations on the Kodiak archipelago. By the 1930s, ranchers on northeastern Kodiak Island reported an increase in bear problems and demanded action. The Game Commission sent a biologist and a team of hunters to eliminate problem bears on the ranches in 1939, and seven bears were killed. In their final report, however, the agents discouraged the idea of further bear-control efforts. They suggested managing the island primarily for "fur, fish, and game" resources, including bears, but managing it in such a way that individuals could continue to defend their livestock. As a consequence of the agents' report, the Game Commission did not liberalize bear-hunting regulations nor did it pursue any further active bear control.

2.2.7 Kodiak National Wildlife Refuge and World War II

To address the dilemma of conserving bears while protecting cattle and residents, President Franklin D. Roosevelt established the Kodiak National Wildlife Refuge (KNWR) by Executive Order in 1941. The refuge withdrew 1,957,000 acres from unreserved public domain to preserve the natural feeding and breeding range of bears and other wildlife. The area encompassed all of Uganik Island and most of southern and western Kodiak Island, except for the Karluk Indian Reservation. A one-mile shoreline strip, included within the refuge boundary as described by executive order, remained open for settlement, sale, or other disposition under the public land laws applicable to Alaska, or to classification and lease for fur farming or other purposes. In 1958, these exceptions involving the shoreline strip were removed through a public land order.

World War II brought an unprecedented increase of people, structures, and activity to Alaska. The population of Kodiak city swelled from about 400 to more than 20,000. A submarine base, an air station, a fleet weather command, and an army command post were established near Buskin River. Remote submarine and aircraft observation posts were developed on numerous islands and capes in the archipelago. The Army also developed logging operations

on Afognak Island. While sport hunting for bears declined during the war, indirect impacts on bears abounded, and, in 1942, the Game Commission reduced the bag limit on the archipelago to one bear per year.

Refuge establishment and the war did little, however, to quell the concerns about bears preying on salmon. During the 1940s, the sockeye escapement on the Karluk River dwindled, and bears were cited as a leading cause of the decline. One study indicated that bears killed a third of the salmon entering the Karluk River before they had a chance to spawn, resulting in a loss of $3 million per year. Fishermen called for bear control, and sportsmen across the nation lobbied against it. Follow-up studies revealed that bears did kill a large number of salmon, but the vast majority (98 percent) were fish that had already spawned, and that the impact of bears on future salmon runs was minimal. After considering these diverse opinions and results of the studies, as well as the concerns of fishermen and continued concerns about bear-cattle interactions, the Alaska Game Commission again opted to forego any bear control or hunting-season liberalization. It did, however, pass a new regulation in 1957 that protected maternal female bears statewide. The next year, that protection was extended to also include dependent cubs.

2.2.8 Changes in Alutiiq Use of Bears

The Alutiit continued to subsistence hunt for bears after the first harvesting regulations were developed in 1925. (See chapter 4, section 4.2, for more information on the history of subsistence hunting.) Gradually, however, subsistence hunting for bears diminished, in part due to more complex regulations and a burgeoning deer population, which provided an alternate source of red meat. Some Alutiiq hunters continued their traditional harvest activities through the 1940s, ’50s, and ’60s. Bear hides, meat, and other parts were used locally, and some hides were sold for income[3]. Legally sanctioned subsistence bear hunting was opened by the State of Alaska from 1985 through 1987, but there appeared to be little interest. In 1997, the subsistence bear hunt was reinstated under federal management, with a limited number of permits available to each of the Kodiak archipelago villages (see section 2.2.9).

2.2.9 After Statehood

Alaska achieved statehood in 1959 and assumed responsibility for managing the state’s wildlife. The Game Commission’s successor, the Alaska Board of Game, reduced bear-hunting seasons on Afognak and Raspberry islands and on KNWR. They also implemented a hide-sealing requirement, established a tag fee for nonresident bear hunters, and stationed a game biologist in Kodiak. At the same time, the board liberalized bear seasons on nonrefuge lands on Kodiak Island and initiated another investigation into bear-cattle problems on northeastern Kodiak Island.

During the 1960s, state biologists worked with ranchers along the Kodiak road system to examine and reduce the predation problem. During the project, 15 bears were killed by agents, and several more were killed by hunters and ranchers. Biologists reported cattle and bears as not compatible. Potential solutions included poisons, fences to isolate cattle ranges, and reduction of land disposals in areas with bears.

[3] Information provided by Sven Haakansen, Sr., born in Ouzinkie and presently living in Old Harbor

Sportsmen concerned about bears being killed because of conflicts between bears and cattle published articles that described a "secret" state-sanctioned program that employed the use of fighter pilots to shoot bears from the air. There was also a detailed description of the ground efforts by biologists and the ongoing anti-bear campaign by ranchers. In spite of this public pressure, the state continued its involvement in dispatching problem bears and attempted to capture and move some bears. From 1966 through 1969, the state authorized the use of dogs to hunt bears on northeastern Kodiak Island.

Same-day airborne hunting was prohibited in 1967. In that same year, hunters were required to bring the skulls of harvested bears out of the field, and, in 1968, skull-sealing was required. Population studies around Karluk Lake suggested the local harvest was excessive, so the drainage was closed to fall bear hunting in 1967 (by emergency order) and 1968 (by regulation). In an additional effort to better distribute bear harvests on the refuge, a permit-quota system was established in 1968. In 1969, the bag limit for bears was reduced to one bear per four years, and, for most of the archipelago, the winter hunting season was eliminated.

In late 1970, the state issued a policy curtailing bear-control programs. Ranchers suffering losses could continue to take bears in DLP, but could not shoot bears from airplanes or poison them. Sport hunting was to be the primary means of reducing bear numbers, and hunting regulations were liberalized. Ranchers were upset with the decision and continued to devise ways to protect their livestock without government intervention.

2.2.10 Federal Legislation

Discovery of the Prudhoe Bay oil field and a national surge of environmental awareness resulted in new legislation that affected Kodiak. In 1971, the Alaska Native Claims Settlement Act (ANCSA) resolved many long-standing land issues with aboriginal Alaskans statewide. The impacts were felt strongly on the archipelago as large areas of the coastline (the Karluk River drainage; Sitkalidak, Spruce, and Whale islands) and most of the forested areas of Afognak and Raspberry islands were conveyed to Native corporations. Federal management of the National Forest lands on Afognak was threatened, and KNWR lost control of 310,000 acres of prime bear habitat (more than 17 percent of refuge lands). Other pertinent new legislation included the Wilderness Act, the Endangered Species Act, the National Environmental Policy Act, and the Marine Mammals Protection Act. Also in 1972, the government review found that as much as 97 percent of the refuge qualified as wilderness under the guidelines of the Wilderness Act.

Sharp increases in the demand for bear-hunting permits occurred in 1972 and again in 1973. Restrictions in season length on the Alaska Peninsula and the loss of polar bear hunting due to the Marine Mammals Protection Act were partially responsible for the surge. In 1975, the state created 19 exclusive guiding areas on the archipelago. The state also began distributing most of the bear hunting permits on Kodiak Island by lottery. Twenty-six hunt areas were established, Alaska residents were allocated at least 60 percent of the permits, and all harvested bears had to be inspected by a state biologist in Kodiak.

2.2.11 Draft Management Plans

To address the changing relationships and uses of bears, the Alaska Department of Fish and Game (ADF&G) developed a series of draft management plans for bears on the Kodiak archipelago in 1977. The plans called for specific management priorities, including areas that would provide high-quality hunting conditions, areas where bear conflicts with livestock and people would be minimized, and areas that would be managed to provide opportunities to view and photograph bears. In spite of the effort and public input involved in developing these plans, the Board of Game did not formally adopt them.

2.2.12 Timber Harvest

The USDA Forest Service (USFS) started planning the first timber sale on Afognak Island in 1966. Many local citizens were surprised by the plan to renew logging on Afognak after a 25-yr hiatus, and they were opposed to clearcut harvesting, noting the slow regeneration times for trees that had been previously cut from the island. In response to these protests, and because of the newly established National Environmental Policy Act, USFS delayed the sale and drafted an environmental impact statement. Projected impacts on bears included disturbance by logging activities and road traffic, disruption of salmon feeding areas, increased hunter access, and increased bear-human encounters resulting in bears being killed in DLP situations. Finally, in 1975, USFS began construction of a logging road between Kazakof (Danger) Bay and Discoverer Bay, and timber harvesting began in 1977.

Under ANCSA's provisions, the Native villages of Afognak, Kodiak, and Ouzinkie selected many of the prime forest lands on Afognak Island as well as many of the coastal areas. Koncor Forest Products began managing timber harvests on Kodiak and Ouzinkie lands in 1978, and the next year Afognak Native Corporation took over management of its recently acquired lands. Passage of the Alaska National Interest Lands Conservation Act (ANILCA) in 1980 added the northwestern portion of Afognak Island to the refuge, but it also curtailed USFS management on the island. In subsequent years, the rate of timber harvest was greatly accelerated over original projections.

2.2.13 Hydroelectric Development

In 1979, the Federal Energy Regulatory Commission began working on an environmental impact statement for the Terror Lake hydroelectric project. The project was to include an earthen dam on Terror Lake o KNWR and a six-mile–long tunnel through a mountain ridge to a penstock and powerhouse in the Kizhuyak River drainage. The proposed project was to be the first significant invasion of inland bear habitat on Kodiak Island. To address the opposition encountered from the public and agencies, a mitigation settlement was negotiated in 1981. The settlement was precedent-setting in its scope, providing for studies of project impacts on salmon, mountain goats, and bears during the three years of construction and two years of operation of the project. It also set aside most of the state and Kodiak Island Borough lands on the Shearwater Peninsula to be managed as wildlife habitat (including a livestock-grazing prohibition) and established the Kodiak Brown Bear Research and Habitat Maintenance Trust (also called the

Kodiak Brown Bear Trust). The Kodiak Brown Bear Trust is a 501(c)3 nonprofit corporation created as part of the 1981 mitigation agreement (see Appendix S) between U.S. Fish & Wildlife Service (USFWS) and the Alaska Industrial Development Authority that allowed the construction of the Kodiak Electric Authority's Terror Lake Hydroelectric Project within the boundaries of KNWR. In the end, the forethought and planning were successful, and there were few negative impacts on bears that could be directly related to the Terror Lake hydroelectric project.

2.2.14 Increased Research Efforts

Human alteration of bear habitat on Kodiak and Afognak islands spurred renewed interest and funding for bear research on the archipelago, resulting in a surge of baseline and applied bear research on Kodiak through the 1980s and 1990s. Extensive use of radiotelemetry on bears revealed denning, feeding, movement, mortality rates, and reproductive history patterns. Perhaps the most significant result of the research was development of an objective method of measuring bear population densities and trends on specific parts of Kodiak Island. Application of this technique to several parts of Kodiak Island, along with some extrapolation to the rest of the archipelago, provided the first refined estimate of bear numbers (2,980) and density (0.62 bears per square mile).

Another significant event for bears in the early 1980s was a surge in the deer populations throughout the archipelago. By that time, deer had occupied all available habitat with an estimated population in excess of 100,000 and a peak harvest in 1987 with an estimated 13,791 deer killed by 6,022 hunters. Some bears actively preyed on deer, especially when they were concentrated on winter and late-spring ranges along the coast; in most cases, however, such predation seemed opportunistic at best. The number of bear-human encounters grew steadily, and it was evident that individual bears quickly discovered techniques to claim hunter-killed deer in the field and at campsites. Increasing encounters translated into more DLP bear mortalities. Efforts to educate hunters about bears were accelerated, with an emphasis on ways to avoid bear encounters and how to handle them if they occurred.

2.2.15 Oil and Gas Development

Commencing prior to 1976, a series of oil and gas lease sales have been attempted or conducted on either side of the Kodiak archipelago. Estimated recoverable reserves range between 150 million and 1.9 billion barrels of oil and as much as 2.920 trillion cubic feet of natural gas on the east side of the archipelago. Mean projections for the Shelikof Strait, on the west side of the archipelago, are 120 million barrels of oil and 680 billion cubic feet of gas. In all cases, the natural gas is characterized as "wet," or containing high proportions of volatile liquids, which would have to be separated and either re-injected into the field or transported.

Evaluation by the federal Minerals Management Service of the impacts from developing these resources included identification of 15 potential onshore sites on the east side of Kodiak Island, including several in KNWR, with other unspecified potential sites on the west side of Afognak Island and northwestern Kodiak Island.

No past hydrocarbon lease sale resulted in hydrocarbon field development; this is due to either failure to discover recoverable deposits in the Shelikof Strait (Lease Sale #60) or limited interest on the part of the oil industry because of the projected difficulty of operations with then-current technology on the east side of the archipelago. However, because of recent advances in deep-water drilling technology and acoustic survey techniques, along with the growing energy shortages in the nation, the region may be reconsidered for exploration and development in the future.

Predicting the configuration and impacts of hydrocarbon development on the archipelago may be as difficult as projecting the likelihood of discovering recoverable reserves if drilling occurs. Should hydrocarbon development take place, however, it is likely that impacts, on the bears and their habitat, of the development and associated human activities will become significant aspects of all bear-management considerations.

2.2.16 Exxon Valdez *Oil Spill*

In 1989, the oil tanker *Exxon Valdez* ran aground on a reef in Prince William Sound. Within the first week, oil dispersed to the islands of the Kodiak archipelago. Marine mammals, including sea otters, seals, sea lions, and whales, were oiled and poisoned; coastal birds and mammals were also affected because feeding and resting areas were tainted. Biologists were concerned that bears foraging in the oiled intertidal areas would be adversely affected. The intensity of human activity on beaches and near shore waters was increased by the presence of cleanup crews; resource managers recognized that the impact to bears of those workers was potentially greater than the impact of the oil itself. To minimize bear-human encounters, bear-safety training was required for everyone involved with the cleanup.

Bears were not directly harmed by the spill, although some were displaced, by cleanup crews, from traditional feeding and traveling areas. No one was injured by a bear, and no Kodiak bears were killed. To mitigate the adverse impacts of the spill, Exxon reached a settlement with the state and federal governments for $1 billion. Paradoxically, the impacts of the oil spill and the subsequent cleanup and settlement proved to be beneficial to bears on Kodiak. Bear-safety training exposed thousands of workers to factual information about bears, and the media raised the consciousness of people around the world to the fragility of the ecosystem.

Political pressure mounted to preserve Kodiak's pristine habitats, and money from the *Exxon Valdez* settlement fund was the obvious source for land acquisitions. By the close of the 1990s, about 90 percent (290,000 acres) of the refuge lands that had been lost as a result of ANCSA were reinstated into the refuge, either through direct purchase or by means of conservation easements.

Using monies from the *Exxon Valdez* oil spill settlement fund, lands were also purchased on Afognak (83,2999 acres) and Shuyak (26,665 acres) islands and transferred into state ownership. The Kodiak Brown Bear Trust coordinated a coalition of sportsmen and other wildlife conservation groups from around the nation to lobby for use of settlement funds to acquire Kodiak lands. The groups also directly contributed funding to protect small parcels of important bear habitat around the islands.

2.2.17 Bear Viewing

Although hunting continued to be the most popular human use of bears on Kodiak in the early 1990s, the area was experiencing an expansion of bear viewing and bear photography. The publicity the islands and the bears received during and after the oil spill and growth of statewide tourism motivated people to come and see the bears in their natural habitat. To address this public demand, a bear-viewing program was administered by KNWR in 1990. The program was cancelled after 1994 because of a legal challenge to the procedures used in awarding the

bear-viewing concession. Biologists studied bear-human interactions at the viewing areas and concluded that bears could tolerate viewing programs as long as the human activities were predicable and restricted to specific areas (Wilker and Barnes 1998).

Given the importance of the subject of bear viewing, a significant portion of chapter 6 (see section 6.6) is devoted to a discussion and recommendations on the topic.

2.3 Current Kodiak Bear Management

Kodiak archipelago bear research, management, and habitat protection are done cooperatively by ADF&G and USFWS.

Primary authority for managing the bears rests with ADF&G. The mission of ADF&G's Division of Wildlife Conservation is to conserve and enhance Alaska's wildlife and to provide for a wide range of uses for the greatest benefit of current and future generations. The specific objectives for management of Kodiak bears are

- to maintain a stable Kodiak bear population that will sustain an annual harvest of 150 bears, composed of at least 60 percent males;
- to maintain diversity in the sex and age composition of the bear population, with adult bears of all ages represented in the population and in the harvest; and
- to limit human-caused mortality of female bears to a level consistent with maintaining maximum productivity.

Kodiak bear population estimates were developed for nine study areas with the intensive aerial survey technique. This technique is a modification of the capture-recapture methods that initially used radio-collared bears to determine the chance of seeing bears in different types of terrain and vegetation (observability). Aerial transects are then flown within the study area to count bears, and total counts are multiplied by the observability factors to derive population estimates. Surveys are conducted in the spring, immediately following the bear-hunting season, prior to spring green-up and after most bears have emerged from their dens. At least one of the nine study areas is surveyed each year, and attempts are made to resurvey each area within five to seven years.

2.3.1 Kodiak National Wildlife Refuge

U.S. Fish & Wildlife Service, in managing KNWR, is primarily responsible for managing the habitat on the refuge; it is also charged with management of bears and their habitat in their natural diversity. ANILCA states the following:

> The purposes for which the Kodiak National Wildlife Refuge is established and shall be managed include
>
> (i) to conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, Kodiak bears, salmonids, sea otters, sea lions, and other marine mammals and migratory birds;
>
> (ii) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats;
>
> (iii) to provide, in a manner consistent with the purposes set forth in subparagraphs (i) and (ii), the opportunity for continued subsistence uses by local residents; and
>
> (iv) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

2.3.2 Hunting

The current bear population is above the minimum level set by the state's current objectives, and it supports an annual harvest of approximately 160 Kodiak bears (69 percent males) each year under tightly controlled regulations. About 5,000 resident hunters apply each year for a chance at the 319 bear permits (107 in fall and 212 in spring) available to them. Hunters who are not residents of Alaska vie for some 153 permits (53 in fall and 100 in spring) and must hire professional guides, paying $9,000–15,000 per hunt. Since 1997, a federally authorized subsistence hunt allows issuance of as many as 11 bear permits for the six Native communities on the Kodiak archipelago (see chapter 4, section 4.2). ADF&G currently manages the resource to accommodate an average annual human-caused mortality (from all sources) of no more than 6 percent of the known population.

2.3.3 Bears Killed in Defense of Life or Property

Bears may also be legally killed under the state's DLP provisions (5 AAC[4] 92.410). A person may legally kill a bear if that person did not provoke an attack or cause a problem by leaving food or garbage lying around, and if that person has done everything else practical to protect life or property. Property is defined as a dwelling, means of travel, pets, or other valuable property necessary for livelihood or survival. A bear killed under DLP provisions must be reported immediately, and the hide and skull must be given to the state. Reporting rates for DLP mortalities are unknown, but suspected to be less than 50 percent of the actual kill.

During the summer of 1999, when the population of bears on Kodiak was at a historic high, as many problem bears (eight) were killed near the city of Kodiak as had been killed in the

[4] Alaska Administrative Code

previous nine years combined. Kodiak Island villages also had more bear problems than ever, and deer hunters reported a dramatic increase in bear encounters islandwide, including the first fatal mauling in more than 60 years. The rash of bear confrontations was probably caused by a disastrous failure of berries, on which the bears depended for food in early August. Some of the worst winter weather in 40 years struck the island during the winter of 1998–99 and damaged the berry bushes so severely that they could not produce fruit. In their search for food, some bears found garbage, livestock, and dog food, bringing bears in close contact with people.

2.3.4 Changing Public Involvement

The reaction to these bear encounters by residents, visitors, and government agents reflected the increased tolerance and knowledge of the populace. Kodiak residents requested and received bear-education programs for school children, for public television and radio, and for ethnic groups. Waste management was enhanced by installation of bear-resistant dumpsters in rural areas on the Kodiak road system and by increased enforcement of litter laws. A previously installed electric fence around the community landfill was reinforced, vegetative cover within the fence was removed, and garbage was buried more frequently (see Appendix N). Deer and elk hunters were alerted to the potentially dangerous situation. When the fatal mauling occurred, media were quick to point out the hunter's errors rather than to blame the bear; law enforcement and wildlife officials did not hunt or kill the bear responsible for the mauling. All in all, the community pulled together to address the problems and everyone, including the bears, benefited.

Most of the people of Kodiak are proud of the fact that they live with the largest bears, and one of the densest populations of bears, in the world. They are willing to take an active role in ensuring continued coexistence. This increased ownership of the bears also resulted in a call to have a citizens advisory committee work closely with ADF&G, with the cooperation of KNWR, to develop this management plan addressing the wide variety of issues—including hunting, habitat, and viewing—that impact bears.

2.4 The Archipelago's Residents

The archipelago is also home for about 14,000 people, all residing in coastal areas. The City of Kodiak and associated road-connected communities include almost 13,000 people, with most of the remainder of the population residing in the six villages on Kodiak and Spruce islands. During the summer, the human population increases dramatically and disperses throughout coastal areas. Remote cabins and lodges are used in support of commercial fishing and recreational activities. Human use of inland areas is usually transient, with the exception of Afognak Island where extensive logging has been conducted for the past 25 years.

Kodiak bears contribute to Kodiak's economy by providing hunting, viewing, and other opportunities to enjoy wildlife and recreational pursuits in an unmolested natural setting. Along with Kodiak's commercial and sport fisheries, these activities, contribute to every aspect of the area's economy, including tourism, lodging, transportation, and related professions such as guiding. In fact, most businesses and jobs in Kodiak benefit directly or indirectly from the conservation of Kodiak bears and their habitat.

Bears also are responsible for economic losses to cattle ranchers, campers, and home owners, and bear-human interactions can result in destruction of private property and DLP bear mortalities.

Kodiak's balanced ecosystem, of which people are an integral part, forms the baseline from which this plan was designed. The plan is not intended to seek remedies for a threatened bear population; rather, it is an analysis of a successful coexistence between people and bears and an attempt to improve on that situation to accommodate shifts in human uses of bears. It also suggests ways to reduce people-bear conflicts in a mutually beneficial manner in the face of anticipated increases in human activities and impacts within the archipelago.

3. Kodiak Bear Habitat

Synopsis: Kodiak bears live throughout most of the Kodiak archipelago and use virtually all available habitats from the coast to alpine regions. The archipelago is considered high-quality bear habitat, containing ample food, water, cover, and space. While vegetation is a substantial part of the bears' diet, salmon is the most important source of protein for most Kodiak bears. Currently, the human population and related human development have minimal impacts on bear habitat. Potential threats include seasonal human use of inland and coastal areas, future developments (e.g., road and energy development) and related problems (e.g., oil spills), and natural occurrences (e.g., reduction in salmon stocks). Bear habitat and bear-human relationship are intimately intertwined; if people are not willing to make an effort to live around bears, large expanses of wilderness areas are necessary for sustainable bear populations. With this information in mind, the Citizens Advisory Committee(CAC) makes a number of recommendations to protect bear habitat on the archipelago. These recommendations cover the following subject areas: land use, acquisition, and planning; activities on Afognak Island; minimizing habitat degradation; road building in bear habitat; motorized access; bear-use areas; human activities in bear habitat; introduced species; and salmon as a part of bear habitat.

3.1 Habitat Requirements

Kodiak bears live throughout the archipelago, except on Chirikof and the Trinity islands, and use virtually all available habitats from the coast to alpine regions. An estimated 2,980 bears live within the 4,757-square–mile area, and bear densities vary by area and by season. The highest densities are found around Karluk Lake and Kiliuda Bay, while the lowest densities are on Whale, Marmot, and Spruce islands (see Figure 3-1).

Kodiak-bear habitat must provide the same basic elements required by most animal species: food, water, cover, and space.

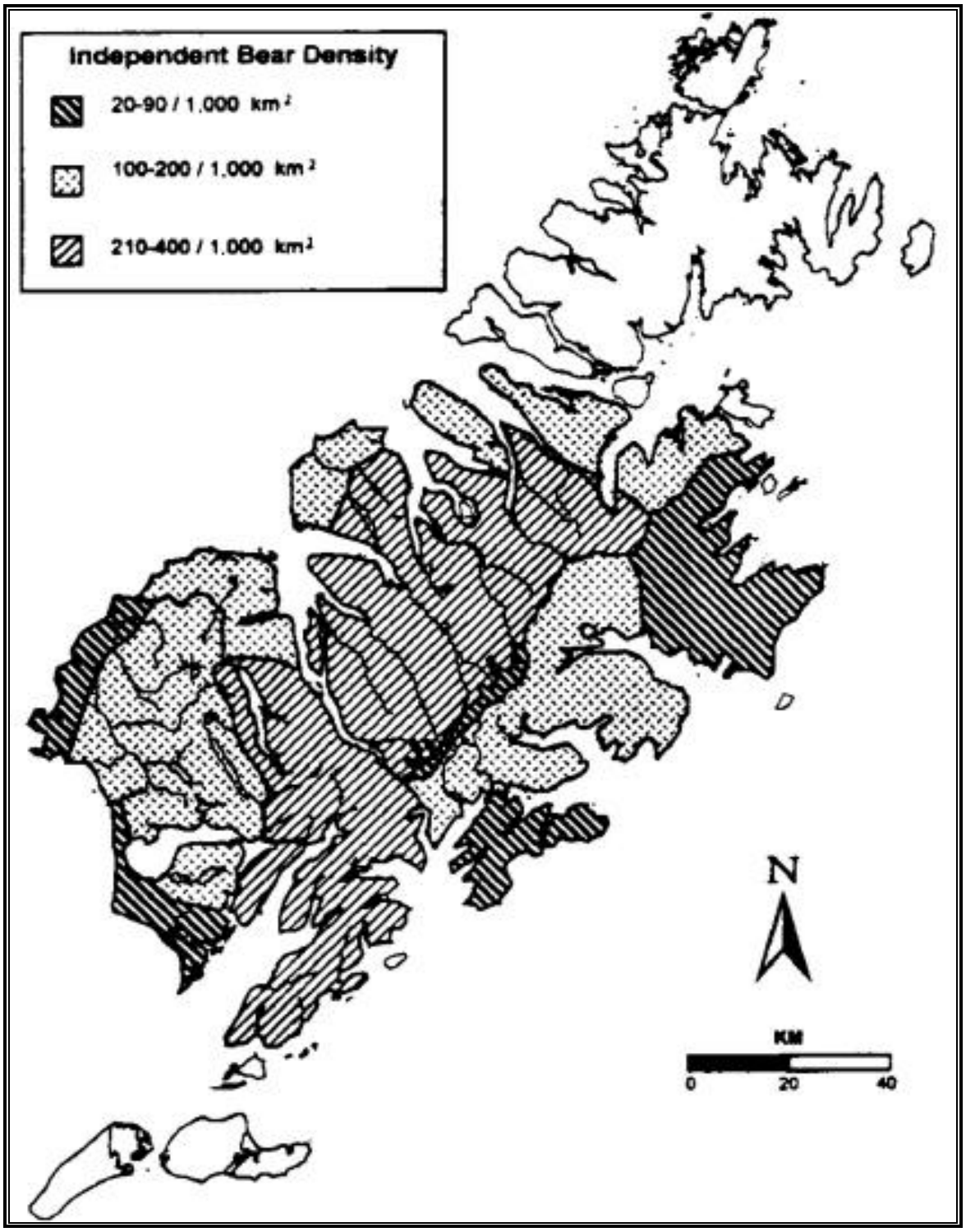

Figure 3-1. Densities (bears per 1,000 square kilometers) of independent bears throughout the Kodiak archipelago (*Note*: “independent" bears includes all bears that are more than 3 yr old.) (Barnes and Smith 1998)

3.1.1 Food and Water

Bears use a wide variety of foods on Kodiak; grasses, roots, berries, carrion, and salmon are the most important. Bears' intelligence and their need to obtain large quantities of high-quality food while they are out of their dens have resulted in a high degree of adaptability. This adaptability is most obvious to us when bears live near people and learn to eat garbage, pet food, and hunter-killed game instead of more natural fare.

3.1.2 Salmon

While vegetation is the bulk of the bears' diet, salmon are the primary source of protein for most Kodiak bears. These same salmon stocks are also heavily used by humans for commercial, subsistence, and sport harvests. Current Alaska Department of Fish & Game (ADF&G) status reports on archipelago salmon stocks characterize them as healthy and stable. ADF&G's abundance-based harvest strategies, coupled with its goal of achieving maximum sustained yield (MSY), have successfully stabilized Alaska's salmon stocks at historically high levels. Archipelago salmon production has evolved from historical lows to historical highs during the 40-year period since statehood, when ADF&G management was fully implemented.

Human fisheries harvest activities are controlled by the Alaska Board of Fisheries via management plans guided by Alaska's Sustainable Fisheries Policy. Additionally, Kodiak's Regional Comprehensive Salmon Management Plan, as developed by Kodiak's Regional Planing Team (RPT) per AS[5] 16.10.375, depicts a salmon enhancement framework for achieving and sustaining long-term stability of Kodiak's salmon production. Kodiak archipelago's bear populations have flourished under this management regime; both ADF&G and U.S. Fish & Wildlife Service's (USFWS's) bear number and density statistics reflect historically high, stable bear populations on the archipelago in recent years.

Approximately 350 streams annually provide significant salmon production for bear food and human harvests. Of these, approximately three produce chinook, 33 produce sockeye, 147 produce coho, 104 produce chums, and all produce pinks. Biological escapement ranges are targeted by ADF&G to achieve MSY production goals. Biological escapement goals (BEG) set the number of spawning salmon required to sustain maximum production levels for each salmon species. Allowing escapements to fall below or go above these ranges may lead to lower production. Escapements are monitored by daily hand tallies at 12 fish-weir sites, by frequent in-season aerial surveys, or by post-season foot surveys. Established species-specific time-of-entry patterns are referenced in season against developing returns to evaluate run strengths. Timely in-season adjustments to human harvest opportunities ensure that escapements are achieved.

Overall escapement goals by species for the archipelago are approximately 11,000 to 18,000 chinook; 1,307,000 to 1,959,000 sockeye; 90,000 to 150,000 coho; 140,000 to 420,000 chums; and 792,000 to 2,376,000 odd-year pinks or 2,142,000 to 5,226,000 even-year pinks. These escapement levels should produce long-term average total returns approximating 38,000 chinook; 6,064,000 sockeye; 375,000 coho; 784,000 chums; and 4,752,000 odd-year pinks or 11,052,000 even-year pinks. Total salmon returns during the decade of the 1990s exceeded these long-term production goals. To the extent of their importance to Kodiak's bear populations, the

[5] Alaska Statute

archipelago's healthy, stable salmon populations correlate closely with its current robust bear populations. (See Appendix U, "Policy for Statewide Salmon Escapement Goals" for complete information about salmon escapement.)

3.1.2.1 Recommendations about Salmon as a Part of Bear Habitat

- Endorse the Kodiak Area Salmon Management plans that regulate commercial fishing on and around the archipelago.
- Continue to collect salmon escapement data to ensure the sustainability of salmon stocks.
- Support operation of essential weirs islandwide and acquire weir sites where appropriate.
- Ensure that easements for access to weir sites be restricted to use by essential personnel.
- Continue to design all salmon enhancement and rehabilitation projects to minimize disturbance of bears and to avoid unnecessary damage to their wild habitats (see Appendix F for more information about salmon enhancement and rehabilitation projects).
- Recognize that the protection of riverine and coastal habitats for bears will help sustain the annual Kodiak salmon commercial harvest, which generates an average exvessel value of $35 million and provides as many as 5,000 associated jobs.

3.1.2.2 Vegetation

Bears rely primarily on vegetation when salmon are not present in rivers. Although bears forage on a variety of vegetation, certain species of sedge and berry-producing shrubs are especially important. Bears use sedges in estuaries during June and in alpine areas in late June and early July. Berries produced by salmonberry, red-berried elder, blueberry, and devil's club shrubs are used extensively during summer. Berry production influences bear movements away from salmon-spawning streams when berries are abundant and often results in increased bear-human interactions during years when berry production is low.

Sitka black-tailed deer and Roosevelt elk were introduced onto the archipelago in the 1920s. These ungulates proliferated and provided both humans and bears with an alternate food source. Deer and elk also share food sources with bears. In areas where they concentrate during the winter, the ungulates have heavily browsed some shrubs, including high-bush cranberry and red-berried elder, which are important foods for bears. It is not known what long-term impact this browsing will have on bear populations.

3.1.2.3 Recommendations about Introduced Species

- Identify funding sources to study effects of introduced species on bear habitat (see chapter 7, "Research and Monitoring").
- 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, consider social issues (e.g., subsistence hunting).

Research should be subject to peer review (also see chapter 7, "Research and Monitoring").

- Federal and state governments work with villages and other landowners to maintain the species that currently exist on the Kodiak archipelago.
- Guard against the introduction of additional nonindigenous species that could prove harmful to bears and their habitat. (See also section 6.4.1.)

3.1.2.4 Water

Water availability is rarely a problem on the Kodiak archipelago, but it is a critical need for bears' consumption and thermoregulation. Bears drink regularly, and ready supplies of fresh water are essential. Because of their large size and thick coats of fur and fat, Kodiak bears are designed to stay warm. When confronted with warm summer temperatures (>65º F) or after prolonged physical exertion, they frequently rest in snowbanks or shallow lakes or rivers to cool themselves.

3.1.3 Cover

Cover requirements include protection from the weather, security from detection, and areas for denning. Alder thickets, which abound in lower and middle elevations on Kodiak Island and southwestern Afognak Island, are the favored resting locations for bears during inclement weather and when they are sleeping. The thickets also provide secure areas where bears can avoid being detected by people. On Shuyak Island, northeastern Kodiak Island, and much of Afognak Island, spruce trees and the associated undergrowth of devil's club provide cover for bears. Steep or rocky areas can also provide cover for family groups when they are avoiding predatory male bears.

Dens are typically dug, although natural cavities may be used if available. Bears seek well-drained sites for dens. When high, steep country is available, it is used; in areas of more moderate topographic relief, however, bear dens may occur in the sides of hills or hummocks. When the substrate is not stable enough to support excavations, bears dig dens under the roots of alders or spruce trees.

3.1.4 Space

The physical arrangement, or spacing of resources within a bear's habitat is as important as the availability of the resource itself. If food resources are not near places where the bears are secure, the animals will hesitate to use them. Spacing of resources also refers to the time at which resources are used. When forced to compete with other bears or with people for resources, bears may shift their activity patterns to reduce conflict. This is why most bears living near human habitation adopt more nocturnal behavior.

3.2 Status of Bear Habitat on the Kodiak Archipelago

The Kodiak archipelago is arguably the best bear habitat in the world. Thus, it supports one of the densest known populations of brown bears, and those bears grow larger than they do in most other areas.

At the current time, Kodiak Island's inland habitat is contiguous and intact. Coastal areas have much more human activity, but it is generally restricted to isolated areas and small numbers of people. Roads are restricted to the northeastern coast of the island and in the immediate vicinity of villages. The only large-scale disruption of inland habitat, the Terror Lake hydroelectric project, was completed with minimal direct or indirect adverse impact to bears or their habitat because of a conscious effort to work with and around the bears (see also section 2.2.13). Wildfire, primarily human-caused, has burned an average of 1,135 acres of habitat annually over the past 10 years. No research on the effects of wildfire on Kodiak bear habitat has been undertaken.

In summary, Kodiak bears are adaptable, and with a healthy habitat and human neighbors who are tolerant and knowledgeable, they can thrive. Bear habitat and bear-human relationships are intimately intertwined, however, and if people are *not* willing to make the extra effort to live around bears, large expanses of wilderness areas are necessary for sustainable bear populations.

3.2.1 Logging on Afognak Island

Afognak Island's bear habitat has experienced considerable alteration in the past 25 years because of commercial logging on private lands. These lands are primarily managed for timber production, but they are under the jurisdiction of the Forest Practices Act, which governs commercial logging and seeks to ensure that protection of natural resources is a high priority.

Large-scale logging has the potential of damaging wildlife habitat by diminishing or altering vegetative cover; increasing blockage of bear access corridors and access to salmon-spawning streams by slash, erosion, and siltation; and causing indirect impacts through human activities. Although there have been no objective studies, it appears that, despite the fact that there have been major changes to the habitat, these logging activities have not had major adverse impacts on the bear population. The bears still have access to healthy salmon, and berry and grass production has been enhanced in many areas. Hunting regulations in these logged areas have become more restrictive to limit the effects of direct persecution, and general access to logging roads has been restricted.

Commercial activities such as logging do not necessarily have negative impacts on bear habitat if appropriate mitigation or avoidance measures are taken. It is often the cumulative effects that follow logging activities, particularly increased access, that impact bears. This includes displacement of bears from important habitat, increased human presence in bear habitat, or defense of life or property (DLP) killing of bears.

3.2.1.1 Recommendations Regarding Afognak Island

- Establish an education plan and explore economic incentives aimed at encouraging public and private landowners to consider the effects of motorized access on bears.
- Establish an education plan and explore economic incentives aimed at encouraging private landowners to continue land-management programs that are consistent with wildlife conservation.
- Teach outdoor recreationists to be bear-aware.

- Urge ADF&G, sports enthusiasts, and wildlife conservation groups to cooperate with private landowners to help make their forest practices as compatible as possible with conservation of bears (e.g., continued adherence to the Forest Practices Act and continued use of responsible garbage-management practices).
- Respect private property rights, while recognizing private land owners' responsibilities to adhere to applicable laws in the conservation of bears and their habitats.

3.2.2 Human Population

The estimated resident human population of the Kodiak archipelago is 14,181 and has been relatively stable for the past 20 years. More than 90 percent of the human populace lives along the road system that circumscribes Chiniak Bay on northeastern Kodiak Island. Five-year averages show that each year approximately 4,360 people are in the field hunting deer, approximately 520 hunting elk, 95 hunting goats, and 510 hunting bears. Each year, an average 15,565 anglers fish in Kodiak's fresh and salt waters.

Commercial fishing is vital to the economy of the region; fishing and fish-processing occur year-round. During summer months, however, residents and transients alike expand their activities to remote coastal areas in pursuit of salmon.

Residents of the Kodiak archipelago generally have a higher tolerance and a greater understanding of bears than do people in many other areas. To ensure this understanding, various agencies make ongoing efforts to educate newcomers and visitors and to minimize attracting bears to human habitat.

As the human population expands its activities throughout the archipelago, however, human encroachment into bear habitat could pose problems for bears.

3.2.2.1 Recommendations Regarding Human Activities in Bear Habitat

- Maintain or enhance the current high-quality bear habitat on the Kodiak archipelago by protecting riparian areas, including water quality and salmon resources; protecting healthy and contiguous upland areas; and continuing the type of human uses of the area that fosters coexistence.
- Strongly encourage education of outdoor recreationists about bear behavior, impacts to bear habitat, bear-human interactions (e.g., resulting from improperly handled food and trash), field safety practices, and use of bear-resistant containers and electric fences, etc. (see also chapter 8, "Education").
- Distribute to refuge users educational materials on building safe campfires(see also chapter 8, "Education").

3.2.3 Kodiak Archipelago Land Management

Lands of the Kodiak archipelago are primarily managed by three major entities (see Figure 3-2): U.S. Fish & Wildlife Service, which manages Kodiak National Wildlife Refuge; Alaska Department of Natural Resources, which manages grazing leases and includes the Alaska State Park System; and Native corporations.

Shuyak, eastern Afognak, western Raspberry, northeastern Kodiak, Sitkinak, and Tugidak islands are primarily state lands. Native landowners control most of Afognak, Whale, Spruce, and Sitkalidak islands and coastal areas on northern Kodiak Island. Much of the Karluk and Sturgeon rivers, the Akhiok area, and the eastern part of Raspberry Island are also managed by Native landowners.

Kodiak National Wildlife Refuge (KNWR) encompasses the southern two-thirds of Kodiak Island, the northwestern portion of Afognak Island, and all of Uganik Island. Beginning in the 1970s, Alaska Native Claims Settlement Act (ANCSA) legislation conveyed to Native ownership some 310,000 acres (approximately 20 percent) of KNWR. During the 1990s, a broad coalition of interest groups—using money from *Exxon Valdez* oil spill settlement funds, the Land and Water Conservation Fund, and private donations—purchased back high-quality bear habitat from willing sellers. These lands are now managed by KNWR or the Alaska State Park System.

Management of bear populations requires close attention to direct human-caused mortality, such as annual harvest levels, as well indirect human impacts, such as management of habitat. Wildlife managers recognize that the cumulative effects of increasing land-use activities may ultimately result in an irreversible decline in bear numbers. Accordingly, conservation of the Kodiak bear population should be considered in comprehensive land-use planning and land-acquisition decisions.

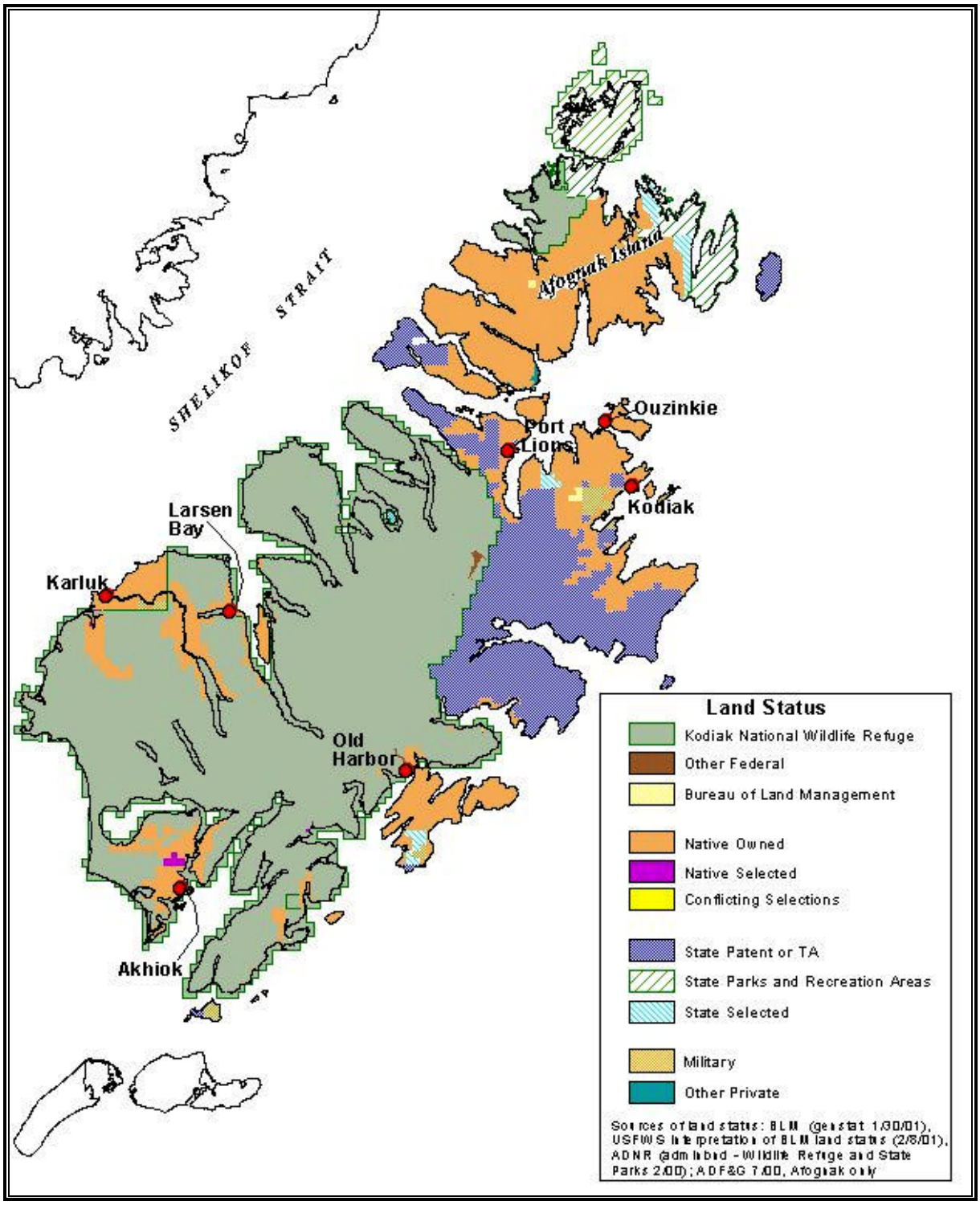

Figure 3-2. General land-ownership status for the Kodiak archipelago

3.2.3.1 Recommendations for Land Use, Land Acquisition, and Planning

- Continue acquiring small parcels of high-priority bear and salmon habitat from informed willing sellers.
- Consider bear habitat when evaluating lands for acquisition.
- In any land transfer, recognize subsistence activity, consistent with state and federal laws.
- When their lands are affected, involve village representatives and individuals associated with remote camps in land-acquisition planning.
- Consider bear habitat when conducting land disposals on state land.
- Pursue the acquisition of high-priority bear and salmon habitat on Afognak and Shuyak islands to complete the planned state park units there.
- Through land-use planning, maintain contiguous bear and salmon habitat (i.e., avoid patchwork development).
- Retain state and federal agency access to salmon populations to allow monitoring of stock status. Retain historical salmon rehabilitation and enhancement options identified in Kodiak's comprehensive salmon plan (i.e., lake fertilization, stocking of barren lakes, hydroacoustic surveys of smolt and presmolt populations, use of barrier nets in terminal harvest areas, monitoring of weir sites and fish passes, lake monitoring through limnology assessment, smolt enumeration through mark and recapture, and conducting egg-takes for out-stocking programs) (see also Appendix F).
- Encourage private landowners (e.g., via the use of conservation easements, economic incentives, and education) to consider bear habitat when making land-management decisions.
- Encourage a high level of cooperation among various landowners to achieve ecosystem management objectives for bears.
- Urge all parties to work cooperatively to ensure successful implementation of the conservation easement agreement on the Karluk and Sturgeon rivers watersheds.
- Urge ADF&G, in cooperation with USFWS, to identify key habitat linkages to ensure free movement of bears throughout their natural ranges and to avoid habitat fragmentation.
- Encourage Bureau of Land Management, USFWS, the public, and landowners to together review controversial 17(b) easements and corridors, renegotiate terms and conditions if proved necessary to prevent resource damage, and consider relocating or relinquishing easements that adversely impact important bear habitat. The CAC strongly recommends discouraging off-road vehicle (ORV) use on easements not currently used by ORVs.

3.2.3.2 Recommendations to Minimize Habitat Degradation

- Urge ADF&G, in close cooperation with USFWS, to identify and monitor threats to bears and their habitats and take effective actions to alleviate these threats.
- Encourage appropriate agencies to mitigate damage to bear habitat.
- Urge ADF&G, in close cooperation with USFWS, Kodiak Island Borough, and private landowners, to identify and map all important bear habitats in the archipelago and design action strategies to protect them.

3.3 Kiliuda and Shearwater Habitats

Kodiak bear research is an important priority for ADF&G, USFWS, and the Kodiak Brown Bear Trust. Kodiak bear research began with harvest statistics in the 1940s when it was recognized that Kodiak Island was producing the largest brown bears (measured by skull size). Over the decades, the data collected on Kodiak bears have grown, and the technology and methods of the researchers have improved.

Research on bear population density is perhaps the most important tool for effective bear management. In 1996, the Kodiak Brown Bear Trust partnered with the State of Alaska, USFWS, and the National Rifle Association to fund a brown-bear abundance and habitat assessment study in the Kiliuda Bay section of KNWR and the Shearwater Peninsula.

Objectives of the study included the following:

- estimation of brown-bear abundance in a 150–square-mile area
- estimation of the brown-bear habitat quality on the Shearwater Peninsula mitigation lands for the Terror Lake Hydroelectric Project
- revision of brown-bear population estimates for the Kodiak archipelago

The Kiliuda/Shearwater study project was important because previous research on Kodiak bears had focused on the southern and western portions of Kodiak Island. Knowledge of bear populations on the island's eastern drainages was limited, consisting mainly of hunters' observations and occasional bear sightings incidental to aerial salmon-escapement surveys.

In contrast with drainages in southern and western Kodiak Island, eastern drainages are shorter and steeper, and salmon populations are less diverse and abundant. No major sockeye salmon systems occur within KNWR on the eastern side of the island.

3.3.1 Summary of Kiliuda-Shearwater Findings

Two types of aerial surveys (transect and intensive) produced 239 sightings of bear groups during the May 19–27, 1996, survey period. Single animals and family groups accounted for about one-half and one-third of the observations, respectively. The remaining observations were of bears in breeding and sibling groups.

Bears were found throughout the study area, with the largest number of sightings recorded in the areas immediately north and east of the head of Kiliuda Bay (Shearwater Peninsula; see Figure 3-3). More than 75 percent of the bears were found in midslope (500–1,500 ft) habitats.

Observation rates indicated that bear density was higher than predicted. Density of total bears was estimated at 360 independent bears in the 374-square mile area (0.96/sq mi). This density ranks the area as the second highest brown-bear population density on the Kodiak archipelago, second only to the Karluk Lake drainage's 179 bears in the 121-square mile area (1.48 bears/sq mi).

An assessment of habitat quality on the study area was based on the aerial survey data, distribution and abundance of salmon, and the distribution and level of human activity associated with developments on private land. Streams with strong runs of chum and pink salmon were highlighted as key feeding sites for bears.

Considerable development has occurred in parts of the Shearwater Peninsula, and continued development could have an adverse effect on bears. Conversely, acquisition of private inholdings on the Kiliuda peninsula is nearly complete and has reduced threats to bears in portions of Kiliuda Bay. Currently, a high proportion of bear habitat on the Shearwater-Kiliuda area is intact and sustaining negligible or low levels of human activity. Data from this study indicate that the north side of Kiliuda Bay supports high levels of bear use during spring and summer and is an area where further development of private parcels could be detrimental to the bear population.

Biologists have identified the Shearwater Peninsula as having high densities of Kodiak bears. The CAC believes it is important that human impact (i.e., development) be minimized in this important bear habitat.

3.3.2 Recommendations Regarding the Shearwater Peninsula[6]

- State lands should continue to be managed consistent with terms of the 1981 Terror Lake Agreement (see Appendix S).
- Alaska Department of Natural Resources should work with ADF&G and USFWS to identify important bear habitat within the Shearwater Peninsula that should be classified as wildlife habitat and protected from land disposal.
- Support fair and timely consummation of the proposed Old Harbor Village Corporation land exchange of Sitkalidak Island for lands on Kiliuda Bay on the Shearwater Peninsula.

[6] The CAC identified this issue as being of current concern and one for which the CAC is making recommendations for immediate action.

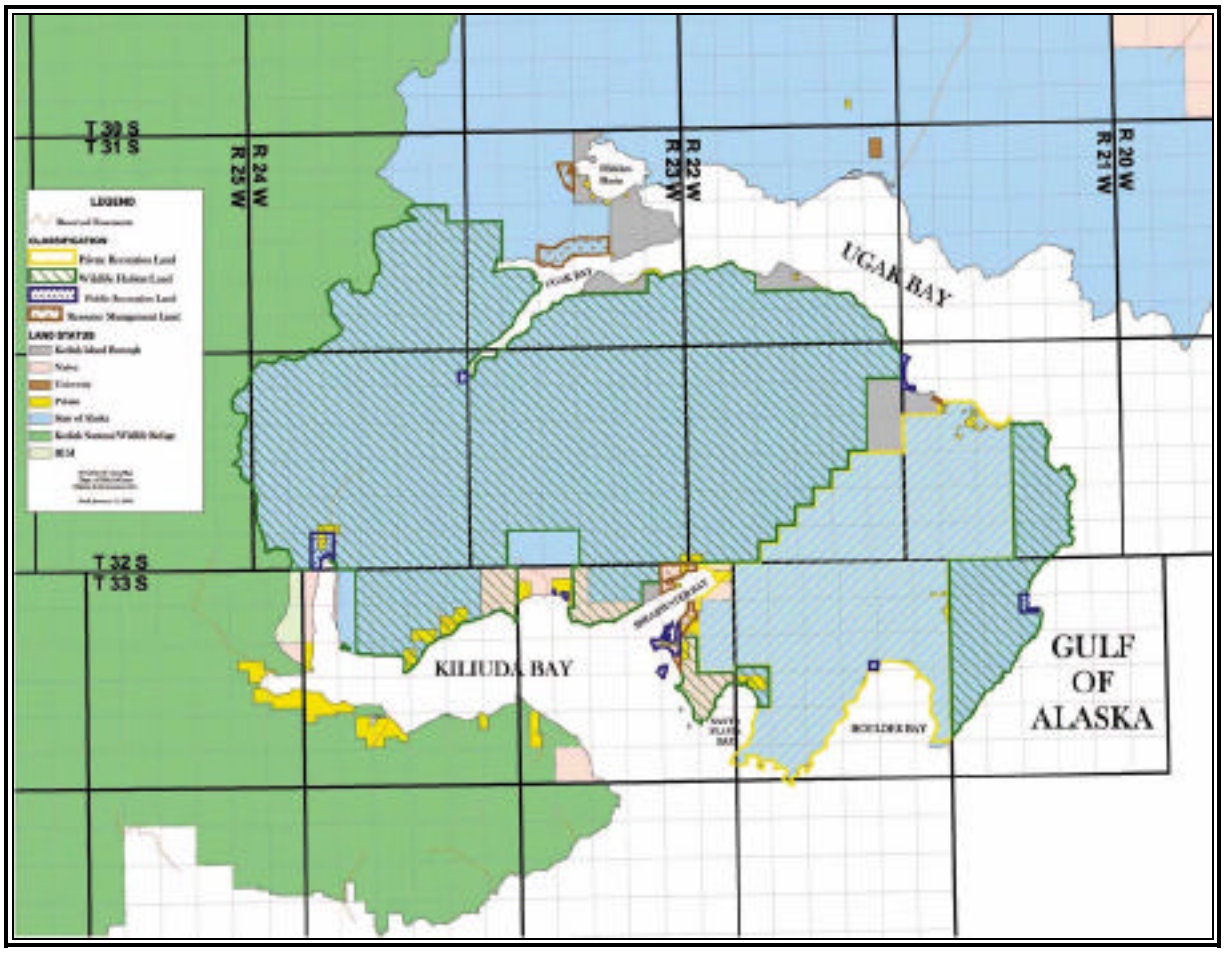

Figure 3-3. Shearwater Peninsula

3.4 Potential Threats to Bear Habitat

Resident human populations are relatively stable, most of the lands are managed for healthy ecosystems, and no large-scale developments are currently proposed.

3.4.1 Use of Back-Country Areas

Of greatest concern is the increasing seasonal human use of inland and coastal areas. Backcountry use of streams continues to gain in popularity; in some locales, this includes private land that has been acquired for public use. The increase in sport fishing and camping along these streams is generating conflicts between people and bears.

Use of ORVs and snowmachines has continued to expand throughout the state, especially in road-accessible areas of southcentral and interior Alaska. Riders are taking these machines into previously undisturbed bear habitat and affecting both the physical habitat and the security of bears. The majority of the increase is associated with the use of four-wheel all-terrain vehicles (ATVs) particularly associated with nonhunting recreational use. Increasing public complaints and observations of resource managers indicate that some areas of Alaska experience problems

with ORV and snowmachine use. Typical problems include damage to soils and vegetation, displacement of wildlife, and conflicts with other outdoor users. Unregulated motorized access can potentially impact bear habitat on the Kodiak archipelago. US. Fish and Wildlife Service has the authority to limit ORV use on refuge lands, and use of ORVs is not allowed on USFWS managed lands within KNWR.

3.4.1.1 Recommendations Related to Bear-Use Areas

- USFWS should work with ADF&G and the Kodiak Unified Bear Subcommittee (KUBS) when reexamining refuge areas that are closed or proposed to be closed to the public and commercial operators (see section 1.4.5).
- On USFWS land, restrict back-country use (e.g., require permits) before resorting to total closure to use (USFWS must be equipped to do so).
- Continue to seek enhanced funding for identification and study of important and critical bear habitat.
- Manage critical bear habitat to prevent adverse impacts.
- Consider restricting human use on important streams if there are documented adverse impacts on salmon stocks, bears, or both.
- Mandate an open public process prior to restrictions and ensure that nothing in these recommendation will conflict with federal and state subsistence laws.

3.4.1.2 Recommendations Regarding Motorized Access

- Create baseline information regarding ORV use throughout the archipelago in order to evaluate areas of problems (see chapter 7, “Research and Monitoring”).
- The CAC strongly recommends discouraging ORV use on easements not currently used by ORVs.
- Limit ORV use in important bear habitat areas (i.e., restrict recreational use of ORVs to designated-use areas [e.g., corridors] near villages).
- Develop statewide legislation requiring the licensing and registration of ORVs.
- Urge Kodiak Island Borough (KIB) to coordinate efforts among ADF&G, USFWS, private landowners, ORV users, and other interested parties to initiate an ORV planning process.
- Commend private property owners’ existing policies restricting motorized public access and encourage continuation of these policies.
- Formally recognize the Kodiak Snow Bruins for it policies regarding responsible snowmachine use.
- To minimize snowmachine impact on bears, do additional research to provide the facts necessary to identify highly sensitive areas of bear habitat (e.g., denning areas) (see chapter 7, “Research and Monitoring”).
- Develop snowmachine limitations (e.g., closures) for sensitive denning areas.

- Develop an education and enforcement plan for responsible use of ORVs to minimize negative impacts on bear habitat.
- The CAC objects to ORV manufacturers and retailers whose advertising (commercials) encourage unethical and damaging use of ORVs on public lands.
- Seek the cooperation of ORV user groups to encourage more responsible use of ORVs while in bear habitat.
- Prohibit air boats and personal watercraft (e.g., jet skis) in important bear habitat.
- Enforce state and federal laws regarding the intentional harassment of bears with aircraft (also see section 6.7).
- To minimize disturbance to bears, develop guidelines for overflying by helicopters for recreational purposes (also see section 6.7).
- To minimize disturbance to bears, develop guidelines for overflying by fixed-wing aircraft for recreational purposes (also see section 6.7).

3.4.2 Road Building and Energy Development

Future developments that could have adverse impacts on bears include road and energy development. A plan to construct a road to circumnavigate Kodiak Island has been proposed, but it is unlikely this project will proceed in the near future. Oil and gas deposits in Shelikof Strait are available for leasing through the federal government (see also section 2.2.15). Interest in these deposits is expected to be high; if they are proved and developed, exploration and extraction operations would probably be established on the Kodiak archipelago. Sites for additional hydroelectric facilities on Kodiak Island have also been identified.

Access routes, including roads, can increase human presence in bear habitat. Routes and roads may displace bears, fragment habitat, increase human use of an area, and lead to increased bear-human conflicts and DLP mortality. Existing roads and the continued building of new roads in bear habitat could be detrimental to the long-term well-being of Kodiak bears.

More insidious threats to bear habitat are those that are not anticipated or are the cumulative effect of several minor impacts. Climatic changes that reduce salmon stocks or berry production for long periods would have catastrophic impacts on bears. Human-caused factors such as oil spills would also be detrimental. The cumulative effects of increasing human uses in the backcountry, expansion of coastal facilities, and bears being killed in defense of life or property (DLP) near towns and villages are not fully understood, but have potentially greater impact than any single threat to Kodiak bear habitat.

3.4.2.1 Recommendations about Road Building in Bear Habitat

- Explore alternatives to building new roads in important bear habitat areas.
- Support closure (i.e., decommissioning) of obsolete logging roads on public and privately owned lands.
- Continue existing practices to limit motorized public access to logging roads.

3.5 Wilderness and Wild Rivers Designations

The CAC recognizes that the Kodiak archipelago possesses outstanding and unique wilderness and wild river values of great importance to bears, salmon, and other fish and wildlife and believes these public resources should continue to be available for public use and enjoyment.

U.S. Fish & Wildlife Service produced wilderness study reports for KNWR in 1972 and again in 1987, as required by the Wilderness Act of 1964 and the Alaska National Interest Lands Conservation Act of 1980, respectively. Both reports found that most lands in the refuge meet criteria for designation as wilderness, defined in the Wilderness Act for size, ownership, natural integrity, naturalness, solitude, and primitive recreational opportunities. Refuge lands were also found to possess outstanding special values, including some of the finest bear habitat in the world; hundreds of bald eagles, a refugium with unique characteristics; the most productive waterfowl habitat on the Kodiak archipelago; and spawning habitat for steelhead trout, Dolly Varden, Arctic char, and millions of Pacific salmon.

A succession of federal administrations has failed to act on these recommendations because of opposition from development interests, along with widespread public misunderstanding, confusion, and fear of what such designations might mean, especially in terms of access to and uses of refuge lands and waters.

The CAC believes it is essential that the public understand the true values, economic benefits, and possible impacts derived from proposed wilderness and wild river designations. U.S. Fish & Wildlife Service is required by law to identify, during the revision of KNWR Comprehensive Conservation Plan (U.S. Fish & Wildlife Service 1987), those lands and waters within KNWR that qualify for such designations.

4. Harvest Issues

Synopsis: Residents and visitors harvest a variety of fish, wildlife, and plant resources on the Kodiak archipelago. All of these resource-extraction activities are interrelated with bears. Management of the harvest of Kodiak bears is currently based primarily on population assessments and regulation of sport hunting. With a healthy population of bears on the archipelago, the emphasis has been on maintaining a stable bear population that will sustain an annual harvest of 150 bears, composed of at least 60 percent males. Subsistence harvest of bears is presently managed by the U.S. Fish & Wildlife Service. Subsistence hunting permits are allocated each year: one in Akhiok, one in Karluk, three in Larsen Bay, two in Old Harbor, two in Ouzinkie, and two in Port Lions. Sport hunting of bears in Game Management Unit 8 (Kodiak archipelago) is regulated by a complex system involving drawing hunts and registration hunts. Nonresident bear hunters are required to use the services of a registered big-game guide. The Citizens Advisory Committee(CAC) makes recommendations on a number of harvest issues, including the following: management of bear-harvest activities, subsistence use of bears, sport hunting, guiding, other resource-extraction activities, and regulations and their enforcement.

The Kodiak archipelago offers many opportunities to harvest a variety of resources. Residents and visitors hunt deer, elk, mountain goats, and bears. Commercial fishing and sport fishing are major industries on the archipelago. Berries and other vegetation are regularly harvested by urban and rural residents.

Bear hunting has the most obvious direct impact on the bear population, but all of these harvest activities are interrelated with bears. Bears share many food resources (such as salmon and berries) with humans, and humans harvesting resources in bear habitat may lead to bear-human encounters resulting in injuries or death for either party. Thus, to prepare a management plan for Kodiak bears, all types of harvesting activities and issues are taken into consideration. These include subsistence use of bears; regulations governing hunters; the roles of guide/outfitters and transporters; the impacts of other resource extraction (i.e., harvest of other fish, vegetation, and wildlife); enforcement of regulations; population assessments and monitoring; the various natural habitats and their carrying capacities; and the needs and desires of human residents that define the wildlife-acceptance capacity[7].

4.1 Current Management of Bear-Harvesting Activities

Hunting of bears on the Kodiak archipelago has a historical, customary, and traditional role in bear population management. Kodiak has maintained a stable to increasing population of bears in part because of management policies and regulations addressing bear harvesting on the

[7] reflects the maximum wildlife population level in an area that is acceptable to people (Decker and Purdy 1988)

archipelago. In some areas near the City of Kodiak and around some villages on the archipelago, the population of bears has been perceived as increasing to the point of concern.

Management of the harvest of Kodiak bears is currently based primarily on population assessments and regulation of sport hunting. With a healthy population of bears on the Kodiak archipelago, the emphasis has been on maintaining a stable bear population that will sustain an annual harvest of 150 bears, composed of at least 60 percent males. When there is a need to reduce the bear population in a specific area, and thus reduce the incidence of killing bears in defense of life or property (DLP), hunter harvest is the preferred method. During the past decade (1990–1999), hunters harvested an average of 160 Kodiak bears each year under tightly controlled regulation. (For further description of Kodiak's bear-management, see section 2.3.)

Present management concerns include the following:

- Are DLP mortalities being accounted for accurately?
- Are the allocations among users appropriate to current needs and desires?
- Although the natural carrying capacity of bear habitat is not being strained, is the wildlife-acceptance capacity being exceeded in any area of the archipelago?
- Is there a need to reduce the number of bears in any specific localities?
- Can population data be improved to keep harvest rates commensurate with bear densities?

4.1.1 Recommendations on Management of Bear-Harvesting Activities

- Endorse Alaska Department of Fish & Game's (ADF&G's) current bear-management objectives, as modified by recommendations made by the CAC in this management plan (also see chapter 5, "Redefining Bear-Management Strategy").
- Continue to prohibit the baiting of bears throughout the Kodiak archipelago.
- Manage bear populations on carrying capacity and density as well as on harvest objectives (see chapter 5, "Redefining Bear-Management Strategy").
- Recommend that ADF&G refine population estimates in order to maintain a bear population that can sustain a 6 percent annual sport harvest (see chapter 7, "Research and Monitoring").
- Develop a co-management agreement with villages to reduce DLPs (see section 6.2) in and around villages and to provide economic incentives to conserve bears; this would include expansion of bear-safety practices, solid-waste management, encouraging Natives to become registered big-game guides, and consideration of bear-hunting permits in areas adjacent to villages.
- ADF&G, U.S. Fish & Wildlife Service (USFWS), and other appropriate groups should develop informational and educational materials to help minimize bear-human conflicts and thereby improve hunter image. These materials should be developed for multimedia use and include the following subjects (see chapter 8, "Education"):

- trip planning and physical conditioning
- meat handling and storage skills
- bear behavior and safety
- a safety-in-bear-country video for wide distribution and use

4.2 Subsistence Use of Kodiak Bears

Alutiiq residents of the Kodiak archipelago harvested bears for subsistence purposes for more than 7,000 years without external regulation, until 1925. In that year, however, the Alaska Game Commission developed a harvest limit of three bears per year; and, in 1926, bear harvesting was prohibited during the summer months, except in DLP situations.

When Alaska became a state in 1959, the state government took over management of wildlife, including regulating harvest of bears. The first specific subsistence hunting regulations for Kodiak bears were developed by the state in 1985, when the Alaska Board of Game established a registration permit hunt. Because Alutiiq hunters believed it was illegal to hunt for bear, they did so without completing the required paperwork. Consequently, the substantiation of that practice was not available, and ADF&G determined, in 1987, that there was no customary and traditional use of Kodiak bears. Since then, subsistence bear hunting has not been allowed under state regulations.

In 1990, management authority for subsistence activities was assumed by the federal government (USFWS). The subsistence bear hunt was reinstated under federal management in 1997, when interviews with Alutiit confirmed the continued subsistence use of bears. At that time, the Federal Subsistence Board determined a customary and traditional use of bears by villages on the Kodiak archipelago and established subsistence hunting regulations for Kodiak bears.

Currently, USFWS manages subsistence activities on federal lands. Subsistence hunting permits for Kodiak bears are available through the Kodiak National Wildlife Refuge (KNWR) each year as follows: one in Akhiok, one in Karluk, three in Larsen Bay, two in Old Harbor, two in Ouzinkie, and two in Port Lions. The subsistence hunting seasons are December 1–15 and April 1–May 15.

4.2.1 Recommendation on Village Subsistence Use of Kodiak Bears

- Continue to provide opportunities for subsistence uses of bears by local residents, consistent with conservation provisions essential to sustain the resource.

4.3 Sport Hunting of Kodiak Bears

Regulation of bear hunting on the Kodiak archipelago is complex, probably the most complex regulatory system in Alaska. Game Management Unit 8 (GMU 8), which comprises the Kodiak archipelago, is divided into 30 hunt areas. Drawing permits are needed to hunt in 29 of these areas; hunting in the final area, which is along the Kodiak road system on northeastern Kodiak Island, is by registration permit.

There are two seasons for hunting bears in GMU 8: fall (October 25 through November 30) and spring (April 1 through May 15). The individual bag limit for all areas is one bear every four years, and cubs or sows accompanied by their cubs cannot be taken. All bear hunters receive a brief orientation from ADF&G staff prior to going afield; hunters must also contact ADF&G to check out of the field after their hunts. All bears killed in GMU 8 must be inspected and sealed by ADF&G staff in Kodiak within 30 days of the end of the season. A resident hunter must have a hunting license and a bear tag. Nonresident hunters for Kodiak bears must meet the additional requirement of hunting with a registered guide (see section 4.4).

Poaching of Kodiak bears is not common in part because it is difficult to access hunt areas without the services of air taxi or charter boat operators, who take great responsibility for reporting the hunting activities of their clients. Another reason is the prevalence and diligence of Division of Fish & Wildlife Protection and of KNWR law enforcement officers (see section 4.6).

4.3.1 Drawing Hunts

Hunting for bears in areas where hunter demand exceeds the number of animals available for harvest is regulated by drawing permits.

To hunt in one of the 29 areas governed by drawing permits, a hunter must first select the area and the season in which to hunt. A hunter may apply for permits in as many as three areas for each season. A certain number of permits are allocated for each hunt area for each season, with at least 60 percent of the permits going to Alaska residents. An application for a drawing permit requires a hunting license and the appropriate application fee. The overall odds of being drawn are 5 percent; in some popular areas, such as around Karluk, the odds are about 2 percent, whereas odds for being drawn for a hunt on Afognak Island are closer to 6 percent.

If a hunter's application is drawn, he or she must come to Kodiak to obtain the permit. The hunter must personally speak with the area biologist, the wildlife technician, or the administrative clerk in the Kodiak ADF&G office. After showing a valid hunting license and bear tag, the hunter receives the permit. To do so, the hunter must sign a form agreeing to all the regulations governing its use (including provisions such as not shooting on the same day as flying in to the area). The hunter then chooses and declares a 15-day period within which to use the permit to hunt Kodiak bear in the specific hunt area. No guide is required for resident hunters, although some choose to use the services of guides to ensure a more successful hunt.

After the 15-day hunting period has ended, the hunter must return to the ADF&G office in Kodiak, bringing the hide and skull of the killed bear for sealing by the area biologist or assistant. If the hunter is unsuccessful, a phone call is sufficient for checking out; hunter report cards, however, must be returned within 15 days.

Nonresident hunters must meet other requirements, the primary one being that, to hunt, she or he must have a licensed guide. The hunter can be guided by someone of second-degree kindred (e.g., sibling, uncle or aunt, father or mother) or the hunter may hire a professional guide (see section 4.4).

Each registered or master guide in Alaska can select as many as three guide-use areas within the state in which to guide hunters. A hunter can select any of these guides, unless the hunt is to take place on KNWR. A hunter who wins a permit to hunt in an area on the refuge must select one of the guides who is permitted to guide in that area. If for some reason the hunter does not wish to use a guide who is authorized for that hunt area, the permit is forfeited.

If a nonresident wins a permit in the drawing and decides not to take it, the permit goes to an alternate applicant. If the alternate also declines the permit, it is then issued on a first-come, first-served basis to a person who has a signed agreement between a guide and the client. This provision is designed to ensure that professional guides do not lose business if an application is submitted frivolously.

When a nonresident hunter is successful, he or she is required to check out and return the hunt report to ADF&G. The hunter may bring the hide and skull to ADF&G for sealing or leave it in the field with the guide, who may bring in several bears for sealing at one time.

4.3.2 Registration Hunts

Hunting in areas (e.g., northeastern Kodiak), where more bears may be harvested, is regulated by registration permit.

To get a registration hunt permit, however, the hunter must come to ADF&G's Kodiak office. In a registration hunt, the number of permits is unlimited, but successful hunts must be reported and the hide and skull brought in for sealing within five days of the kill. Unsuccessful hunters report by mail within 15 days of the close of season. Registration hunts have the same requirements for use of guides as do drawing hunts.

4.3.3 Recommendations about Sport Hunting of Kodiak Bears

- Maintain the tradition of bear hunting, consistent with the conservative management and regulatory regime that avoid overharvest of the resource.
- Maintain the tradition of bear hunting, consistent with the highest ethical standards of safety and fair chase.
- Ensure that all hunters are provided with the Boone & Crockett fair-chase statement[8] and that it is printed on all ADF&G and USFWS materials relating to hunting, as appropriate (see also Appendix C).
- If reductions in harvest are necessary, consider ways of reducing the female harvest prior to reducing permit numbers (i.e., skull-sex minimums in southwestern Kodiak).
- To better achieve wildlife-acceptance capacity (see section 5.3) along the Kodiak road system, increase bear harvest by extending the spring bear-hunting season to May 31.

[8] Fair Chase, as defined by the Boone and Crockett Club, is the ethical, sportsmanlike and lawful pursuit and taking of any free-ranging wild, native North American big-game animal that does not give the hunter an improper advantage over such game animals.

4.4 Big-Game Guides, Outfitters, and Transporters

Big-game hunting is a significant business on the Kodiak archipelago, especially hunting for Kodiak bears, and many big-game hunters that do not live on the archipelago make use of guides or transporters. No one may accept payment for providing a big-game hunting service (such as guiding) without having the appropriate license.

4.4.1 Guides and Outfitters

Nonresident bear hunters are required to use a guide (see section 4.3), and some residents also choose to avail themselves of the expertise and experience a guide offers. Because guided bear hunts provide a source of significant income to not only the guide, but to the community as a whole, these animals are of considerable economic value to Kodiak. To legally contract to provide big-game hunting services for clients, guides must fulfill stringent requirements to be licensed by the Alaska Department of Community and Economic Development, Division of Occupational Licensing.

Four levels of guide licenses can be earned: assistant guide, class-A assistant guide, registered guide, and master guide (one must have a guide's license in order to be an outfitter for big-game hunts.)

An applicant for an **assistant guide** license has to have hunted legally in the state during two calendar years and must have a written recommendation from a registered guide or other qualified person (as described in AS 08.54.630). An assistant guide may not contract to guide or outfit a big-game hunt, but must be employed by a registered guide and under the supervision of either a registered guide or a class-A assistant guide while in the field. Further, an assistant guide may not take charge of a camp or conduct guide activities unless the contracting registered guide is in the field and participating in the contracted hunt.

The **class-A assistant guide** license requires at least three years' experience as an assistant guide or 10 years' hunting experience in Alaska and a written recommendation from an appropriate source. A class-A assistant guide cannot contract to guide or outfit a big-game hunt; he or she must be employed by and work under the supervision of a registered guide. However, the class-A assistant guide may take charge of a camp and conduct guide activities from the camp without the contracting guide being present in the field.

To become a **registered guide**, a person must have significant practical field experience in a number of relevant activities. He or she must also pass a qualifying examination (*or* have 25 years' experience as a class-A assistant guide or class-A assistant guide/outfitter), have hunted in the state for part of each of any five years, and have three years' experience as a class-A assistant guide or class-A assistant guide/outfitter. In addition, the applicant must pass a certification examination prepared specifically for at least one game management unit. She or he must also have been favorably recommended by eight big-game hunters and must show proof of financial responsibility.

To become a **master guide**, one must be licensed as a registered guide for at least 12 of the last 15 years. He or she must submit a list of at least 25 clients for whom guiding or outfitting services have been provided, and must have received favorable evaluations from at least ten of

them. A master guide may contract to guide or outfit hunts for big game and may provide transportation services. When the master guide contracts for a guided hunt, he or she must be physically present in the field with the client at least once during the contracted hunt.

The preceding paragraphs describe only a portion of the requirements that guides must meet to be licensed. Their licenses are evidence of extensive experience, skill, and value to their clients, and the penalties for not adhering to the legal requirements of their professional licenses are severe.

4.4.2 Transporters

A transporter is licensed to provide transportation, lodging, and similar services to the hunter but is not allowed to perform big-game guiding services. By the same token, a transporter cannot call him or herself an outfitter. Licensed transporters cannot set up tents in the field for hunters; they must own cabins and rent them or provide services from them. Further, if a transporter wishes to use a plane, she or he must also have an air taxi operator's license; to transport hunters by boat, a license from the USCG is needed.

A licensed guide may act as a transporter in his or her own guide-use areas, but to take clients outside those areas, she or he must have a transporter license.

4.4.3 Guides in GMU 8

As of January 2001, there were 82 master guides and 498 registered guides in the state. Of these, 39 guides were registered to guide in guide-use areas in GMU 8. Guides may be registered in as many as three guide-use areas within the state, and several guides on the Kodiak archipelago have all three of their registered guide-use areas within GMU 8.

4.4.4 Guiding on the Kodiak National Wildlife Refuge

Guiding for both big-game hunts and sport fishing on the refuge is very complicated. Guides must secure special-use permits from USFWS. The fee for such a permit includes a flat administrative fee and a per client-use day charge for time spent in the field with the client. Within the refuge, the guide-area boundaries of GMU 8 correspond with refuge permit areas. (In addition to the 21 big-game guide areas on KNWR, portions of nine areas on state land on the archipelago are also open to registered guides.)

See Appendix D for a description of the big-game guide permitting process on KNWR.

4.4.5 Alaska Professional Hunters Association

The Alaska Professional Hunters Association (APHA) is an organization of professional guides in Alaska. Members of APHA subscribe to a fair-chase code of ethics (see Appendix C for the APHA's Code of Ethics). In the absence of the Guide Board, which was disbanded by the state legislature in 1994, APHA attempts to police its profession by ensuring that those who are convicted of violating state or federal laws regarding wildlife or the guiding profession cannot be members of APHA.

4.4.6 Alaska Native Big-Game Guides

Guiding brown-bear hunters has been an important economic and social activity for some individuals in every community on the Kodiak archipelago. With the beginning of the brown-bear expeditions in the early 1900s, professional hunters and guides, with their clientele, enlisted the help of Alutiiq hunters because of their local knowledge of weather, terrain, and bear habits. These village hunters were employed as packers and guides, and many went on to become licensed as class-A or assistant guides. Some worked toward acquiring registered guide licenses and established their own businesses. Eli Metrokin was probably the first Alutiiq on Kodiak to receive his registered guide license. He was followed in the late 1940s–60s by Roy Madsen, Leonard Helgason, Nick Nekeferoff, and Larry Matfay.

A strong tradition of passing the interest in guiding bear hunters to the next generation is evidenced by the following Old Harbor family: Moses Naumoff trained his son-in-law Larry Matfay, who in turn trained Ralph Christiansen and his sons David and Wesley. This extended family interest and involvement in guiding bear hunters continues today. Leonard Helgason, with roots to Afognak village, was taught to hunt bears by “Uncle Bill” Baumann. Leonard’s son Steven received his registered guide license during the 1990s.

Nick Malutin and Griska Nicholi were the village hunters in Karluk village. Both went on to guide extensively for Charlie Madsen. Other well-respected Native bear guides were the Panamaroff brothers, Alex, Walter, and Lawrence; Johnny Aga; Frank Noya; Oscar Alpiak; William Ambrosia; Fred and Bill Kvasnikoff; and others. All held class-A or assistant guide licenses and, over the years, have contributed a great deal to the character and uniqueness of the Kodiak bear-hunting experience. Willie Eluska and Bill Agnot, from Akhiok, guided for many years for Bill Pinnell and Morris Talifson at Olga Bay, as did Minni and Ephriam Agnot to a lesser extent. Herman Malutin, Jeff Peterson, Johnny Parker, and others are currently licensed as class-A assistant guides; David Christiansen was scheduled to take the registered guide licensing exam in winter 2001-2002.

Alaska Village Initiatives (AVI) has formed the Village Wildlife Conservation Cooperative (VWCC) for the purpose of providing rural land owners with education and advocacy on private-land wildlife-habitat management. The VWCC will focus on the enhancement or recovery of subsistence and sport hunting wildlife from private lands and will provide assistance for eco-, adventure- and watchable-wildlife tourism. As part of this effort, The VWCC is working with APHA to develop a cooperative approach to increasing the number of Native registered guides in the business and to dealing with access and trespass issues on private lands.

4.4.7 Recommendations Relating to Guiding

- Strongly support the restrictive guide system currently in use on federal lands of the Kodiak archipelago and encourage reinstatement of this system on other lands.
- Support the Alaska Board of Game resolution 98.127, 1998, (see Appendix R) requesting reinstatement of the Big-Game Commercial Services Board.
- Encourage guides/outfitters and transporters to make bear-safety educational materials available to elk hunters.

4.5 Other Resource Extraction

4.5.1 Sport Hunting

In addition to Kodiak bears, three primary big-game species are hunted on the Kodiak archipelago: Sitka black-tailed deer, Roosevelt elk, and mountain goats. Goat hunting does not usually bring hunters into conflict with bears because fewer hunters are afield during hunting season (approximately 150 goat hunters compared to 4,000 deer hunters), the terrain in which goats are hunted is more open, and smaller amounts of meat from the kill are available for bears.

Deer hunting and elk hunting, however, present increased opportunities for bear-human interactions and DLP killing of bears (see section 6.2 for more information about DLPs).

4.5.1.1 Deer Hunting

Sitka black-tailed deer populations on Kodiak Island reached peak numbers in the 1980s. At that time, there were more than 100,000 of the animals on the island, and some 13,000 deer were taken by hunters each year. The deer population in 2001 was down to approximately 40,000, and annual harvest was down to approximately 2,000 animals. Deer occur throughout the Kodiak archipelago, and efforts are being made to rebuild the population after the severe decline in the late 1990s.

Seventy percent of the harvest is taken during November and December, 20 percent is taken in October, and the remaining 10 percent is taken during the rest of the hunting season (there are three hunting seasons). At its spring 2001 meeting, the Alaska Board of Game changed state regulations to allow hunters to harvest a maximum of three deer (down from four) in GMU 8. Federal subsistence regulations allow residents of GMU 8 to take deer on federal lands within the archipelago (except on the road system). Subsistence harvest limits sometimes differ from state regulations. Federal subsistence regulations on Kodiak only pertain to lands managed by USFWS; state, Native corporation, private, borough, and municipal lands are not included in these liberalized restrictions.

The impact of deer hunting on Kodiak bear behavior and mortality can be significant. When there was a high level of deer hunting, there was an increase in the number of DLP mortalities of bears and requests to reduce deer hunting to protect bears.

4.5.1.2 Elk Hunting

Roosevelt elk, which were introduced to Afognak Island in 1929, now occur on Kodiak, Afognak, and Raspberry islands. In 1959, there were approximately 1,500 elk. As of January 2001, there were about 900 animals. Approximately 650 hunters come to Kodiak each year to hunt for elk.

In 1998, the Federal Subsistence Board opened a subsistence elk hunt September 1–25 on KNWR lands on northwestern Afognak Island, within the traditional range of the Waterfall elk herd. In 1999, the season was liberalized to extend through November 30. Hunters were limited to GMU 8 residents, and access was limited to marine waters only in 1998 and 1999. In 2000, the access restriction was rescinded.

Many hunters are not familiar with hunting Roosevelt elk, the Pacific Northwest subspecies of elk that inhabit the northern portion of the Kodiak archipelago. Roosevelt elk are larger than the more common subspecies (the Rocky Mountain elk), are generally difficult to hunt, and are often found in the most remote parts of the archipelago. Successful hunters may be faced with transporting significant amounts of game meat over long distances or rough terrain without the aid of all-terrain vehicles or pack animals. Several trips are required to salvage all of the meat of a large elk. As a result, many elk hunters fail to salvage all of the meat. Salvaging meat over the course of days has additional negative impacts because bears are frequently attracted to the kill sites in a short time. Encounters between bears and hunters returning to the kill site or meat caches may result in DLP situations.

4.5.1.3 Recommendations about Sport Hunting

- Urge ADF&G to continue to track the number of bears killed by deer, elk, and goat hunters to minimize such bear mortality and to make a serious effort to mitigate this problem through education of big-game hunters on how to avoid dangerous situations involving bears (see also chapter 8, “Education,” and chapter 7, “Research and Monitoring”).
- Require mandatory hunter education, which should include bear-safety instruction, before going afield in GMU 8 (see chapter 8, “Education”).
- Encourage hunters to quickly remove kill meat to a safe distance from the kill site (see also chapter 8, “Education”).
- Using the ADF&G Web site and brochures, educate hunters about terrain issues (see also chapter 8, “Education”).
- ADF&G develop other educational tools (e.g., videos using local people) to educate hunters about hunting in bear country (see also chapter 8, “Education”).
- Submit an article about hunting on Kodiak (written by Hank Pennington) to a sporting magazine (see chapter 8, “Education”).
- Place educational materials in places (or with people) where they can be readily accessed (e.g., Web site, airport, magazines, tourism offices, U.S. Coast Guard (USCG) base, villages, guide/outfitters, public libraries, schools, museums, ferries, tribal council offices, Fish & Wildlife Protection officers, Alaska State Park offices and state parks staff, public radio, and television) (see also chapter 8, “Education”).
- Recommend strongly that elk hunters hunt in groups or teams.
- Limit the harvest of deer to the number of animals the hunter can handle.
- Encourage hunters to promptly gut the harvested animal and move it to a safe, visible location.
- Encourage hunters to store meat responsibly so it won’t attract bears (e.g., high in trees, within electric fences); use of mini-electric fences is advised.
- Encourage hunters to be aware of carcasses or gut piles from animals harvested by others.

- Urge ADF&G, USFWS, and other appropriate groups to develop educational materials to eliminate conflicts between deer hunters and bears (e.g., how to handle meat, safety, location, bear posture) (see also chapter 8, "Education").

4.5.2 Commercial Fishing

As well as being an important element of Kodiak bears' diet, salmon are the mainstay of Kodiak's commercial fishery. The commercial fishery's Kodiak Management Area (KMA) encompasses waters surrounding the Kodiak archipelago. The KMA comprises seven districts and 52 sections around the Kodiak archipelago and along the coast of the Alaska Peninsula that borders Shelikof Strait. The KMA includes approximately 700 streams on the Kodiak archipelago in which salmon migration or spawning has been documented. Figure 4-1 shows the canneries and sockeye enhancement, weir, and hatchery locations of the KMA in 2000.

The salmon resources of the KMA have been used commercially for more than 150 years by setnetters, gillnetters, and seiners (fish traps were outlawed in 1959, when Alaska gained statehood). A limited entry system, initiated by the state in 1974, restricted the number of individuals allowed to participate in the commercial salmon fisheries. This system formally established maximum numbers by specific gear type by area that could participate annually; it is administered by the Commercial Fisheries Entry Commission. Currently, there are 608 commercial salmon permits for the KMA.

Commercial harvest limits are controlled by opening and closing fishing periods based on the achievement of escapement goals. Because sport anglers, subsistence users, and Kodiak bears also share use of the salmon resources, it is imperative that escapements be closely monitored and managed to ensure that maximum production levels are maintained.

Biological escapement goals (BEG) set the number of spawning salmon required to sustain maximum production levels for each salmon species. The KMA commercial salmon fisheries are managed to achieve escapement levels that are within the BEG range. The majority of all sockeye and all chinook salmon escapement counts are obtained with the use of weirs, which have been used in as many as 18 different spawning systems.

The KMA staff issues subsistence salmon permits annually to obtain harvest data. Only residents of the State of Alaska are eligible to take salmon for subsistence purposes. With few restrictions, the entire KMA is open to subsistence salmon fishing. Reported subsistence harvests have averaged more than 31,100 fish annually for the 10-year period 1991–2000. Sockeye salmon accounts for more than 70 percent of that harvest. In addition to state subsistence regulations, there are federal subsistence regulations that apply to the federal lands and waters located within the KMA. Alaskans who reside in the Kodiak Island Borough, except those residing on the U.S. Coast Guard Base, are qualified for participation in the federal subsistence fishery.

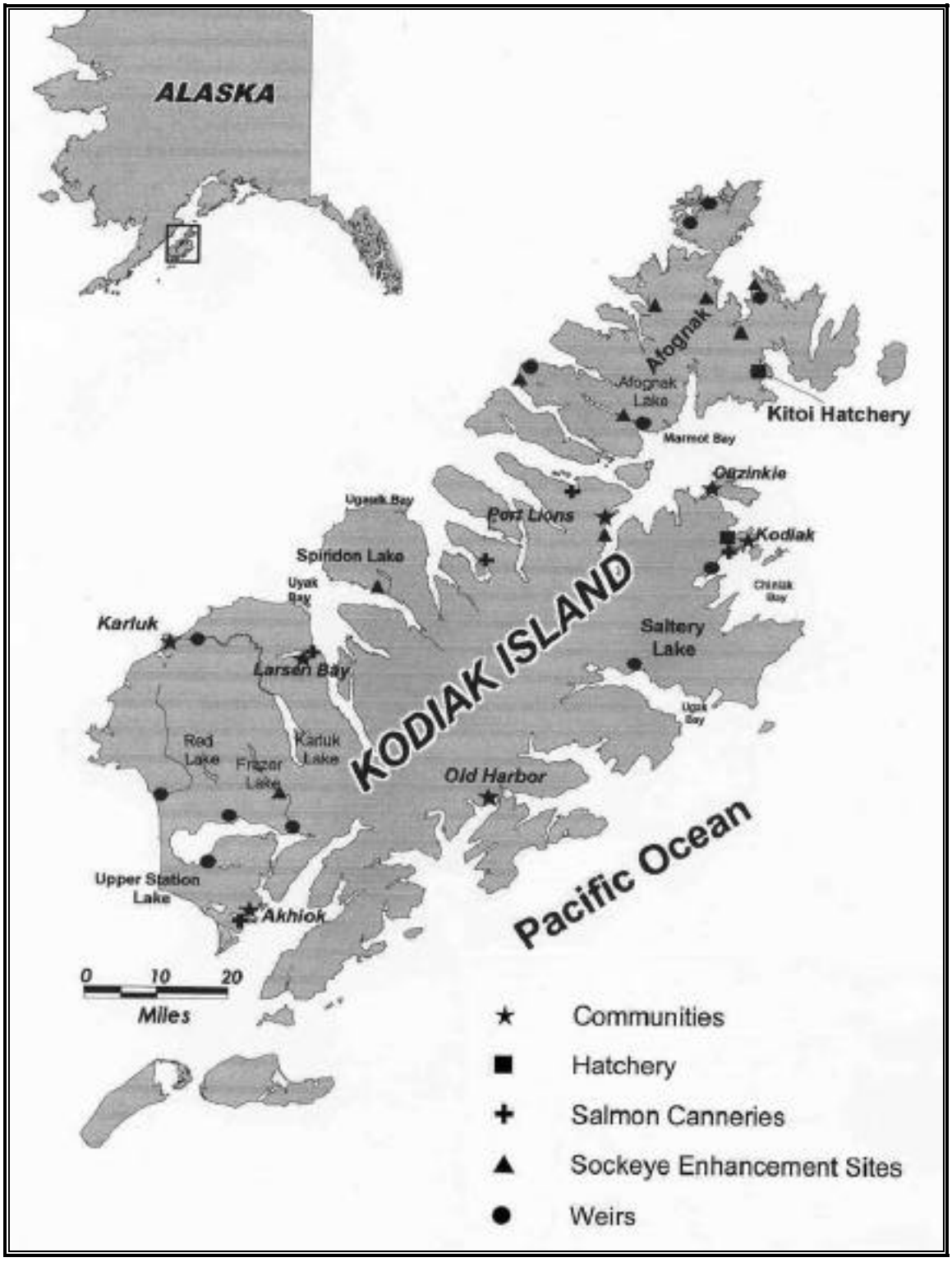

Figure 4-1. Kodiak Island's communities, canneries, and sockeye salmon–enhancement, weir, and hatchery locations of the Kodiak Management Area (2000)

Commercial fishing and processing can account for as much as 55 percent of the private sector work force (according to 1991 figures) of the approximately 14,000 people who reside within the KMA. During the commercial salmon fishing season (approximately June through September), as many as 5,000 people may be directly involved in harvesting, tendering, or processing.

A regional planning team (RPT) plans for the long-term future of the salmon resource within the region. The RPT's primary responsibility is to initiate and continue an orderly process that examines the full potential of the region's salmon production capacity. To accomplish this, the RPT develops a comprehensive salmon plan for the region it represents. Phase II of the Kodiak Regional Comprehensive Salmon Plan 1982–2002 was developed by the Kodiak RPT in March 1992.

4.5.2.1 Recommendations Regarding Commercial Fishing

- Salmon escapement goals should continue to allow for natural predation by bears and other wildlife (see Appendix F, "Principles and Criteria for Sustainable Salmon Fishing," and Appendix U, "Policy for Statewide Salmon Escapement Goals").
- Continue evaluating species-specific salmon escapement levels against drainage-specific bear use of salmon; investigations should emphasize an ecosystem overview (e.g., salmon BEG rather than bear densities) (see chapter 3, "Kodiak Bear Habitat" and chapter 7, "Research and Monitoring").
- 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").

4.5.3 Sport Fishing

Sport-fishing activities are managed by ADF&G's Sport Fish Division. Sport fish salmon harvest estimated for the Kodiak archipelago includes both guided and unguided angling. Although the sport-fishing harvest is a relatively small percentage of the total return or harvest of salmon, from 1977 through 1998 an overall increasing trend was evident in the total number of salmon reported as harvested by anglers; this was due primarily to increases in the harvest of sockeye, chinook, and coho salmon. Reported annual harvests have ranged from 327 to 5,221 chinook; 1,255 to 12, 505 sockeye; 4,716 to 29,456 coho; and 5,336 to 19,044 pink salmon. Annual sport harvests of chum salmon are generally less than 1,000.

The primary conservation burden to ensure that salmon escapement goals are achieved is placed on the commercial net fisheries by means of in-season restrictions. Additional restrictions have been placed on sport salmon fisheries along Kodiak Island's road system and, although it has not been necessary in the past, could be placed on additional system-specific sites as needed.

Approximately half of sport fishing on the Kodiak archipelago takes place in salt water, for halibut. Of the remaining half, about 68 percent takes place in streams along the road system on northeastern Kodiak Island. In 1999, anglers expended approximately 115,000 days of effort, of which less than 20,000 were spent in remote sport fishing.

It is with remote sport fishing, however, that most bear-human conflicts arise because of the extended presence of and camping by anglers in bear habitat. Anecdotal information indicates that the two areas in which most problem interactions between bears and anglers occur are on the Karluk River, concentrated around the portage and fish weir area, and on the Ayakulik River, where Bare Creek connects with the Ayakulik River.

In these two areas, bears do not normally seek fish. Except for food brought in by anglers and cleaned fish or fish carcasses, there is little reason for bears to remain in the area when humans are not present. However, when many anglers are concentrated in an area for a period of time, they make available easy food for bears. This convenient food supply draws bears to the sport-fishing sites and may result in bear-human conflicts. Although efforts have been made to frighten bears away by shooting them with rubber bullets, such deterrents do not seem sufficient to keep the bears away from the easy food source.

Implementation of the CAC's recommendations (see section 4.5.3.1) to accommodate anglers (e.g., hardening campsites[9], securing food storage, providing angler education) will likely solve many of the bear-human conflicts that have been occurring.

At the present time, Koniag, Inc., lands adjacent to the Karluk River are subject to a nondevelopment easement granted by Koniag. The current agreement limits large-scale development and habitat alteration by Koniag on its land. After October 15, 2002, a new conservation easement granted by Koniag will go into effect. The most significant aspect of that easement is the agreement to limit the number of users of the uplands. While the easement does not limit the subsistence use of the lands by the residents of Karluk and Larsen Bay, all other users, including subsistence users from other areas, will be subject to the terms of the easement.

Under the proposed easement, USFWS will conduct a study to determine the appropriate angler handling capacity of the river. Until the study is completed, an interim level of use of 70 users per day would be in effect for the period June 10 through July 15. All commercial use of the uplands is reserved to Koniag and its licensees.

The right of the general public to use the bottom of the Karluk River is presently disputed. While the United States conveyed the Karluk River bottom to Koniag as part of its conveyances under Alaska Native Claims Settlement Act (ANCSA), the State of Alaska has asserted that it holds title to the river bottom. Irrespective of the status of the river's bottom, at the present time, there is no fishing from or other permitted use of the uplands without the owner's permission. While there are 17(b) easements near the river, by law their use is limited to travel-related use only, and they can not be used for fishing. The location of these easements also precludes their use for fishing without trespassing on the private lands.

On the Ayakulik River, there are no cabins; anglers camp in tents. Problems do not develop immediately when the sport fishery opens, but bears become a problem later on in the season. The Division of Sport Fish has recommended to KNWR staff that food caches be established. In 2000, USFWS put up electric fences within which campers could stash their food supplies; this

[9] 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.

reduced the problems. During the 1990s, on the Kodiak archipelago, anglers shot two bears in DLP situations. Both of these incidents occurred on the Ayakulik River. Although other DLP mortalities of bears may be attributed to anglers, they have not been recorded.

Kodiak National Wildlife Refuge did a three-year study in the early 1990s on the interaction of bears and humans along the Ayakulik River. This study could not demonstrate any long-term harm to bears from the presence of anglers.

The Division of Sport Fish strives to provide a diversity of experience for anglers. If anglers are elbow-to-elbow, the experience may not meet anyone's desires for quality. The division is presently engaged in a study of what anglers want in terms of a quality experience on the Situk River, near Yakutat. The Board of Fisheries has the authority to limit the harvest of fish but not the authority to reduce the number of anglers at any one place or time.

Guiding requirements for sport fishing are very different from those for big-game hunting; a sport-fishing guide has only to register with ADF&G. Sport-fishing guiding on the refuge, however, requires a special-use permit. There are currently four drainages within the refuge (i.e., Ayakulik, Dog Salmon, Uganik, and Little River) that are under the refuge's prospectus system with a limited number of guided-use permits.

4.5.3.1 Recommendations Regarding Sport Fishing

- Urge ADF&G to evaluate whether increased human activity will lead to increased negative bear-human encounters in areas of especially high bear use (see chapter 7, "Research and Monitoring").
- Identify areas where hardened[10] fishing campsites would minimize bear-human conflicts (see chapter 7, "Research and Monitoring").
- Encourage Kodiak Unified Bear Subcommittee (KUBS), ADF&G, and USFWS to work together to identify areas where there may need to be restrictions on camping and other activities because of the potential displacement of bears (see chapter 7, "Research and Monitoring").
- Designate food-storage areas, especially at Bare Creek.
- Continue use of electric fences or other practical means of excluding bears from anglers' food caches on KNWR and in other areas and jurisdictions of the Kodiak archipelago.
- Develop an educational program for anglers in cooperation with professional organizations, agencies, and sportsmen's groups to include information about proper food and fish storage and cleaning of fish (see chapter 8, "Education").
- Encourage the use of bear-resistant food containers and require their use in areas of high bear concentrations (e.g., along prime sport fishing streams).

[10] 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.

- In certain bear-feeding areas, there is a predictable, seasonal increase in potential bear-human conflicts related to sport fishing activities. The CAC recognizes that ADF&G Division of Sport Fish biologists are not authorized to write emergency orders to manage a sport fishery to address bear conservation. The CAC recommends that ADF&G Divisions of Sport Fish and of Wildlife Conservation cooperatively prepare an integrated management plan for approval by the combined Board of Fisheries and Board of Game, with the prime purpose of the management plan being to reduce bear-human conflicts associated with sport fishing. This plan should determine the carrying capacity for anglers and guide operations at favored fishing sites and the setting of limits necessary to maintain a high-quality wilderness sport fishing experiences.

4.5.4 Harvest of Berries and Other Plants

Kodiak's lush vegetation provides critical habitat for bears, with sedges, forbs, roots, and berries being important seasonal food sources. Bears share these resources with other animals, including humans, and in some isolated areas competition may result. Vegetative resources are also subject to annual fluctuations of abundance. This is most notable with berry crops, which may swing from absence to overabundance in consecutive years.

The archipelago's vegetation evolved without indigenous ungulates. Grazing by cattle, deer, elk, and mountain goats in the past century has had a notable impact on some plant species and areas. How these impacts affect bears or the long-term survival of the plants has yet to be thoroughly examined.

Berry crops have been harvested by people since the first Alutiit arrived on Kodiak more than 7,500 years ago. Most human use of berries has been restricted to near coastal areas and probably has had little impact on the bear population. Recent development of commercial markets for wild berries (e.g., wine and jelly production) may increase the demand for Kodiak berries. No direct impacts on bears have yet been noted, but future effects, especially in years with reduced berry crops, will have to be monitored.

4.5.4.1 Recommendations Regarding the Harvest of Plants and Berries

- Develop methods to objectively document annual abundance and availability to bears of vegetation in representative habitats on the Kodiak archipelago.
- Research the impact on bears of commercial use of salmonberries and blueberries.

4.6 Regulation Enforcement

Enforcement of state game regulations, for both hunting and fishing, is handled by the Alaska Department of Public Safety, Division of Fish and Wildlife Protection officers, who are Alaska State Troopers. Most big-game enforcement on the Kodiak archipelago is done from the air or by boat. Basically, the officers check for resident or nonresident hunting licenses, make sure hunters have the required locking tags, ensure that the people who are hunting in a specific area have the permits to do so, and enforce meat-salvage requirements.

Most enforcement activities focus on state lands. The protection officers make a point of meeting with guides, outfitters, and transporters to make sure they fulfill their responsibilities with regard to locking tags, bear sealing, etc. They also check to see that bear hides and skulls are returned to the Kodiak ADF&G office within 30 days, as required by law.

Kodiak National Wildlife Refuge officers provide education and law enforcement services to enhance the experience of visitors and to protect resource values on the refuge. Emphasis is on the enforcement of federal rules and regulations pertaining to visitor uses, subsistence activities, and commercial operators. Officers also enforce state hunting and fishing regulations in cooperation and coordination with state Wildlife Protection officers.

U.S. Coast Guard (USCG) and Federal Aviation Administration regulations and guidelines govern activities relating to the USCG's mission on the archipelago. Part of that mission includes low-flying maneuvers. ADF&G staff in Kodiak assist the USCG in educating air crews about the negative effects of low flying on wildlife, hunters, and viewers and about state and federal regulations prohibiting harassment of wildlife. ADF&G also regularly meets with incoming USCG staff and families to provide bear-safety education as well as information regarding hunting.

On lands managed by Alaska State Parks, commissioned park rangers are authorized to enforce most state laws, including fish and game enforcement, and park regulations. They are also involved with resource-management issues, visitor information and safety, and the regulation of commercial operators in state parks.

4.6.1 Recommendations on Regulations and Enforcement

See chapter 6, "Bear-Human Interactions," for recommendations related to DLP harvesting of Kodiak bears. Following are those recommendations for regulations and enforcement other than those relating to DLPs.

- Ensure a level of cooperative state and federal law enforcement deemed essential to achieve compliance with conservation laws, rules, and regulations; preventive education should be the first priority in this regard (also see chapter 8, "Education").
- Provide better funding and staffing of the state Division of Fish & Wildlife Protection to achieve the optimum level of law enforcement presence on the Kodiak archipelago.
- Urge state and federal wildlife protection and enforcement agencies to take appropriate actions under existing law to prevent trade in Kodiak bear parts.
- Identify appropriate elders and leaders to work with village public safety officers (VPSOs) to help educate residents about conservation laws, rules, and regulations (also see chapter 8, "Education").
- To foster cooperation, request that the Alaska Department of Public Safety, Division of Fish & Wildlife Protection, and the U.S. Fish & Wildlife Service conduct annual outreach programs, explaining regulations and enforcement issues (including DLPs) in communities throughout the Kodiak archipelago (also see chapter 8, "Education").

- Urge ADF&G and USFWS to work with the USCG to identify those areas and seasons in which bears and hunters are particularly vulnerable to harassment by overflying and to encourage reinforcing USCG policy minimizing low overflight in these areas (see also section 6.7).
- Continue education cooperation between ADF&G and the USCG annually, or more often as required, to alert air crews to their wildlife-conservation responsibilities and to promote good relations within the community (see also chapter 8, "Education").
- Encourage USFWS to make enforcement of off-road vehicle (ORV) regulations a priority on the Kodiak National Wildlife Refuge.
- Cross-deputize Division of Fish and Wildlife Protection officers and Kodiak National Wildlife Refuge officers to provide authority for enforcing pertinent state and federal sport fish, wildlife, and refuge laws.

4.6.2 Bear Mortalities in Defense of Life or Property

Alaska Administrative Code (ACC) (5 AAC 92.410) authorizes anyone to protect human life or property from bears as long as specific conditions and reporting requirements are met (see Appendix I). In some cases, Fish & Wildlife Protection officers conduct an investigation of DLP kills and submit formal reports. The main reasons for these investigations are to ensure that all requirements of the DLP regulation have been met, that biological specimens and information are gathered, and that the person who killed the animal did not realize any economic gain from the act. Although individuals are rarely charged with a violation in connection with DLPs, the manner in which investigations are conducted may be viewed by some as intimidating. (See chapter 6, section 6.2 for more discussion of and recommendations on DLPs.)

5. Redefining Bear-Management Strategy

<u>Synopsis:</u> Management objectives for Kodiak archipelago bears currently are based on harvest figures. ADF&G biologists, however, make management decisions and harvest recommendations based both on biological carrying capacity and on wildlife-acceptance capacity[11]. At present, the total bear population on the Kodiak archipelago is stable and can be sustained at this high level by the natural habitat. Habitat in different areas is capable of sustaining different bear densities. Although the entire Kodiak archipelago is high-quality bear habitat, there are areas where human development and residence take precedence. Thus, biological carrying capacity and wildlife-acceptance capacity may be different. With this awareness, the Citizens Advisory Committee (CAC) recommends a shift in strategy to managing the bear population by density rather than by harvest alone. To do this, biologists need accurate data on bear populations and habitat carrying capacities. The CAC also recommends reducing, through liberalized sport-hunting seasons in the spring and issuance of appropriate depredation permits, the bear population along the road system of northeastern Kodiak Island by 10-20 percent below the current estimated level.

Current bear-management objectives are based on maintaining a population that can support certain harvest criteria. Consequently, harvest data collection and analysis are important components of bear-management reports produced by the Alaska Department of Fish and Game (ADF&G). ADF&G has historically relied primarily on harvest data because it lacked detailed bear census information. Since the Terror Lake hydroelectric project, however, increasing amounts of data on bears have been collected. Although the present stated management strategy and objectives relate only to harvest figures, in reality ADF&G biologists make management decisions and harvest recommendations based on both biological carrying capacity and wildlife-acceptance capacity[9].

5.1 Population Assessment and Monitoring

As part of an ongoing cooperative management program between ADF&G and the Kodiak National Wildlife Refuge (KNWR), a bear survey is conducted annually in one of five different areas (management subunits) of the archipelago to provide an objective indicator of population trends (see Figure 5-1); these areas correspond to the five subunits of Game Management Unit 8 (GMU 8). Under this cyclic survey program, census information gathered from any one area will not be updated for at least another five years.

Population figures for three of the subunits are considered by biologists to be fairly precise; census figures for Afognak Island and for northeastern Kodiak Island (along the Kodiak road system), however, are less precise.

[11] reflects the maximum wildlife population level in an area that is acceptable to people (Decker and Purdy 1988)

At present, the total bear population on the Kodiak archipelago is stable and can be sustained at this high level (approximately 2,980 animals) by the natural habitat (see chapter 3 for detailed information about Kodiak bear habitat). From 1990 through 1999, the population sustained an average annual hunter harvest of 160 bears, of which 69 percent were males.

Reported nonsport harvest (e.g., DLP, illegal, subsistence) has averaged 18 animals each year for the same time period. Annual human-caused mortality (sport hunter and nonsport kills) have averaged approximately 6 percent of the estimated population. As noted in chapter 6, section 6.2, however, the accuracy of the number of DLP kills is questionable.

5.2 Biological Carrying Capacity

Habitat in different areas of the Kodiak archipelago is capable of sustaining different bear densities. For example, southern Kodiak Island (made up primarily of KNWR and having the largest sockeye salmon systems) has the highest-quality bear habitat. Northeastern Kodiak Island, on the other hand, has the least suitable habitat because of high concentrations of humans, large tracts of agricultural land and private property, and smaller salmon systems. In the late 1990s,. ADF&G biologists estimated the bear densities in each of the five subunits surveyed (see Table 5-1). (The current high population of Kodiak bears on the archipelago is assumed to be appropriate to the high end of the biological carrying capacity of bear habitat.)

A high cycle in Alaska salmon productivity has been documented during the past 20 years. The current high population of bears on the Kodiak archipelago may reflect this cyclic high in salmon productivity.

Fisheries researchers are just beginning to understand natural cycles and long-term regime shifts in the North Pacific Ocean. These shifts in the ocean environment cause significant changes in salmon populations and fluctuations in the availability of other near-shore species used as food sources by bears.

Depending on how strongly bear population density is linked to salmon population strength or weakness, ocean regime shifts may determine bear population ranges and should be factored into a proposed bear-density management strategy.

Table 5-1. Current estimated bear densities for five management subunits of the Kodiak archipelago

Subunit	Geographic Unit	Area (mi^2)	Total Bears	Bears/mi^2	mi^2/bear
1	Afognak and northern islands	923	334	0.36	2.78
2	Northeastern Kodiak (road system)	533	181	0.34	2.94
3	Southeastern Kodiak	619	468	0.76	1.32
4	Southwestern Kodiak	1,635	1,250	0.76	1.31
5	Northwestern Kodiak	1,048	750	0.72	1.40
TOTAL		4,758	2,980	0.63	1.59

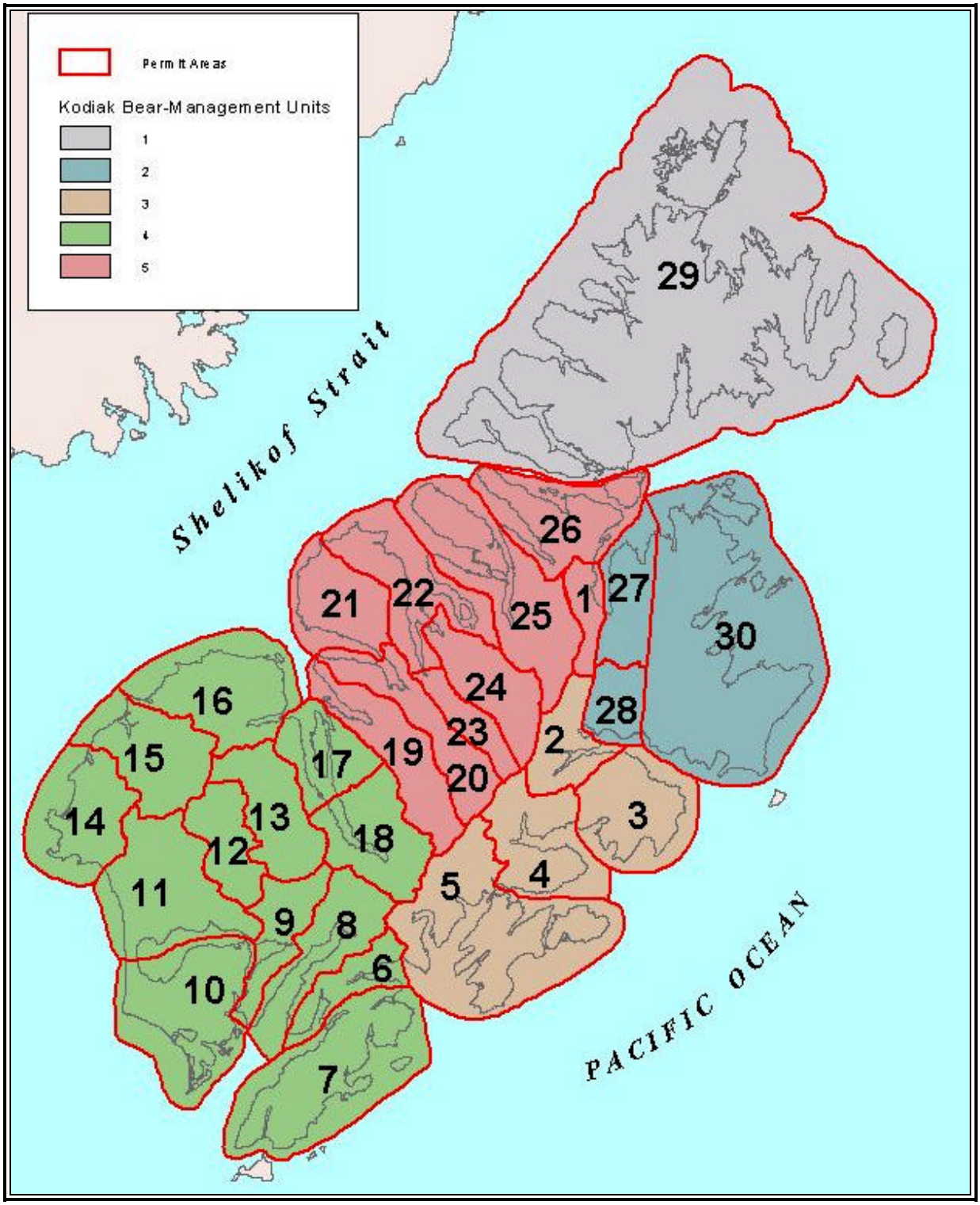

Figure 5-1. Management subunits for Game Management Unit 8

5.3 Wildlife-Acceptance Capacity

While biological carrying capacity refers to habitat that fulfills the requirements of bears, wildlife-acceptance capacity refers to fulfilling the needs and desires of human populations living in bear habitat.

Human development (e.g., communities, agricultural activities) in bear habitat result in increased interactions between bears and humans. The entire Kodiak archipelago is high-quality bear habitat in many respects. But there are areas—for example, the Buskin River area—where humans are living in this high-quality bear habitat. Thus, biological carrying capacity and wildlife-acceptance capacity may be different, and the fact that there are places where people have to exist with bears needs to be acknowledged.

Although residents of the Kodiak archipelago are proud of their bears, they also recognize needs for lower numbers of bears in areas where interaction between bears and humans is either undesirable or could prove detrimental to human safety and might result in DLP mortality of bears. People have made conscious decisions to limit the number of bears on certain portions of the archipelago, particularly on the Kodiak road system. Kodiak National Wildlife Refuge, however, was established to protect bears and their natural habitat, and that will remain its purpose.

Just as food is a focus in assessing biological carrying capacity of bear habitat, human safety is a focus when determining the wildlife-acceptance capacity for bears in an area. Thus, it is important to consider the needs and desires of numerous entities—the bears themselves, various recreational and subsistence users, other animals sharing the habitat, and the human residents—when making management decisions regarding the desired level of bear density in given areas of the archipelago.

5.4 Bear-Management Strategy on the Kodiak Archipelago

With awareness of bear habitat's biological carrying capacity and also the wildlife-acceptance capacity of the bear-management subunits within GMU 8 (the Kodiak archipelago), the CAC wishes to promote a strategy of bear-management objectives based on bear densities in various habitat areas as well as on harvest numbers.

More than two decades of conservative hunting seasons and abundant food resources have brought the Kodiak bear population to an overall density that is probably near biological carrying capacity of the habitat. In an effort to maintain the population at its maximum sustainable yield, the CAC proposes to manage most of the archipelago at or slightly below (10 percent) the current estimated density, as shown in Table 5-2. These targets should recognize natural fluctuations in cub production (and statistical limitations of available procedures). They should also be reevaluated if significant natural changes in habitat (e.g., climatic shifts) are detected (see section 5.2 regarding ocean regime shifts and fluctuations in salmon populations).

On northeastern Kodiak Island—which includes the Kodiak road system (area 30 in management subunit # 2 on Figure 5-1); most of the livestock ranches; and the vast majority of the human population—the CAC believes a reduction in bear density is appropriate. Reducing the current population of bears occupying that area by 10–20 percent below current estimates

would help reduce negative bear-human interactions. Such a reduction is consistent with agreements that established KNWR in 1941 and is in keeping with the ADF&G policies promulgated in 1970 (see section 6.4). Reductions would be made by liberalizing sport-hunting seasons in the spring and by issuing depredation permits when appropriate (see footnote 16 on page 6-17 for information about depredation permits). If bear populations in the area were to drop below the target level, appropriate actions to reduce harvests would be taken.

While the CAC is recommending this shift in strategy to managing the bear population by density rather than by harvest alone, it recognizes that bear population numbers must be as accurate as possible. ADF&G biologists have indicated that the population figures they have for Afognak Island and the Kodiak road system area are those in which they have the least statistical confidence. Once new population figures have been established, the density numbers presented in Table 5-2 should be adjusted and management plans adapted accordingly.

Table 5-2. Proposed bear density ranges for five management subunits of the Kodiak archipelago

Subunit	Geographic Unit	Area (mi^2)	Total Bears	Bears/mi^2	mi^2/bear
1	Afognak and northern islands	923	300–335	0.33–0.36	3.00–2.78
2	Northeastern Kodiak (road system)	533	150–165	0.28–0.31	3.58–3.23
3	Southeastern Kodiak	619	425–470	0.69–0.76	1.46–1.32
4	Southwestern Kodiak	1,635	1,125–1,250	0.69–0.76	1.45–1.31
5	Northwestern Kodiak	1,048	675–750	0.64–0.72	1.55–1.40
TOTAL		**4,758**	**2,670–2,945**	**0.56–0.62**	**1.79–1.61**

5.5 Recommendations for Redefining Kodiak Bear-Management Strategy

- ADF&G manage bear populations based on carrying capacity and density as well as on harvest objectives (see Figure 5-1 and Table 5-2).
- ADF&G reduce the bear population on northeastern Kodiak Island (i.e., along the road system; area 30 of management subunit #2 on Figure 5-1) by 10–20 percent below the current estimated level through liberalized sport hunting seasons in the spring (see also section 4.3) and issuance of appropriate depredation permits.
- Urge ADF&G and USFWS to dedicate funds to survey Afognak Island and the Kodiak road system (management subunit # 1 and area 30 of management subunit #2) as soon as possible to determine accurate bear populations (also see chapter 7, “Research and Monitoring”).
- Encourage ADF&G, USFWS, and village tribal councils to work together to gather data on bear populations and carrying capacity for management purposes.

6. Bear-Human Interactions

Synopsis: Bears and humans have inhabited the Kodiak archipelago for more than 7,000 years. As the human population expands, however, and there is increasing human activity in areas once considered bear habitat, the potential for bear-human interactions also increases. These interactions can be positive for humans or they can have negative impact, sometimes with dangerous consequences that could result in human or bear mortality. This chapter looks at habituation and food-conditioning of bears by humans, bear mortality in defense of life or property, and a number of circumstances in which humans and bears are coming or will increasingly come in contact. These include solid-waste management, storage of human and pet food, livestock ranching, remote cabins, and bear-viewing opportunities. The last of these–bear viewing–was perhaps the single most complicated issue discussed by the Citizens Advisory Committee (CAC). For each situation, the CAC makes recommendations to avoid negative bear-human interactions and to protect Kodiak bears and their habitat.

Over centuries, bears and humans have co-existed successfully on the Kodiak archipelago. As the human population expands, however, and there is increasing human activity in areas once considered bear habitat, the potential for bear-human interactions also increases. These interactions can be positive for humans, as with the pleasure derived from bear viewing, or they can have negative impacts and result in dangerous situations, which sometimes result in human or, more likely, bear mortality.

As human presence in bear habitat becomes more common, bears can become accustomed to that presence. The level and nature of this habituation of bears to humans and their activities can determine the type of impact to bears and humans alike.

This chapter discusses habituation of bears by humans and then looks at a variety of situations in which bears and humans interact:

- bear mortality in defense of life or property (section 6.2)
- solid-waste management and storage of human and pet food (section 6.3)
- livestock ranching (section 6.4).
- bear-viewing activities (section 6.6)
- use of aircraft (section 6.7)
- public-use and remote cabins (section 6.8)
- other recreational activities (section 6.9)

Figure 6-1 shows the major drainages, refuge boundaries, public-use cabins, permitted setnet sites, and the communities on the Kodiak archipelago that are discussed in this chapter.

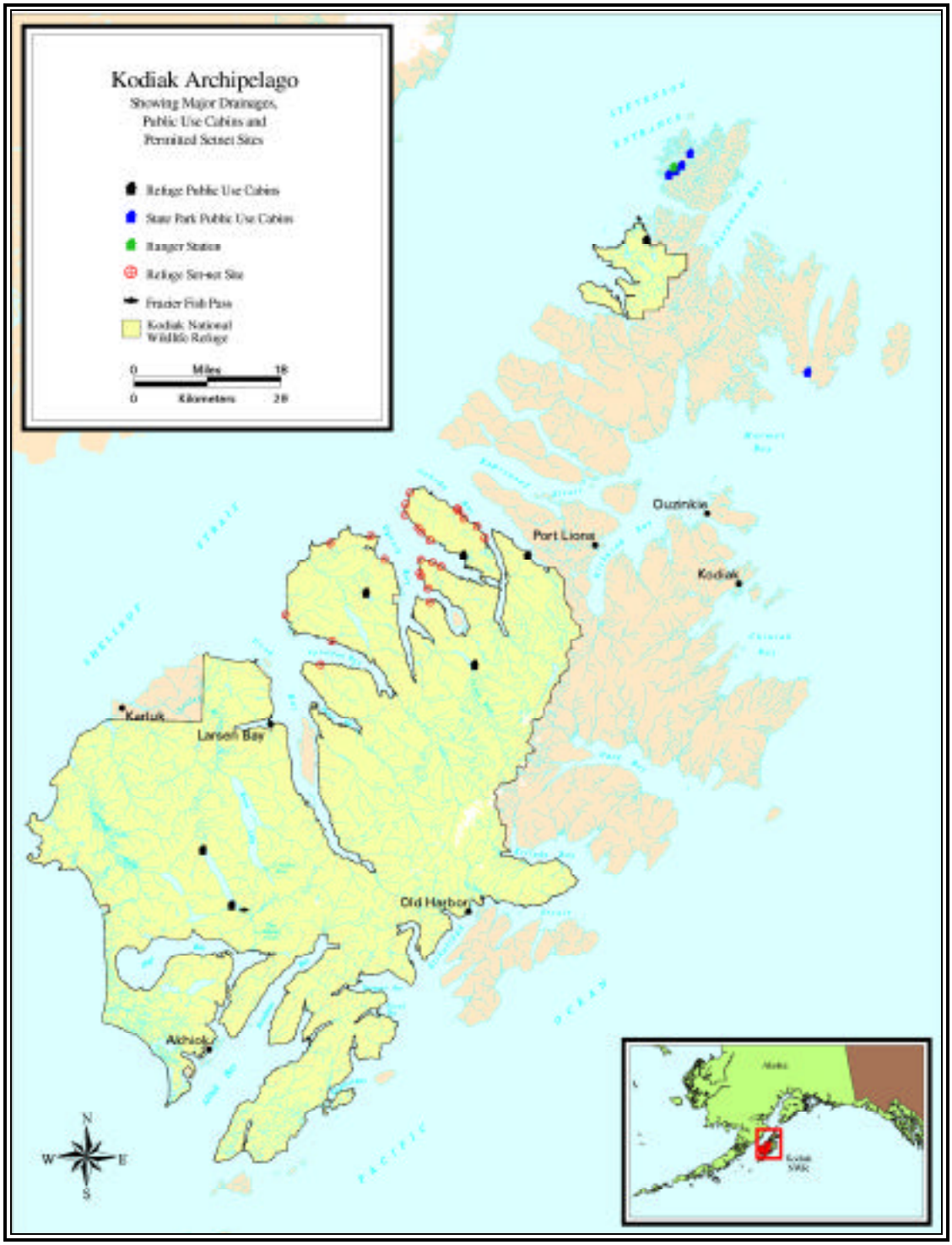

Figure 6-1. Kodiak archipelago communities, major drainages, public-use cabins, and permitted setnet sites

6.1 Habituation and Food-Conditioning of Bears by Humans

Habituation of bears is of concern to archipelago residents, resource managers, hunters, and recreationists. A generally accepted definition of habituation is "an absence of response (from bears) that comes about after repeated, benign interactions with humans." Habituation in and of itself does not result in "bad" bears. *Neutral* habituation is an acceptable process at several world-class viewing areas such as McNeil River, Pack Creek, and Anan Creek. Neutrally conditioned bears neither avoid humans nor actively seek them or their property.

At least one study indicates that habituation of females with cubs reduces incidents of fear-induced bear attacks on humans (Jope 1985). Evidence indicates that maternal females and subadults are more likely to habituate than are adult males. Irregular occurrences of human activity in remote sites seldom lead to habituation, of bears but may displace or disturb bears in their use of that habitat.

Food-conditioning is a behavior learned when a bear receives food, fish, or garbage from people. This is undesirable behavior that may result in property loss or damage, human injury, or defense of life or property (DLP) mortality of bears.

Repeated negative encounters between bears and humans could prove stressful to bears and, in the case of food-conditioned bears, could create a significant danger to humans. It can be anticipated that many more bear-human interactions, especially bear shootings in DLP, will occur if the number of food-conditioned bears increases on the archipelago.

6.1.1 Recommendations about Habituation and Food-Conditioning of Kodiak Bears

- To understand human habituation and its effects on bears, ADF&G and USFWS conduct long-term research into the effects of sport fishing and bear viewing on Kodiak bears (see also chapter 7, "Research and Monitoring").
- Enforce regulations prohibiting the feeding of food, garbage, or fish to bears.
- Provide education to prevent food conditioning of bears by humans (see also chapter 8, "Education").

6.2 Bear Mortality in Defense of Life or Property

Alaska state law allows anyone to kill a bear to defend life or property (5 AAC[12] 92.410, Appendix I). For a bear to be legally killed under this provision, the person must demonstrate that he or she did not unreasonably invade a bear's habitat, provoke an attack, or cause a problem by leaving food or garbage lying around. Prior to killing the bear, the person must take every practical, nonlethal means to protect life or property. For the purposes of this provision, property means a person's dwelling, means of travel, pets, or other valuable property necessary for livelihood or survival. If a bear is killed in DLP, the person is required to remove the hide

[12] Alaska Administrative Code

(including claws) and the skull and give them to the Alaska Department of Fish & Game (ADF&G). Meat will be donated to anyone who wants it. The person who kills the bear must also notify ADF&G as soon as possible and fill out a questionnaire related to the DLP killing.

The DLP provision was included in Alaska law in 1926. It has gone through a number of revisions, but the basic premises remain the same:

- First, and foremost, it gives people the right to defend themselves from bears. This is especially important in a state such as Alaska where self-reliance is a cherished and necessary part of daily life, especially in remote areas.
- Second, the provision seeks to protect bears from unnecessary persecution. The person has a responsibility to do everything possible to avoid lethal action. The bear must be taken while it is in the act of causing a problem and cannot be hunted down or baited.
- Third, the provision accommodates the needs of wildlife managers. Requiring prompt notification of authorities, a written report, and surrender of the hide and skull allows managers to gather information on the sex and age of the bear and the circumstances of the kill. Recovery of the hide and skull also acts as a deterrent for unnecessary kills and reduces opportunities to profit from the illegal sale of bear parts.

Unfortunately, the strict stipulations of the provision sometimes deter people from reporting DLP mortalities of bears. ADF&G believes that fewer than half of the bears killed on the Kodiak archipelago under DLP provisions have been reported. Reporting rates vary by year and by user group. The most common reason for not reporting DLP bear kills is fear of prosecution. People are either unaware of the provisions of the law or are concerned about their proper compliance with the law.

Another reason given for not reporting DLPs is the inability or refusal to skin the bear and remove its skull. Lack of complete information, because of unreported DLP mortalities, is hampering wildlife biologists' ability to make complete assessments of human impacts on the bear population and to understand various human uses of bears on the archipelago.

6.2.1 Recommendations Relating to Defense of Life or Property Kills

- Continue to follow state regulations regarding bears killed in DLP.
- The Kodiak Fish and Game Advisory Committee should propose a change in state hunting regulations to establish and authorize use of depredation permits.[13]
- ADF&G should develop strict criteria for issuance of depredation permits for problem bears. These permits should be issued only after reasonable, nonlethal methods to deal with problem bears have been exhausted.
- Conduct research and monitoring to evaluate the effectiveness of depredation permits (see also chapter 7, "Research and Monitoring").

[13] Depredation permits would be issued to an individual, to allow killing of a problem bear, in a specific incident and would only be available after careful consideration by ADF&G's Kodiak area biologist. Reporting and salvage requirements would be the same as under the DLP provisions.

- Encourage village residents, village public safety officers (VPSOs), and appropriate agencies to work together to develop information and education materials and strategies to reduce bear-human conflicts in the villages (see also chapter 8, "Education").
- State troopers and U.S. Fish & Wildlife Service (USFWS) should provide information to rural residents about the laws, rights, and duties regarding DLPs (see also chapter 8, "Education").
- Through a co-management agreement with the state, use village committees and VPSOs to take responsibility for working on DLP issues in villages, including solid-waste management issues; this should include a significant educational component (e.g., schools, videos, and employing elders) (see also chapter 8, "Education").

6.3 Solid-Waste Management and Storage of Human and Pet Food

Bears spend much of their time seeking food to replenish fat reserves between denning periods. This need, coupled with their high levels of strength and intelligence, makes bears effective predators and scavengers. Concentrated food sources, be they natural (e.g., salmon streams, tide flats, or berry patches) or human-made (e.g., dumps, landfills), are especially attractive, and bears often develop creative means of utilizing these resources. They also develop complex social structures and communication skills while in close proximity to other bears that have also been attracted to feeding sites.

Bear concentrations at natural feeding sites are essential elements of a healthy bear population. They are indications that bears are taking advantage of high-quality food sources, and they allow people to observe bear behaviors and learn about them. Bear concentrations at human-made feeding sites, however, have been shown to increase undesirable bear-human encounters.

As late as the 1940s, bear viewing at dumps was a sanctioned activity at many U.S. national parks. At Yellowstone National Park, bleachers were erected near the dump, and rangers gave informative lectures each day. In 1903, Theodore Roosevelt noted that tourists were as interested in the bear shows as they were interested in the geysers. Bear populations increased as a result of the open dumps, and rough estimates of the park's grizzly population amplified from 40 in 1920 to 260 by 1933. Unfortunately, along with this increase came a commensurate increase in bear-human encounters as the bears began to equate human habitations—be they tents, cars, or cafeterias—with places to find a meal. In 1960, the National Park Service curtailed the practice of feeding bears at the dumps and prohibited visitors from loitering in the vicinity of the dumps. In the early 1970s, dumps were closed completely, and many bears were killed as they responded to the closures by becoming more aggressive in their attempts to procure human food and garbage.

Similar situations continue to this day throughout North America. Even though the lessons learned at Yellowstone are still valid, the temptation to have a reliable place to see bears prompts some individuals or communities to dispose of their garbage in locations where bears can easily get to it. It is also easier and cheaper in the short term to throw waste in a centralized location with no fencing or coverage. Federal and state regulations prohibit such disposal, but

enforcement of those regulations is often times lax. Bears using unregulated dumps may have higher productivity than other bears, but they are subject to increased exposure to toxins and physical threats.

Individual bears may also gain access to human foods by raiding homes or camps. Household garbage and pet food are frequently stored in unsecured areas near homes. Bears living in the vicinity of these homes may be tempted by the smell of these items and may investigate. The same scenario might also develop with fish-drying racks, game hanging near camps, or food or fish left in camps. If bears are rewarded for their curiosity by obtaining food, they usually become bolder in their efforts to get food from human sources. These efforts may result in destruction of property or life-threatening situations. Frequently, the bears involved are killed.

The CAC recognizes that it is undesirable for bears to obtain food from any kind of human source (see section 6.1 for more on food-conditioning) and that it is more effective to prevent bears from getting food or garbage initially than it is to re-educate them once food or garbage has already been obtained.

Translocation (moving bears to a new area) is seldom an effective solution. Bears have a proved ability to return to home ranges from long distances and over rugged terrain. Those that do not return are likely to continue to be involved in bear-human conflicts in new locations. Although translocation is often preferred by the public, because of its demonstrated ineffectiveness, human safety concerns, and the high expense, it is generally inappropriate to spend time and funds on such efforts (see also Appendix O).

Bear-human interactions are a communitywide concern. This issue cannot be viewed as a "Fish and Game problem" or as "the refuge's bears," or as something that "the troopers have to do something about." Everyone in the community, visitor and resident alike, is an integral part of the problem and of the solution. To instill this critical concept, public officials have an obligation to educate the public about bear behavior, the current situation, and the best available courses of action.

The CAC recognizes that a community-based, multifaceted approach has been successful in reducing bear-human encounters along the Kodiak road system in recent years. Continuation and refinement of that program, with efforts to expand it, with appropriate modifications, to villages, lodges, and remote cabins will be more effective in reducing bear-human conflicts than will translocation of "problem" bears.

6.3.1 Landfill Management

Public landfills and dumps are the most readily accessible source of human food for bears. Management of these areas will impact bear-human encounters tremendously. Although it is impossible to bear-proof a solid-waste facility, there are effective techniques to make them much less attractive to bears.

The residents of the Kodiak Island Borough (KIB) have made a commitment to keep bears out of their landfill. In July 1998, an electric fence surrounding the borough landfill near Monashka Bay was completed and energized. Vegetative cover within the fence was removed, and garbage is covered often, thus drastically reducing the attractiveness of the site to bears.

Initially, a few bears tested the fence and learned to dig under it, but borough staff have been able to identify the weak areas of the fencing and reinforce them. Prior to these landfill-management efforts, as many as 12 bears frequented the site; in 2000, no bears were observed within the fence.

Other landfills on the archipelago have not received the level of financial and community commitment that KIB's landfill has. Efforts have been made, however, to move landfills and dumps away from village centers and to fence them. In some cases, incineration has been attempted, but with limited success. No electric fences have been erected (other than in Ouzinkie), and brush remains adjacent to most sites. The CAC has specifically identified the Larsen Bay solid-waste disposal site as an area that deserves immediate attention.

6.3.1.1 Recommendations about Landfill Management

- Encourage KIB and individual communities to develop community-specific waste-management plans that include implementation and funding strategies.
- Encourage village governments to seek federal, state, and local funding such that village landfills can meet federal standards and Alaska Department of Environmental Conservation (DEC) regulations and such that those regulations can be enforced at solid-waste disposal sites, thereby reducing their attractiveness to bears.
- Request the State of Alaska to increase funding for the Revenue Sharing/Safe Communities programs, which would provide additional funding to small city governments (see also section 6.3.1.2).
- Encourage cities to utilize additional funding for employment of electric fencing, incineration, and bulldozers for regular and frequent covering of garbage at landfills (see also section 6.3.1.2).
- Enforce DEC regulations at dump sites, thereby reducing their attractiveness to bears.
- Enforce existing landfill regulations from the federal government and for DEC.
- Distribute the ADF&G Policy on Solid Waste Management and Bears in Alaska to agencies and communities and ensure that it is adhered to (see also section 6.3.1.2, and Appendix L).
- Encourage owners of remote cabins and lodges to use properly managed public landfills whenever possible; when private solid-waste disposal sites are necessary, encourage landowners to work with wildlife managers to devise appropriate ways to minimize bear encounters.
- Prohibit, by borough or other local ordinance, bear viewing at solid-waste disposal sites.
- Clear areas adjacent to landfills of trees, brush, and tall grass that can serve as cover for bears (the distance to be cleared depends on the terrain and habitat of the area and should be determined with assistance of wildlife managers).

- Cover landfills often and thoroughly, keeping the active area of waste deposition minimal (at sites where bears are frequent visitors, increased covering and/or compaction of garbage will reduce the area in which bears can search for food; as that active area of garbage gets smaller, competition among bears increases, and subdominant bears opt to find other food sources).
- Encourage recycling programs to reduce the amount of waste deposited in landfills.
- If possible, use incineration to reduce space necessary for landfills and to reduce odors and food sources.
- Install electric fencing around a landfill after the site has been cleared and bear numbers have declined through reduction of active areas. (Electric fences should be well-designed to suit the needs of individual sites and maintained by qualified personnel. Periodic inspections should be scheduled to look for damaged portions of the fences, to remove debris from the fences, and to look for places where bears have tried to burrow under the fences. The fences should remain electrified at all times except during maintenance.)
- Install safe, effective, and easy-to-operate gates (self-closing, if possible) at each landfill and make specific individuals responsible for ensuring that gates remain closed.
- Prior to erecting an electric fence, and immediately after it is up and running, inform residents of the program and the fact that some bears will be displaced (Appendix M). (Note that an increase in bear-human encounters can be expected for the first couple of years the fence is operating.)
- Encourage wildlife managers, residents, and civil officials to work together to devise improvements to keep bears out if they continue to gain access to properly designed landfills.

6.3.1.2 Larsen Bay Solid-Waste Management[14]

One of the most challenging situations currently on the Kodiak archipelago is the management of Larsen Bay's solid-waste disposal site. A number of circumstances make this site stand out as an area that needs to be addressed to minimize the harmful effects on bears and to reduce the level of negative bear-human interaction for which Larsen Bay has become known.

Larsen Bay is located in a high-density area for bears and is home to one of the largest salmon canneries on Kodiak. During the summer months, the human population swells with cannery workers and fishermen. The amount of waste increases as well; it is taken to a waste site on a hill overlooking the city. This area is surrounded by alder and thick brush that allow bears to move freely in and out of the waste site in relative security. Very often, garbage is simply left lying on the ground and has become a great attractant to bears that roam the area.

Over the past few summers, the number of bears that have been food-conditioned at Larsen Bay's solid-waste disposal site has grown to more than 15. As a result, the site has become a popular bear-viewing area. Several sport fishing and hunting lodges have also opened in the last

[14] The CAC identified this issue as being of current concern and one for which the CAC is making recommendations for immediate action.

few years, increasing the number of people who frequent the community. The dump, where large numbers of bears can be viewed from vehicles, has been a popular stop for many of the lodges' clients. While lodge owners enjoy the benefit of predictable bear viewing, other residents are less enthusiastic. After the cannery closes in early September, less garbage is available, and bears begin to move into the city and around the cannery buildings. This frequently results in bears destroying property and an increase of DLP mortalities. As the days become shorter and children go back to school, issues of safety become a concern.

Steps need to be taken to reduce the number of bears that are habituated to humans at Larsen Bay's solid-waste disposal site. These bears pose a threat to the bear viewers themselves, who often have no background or knowledge of Kodiak bears. The diet of garbage the bears live on can be harmful for the bears, and the learned behavior (associating people with food) these bears acquire frequently leads to the destruction of property or destruction of bears.

Funding for remediation of this situation is, of course, always an issue, and Larsen Bay is no exception. Kodiak Salmon Packers pays a fee to the city for the garage it takes to the site, but this is not sufficient to do all that is necessary to solve the problem.

6.3.1.3 Recommendations Regarding Larsen Bay Solid-Waste Disposal Site

- Remediate the Larsen Bay solid-waste site situation in a stair-step approach:
  - Clear the area around the waste site of alders and brush to create a barren zone to make the bears uncomfortable
  - Quickly bury the garbage.
  - Construct an electric fence around the sited and a with means restricting access to the site.
- Seek funding for the necessary measures to reduce food-conditioning and habituation by humans of bears at the Larsen Bay solid-waste disposal site.
- The CAC recognizes the Larsen Bay waste site is a high-priority area for remediation and should be addressed as quickly as possible.
- Prohibit, by borough or other local ordinance. bear viewing at solid-waste disposal sites.

6.3.2 On-Site Food Storage and Waste Management

Storage of food and solid waste near human habitations can bring bears literally face-to-face with people where they live. Bears may be attracted to odors, or they may chance upon human food while transiting an area. Human–food-conditioned bears that habitually forage at dumps are notoriously persistent in their attempts to get food from people. If proper solid-waste site management techniques are used to keep bears out of these facilities, bears may initially be more tempted to seek human food from nearby residences or camps.

Potential increases in bear problems can be reduced by weaning bears from their bad habits before completely closing off access to landfills. At solid-waste disposal sites in which bears are frequent visitors, increased covering and/or compaction of garbage will reduce the active area where bears can search for food. As the active area of garbage gets smaller, competition among bears increases, and subdominant bears opt to find other food sources.

An essential part of reducing bear access to garbage is securing access to these food sources at garbage-collection sites. Along rural areas of the Kodiak road system and at the U.S. Coast Guard (USCG) base, bear-resistant dumpsters are used from April through December. These dumpsters are all metal, have doors that cannot be opened by bears, and are compatible with existing collection equipment. Dumpsters are placed away from natural food sources (salmon streams), brush, and school-bus stops. USCG has taken additional steps by putting all dumpsters in open, lighted, centralized locations away from residences and posting bear-safety information at each site.

Alaska State Parks has removed all open garbage cans in its park units and replaced them with bear-resistant dumpsters and will be installing additional bear-resistant garbage cans and food storage lockers in three popular camping areas in 2002.

Public outreach programs urging residents to ensure that garbage and food near their homes are secured from bears is another essential element in convincing bears to use natural foods. In the City of Kodiak, people are educated to keep garbage and pet foods indoors and to work with neighbors to ensure that there are no bear attractants in their areas. In addition, local police and state troopers enforce state laws prohibiting feeding bears and littering (13 AAC[15] 02.530 and 5 AAC 92.230) (see Appendix P).

The CAC recognizes that it is undesirable for bears to obtain food of any kind from human sources (see section 6.1) and that it is more effective to prevent bears from getting food or garbage initially than it is to re-educate them once food has already been obtained. A community-based, multi-faceted approach has been successful at reducing bear-human encounters along the Kodiak road system in recent years, and the CAC encourages continuation and refinement of that program. Efforts should also be made to expand the program, with appropriate modifications, to villages, lodges, and cabins.

The policies established to minimize bear access to human food and solid waste must include components dealing with public education, landfill management, and on-site storage.

The CAC also recognizes that funding from local, state, and federal sources should be sought as soon as possible to implement appropriate landfill improvements. When applying for grants, applicants should work with wildlife managers to reference all appropriate research that has already been done regarding bears and solid-waste management. Reference of these studies and management experiences can serve to expedite grant approval and subsequent action. The waste-management program of the Kodiak Island Borough should be developed as a blueprint example of how to keep bears out of landfills.

[15] Alaska Administrative Code

6.3.2.1 Recommendations about Food Storage and Solid-Waste Management

- Develop better regulations and enforcement regarding food, garbage, and fish-handling in bear areas.
- Vigorously enforce littering laws and regulations prohibiting feeding of bears.
- Encourage residents to work within their neighborhoods to identify and correct potential problem areas that attract bears.
- Encourage residents to keep garbage in enclosed areas and to empty garbage often during the summer months. Plastic trash bags should be used to line garbage cans, and cans should be washed periodically.
- Encourage residents to store pet and domestic livestock food indoors (if pets are fed outdoors, care should be taken to only provide the amount of food that can be eaten within an hour).
- Encourage residents to house pets and domestic livestock in bear-resistant enclosures when not attended (electric fencing is an effective and inexpensive tool for separating bears and livestock).
- Remove trees, brush, and grass that can serve as cover for bears near residences, bus stops, playgrounds, garbage-storage areas, and pet or livestock pens.
- Ensure that residents have access to information on how to use noise-makers and lighting to chase bears from their yards; rubber bullets, bean-bag shells, and pepper spray are also effective, but should only be used by trained operators (prior to using any deterrents, all potential food sources should be removed from the area).
- Use bear-resistant dumpsters (all metal, designed in a manner that is compatible with existing collection equipment, relatively easy to use by most people, and preferably with self-closing lids) wherever there is dumpster service on Kodiak Island; close coordination with waste-management contractors is essential.
- Locate dumpsters as far as possible from school-bus stops and other places where children congregate; do not place dumpsters near natural food sources (such as salmon streams) or domestic livestock; brush-clearing and lighting near dumpsters are desirable.
- Establish appropriate collection schedules to ensure that dumpsters do not become overly full.
- Encourage KIB to monitor waste-collection schedules and take appropriate action, as needed.
- If there are persistent bear problems in an area, temporarily remove the dumpster; if it is removed, a sign should be placed at the site to inform residents of when it was removed, why it was removed, where it was taken, and when it is expected to be returned.
- In villages, assign specific individuals to provide collection services (e.g., emptying dumpsters, if appropriate); these individuals should receive adequate compensation for their duties and should be held accountable for their performance.

- Encourage everyone using remote areas to remove all solid waste from the area (i.e., pack it in and pack it out) (see also chapter 8, "Education").
- As soon as possible, seek funding from local, state, and federal sources to implement appropriate solid-waste management improvements (KIB should be made a blueprint example of how to keep bears from getting food or garbage from areas of human habitat).
- Recognize the following groups for their efforts to reduce bear-human encounters around Kodiak and encourage continuation and expansion of these activities:
  - fish processors for collecting garbage from setnet sites
  - air-taxi operators for taking out garbage for campers, hunters, and anglers
  - logging camps on Afognak and remote cannery operators for developing effective waste-management techniques
  - Alaska State Parks and Kodiak National Wildlife Refuge for developing and enforcing waste-management policies at remote cabins
  - Kodiak Island Borough and the U.S. Coast Guard for taking leadership roles in establishing effective solid-waste management techniques on the Kodiak road system
- To minimize bear problems, educate people about handling personal property, including chicken pens, drying sheds, food-storage areas, and pet food (see also chapter 8, "Education").
- Develop an intergovernmental working group composed of representatives from wildlife management agencies (ADF&G, USFWS), the Kodiak Fish & Game Advisory Committee, public safety agencies (Alaska State Troopers, local and military police departments), local governments (city, village, and borough), and Alaska State Parks. The working group should meet at least once each spring to review current policies to reduce bear-human encounters and to coordinate efforts for the upcoming year (see also chapter 8, "Education").
- Establish lines of communication among agencies with various areas of responsibility (Appendix J provides an example of how bear reports on the Kodiak road system are handled) (also see chapter 8, "Education").
- Provide public information on actions planned by the intergovernmental working group and encourage public input and questions regarding those actions (see also chapter 8, "Education").
- Make available public information in a variety of media, including print, radio, public television, and personal appearances; attempt to meet the special needs of various cultures and ethnic groups (see also chapter 8, "Education").
- Make the public outreach program ongoing, with emphasis on bear behavior and suggestions on how to minimize negative bear-human interactions (see Appendix K) (comparisons of bear behavior around food and garbage to dog behavior in similar situations can be helpful in improving understanding).

- Advertise laws and regulations relating to leaving food or garbage in a manner that attracts wildlife (see also chapter 8, "Education").
- Encourage agencies to disclose management actions such as moving dumpsters, citing individuals for littering, aversive conditioning of bears, and lethal actions against problem bears (all actions relating to bear-human interactions are matters of public record).
- Encourage the public to report to authorities observations of bears near human habitations (these observations can help to track the activities of individual bears and allow managers to alert school principals and residents of areas in which to be especially cautious; observations should not be advertised to the general public, however, to minimize peoples' seeking out bears) (see also chapter 8, "Education").
- Disseminate to the public information about ADF&G's policy regarding relocation of nuisance bears (see Appendix L), which the CAC endorses.
- Locate on-site bear safety reminders on dumpsters (e.g., "Be Bear Aware") and at collections sites (i.e., public landfills) (see also chapter 8, "Education").
- Ensure that visitors are made aware of the efforts to keep bears away from human food and garbage; responsibilities of visitors should be outlined and disseminated so that they recognize their role in preventing problems (see also chapter 8, "Education").

6.4 Bears and Livestock Ranching

Russians brought the first livestock to Kodiak soon after their arrival, and by the late 1790s, cattle, sheep, goats, and pigs were common assets at settlement sites. Cattle numbers varied through the 1800s, but continued to increase. Kodiak's luxuriant grasslands tempted more and more ranchers, and in 1906, the U.S. Department of Agriculture established an experimental station in Kodiak to refine cattle breeds and to develop methods to take advantage of the seemingly limitless range.

In March 1939, the Alaska Game Commission sent wildlife agents to Kodiak to kill all bears seen in the proximity of any cattle range. The intention was to reduce bear numbers within the cattle area and to remove them whenever possible as a potential menace to livestock.

From May 1964 through June 1965, ADF&G biologists worked with ranchers along the Kodiak road system to determine the extent of the predation problem, the sex and age composition of the bear population, the origin of bears in the area, and movement patterns of bears in the area. They also actively pursued and killed all bears suspected of being cattle killers. Ranchers appreciated the efforts, but sportsmen were outraged. In spite of the concerns, the department continued its involvement in dispatching problem bears and attempted to capture and move some bears.

In November 1970, the department reevaluated its role in bear management on Kodiak, and the director of the Game Division wrote

The following shall be the Department's policy concerning predation of cattle by bear:

- *The Department shall not participate in bear depredation programs designed to alleviate cattle losses.*
- *The person suffering these losses may take bears in defense of life or property . . . . Under no circumstances may bears be shot from airplanes or taken by means of any poisonous substance.*
- *That section of the regulations pertaining to immediate notification of the Alaska Department of Fish and Game upon taking a bear and to written documentation and salvaging of the hide will be strictly enforced.*
- *The Department will make every effort to keep sport hunting regulations liberal to make possible the effective removal of bears by hunters.*

This policy reiterated decisions made 30 years earlier by the Alaska Game Commission and appeared to close a long chapter in the relationship among cattlemen, government agents, and Kodiak bears. Ranchers were understandably upset with the decision, however, and they continued to devise creative ways to protect their livestock without government intervention.

Today livestock ranching remains an important and viable industry on Kodiak and adjacent islands. The largest herds occur on three leases on northeastern Kodiak Island (see Figure 6-2) and on separate leases on Sitkinak and Chirikof islands, where bears are not a problem.

The Kodiak Island leases encompass about 100,000 acres of state land and are used by approximately 300 cattle and 400 bison. Ranchers lease grazing rights from the Alaska Department of Natural Resources and work in close cooperation with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service to create and implement conservation plans that include stocking rates, range rotation plans, and fencing plans. These conservation plans ensure that both upland and riparian areas are used wisely and are protected. Although fencing is not required by the conditions of the leases, ranchers are encouraged to fence to minimize bear encounters, especially along riparian areas.

Land leased for grazing remains open to public access, per 11 AAC 58.800: "The lawful pursuit of the hunting of game, the taking of fish and trapping, or picking of berries shall not be denied on lands leased for agricultural or grazing purposes." However, when requested in writing, the director of the Department of Natural Resources can grant permission that all or a portion of the lessee's premises may be posted wherever necessary to protect the lessee and property.

Ranchers have learned ways to live with bears on their leased lands, and bears are not as great a problem as they were 40 years ago. Bison have proved to be less susceptible to bear predation, and electric fences are successfully used to protect livestock in select areas. Ranchers may also take advantage of federal grants to improve fencing to reduce bear predation. Individual bears do, however, continue to cause problems either through direct predation or by

moving cattle away from preferred ranges. On northeastern Kodiak Island, the primary tools to reduce bear-cattle conflicts remain a liberal sport hunting season and the DLP provisions.

The CAC also examined the effects of grazing on bear habitat. Conservation plans address issues of overgrazing with conditions regarding stocking rates and range rotation. Although ranchers may wish to implement controlled burns to increase grass production for grazing purposes, state law (11 AAC 58.710) addresses the issue of grazing lessees using fire: "Lessee will take all reasonable precautions to prevent, and take necessary action to suppress, destructive or uncontrolled fires within the leased premises."

6.4.1 Farm Elk and Deer Propagation

Although there are no problems at this time (i.e., January 2002), there is concern about the possible effects to Kodiak wildlife of certain diseases among cattle that could be communicated by farm elk and deer. It is possible that chronic wasting disease (related to spongiform encephalopathy), now occurring in captive elk herds in the Lower 48 states and Canada, could pass to wild deer or elk populations on the archipelago, with any resultant severe decline affecting bears. The possible transmittal of said disease to bears in unknown.

6.4.2 Recommendations Regarding Livestock Ranching

- Support the KIB Commercial Grazing and Conservation Zoning Plan.
- Encourage ranchers to continue practices that minimize bear predation.
- Recognizing the seriousness of foot and mouth disease and chronic wasting disease, the state should continue research about them and develop strategies to prevent their occurrence in Alaska.

6.5 Compensation for Property Loss

In several western states under certain circumstances, cattlemen are compensated, by interest groups such as Defenders of Wildlife, for cattle killed by grizzly bears. Alaska, however, has never authorized similar compensation. There also are no provisions for state reimbursement for loss, due to bear predation, of cabins, drying sheds, or other personal property.

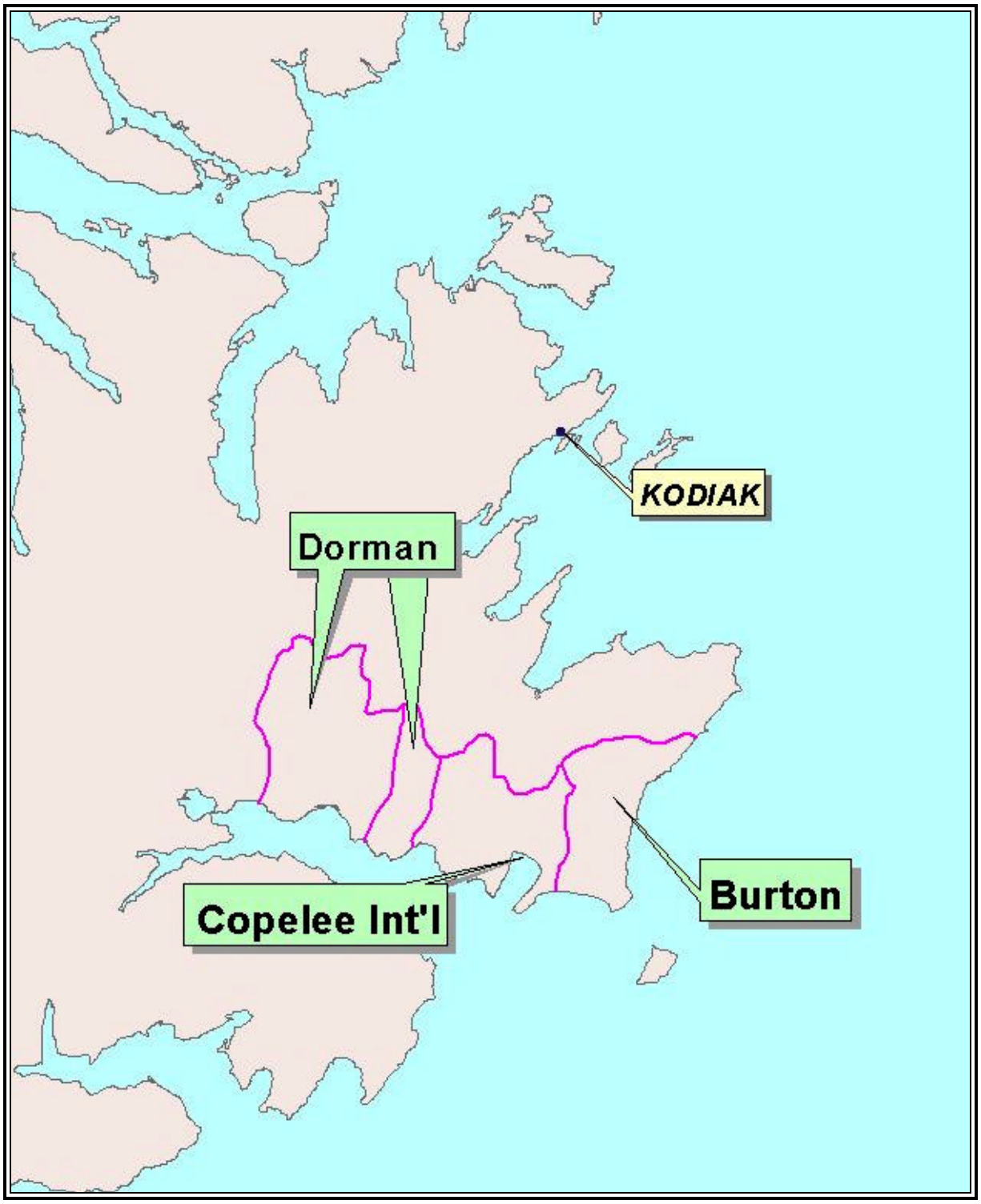

Figure 6-2. Approximate boundaries of grazing areas on the Kodiak archipelago leased by Charles Dorman, Copelee International, and Bill Burton

6.5.1 Recommendation Regarding Compensation for Property Loss

While the CAC recognized that depredation of livestock and damage to personal property can be a significant loss to individuals, the group agreed that awarding compensation would be complicated by difficulty in verifying if the animal had actually been killed by a bear versus a bear scavenging on an animal that died from other causes; difficulty in determining if the property owner had taken necessary steps to minimize bear damage (e.g., used fencing, cleared brush around fish-drying sheds); difficulty in securing a source for funding; and the fact that, if depredation of livestock were related to overpopulation of bears in an area, it would be important that the population be stabilized before compensating for any loss.

The group decided that the institution of depredation permits,[16] coupled with education about minimizing problems with bears, was more appropriate than seeking compensation for property loss at this time.

6.6 Bear-Viewing Activities

Bear viewing on the Kodiak archipelago is a recognized, legitimate activity, as are hunting, angling, boating, hiking, weir operations, and camping, and also occurs incidental to these activities. The demand for wildlife viewing as a primary activity is significant and expected to increase.

The impact wildlife viewing has on tourism-related businesses is significant. The Kodiak Island Convention and Visitors' Bureau (KICVB) reports that in 1997, 49 percent of the total tourism inquiries for specific information asked about wildlife viewing; in the first quarter of 2001, that rose to 64 percent. Of those requesting wildlife-viewing information, 95 percent were asking about Kodiak bears. Approximately 85 percent of the lodges with membership in KICVB advertise bear viewing as part of services they provide.

According to one study (Miller 1999), visitors' average willingness to pay for day trips involving wildlife-viewing opportunities varied from a low of $108 to see Dall sheep to a high of $355 to see grizzly bears. Alaska's wildlife resources are the best the nation has to offer, and Kodiak bears are likely the most sought-after by wildlife viewers visiting the Kodiak archipelago.

There are, of course, a variety of types of wildlife viewers. Some are looking to see a large number of animals or species in a brief period of time. Others are interested in spending more time observing bears and their behavior and interaction with their natural habitat. Still another type may wish to devote days or weeks to observing bears as far from structured viewing situations as possible. Kodiak is in a position to provide opportunities that meet all these desires.

[16] Depredation permits would be issued to an individual, to allow killing of a problem bear, in a specific incident and would only be available after careful consideration by ADF&G's Kodiak area biologist. Reporting and salvage requirements would be the same as under the DLP provisions.

6.6.1 Interface of Bear Viewing and Other Activities

Well-managed bear populations provide opportunities for diverse recreational activities throughout the Kodiak archipelago, including on the Kodiak National Wildlife Refuge (KNWR). It is assumed that through existing and creative management practices, these activities are compatible and nonexclusive.

It is the CAC's strong belief that, in general, bear viewing is compatible with other recreational and commercial activities (e.g., sport fishing, hunting, guiding, hiking) that take place in areas that might be considered for development of formalized bear-viewing opportunities. None of the recommendations made in this document are intended to displace these activities as long as the bears themselves and their habitat are not threatened in any way.

Numerous studies have been done to determine the compatibility of bear-viewing activities with other traditional uses of the same resource or area (e.g., commercial photography, bear hunting, sport and commercial fishing activities, camping and hiking). Extensive work by KNWR staff investigated bear-human interactions on the O'Malley and Thumb river drainages from 1991 through 1999. Results from one of those studies are summarized in a paper published in *Ursus* in 1998 (Wilker and Barnes 1998), an abstract of which can be found in Appendix V. Some of these studies looked at the interface from the human viewpoint:

- How far away do photographers have to remain from bear viewers?
- If a bear is habituated to human presence, is it "fair" to hunt it?
- Can anglers continue to fish in bear-viewing areas?
- Do weirs and other fisheries research tools have a negative effect on either bears or viewers?

Others considered the potential effects on bears:

- displacement
- disturbance
- human habituation
- competition for habitat resources (e.g., food, water, cover, space)

Generally speaking, when people establish patterns of use in particular areas, bears respect those patterns. Bears accommodate a level of human presence that works for them; if humans learn to read bears' actions and follow guidelines based on considerable study by wildlife professionals, that level of presence can work for people as well. Bears respond with neutral habituation (see section 6.1) to humans when people are present in a predictable, nonthreatening manner. Of course, management needs to set limitations on the numbers of humans and their activities to ensure that these are not detrimental to bears' well-being or to their habitat.

Responsible commercial wildlife photographers subscribe to a code of field ethics that advocates against bear disturbance or displacement (see Appendix H). Photographers do have equipment limitations regarding distances and locations, and thus their needs must be considered

when establishing guidelines for use of a bear-viewing site. Their presence, however, need not interfere with the activities of bear viewers any more than they do with the activities of the bears.

It has been noted that the bears that frequent formal viewing sites are rarely the same bears being sought by trophy hunters. Subadults, sows, and sows with cubs are usually the bears being observed by bear-viewers. The adult males tend to avoid bear-viewing areas, preferring either to feed on another part of the river or to feed at night when no bear viewers are present.

Conflicts between anglers and bears usually are related to a common interest in fish. With careful management of sport fishing activities (see section 4.5.3), most conflicts can be avoided. Similarly, by recognizing that bear viewers (or others) are in the area and adapting their fish-handling to that presence, anglers can avoid many potential conflicts between sport fishing and bear viewing.

Although bear viewers may not care for the aesthetics of weirs and other fisheries management tools appearing at a bear-viewing site, there is no evidence that such equipment in any way disturbs or displaces bears.

6.6.2 Existing Bear-Viewing Opportunities

The Kodiak archipelago provides a wealth of opportunities to view bears in spectacular wild country. Bear viewing is enhanced in the spacious, open tundra-heath landscape of Kodiak Island. In contrast, the forest habitat found on Afognak and Shuyak islands makes bear viewing there more of a challenge.

Consistent with the CAC's preferred option of dispersed, low-density viewing in Kodiak's diverse natural setting, outstanding opportunities for viewing bears throughout the archipelago include the following:

- floating or fishing the hundreds of miles of wild rivers
- boating and kayaking along several thousand miles of ocean and lake shorelines
- trekking along animal trails in the backcountry
- flying (above 800 feet in altitude, using respectful flight patterns) over bear feeding and movement corridors
- visiting one of ADF&G's 18 salmon weir sites on major anadromous fish streams
- viewing incidental to hunting bears, deer, elk, mountain goats, waterfowl, or ptarmigan
- visiting one of the 700 anadromous fish streams that provide feeding opportunities for salmon-seeking bears
- taking a chartered boat trip to one of many bear-viewing areas
- boating or trekking out of the archipelago's approximately 50 backcountry lodges and camps to choice bear-viewing destinations such as Thumb River, Karluk Lake, Karluk River, North Kiliuda Bay, Frazer River falls, Uyak Bay, Uganik Bay, and Afognak River and Lake.

Kodiak Island Convention and Visitors Bureau conducted surveys during the summer of 2001 that indicate there are two major types of bear-viewing tourists. The first (about 25 percent of the total) comprises those who will pay a short-term visit to Kodiak, staying one to three nights. Of those, 30 percent say they wish to view bears during their visit. The other type of visitor plans to stay longer: about nine nights (of a total 11 nights in Alaska). Of those visitors, 5 percent indicate they want to view bears.

To accommodate these visitors, many commercial businesses are either devoted to bear viewing (e.g., lodges with day trips and camping and backpacking trips; charter aircraft that provide four hours of viewing, with description, or provide day trips in which the plane lands and the visitors are guided to viewing areas on the ground; charter boats; public-use cabins that provide bear-viewing opportunities). A number of commercial operations also provide bear-viewing opportunities as a component of sport fishing, hunting, kayaking, rafting, and hiking trips. Many of these unstructured bear-viewing opportunities are provided by commercial operations having special-use permits to take visitors onto KNWR.

Additional bear-viewing opportunities are provided on private land, some of which are managed by Native corporations. For example, Koniag, Inc., provides bear-viewing trips, out of Larsen Bay, to Camp Island.

Currently there are no formal state or federally managed bear-viewing opportunities on the Kodiak archipelago, but visitors to Alaska can see bears at these sites elsewhere in Alaska (see Appendix G for details):

- Anan Creek Wildlife Observatory 35 miles southeast of Wrangell
- Brooks Camp, Katmai National Park and Preserve, on the Alaska Peninsula
- McNeil River State Game Sanctuary, about 100 air miles west of Homer
- Stan Price State Game Sanctuary, at Pack Creek on Admiralty Island

There are also those areas, such as Wolverine Creek, across Cook Inlet from the Kenai Peninsula, that have become magnets for people who want to watch concentrations of bears in totally unstructured and unmanaged circumstances; this type of viewing, however, is not recommended.

6.6.2.1 Bear Viewing on Kodiak National Wildlife Refuge

Many of the unstructured bear-viewing opportunities are currently provided by commercial operations having special-use permits to take visitors onto KNWR. There is not, however, any structured bear viewing on the refuge at this time (January 2002), despite efforts to establish it in the past.

In March 1987, KNWR completed its first Comprehensive Conservation Plan (CCP) (U.S. Fish & Wildlife Service 1987). For a variety of reasons, the State of Alaska and the Kodiak Island Borough objected to proposed public-use restrictions. The final step-down Public Use Management Plan (PUMP), completed in 1993 (U.S. Fish & Wildlife Service 1993), proposed to restrict public access and use of nine critical bear-use areas during key bear-use times because "expanding public use threatens bear habitat and exposes bears to increased human habituation

and displacement if not managed carefully" (see section 6.6.2.2 for more details on the PUMP proposed restrictions). To date, only the seasonal closure at O'Malley Creek has been published as a final regulation in the Federal Register.

In 1999, the U.S. Fish & Wildlife Service (USFWS) began revision of the CCP for KNWR. One of the preliminary alternatives, developed in response to public concern about habituated bears being hunted, contained a proposed 100-square-mile closed area centered on O'Malley Creek; this alternative was a component of establishing a structured bear-viewing program at O'Malley Creek. Public comment, and subsequent analysis of data (see Appendix T) collected at the O'Malley site over a period of several years resulted in the refuge staff reducing the size of the proposed closure. Any proposed closures would be first presented to the Board of Game (BOG) for action, but the closure could be implemented by special regulation if the BOG did not take action. This alternative and other alternatives that would manage human use on the refuge have been modified since the public meetings in March 2000, and further development and presentation to the public were postponed pending the completion of this bear-management plan.

The CCP and the PUMP address conservation and management issues on refuge lands. One of the obvious changes occurring during the 1980s' development of these plans was the rapid expansion of bear viewing and photography on the archipelago. Although these activities had always been popular, the publicity the islands and the bears received during and after the oil spill (1989) motivated people to come and see the bears in their natural habitat.

To address this public interest, a trial bear-viewing program, modeled after the McNeil River State Game Sanctuary program, was administered by the refuge at Dog Salmon River in 1990 and 1991. At O'Malley Creek, the refuge provided a structured viewing program in 1992. The following year, the plan was to allow a concessionaire to manage the bear-viewing program; however, the lengthy process dictated by the Alaska National Interest Lands Conservation Act (ANILCA) made that impossible, and there was no program in 1993. A private concessionaire was awarded a five-year contract to manage the program beginning in 1994, but the contract was halted after only a year because of a legal challenge to the procedures used in awarding the concession.

Currently, all commercial operators providing wildlife-viewing services on the refuge are regulated by special-use permits. O'Malley Creek is closed to all human access from June 25 through September 30. Special-use permits close some areas to commercial operators and restrict commercial use to daylight hours in other areas during key times when human presence is most likely to disrupt bear use. A guided bear-viewing program was conducted by a private operator on Koniag, Inc., land (a private inholding within the refuge boundaries) at Thumb River on Karluk Lake from 1995 through 1999.

In 1990, the refuge initiated a viewing permit system primarily because of newly developed bear-viewing services offered by guides and air taxi operators. Twenty-one commercial operations (e.g., guides, lodges, air taxi operators) presently use the refuge for wildlife-viewing purposes. The permit conditions require that viewing operations not cause habituation of bears to humans (see section 6.1) or displacement of bears except at weir sites. By using this permit system, refuge staff can quantify viewing use, maintain safe and compatible operations, and protect critical bear habitat.

The refuge presently supports a diversity of types of viewing opportunities, including flight-seeing, hiking in with a guide, boat-based, guided, and unguided. Most commercial, guided, walk-in viewing operations are site- and time-specific, highly controlled ventures where bears are typically within 50 to 300 yards of viewers and generally aware of viewer presence.

In 1991, the refuge began a study of bear viewing at O'Malley Creek, an area particularly suited for this activity because of the concentration of bears. Two more studies, at Thumb River and Uyak River in 1995 and 1996, respectively, were conducted by refuge staff. During the 1990s, viewing use expanded, and commercial viewing services increased in concert. The refuge developed permit stipulations to control guided use of sites, and the number of wildlife-viewing permits grew to 21 by 2001. According to USFWS, there is no evidence that human safety was jeopardized during any wildlife viewing operations on the Kodiak archipelago.

Currently, there are no site-specific objectives for the refuge related to bear use of critical foraging habitat (i.e., bear concentration areas). U.S. Fish & Wildlife Service indicates that such objectives need to be developed to determine the appropriate thresholds of compatible public use of bear-concentration areas. Apparent problems with bear-human conflicts and food-conditioning of bears by humans at sites on Dog Salmon and Ayakulik rivers do not stem from commercial viewing operations, but from concurrent operation of viewing and sport-fishing activities (see section 4.5.3).

The closure of O'Malley Creek to public entry on a seasonal basis (June 25–September 30), recreational-use fees charged on private lands in the refuge, and restrictive conditions imposed by special-use permits on commercial operations have effectively limited the number of sites available for, and restrained the growth of, short-duration fly-in bear viewing. Services offered by lodges and guides for multi-day bear-viewing opportunities currently (January 2002) appear to be underutilized.

6.6.2.2 Public-Use Regulations for Kodiak National Wildlife Refuge

Kodiak National Wildlife Refuge management intent and goal (in both 1993 and 2000) were proactive protection of bear site use and human safety; a balance of public use and resource protection; and employment of a mix of strategies to maintain compatibility between humans and bears and their habitat.

To this end, USFWS and ADF&G assessed 44 specific sites that were considered to be key bear habitat on KNWR and that were of highest concern because of easy access and very high seasonal bear densities where bears are dependent on salmon. The sites were identified and ranked by three criteria for five time periods. An expert team was convened in 1989 to rank the sites for accessibility, bear density, and conflict potential (bear-displacement risk; human safety risk). The evaluation was refined a year later, and nine sites were omitted.

In 1988, KNWR initiated its PUMP (U.S. Fish & Wildlife Service 1993). In preparing the PUMP, USFWS evaluated the remaining 35 seasonal bear concentration areas on the refuge. The evaluations did not look at current use in the areas, but at the potential for use, nor did they assess conflicts among users. Nineteen of these areas were given "high" or "critical" ratings for potential conflicts between wildlife and humans; these areas were considered for some level of public-use closure.

The recommended regulations from the PUMP process, which was completed in 1993, proposed the following seasonal closures (shown on map in Figure 6-3):

- Connecticut Creek closed July 15–August 31
- Humpy Creek closed July 15–September 15
- Seven Rivers closed July 15–September 15
- lower falls on the Dog Salmon River closed June 25–August 31

Day-use-only restrictions were proposed as follows:

- Red Lake River and lakeshore, July 1–August 31
- Upper Thumb River, July 1–August 31
- Southeast Creek (Red Lake), July 15–August 31
- Little River Lake lakeshore, July 15–August 31
- Deadman Bay Creek, August 15–September 30.

Six other restrictions are proposed as part of the PUMP:

- Two high-use bear denning areas are closed to snowmachines.
- Domestic pack animals require a special-use permit (dogs as pack animals not included).
- New tent platforms are allowed by permit only to replace existing platforms or cabins.
- Occupancy and use of commercial, administrative, or public-use cabins is by written authorization of the refuge manager.
- No camping is allowed within one-quarter mile of public-use cabins and 200 yards of federal and state administrative structures (e.g., the weir at Frazer fish pass).
- No deposit of fish offal is allowed within one-half mile of high-water mark of mainstem Ayakulik River, upstream from Bare Creek one and one-eighth mile (landing/take-off area), and downstream from Bare Creek one and three-eighths mile (Boulder Hole).

In 2000, KNWR proposed regulations were the same as those in the PUMP except that O'Malley Creek was closed to public use in 1996; some sites were omitted because access was re-evaluated; and some sites were added because they had since been acquired by USFWS. Other proposed restrictions on upland aircraft landing, jet drives on motorboats, camping limits, and public-use cabins were dropped.

6.6.2.3 Recommendation Regarding Public-Use Restrictions on Kodiak National Wildlife Refuge

- Recommend that KNWR initiate a step-down re-evaluation process for the PUMP area closures in light of the fact that new data are needed (research data are 12 years old) and that the public-use potential, on which some of the closures were based, has not been fulfilled and likely won't be.

6.6.3 Developing Formal Bear-Viewing Sites

Recognizing the increasing demand from the public—both Alaska residents and tourists—for bear-viewing opportunities on the Kodiak archipelago, efforts are underway to meet those needs in keeping with the desires and needs of local residents; commercial operators; state, federal, and local agencies having management authority; and those outside the area who are involved in planning activities on KNWR.

The fact that bear-viewing opportunities will be developed is not questioned. The emphasis is on who will determine the nature of those opportunities and how they will be implemented. The thrust of this document is to provide consensus recommendations supported by diverse interest groups. Over all, the concern is to protect bears and their habitat and to provide bear-viewing opportunities that are compatible with other uses such as hunting and sport fishing. The preferred viewing option is one of dispersed, low-density, unregimented viewing in Kodiak's diverse natural setting. One consideration, to enhance viewing opportunities for increased numbers of people, is the possibility of installing a remote viewing camera at a suitable site for linking to viewers in Kodiak city or via the Internet.

Regulating bear-viewing activities is not a new subject. Between 1932 and 1967, territorial and state regulations mandated that all nonresident bear photographers be accompanied by registered big-game guides. Several areas in the state attracted bears and photographers. In 1973, McNeil River State Game Sanctuary became the first area to establish a formal viewing program with limited entry for visitors.

Areas on the archipelago that are currently receiving a substantial amount of use as bear-viewing sites or that have the potential to receive a substantial amount of use in the near future are likely candidates for formal regulation by land managers. Those areas considered by the CAC to be of the most significant management concern are addressed in the CAC's recommendations.

The CAC does not wish to propose a specific site for establishment of this world-class[17] bear-viewing opportunity; rather it wishes to see a site selected based on certain criteria to be developed. However, the CAC members consider the O'Malley Creek site as a particular candidate because of high bear densities and the unique features that cause it to be acknowledged as the best site on Kodiak Island for an organized bear-viewing program (see Appendix T).

[17] A world-class bear-viewing opportunity is one that provides a unique combination of natural phenomena that has worldwide human interest and value. In the case of Kodiak, a thriving population of bears, the largest land carnivore on earth, inhabiting a unique island wilderness, constitutes a spectacle of nature unique in the world. A model bear-viewing program should be consistent with perpetuation of the natural phenomena while allowing for high-quality public use and enjoyment.

Figure 6-3. Areas to receive protection under special rule for public access and use of Kodiak National Wildlife Refuge

In connection with developing criteria for evaluating sites for formal bear-viewing opportunities, it is important to develop guidelines for bear viewers and commercial operators (e.g., similar to principles of ethical field practices of the North American Nature Photographers Association [see Appendix H] or the best-management practices adopted by the Alaska Visitors Association [see Appendix N]). Avoidance of negative bear-human interactions, potentially resulting in food-conditioned bears, damage to property, injury to humans, damage to or destruction of bear habitat, or DLP mortality of bears depends on such guidelines and on an educated public. Similarly, such guidelines can strengthen continued use of the resource by multiple user groups and interests.

6.6.4 Frazer Fish Pass[18]

Bears and humans have shared the area of the Frazer River where the fish pass is located since the introduction of the Frazer Lake sockeye salmon run in the late 1950s and the construction of the fish pass. Bears feed on sockeye salmon in the Dog Salmon River from June through September and congregate near the fish pass, especially below the weir, making it a practical location for bear viewing. The fish pass facility, which includes staff housing, was constructed entirely within KNWR on land administered by USFWS and leased to ADF&G. The facility is operated by ADF&G, with personnel living on site from May through August each year, and is accessed via an off-road vehicle (ORV) trail from Frazer Lake.

Each year, the Frazer–Dog Salmon system attracts numerous guided and unguided anglers targeting sockeye salmon and rainbow and Dolly Varden trout from June through August. The number of unguided anglers is currently unrestricted, and there are typically fewer than 12 unguided anglers per day on the system. Guided sport fishing on the Dog Salmon is restricted by USFWS, limiting the number of guided clients to eight per day.

Prior to 1983, bear viewing on the Dog Salmon mostly occurred as an informal, unguided activity at the fish pass and along the river by anglers, unguided photographers, or people staying at the USFWS public-use cabin two miles southwest of the river on Frazer Lake. Guided bear viewing has been conducted at the Frazer fish pass since the late 1970s, initially as an incidental activity for guided anglers and occasionally as guided wildlife photography.

In 1990, USFWS established a guided bear-viewing program at the Frazer fish pass with a viewing platform adjacent to the weir. The program was available to the public by lottery for the 1990 and 1991 summer seasons and was staffed by USFWS guides. In order to reduce disruptions in the vicinity of the bear-viewing program, USFWS closed the Dog Salmon River to commercial wildlife-viewing guides. Unguided anglers were restricted only by the existing state-regulated closure within 100 yards of weirs, but were encouraged by USFWS to avoid the bear-viewing program area.

[18] The CAC identified this issue as being of current concern and one for which the CAC recommended immediate action. As a result, the Alaska Board of Fisheries, in January 2002, adopted the recommendation made by the CAC to prohibit fishing within 200 yards downstream of the Frazer Fish Pass from June 1 through August 31.

Due, in part, to negative public response to the 1990 closure of the Dog Salmon River to guided sport fishing and commercially guided bear viewing, USFWS relocated its structured bear-viewing program to O'Malley Creek on Karluk Lake for the 1992 season. The access restrictions on guided anglers and bear-viewers below the weir on the Dog Salmon River were eliminated, and those activities resumed in 1992.

Since the mid-1980s, the popularity of bear viewing as a tourist activity on Kodiak Island has increased; since reopening to the public in 1992, Frazer fish pass has become the highest-use bear-viewing site on Kodiak Island. Bear viewers visit the fish pass from mid-June through August, with an average of 500 visitors per season during the past six years, with occasional peak use days of as many as 50 visitors. Guided bear viewing at the fish pass has been conducted predominantly by air-taxi operators, regulated by USFWS wildlife-viewing conditional-use permits. Bear viewers accompanied by USFWS-permitted guides are required to remain on the ORV trail and on the viewing pad adjacent to the weir.

When anglers are in the river just below the weir, bears will usually move farther downstream to fish and are then out of sight of bear-viewers at the viewing pad. Some bear-viewers have reported their frustrations to USFWS. To help relieve potential conflicts between anglers and bear-viewers, USFWS added restrictions to the sport fish guide permits, prohibiting guided anglers from fishing within 200 yd downstream of the weir. Currently, no similar restrictions are placed on unguided anglers.

The section of the river within 200 yd downstream of the weir is moderately productive for sockeye, but most anglers prefer fishing in a bend of the river beginning about 400 yards below the weir. Guides affected by the USFWS 200-yd restriction say they feel this is a reasonable compromise that does not diminish the quality of their fishing opportunities and achieves a solution with the least possible loss of fishing area.

6.6.4.1 Recommendation Regarding Frazer Fish Pass

Recognizing the practical benefits of the solution implemented by USFWS for guided sport fishing, and in order to keep the rules fair and consistent for guided and unguided anglers, the following change should be made to State of Alaska sport fishing regulations: modify waters closed to sport fishing on the Dog Salmon River to prohibit fishing within 200 yd downstream of the Frazer fish pass from June 1 through August 31. (By recommending this closure, the CAC does not imply support for sport-fishing closures in other systems on the Kodiak archipelago to create bear-viewing opportunities.)[19]

6.6.5 Recommendations Regarding Bear Viewing

The CAC has requested formation of the Kodiak Unified Bear Subcommittee (KUBS), a local group consisting of representatives of a similar mix of public interests as those included in the CAC plus the addition of a single representative for each of the following interests (see also section 1.4.5):

[19] The CAC identified this issue as being of current concern and one for which the CAC recommended immediate action. As a result, the Alaska Board of Fisheries, in January 2002, adopted the recommendation made by the CAC to prohibit fishing within 200 yd downstream of the Frazer fish pass from June 1 through August 31.

- Kodiak Fish and Game Advisory Committee
- bear-viewing guides and bear viewers
- small property/lodge owners
- sport fishing guides

Although bear viewing is a major issue that KUBS will address, the group would also make recommendations to appropriate government agencies and boards concerning other Kodiak bear conservation and management issues. KUBS is envisioned as either an independent citizens advisory group that will secure its own funding or as a recognized subcommittee of the Kodiak Fish and Game Advisory Committee.

Among its other tasks, KUBS would help ensure the implementation of the following recommendations in an open, public forum:

- Evaluate bear-viewing sites around the archipelago using a set of important criteria such as private or public land ownership, number of human visitors and timing of bear use, accessibility to visitors, existing viewing use, proximity of bears to local communities or dwellings, competing uses, and compatible uses.
- Develop a general set of operational guidelines, which protect all natural resources, relating to bear-viewing sites.
- Review the following lands within the borders of KNWR to consider suitability for re-opening (access to some of the following public and private lands is restricted or closed to the public, to commercial operators, or to both:
  - Area closed by regulation to all entry:
    - O'Malley River, June 25–September 30 (2,560 acres)
  - Areas administratively closed to all commercial users and their clients:
    - Connecticut Creek, July 15–August 31 (2,262 acres)
    - Dog Salmon River, June 25–August 31 (960 acres)
    - Humpy Creek, July 15–September 15 (2,879 acres)
    - Seven Rivers, July 15–September 15 (3,796 acres)
  - Areas administratively restricted to day-use only by all commercial users and their clients:
    - Red Lake River/lakeshore, July 1–August 31 (1,746 acres)
    - Upper Thumb River, July 1–August 31 (613 acres)
    - Southeast Creek, July 15–August 31 (1,108 acres)
    - Little River Lake/lakeshore, July 15–August 31 (480 acres)
    - Deadman Bay Creek, July 15–August 31 (951 acres)
  - Access restrictions imposed by private landowner (permit required):
    - Karluk Lake and River

- The following areas may also have restrictions of closures to public access, to commercial operators, or to both and should also be reviewed:
  - Frazer fish pass
  - Lower Dog Salmon Falls
  - Humpy Cover
  - Red Lake SE Creek
  - Ayakulik River at its confluence with the Red River
- If areas are selected for formal regulation as bear-viewing sites, formulate rules and guidelines for the use of viewing areas to address the following:
  - access
  - camping
  - education
  - bear safety
  - group size limits
  - firearm possession and use by viewers
  - food and garbage handling and storage
  - sport fishing
- Investigate sites in the northern archipelago for possible bear-viewing locations (e.g., Paul's Lake, Litnik, Portage, Foul Bay, Hidden Lake).
- Determine the optimum number of people who can use any area at any one time and that will best meet the public demand and still be compatible with refuge purposes and conservation. In the case of Frazer fish pass, this determination should be made soon[20].
- Recommend USFWS monitor human activities in areas that have come to its attention as being of high interest or use; the amount of total use and the types of users (e.g., guided, unguided, viewers, anglers) should be recorded.
- Recommend USFWS encourage only those bear-human interactions that are compatible with maintaining the natural behavior of wild bears and protection of their wilderness habitat.
- Recommend that, if use of an area is found to consistently exceed an acceptable human saturation level or begins to consistently displace bears, the following controls, in descending order of implementation as needed, be implemented:

[20] The CAC reminds USFWS and ADF&G that commercial operators and public users require adequate advance notice of regulatory changes and the time to respond.

1) a site-specific set of use regulations that applies to all users
2) Limitations on group sizes
3) required back-country permits for unguided users and a prospectus process for commercial operators

- If sites are selected for formal regulation as bear-viewing sites, develop a set of recommended allocation levels for guided and unguided use visitations that is designed to avoid conflict with the following:
  - sport fishing
  - hunting
  - agriculture and ranching
  - commercial fishing
  - weirs
  - setnet sites
  - public-use cabins
  - adjacent private land owners
  - human habitations
- Develop requirements for levels of use, allocation of use, public and commercial access, and permitting based on experience and history of similar existing federal and state programs (see Appendix G for information about existing programs); these requirements should minimize conflicts between bear viewing and other wildland recreation interest groups.
- Recommend USFWS conduct a needs assessment for bear-viewing opportunities on public land, and, when conditions warrant, establish a unique viewing area, on public land, with the following attributes and conditions:
  - use by tightly controlled small groups (no more than 12 persons per day) and supervised on-site activities
  - permits issued by drawing for off-site overnight stays of no more than three days
  - remainder of permits available for day use by guides, air taxi operators, and individuals
  - unsuccessful applicants and visitors to be provided with comprehensive information about alternative bear-viewing opportunities on the archipelago
- Recommend USFWS reopen O'Malley Creek area to bear viewers June through September employing a management strategy that allows guided day-use bear viewing.
- Manage any bear-viewing sites on KNWR lands consistent with refuge purposes.
- Prohibit establishing industrial tourism viewing with infrastructure such as that at Brooks Camp.

- Disseminate bear-viewing guidelines for the public and private sector that reflect safety while viewing bears from the ground, from the air, or by walking, and procedures to alert bears to human presence. These guidelines should stress low-impact bear viewing by all users in all locations and should be similar to those of the North American Nature Photographers Association (NANPA; see Appendix H) (see chapter 8, "Education").
- Require ADF&G and USFWS training, and oversight of pertinent regulations, for all guided bear-viewing programs.
- Recommend that ADF&G and USFWS conduct annual bear-viewing guide clinics.
- Encourage private landowners that develop bear-viewing opportunities on private land to do so within accepted state and commercial guidelines.
- Work with service providers to make available to all visitors educational materials emphasizing bear safety, realistic expectations for bear viewing (including cost of access), Kodiak bear life history, and proper wildlife management. These materials should include ADF&G and KNWR bear-safety brochures and all materials specific to bear viewing (see also chapter 8, "Education").
- Create economic incentives for bear management, including bear viewing, in the villages.
- Investigate road-accessible wildlife- and bear-education opportunities that would minimize negative bear-human conflicts (a suggested area is along Buskin Lake near the golf course). The area could include interpretive signs dealing with wildlife management, habitat, track identification, realistic bear-viewing opportunities, and safety. Small spotting scopes, such as those at Fort Abercrombie, could be installed so that visitors can get a close-up view of habitat areas for bears, goats, ducks, eagle, etc. Other areas suggested for bear education/interpretive signing/viewing possibility on the road system are Buskin River State Recreation Site and Fort Abercrombie State Historical Park (see also chapter 8, "Education").
- Seek funding for islandwide education and regulation of bear-viewing businesses through, but not limited to, the following (see also chapter 8, "Education"):
  - reasonable permit fees
  - sale of Kodiak Wildlife Viewing stamps
  - Wildlife Restoration funds
  - Land and Water Conservation Fund
- Recommend the statewide sale of Wildlife Stamps (similar to Duck Stamps or Colorado Wildlife stamps) to both Alaska residents and nonresidents. Sales should be broad-based and aimed at nonconsumptive users of wildlife rather than at commercial operators.
- Encourage bear-viewing visitors to constantly attend food and garbage or store food in bear-resistant containers and to not display or consume food in a manner that may attract bears.

- Recommend that USFWS make its policies concerning wildlife photographers consistent with those of USDA Forest Service, National Park Service, Bureau of Land Management, and Alaska State Parks.
- Recommend that USFWS and ADF&G continue to research bear viewing on KNWR (see also chapter 7, "Research and Monitoring").
- Recommend that USFWS implement practical, site-specific, and biologically based objectives and compatibility standards for wildlife viewing in bear concentration areas using the best technical information and a stakeholder planning process. Guidelines for development of objectives and standards include the following:
  - sites with established viewing use—based on existing amount and pattern of bear use and public use
  - sites with no established viewing use—based on amount and pattern of bear use before public use introduced

6.7 Use of Aircraft on the Kodiak Archipelago and its Effect on Bears

As is the case with most of Alaska, use of aircraft for transportation, public safety, and recreation is common on the Kodiak archipelago.

There are both federal and state laws and regulations that prohibit disturbing wildlife with an aircraft. Applicable federal laws and regulations include the Airborne Hunting Act (Title 16, Chapter 9, United States Code, Section 742j-I) and Code of Federal Regulations (Title 50, part –19, Airborne Hunting). These laws prohibit any person while airborne in an aircraft from shooting or attempting to shoot or harassing any bird, fish, or other animal.

For the purpose of these laws and regulations, an aircraft is defined as any contrivance used for flight in the air. Harass means to disturb, worry, molest, rally, concentrate, harry, chase, drive, herd, or torment.

Penalties for violating these laws and regulations include a fine, revocation of airman certificates, and/or forfeiture of guns, aircraft, and other equipment used in violation of these laws.

6.7.1 Recommendations Regarding Use of Aircraft on the Kodiak Archipelago

- Enforce federal and state laws and regulations that prohibit disturbance of wildlife with an aircraft.
- Manage aircraft use in wildlife-viewing operations: Develop—through the cooperation among appropriate regulatory agencies, private landowners, and commercial service groups—guidelines describing minimum altitudes, flight paths, horizontal distances, and access points. Following are suggested guidelines:
  - When viewing from an airplane while in the air, remain more than 800 feet from any bear.
  - Prohibit intentional bear viewing by helicopter.

  - While flying near viewing areas, transit the area quickly, avoid circling or directly overflying the viewing area, and be considerate of viewers on the ground.
  - Do not take off or land within 300 feet of visible bears.
- Encourage commercial providers of bear-viewing services to adopt standards of operation.
- Urge commercial operators to ensure that all equipment, guides, pilots, and boat operators meet all federal, state, and local requirements that apply to their operations.
- To minimize disturbance to bears, develop guidelines for overflying by helicopters for recreational purposes.
- To minimize disturbance to bears, develop guidelines for overflying by fixed-wing aircraft for recreational purposes.

6.8 Public-Use and Other Remote Cabins

Public-use and remote cabins present specific concerns in relation to bear-human interactions and to potential conflicts among user groups.

6.8.1 Public-Use Cabins

On the whole, public-use cabins focus human use, which can be a positive management tool for containment of human activities in bear habitat. However, commercial operators are affected by regulations about public-use cabins on KNWR. For example, commercial operators cannot camp with clients anywhere within a mile of KNWR public-use cabins. Thus, any time a new public-use cabin is established and it focuses human use in an area, commercial guide activities are limited to avoid the presence of too many people in that area.

It is the perception of some that the refuge's decision to restrict the use of setnet cabins to setnet operations, unless they are being used by hunters, has increased some of the problems with bear-human interactions among campers and other back-country users. Thus, some see a strong need to have more public-use cabins available to focus human use and provide bear-resistant facilities, while at the same time acknowledging that a proliferation of public-use cabins restricts the activities of commercial guides.

6.8.1.1 Kodiak National Wildlife Refuge Public-Use Cabins

There are presently seven public-use cabins on KNWR.[21] The PUMP allows for as many as nine, and that number is deemed appropriate for refuge lands given high public demand for public cabins and the seasonal nature of cabin use. (The PUMP also allows for conversion to public use of abandoned cabins or cabins on newly acquired lands, where they are located in appropriate areas.) These cabins are in areas accessible only by float plane or boat. Brush and terrain make hiking very difficult, and there are no roads or maintained trails on the refuge.

[21] They are located at Blue Fox Bay, Viekoda Bay, Uganik Island, Uganik Lake, Little River Lake, South Frazer Lake, and North Frazer Lake.

Commercial air taxi operators who land on the refuge must have special-use permits to transport clients to public-use cabins. Cabin reservations are scheduled by lottery, with the maximum number of nights they can be reserved ranging from seven to 30, depending on time of year.

Efforts are made to ensure that use of these cabins does not lead to negative bear-human interactions. The cabins are equipped with meat caches, and all fish or game meat must be stored in them. Cabin users must haul out *all* trash, unused food, and fuel cans; garbage cannot be buried.

Existing public-use cabins on KNWR are presumed to be properly located where they do not pose a threat to existing bear habitat. The refuge is encouraged to evaluate siting and use of any new cabins proposed (see section 6.8.1.3).

6.8.1.2 Alaska State Parks Public-Use Cabins

Alaska State Parks presently has six public-use cabins. Four of the cabins and a ranger station and visitor center are on Shuyak Island. There is one cabin on Afognak Island, and a second one, a refurbished USDA Forest Service cabin (Laura Lake), is being added.

These cabins have all been sited in remote areas away from portions of the parks in which the public usually camps. Although they are not sited in areas of bear concentrations, there are small concentrations within a few miles of most of the cabins. Bears concentrate in these areas during late August and early September during the salmon runs, with the exception of the Laura Lake cabin, where early runs of sockeye salmon attract concentrations of bears between Laura and Paul's lakes throughout the summer season.

Although the Pillar Lake cabin on Afognak does not have any salmon streams in its vicinity, it is along a frequently used trail corridor for bears and there have been frequent sightings of bears. Over the past few years, one bear (or perhaps more) has learned to break into game-hanging sheds adjacent to public-use cabins in Shuyak Island State Park. Remedial action was taken to solve the game shed problem in 2000, and efforts are underway to consider new strategies for game-shed management in the future to avoid bear problems. Alaska State Parks acknowledges the need to continue to provide bear-country information at its public-use cabins.

6.8.1.3 Recommendation Regarding Public-Use Cabins

- Proposed new public-use cabins, or those acquired through land acquisition, on KNWR that cause serious adverse impact on important bear habitat or serious conflicts with guides or other user groups should be re-evaluated for relocation to more suitable sites.

6.8.2 Other Remote Cabins

Remote cabins offer local residents and visitors safe and comfortable alternatives to camping or staying at lodges. Although KNWR currently has seven public-use cabins, and the Alaska State Park System has six public-use cabins, the use of other existing cabins may be limited to specific uses and time periods that do not permit opportunities for use by bear-viewers.

However, an abundance of remote cabins throughout the archipelago may cause adverse impacts on bear habitat by focusing additional human use in specific areas.

6.8.2.1 Recommendation Regarding Other Remote Cabins

- All new remote cabins, or land disposals for the purpose of building new remote cabins, that cause serious adverse impacts on important bear habitat or serious conflicts with guides or other user groups should be re-evaluated for location at more suitable sites.

6.9 Other Recreational Activities

Recreational activities such as hiking, camping, trekking, and wildlife viewing can involve negative bear-human interactions if bear-safety guidelines are not heeded. In the section on bear viewing (section 6.6) and in chapter 8, "Education," the CAC addresses necessary educational efforts and general guidelines for behavior while in bear habitat.

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).

8. Education

Synopsis: The primary goals of current Kodiak bear educational efforts are to reduce negative bear-human interactions and to increase appreciation for and understanding of bears and their habitat. The Citizens Advisory Committee (CAC) examined a number of ways to enhance the current effort by establishing educational programs that provide accurate information resulting in continued conservation and management of Kodiak bears.. The key to any educational program is a cooperative effort and commitment by all concerned to provide science-based, accurate information in order to cultivate a well-informed public. Those who live, work, and recreate on the Kodiak archipelago need clear and useful information about bears in order to build understanding of bear behaviors and to minimize negative bear-human interactions. The CAC makes recommendations on the development and dissemination of educational and public-outreach materials. These recommendations relate to the following subjects: general user education, hunter education, off-road vehicle user education, angler education, U.S. Coast Guard education, economic incentives and land management, village and rural residents, and funding for education efforts.

The CAC believes that the widespread dissemination of accurate, fact-based information concerning Kodiak bears is essential for maintaining high-quality bear habitat and for managing bears on the Kodiak archipelago. Further, understanding of proper bear-human relationships, based on facts, must be fostered to prevent false impressions or beliefs that could eventually jeopardize this unique bear population. In the past, erroneous information concerning a variety of issues—including population status, environmental threats, hunting, and ranching—has led to misunderstanding and conflict. In such situations, both humans and bears have been negatively affected. Education and public outreach are critical. The key to any educational program is a cooperative effort and commitment by all concerned to provide science-based, accurate information in order to cultivate a well-informed public. Those who live, work, and recreate on the Kodiak archipelago need clear and useful information about bears in order to build understanding of bear behaviors and to minimize negative bear-human interactions. In addition, with understanding and preparation, people can avoid bear encounters and respond wisely when they do occur.

8.1 Bear-Education on the Kodiak Archipelago

Until approximately the mid-1980s, most bear education in Alaska was provided by law enforcement personnel and was almost exclusively concerned with the dangers presented by bears. Although promoted as bear-safety programs, often times educational efforts were intended to scare people into appropriate behavior around bears. In fact, these programs did indeed frighten people, who then often viewed *all* bears as dangerous and threatening. Perhaps this effort was counter-productive because it may have led to increased numbers of bears killed in defense of life or property (DLP). Since the mid-1980s, education efforts have become more

inclusive—with bear safety being only one facet of a larger educational package that includes biology, management, and natural history (all of which foster understanding of bears) as well as discussions of negative bear-human interactions. A focal point of the early educational presentations was the concept that bears are dangerous because they are unpredictable. In reality, bears are intelligent and learn quickly from a variety of situations, and many behaviors are predictable and avoidable (for example, if food or garbage are left unprotected, bears will eat them).

The primary goals of current Kodiak bear educational efforts are to reduce negative bear-human interactions and to increase appreciation for and understanding of bears and their habitat. The CAC examined a number of ways to enhance the current educational effort by establishing an educational program that provides accurate information resulting in the continued conservation and management of Kodiak bears.

8.2 Providing Bear-Education

Several agencies and organizations provide education about bears. Biologists from the Alaska Department of Fish & Game (ADF&G) in Kodiak and from the Kodiak National Wildlife Refuge (KNWR) respond to requests for information or presentations from schools, the U.S. Coast Guard (USCG) base, and various organizations. Appearances on television or radio and providing information or articles to local news media are also ways in which state and federal wildlife staff disseminate information.

Providing bear education to school students is considered to be one of the most effective means of educating the public in general. Children learn about how managing garbage can prevent problems with bears, for example, and they take that information home and share it with the rest of the family. Educational materials, however, need to be adapted to the needs and other programs of various age groups.

Furthermore, although educational efforts have generally been successful within Kodiak city, those efforts need to be expanded to the villages on the archipelago and made relevant to village culture and circumstances.

8.2.1 Kenai Peninsula Bear-Education Materials

As a direct result of the 2001 brown-bear planning efforts on the Kenai Peninsula, an educational kit on brown-bear conservation was developed by the Alaska Audubon Society bear biologists, Kenai Peninsula Borough School District curriculum specialist and teachers, and ADF&G staff. Appropriate and effective materials were gathered and integrated into the kit, it was field-tested, and it is currently in use. ADF&G's Project WILD staff and facilitators developed and facilitated training sessions for teachers on the Kenai Peninsula. These facilitators have the experience and training to effectively educate teachers about the use of these materials in the classroom and in the context of field trips.

Kits are maintained by the school district with ADF&G providing replacement parts as needed over time. Each time a teacher uses a kit in his or her classroom, the teacher is required to complete an evaluation form, which is gathered by the school district. Yearly, these evaluations

will be reviewed by Audubon, the school district, and ADF&G. After three years of implementation, the Kenai Peninsula brown-bear educational kits will be reviewed for effectiveness and use. Recommendations for change will be implemented at that time, as needed.

8.3 Recommendations for Education

Many of the following recommendations are proposed in the chapters on specific subjects and issues (e.g., habitat, harvest, bear-human interactions). They are presented again here under categories related to the users targeted and are cross-referenced, if appropriate, to the chapter in which background information is provided.

8.3.1 User Education—General

- Develop an intergovernmental working group composed of representatives from wildlife management agencies (ADF&G, USFWS), public safety agencies (Alaska State Troopers, local and military police departments), local governments (city, village, and borough), the Kodiak Fish & Game Advisory Committee, and Alaska State Parks. The working group should meet at least once each spring to review current policies to reduce bear-human encounters and to coordinate efforts for the upcoming year (see chapter 6, "Bear-Human Interactions").
- Develop a bear education kit, similar to that developed on the Kenai Peninsula (see section 8.2.1), for Kodiak archipelago communities. It would include locally relevant materials that either already exist or need to be developed. A group of educators and biologists, similar to the one working on the Kenai kit, would work together to finalize and field test the Kodiak kit. Upon completion of the kit, ADF&G Project WILD staff and facilitators would develop and facilitate training sessions for teachers in each Kodiak archipelago community.
- Ensure a level of cooperative state and federal law enforcement deemed essential to achieve compliance with conservation laws and regulations; preventive education should be the first priority in this regard (see section 4.6).
- Establish lines of communication among agencies with various areas of responsibility. (Appendix J provides an example of how bear reports on the Kodiak road system are handled.) (See chapter 6, "Bear-Human Interactions.")
- Strongly encourage education of outdoor recreationists about bear behavior, impacts to bear habitat, bear-human interactions (e.g., resulting from improperly handled food and trash), field safety practices, and use of bear-resistant containers and electric fences, etc.
- To minimize bear problems, educate people about handling personal property, including chicken pens, fish-drying sheds, food-storage areas, and pet food (see section 6.3.2).
- Ensure that visitors are made aware of the efforts to keep bears away from human food and garbage; individual responsibilities of visitors should be outlined and disseminated so that they recognize their role in preventing problems (see section 6.3.2).

8.3.2 User Education—Hunters

- Urge ADF&G, USFWS, and other appropriate groups to develop informational and educational materials to help minimize bear-human conflicts and thereby improve hunter image. These materials should be developed for multimedia use and include the following subjects (see section 4.1):
  - trip planning and physical conditioning
  - meat handling and storage skills
  - bear behavior and safety
  - a safety-in-bear-country video for wide distribution and use
- Encourage guide/outfitters and transporters to make bear-safety educational materials available to all hunters (see chapter 4, "Harvest Issues").
- Encourage ADF&G to continue to track the number of bears killed by deer, elk, and goat hunters to minimize such bear mortality. ADF&G should make a serious effort to mitigate this problem through education of big-game hunters on how to avoid dangerous situations involving bears (see section 4.5.1 and chapter 7, "Research and Monitoring").
- Require a mandatory hunter-safety course, which should include bear-safety instruction, before going afield to hunt in GMU 8 (see chapter 4, "Harvest Issues").
- Encourage ADF&G to develop other educational tools (e.g., videos using local people) to educate hunters about hunting in bear country (see chapter 4, "Harvest Issues").
- Submit an article (written by Hank Pennington) about hunting on Kodiak to a sporting magazine (see chapter 4, "Harvest Issues").
- Require mandatory hunter education, which should include bear-safety instruction, before going afield in GMU 8 (see chapter 8, "Education").
- Encourage hunters to quickly remove kill meat to a safe distance from the kill site (see also chapter 8, "Education").
- Using the ADF&G Web site and brochures, educate hunters about terrain issues (see also chapter 8, "Education").

8.3.3 User Education—Off-Road Vehicles

- Create an educational program to encourage responsible use of off-road vehicles (ORVs) to minimize negative impacts on bear habitat (see chapter 3, "Kodiak Bear Habitat").

8.3.4 User Education—Anglers

- Develop an educational program for anglers in cooperation with professional organizations, agencies, and sportsmen's groups to include information about proper food and fish storage and cleaning of fish (see section 4.5.3).

- Include bear biology, behavior, and safety information in KNWR salmon camp curriculum.

8.3.5 User Education—U.S. Coast Guard

- Continue education cooperation between ADF&G and the USCG annually, or more often as required, to alert air crews to their wildlife-conservation responsibilities and to promote good relations within the community (see also sections 4.6 and 6.7).
- Urge ADF&G and USFWS to work with the USCG to identify those areas and seasons in which bears and hunters are particularly vulnerable to harassment by overflying and to encourage reinforcing USCG policy minimizing low overflight in these areas (see also sections 4.6 and 6.7).

8.3.6 Economic Incentives and Land Management

- Establish an education plan and explore economic incentives aimed at encouraging public and private landowners to consider the effects on bears of motorized access and to continue land-management programs that are consistent with wildlife conservation (see chapter 3, "Kodiak Bear Habitat").
- Encourage private landowners (e.g., via the use of conservation easements, economic incentives, and education) to consider bear habitat when making land-management decisions (see chapter 3, "Kodiak Bear Habitat").

8.3.7 Villages and Rural Residents

- Identify appropriate elders and leaders to work with village public safety officers (VPSOs) to help educate residents about conservation laws, rules, and regulations (see section 4.6).
- Encourage village residents, VPSOs, and appropriate agencies to work together to develop information and education materials and strategies to reduce bear-human conflicts in the villages (see section 6.2).
- Encourage state troopers and USFWS to provide information to rural residents about the laws, rights, and duties regarding killing bears in defense of life or property (DLP) (see section 6.2).
- Through a co-management agreement with the state, use village committees and VPSOs to take responsibility for working on DLP issues in villages, including solid-waste management issues; this should include a significant educational component (e.g., schools, videos, and employing elders) (see section 6.2).

8.3.8 Outreach

- Ensure a level of cooperative state and federal law enforcement deemed essential to achieve compliance with conservation laws, rules, and regulations; preventive education should be the first priority in this regard (also see section 4.6.1).

- Place educational materials in places (or with people) where they can be readily accessed (Web site, airport, magazines, tourism offices, USCG base, villages, guide/outfitters, public libraries, schools, museums, ferries, tribal council offices, Fish & Wildlife Protection officers, Alaska State Park offices and state parks staff, public radio, and television) (see chapter 4, "Harvest Issues").
- To foster cooperation, the Alaska Department of Public Safety, Division of Fish and Wildlife Protection, and USFWS conduct annual outreach programs, explaining regulations and enforcement issues (including DLPs) in communities throughout the Kodiak archipelago (see section 4.6).
- Provide public information on actions planned by the intergovernmental working group and encourage public input and questions on those actions (see chapter 6, "Bear-Human Interactions").
- Make available public information in a variety of media, including print, radio, public television, and personal appearances; attempt to meet the special needs of various cultures and ethnic groups (see section 6.3.2).
- Make the public outreach program ongoing, with emphasis on bear behavior and suggestions on how to minimize negative bear-human interactions (see Appendix K) (comparisons of bear behavior around food and garbage to dog behavior in similar situations can be helpful in improving understanding) (see section 6.3.2).
- Advertise laws and regulations relating to leaving food or garbage in a manner that attracts wildlife (see chapter 6, "Bear-Human Interactions").
- Encourage agencies to disclose management actions such as moving dumpsters, citing individuals for littering, aversive conditioning of bears, and lethal actions against problem bears (all actions relating to bear-human interactions are matters of public record) (see chapter 6, "Bear-Human Interactions").
- Encourage the public to report to authorities observations of bears near human habitations (these observations can help to track the activities of individual bears and allow managers to alert school principals and residents of areas in which to be especially cautious; observations should not be advertised to the general public, however, to avoid encouraging people seeking out bears) (see section 6.3.2).
- Locate on-site bear safety reminders on dumpsters (e.g., "Be Bear Aware") and at collections sites (i.e., public landfill; see section 6.3.2).
- Work with service providers to make available to all visitors educational materials emphasizing bear safety, realistic expectations for bear viewing (including cost of access), Kodiak bear life history, and proper wildlife management. These materials should include ADF&G and KNWR bear-safety brochures and all materials specific to bear viewing (see section 6.6).
- Disseminate bear-viewing guidelines for the public and private sector that reflect safety while viewing bears from the ground or by walking, and procedures to alert bears to human presence. These guidelines should stress low-impact bear viewing by all users in all locations and should be similar to those of the North American Nature Photographers Association (see Appendix H and section 6.6).

- Investigate road-accessible wildlife- and bear-education opportunities that would minimize negative bear-human conflicts (a suggested area is along Buskin Lake near the golf course). The area could include interpretive signs dealing with wildlife management, habitat, track identification, realistic bear-viewing opportunities, and safety. Small spotting scopes, such as those at Fort Abercrombie, could be installed so that visitors can get a close-up view of habitat areas for bears, goats, ducks, eagle, etc. Other areas suggested for bear education/interpretive signing/viewing possibility on the road system are Buskin River State Recreation Site and Fort Abercrombie State Historical Park (see section 6.6).

8.3.9 Funding

- Seek funding for islandwide education and regulation of bear-viewing businesses through, but not limited to, the following (see section 6.6):
  - reasonable permit fees
  - sale of Kodiak Wildlife Viewing stamps
  - Wildlife Restoration funds
  - Land and Water Conservation Act Fund
- Recommend the statewide sale of Wildlife Stamps (similar to Duck Stamps or Colorado Wildlife stamps) to both Alaska residents and nonresidents. Sales should be broad-based and aimed at nonconsumptive users of wildlife rather than at commercial operators.

9. Recommendations

Synopsis: Chapters 3 through 8 contain recommendations specific to the subject matter of the individual chapters. The recommendations made on the subjects of Kodiak bear habitat, harvest issues, redefining bear-management strategy, bear-human interactions, research and monitoring, and education are listed in this chapter, with cross-references back to the original chapter text.

9.1 Chapter 3, "Kodiak Bear Habitat"

Based on information provided in chapter 3, the Citizens Advisory Committee (CAC) makes the following recommendations regarding Kodiak bear habitat.

9.1.1 Recommendations about Introduced Species

See section 3.1.1 for background information.

- Identify funding sources to study effects of introduced species on bear habitat (see also chapter 7, "Research and Monitoring").
- 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, consider social issues (e.g., subsistence hunting). Research should be subject to peer review (also see chapter 7, "Research and Monitoring").
- Federal and state governments work with villages and other landowners to maintain the species that currently exist on the Kodiak archipelago.
- Guard against the introduction of additional nonindigenous species that could prove harmful to bears and their habitat. (See also section 6.4.1.)

9.1.2 Recommendations about Salmon as a Part of Bear Habitat

See section 3.1.1 for background information.

- Endorse the Kodiak Area Salmon Management plans that regulate commercial fishing on and around the archipelago.
- Continue to collect salmon escapement data to ensure the sustainability of salmon stocks.
- Support operation of essential weirs islandwide and acquire weir sites where appropriate.
- Ensure that easements for access to weir sites be restricted to use by essential personnel.

- Continue to design all salmon enhancement and rehabilitation projects to minimize disturbance of bears and to avoid unnecessary damage to their wild habitats (see Appendix F for more information about salmon enhancement and rehabilitation projects).
- Recognize that the protection of riverine and coastal habitats for bears will help sustain the annual Kodiak salmon commercial harvest, which generates an average exvessel value of $35 million and provides as many as 5,000 associated jobs.

9.1.3 Recommendations Regarding Afognak Island

See section 3.2.1 for background information.

- Establish an education plan and explore economic incentives aimed at encouraging public and private landowners to consider the effects of motorized access on bears.
- Establish an education plan and explore economic incentives aimed at encouraging private landowners to continue land-management programs that are consistent with wildlife conservation.
- Teach outdoor recreationists to be bear-aware.
- Urge ADF&G, sports enthusiasts, and wildlife conservation groups to cooperate with private landowners to help make their forest practices as compatible as possible with conservation of bears (e.g., continued adherence to the Forest Practices Act and continued use of responsible garbage-management practices).
- Respect private property rights, while recognizing private land owners' responsibilities to adhere to applicable laws in the conservation of bears and their habitats.

9.1.4 Recommendations Regarding Human Activities in Bear Habitat

See section 3.2.2 for background information.

- Maintain or enhance the current high-quality bear habitat on the Kodiak archipelago by protecting riparian areas, including water quality and salmon resources; protecting healthy and contiguous upland areas; and continuing the type of human uses of the area that fosters coexistence.
- Strongly encourage education of outdoor recreationists about bear behavior, impacts to bear habitat, bear-human interactions (e.g., resulting from improperly handled food and trash), field safety practices, and use of bear-resistant containers and electric fences, etc. (see also chapter 3, "Kodiak Bear Habitat").
- Distribute to refuge users educational materials on building safe campfires (see also chapter 3, "Kodiak Bear Habitat").

9.1.5 Recommendations for Land Use, Land Acquisition, and Planning

See section 3.2.3 for background information.

- Continue acquiring small parcels of high-priority bear and salmon habitat from informed, willing sellers.
- Consider bear habitat when evaluating lands for acquisition.
- In any land transfer, recognize subsistence activity, consistent with state and federal laws.
- When their lands are affected, involve village representatives and individuals associated with remote camps in land-acquisition planning.
- Consider bear habitat when conducting land disposals on state land.
- Pursue the acquisition of high-priority bear and salmon habitat on Afognak and Shuyak islands to complete the planned state park units there.
- Through land-use planning, maintain contiguous bear and salmon habitat (i.e., avoid patchwork development).
- Retain state and federal agency access to salmon populations to allow monitoring of stock status. Retain historical salmon rehabilitation and enhancement options identified in Kodiak's comprehensive salmon plan (i.e., lake fertilization, stocking of barren lakes, hydroacoustic surveys of smolt and presmolt populations, use of barrier nets in terminal harvest areas, monitoring of weir sites and fish passes, lake monitoring through limnology assessment, smolt enumeration through mark and recapture, and conducting egg-takes for out-stocking programs) (see also Appendix F).
- Encourage private landowners (e.g., via the use of conservation easements, economic incentives, and education) to consider bear habitat when making land-management decisions.
- Encourage a high level of cooperation among various landowners to achieve ecosystem management objectives for bears.
- Urge all parties to work cooperatively to ensure successful implementation of the conservation easement agreement on the Karluk and Sturgeon rivers watersheds.
- Urge ADF&G, in cooperation with USFWS, to identify key habitat linkages to ensure free movement of bears throughout their natural ranges and to avoid habitat fragmentation.
- Encourage Bureau of Land Management, USFWS, the public, and landowners to together review controversial 17(b) easements and corridors, renegotiate terms and conditions if proved necessary to prevent resource damage, and consider relocating or relinquishing easements that adversely impact important bear habitat. The CAC strongly recommends discouraging off-road vehicle (ORV) use on easements not currently used by ORVs.

9.1.6 Recommendations to Minimize Habitat Degradation

See section 3.2.3 for background information.

- Urge ADF&G, in close cooperation with USFWS, to identify and monitor threats to bears and their habitats and take effective actions to alleviate these threats.
- Encourage appropriate agencies to mitigate damage to bear habitat.
- Urge ADF&G, in close cooperation with USFWS, Kodiak Island Borough, and private landowners, to identify and map all important brown-bear habitats in the archipelago and design action strategies to protect them.

9.1.7 Recommendations Regarding the Shearwater Peninsula[23]

See section 3.3 for background information.

- State lands should continue to be managed consistent with terms of the 1981 Terror Lake Agreement (see Appendix S).
- Alaska Department of Natural Resources should work with ADF&G and USFWS to identify important bear habitat within the Shearwater Peninsula that should be classified as wildlife habitat and protected from land disposal.
- Support fair and timely consummation of the proposed Old Harbor Village Corporation land exchange of Sitkalidak Island for lands on Kiliuda Bay on the Shearwater Peninsula.

9.1.8 Recommendations Relating to Bear-Use Areas

See section 3.4.1 for background information.

- USFWS should work with ADF&G and the Kodiak Unified Bear Subcommittee (KUBS) when reexamining refuge areas that are closed or proposed to be closed to the public and commercial operators (see section 1.4.5).
- On USFWS land, restrict back-country use (e.g., require permits) before resorting to total closure to use (USFWS must be equipped to do so).
- Continue to seek enhanced funding for identification and study of important and critical bear habitat.
- Manage critical bear habitat to prevent adverse impacts.
- Consider restricting human use on important streams if there are documented adverse impacts on salmon stocks, bears, or both.
- Mandate an open public process prior to restrictions and ensure that nothing in these recommendation will conflict with federal and state subsistence laws.

[23] The CAC identified this issue as being of current concern and one for which the CAC is making recommendations for immediate action.

9.1.9 Recommendations Regarding Motorized Access

See section 3.4.1 for background information.

- Create baseline information regarding ORV use throughout the archipelago in order to evaluate areas of problems (see chapter 7, "Research and Monitoring").
- The CAC strongly recommends discouraging ORV use on easements not currently used by ORVs.
- Limit ORV use in important bear habitat areas (i.e., restrict recreational use of ORVs to designated-use areas [e.g., corridors] near villages).
- Develop statewide legislation to require the licensing and registration of ORVs.
- Kodiak Island Borough (KIB) coordinate efforts among ADF&G, USFWS, private landowners, ORV users, and other interested parties to initiate an ORV planning process.
- Commend private property owners' existing policies restricting motorized public access and encourage continuation of these policies.
- Formally recognize the Kodiak Snow Bruins for its policies regarding responsible snowmachine use.
- To minimize snowmachine impact on bears, additional research is needed to provide the facts necessary to identify highly sensitive areas of brown-bear habitat (e.g., denning areas) (see chapter 7, "Research and Monitoring").
- Develop snowmachine limitations (e.g., closures) for sensitive denning areas.
- Develop an education and enforcement plan for responsible use of ORVs to minimize negative impacts on bear habitat.
- The CAC objects to ORV manufacturers and retailers whose advertising (commercials) encourage unethical and damaging use of ORVs on public lands.
- Seek the cooperation of ORV user groups to encourage more responsible use of ORVs while in bear habitat.
- Prohibit air boats and personal watercraft (e.g., jet skis) in important bear habitat.

9.1.10 Recommendations about Road Building in Bear Habitat

See section 3.4.2 for background information.

- Explore alternatives to building new roads in important bear habitat areas.
- Support closure (i.e., decommissioning) of obsolete logging roads on public and privately owned lands.
- Continue existing practices to limit motorized public access to logging roads.

9.2 Chapter 4, "Harvest Issues"

Based on the information presented in chapter 4, relating to harvesting activities that involve or impact Kodiak bears, the CAC makes the following recommendations.

9.2.1 Recommendations on Management of Bear-Harvesting Activities

See section 4.1 for background information.

- Endorse ADF&G's current bear-management objectives, as modified by recommendations made by the CAC in this management plan (see also chapter 5, "Redefining Bear-Management Strategy").
- Continue to prohibit the baiting of bears throughout the Kodiak archipelago.
- Manage bear populations on carrying capacity and density as well as on harvest objectives (see chapter 5, "Redefining Bear-Management Strategy").
- Recommend that ADF&G refine population estimates in order to maintain a bear population that can sustain a 6 percent annual sport harvest (see chapter 7, "Research and Monitoring").
- Develop a co-management agreement with villages to reduce DLPs (see section 6.2) in and around villages and to provide economic incentives to conserve bears; this would include expansion of bear-safety practices, solid-waste management, encouraging Natives to become registered big-game guides, and consideration of bear-hunting permits in areas adjacent to villages.
- ADF&G, USFWS, and other appropriate groups should develop informational and educational materials to help minimize bear-human conflicts and thereby improve hunter image. These materials should be developed for multimedia use and include the following subjects (see chapter 8, "Education"):
  - trip planning and physical conditioning
  - meat handling and storage skills
  - bear behavior and safety
  - a safety-in-bear-country video for wide distribution and use

9.2.2 Recommendations on Village Subsistence Use of Kodiak Bears

See section 4.2 for background information.

- Continue to provide opportunities for subsistence uses of bears by local residents, consistent with conservation provisions essential to sustain the resource.

9.2.3 Recommendations about Sport Hunting of Kodiak Bears

See section 4.3 for background information.

- Maintain the tradition of bear hunting, consistent with the conservative management and regulatory regime that avoid overharvest of the resource.
- Maintain the tradition of bear hunting, consistent with the highest ethical standards of safety and fair chase.
- Ensure that all hunters are provided with the Boone & Crockett fair-chase statement[24] and that it is printed on all ADF&G and USFWS materials relating to hunting, as appropriate (see also Appendix C).
- If reductions in harvest are necessary, consider ways of reducing the female harvest prior to reducing permit numbers (i.e., skull-sex minimums in southwestern Kodiak).
- To better achieve wildlife-acceptance capacity (see section 5.3) along the Kodiak road system, increase bear harvest by extending the spring bear-hunting season to May 31.

9.2.4 Recommendations Relating to Guiding

See section 4.4 for background information.

- Strongly support the restrictive guide system currently in use on federal lands of the Kodiak archipelago and encourage reinstatement of this system on other lands.
- Support the Alaska Board of Game resolution 98.127, 1998, (see Appendix R) requesting reinstatement of the Big-Game Commercial Services Board.
- Guides/outfitters and transporters should make bear-safety educational materials available to elk hunters.

9.2.5 Recommendations on Other Resource-Extraction Activities

See section 4.5 for background information.

9.2.5.1 Recommendations about Sport Hunting

- Urge ADF&G to 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 also chapter 8, “Education,” and chapter 7, “Research and Monitoring”).
- Require mandatory hunter education, which should include bear-safety instruction, before entering the field in GMU 8 (see also chapter 8, “Education”).
- Encourage hunters to quickly remove kill meat to a safe distance from the kill site.

[24] Fair Chase, as defined by the Boone and Crockett Club, is the ethical, sportsmanlike and lawful pursuit and taking of any free-ranging wild, native North American big-game animal that does not give the hunter an improper advantage over such game animals.

- Using the ADF&G Web site and brochures, educate hunters about terrain issues (see also chapter 8, "Education").
- Urge ADF&G to develop other educational tools (e.g., videos using local people) to educate hunters about hunting in bear country (see also chapter 8, "Education").
- Submit an article about hunting on Kodiak (written by Hank Pennington) to a sporting magazine (see chapter 8, "Education").
- Place educational materials in places (and with people) where they can be readily accessed (e.g., Web site, airport, magazines, tourism offices, USCG base, villages, guide/outfitters, public libraries, schools, museums, ferries, tribal council offices, Fish & Wildlife Protection officers, Alaska State Park offices and state parks staff, public radio, and television) (see also chapter 8, "Education").
- Recommend strongly that elk hunters hunt in groups or teams.
- Limit the harvest of deer to the number of animals the hunter can handle.
- Encourage hunters to promptly gut the harvested animal and move it to a safe, visible location.
- Encourage hunters to store meat responsibly so it won't attract bears (e.g., high in trees, within electric fences); use of mini-electric fences is advised.
- Encourage hunters to be aware of carcasses or gut piles from animals harvested by others.
- Urge ADF&G, USFWS, and other appropriate groups to develop educational materials to eliminate conflicts between deer hunters and bears (e.g., how to handle meat, safety, location, bear posture) (see also chapter 8, "Education").

9.2.5.2 Recommendations Regarding Commercial Fishing

- Salmon escapement goals should continue to allow for natural predation by bears and other wildlife (see Appendix F, "Principles and Criteria for Sustainable Salmon Fishing," and Appendix U, "Policy for Statewide Salmon Escapement Goals").
- Continue evaluating species-specific salmon escapement levels against drainage-specific bear use of salmon; investigations should emphasize an ecosystem overview (e.g., salmon biological escapement goal [BEG] rather than bear densities) (see chapter 3, "Kodiak Bear Habitat" and chapter 7, "Research and Monitoring").
- 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").

9.2.5.3 Recommendations Regarding Sport Fishing

- Urge ADF&G to evaluate whether increased human activity will lead to increased negative bear-human encounters in areas of especially high bear use (see chapter 7, "Research and Monitoring").

- Identify areas where hardened[25] fishing campsites would minimize bear-human conflicts (see chapter 7, "Research and Monitoring").
- Encourage Kodiak Unified Bear Subcommittee (KUBS), ADF&G, and USFWS to work together to identify areas where there may need to be restrictions on camping and other activities because of the potential displacement of bears (see chapter 7, "Research and Monitoring").
- Designate food-storage areas, especially at Bare Creek.
- Continue use of electric fences or other practical means of excluding bears from anglers' food caches on KNWR and in other areas and jurisdictions of the Kodiak archipelago.
- Develop an educational program for anglers in cooperation with professional organizations, agencies, and sportsmen's groups to include information about proper food and fish storage and cleaning of fish (see chapter 8, "Education").
- Encourage the use of bear-resistant food containers and require their use in areas of high bear concentrations (e.g., along prime sport fishing streams).
- In certain bear-feeding areas, there is a predictable, seasonal increase in potential bear-human conflicts related to sport fishing activities. The CAC recognizes that ADF&G Division of Sport Fish biologists are not authorized to write emergency orders to manage a sport fishery to address bear conservation. The CAC recommends that ADF&G Divisions of Sport Fish and of Wildlife Conservation cooperatively prepare an integrated management plan for approval by the combined Board of Fisheries and Board of Game, with the prime purpose of the management plan being to reduce bear-human conflicts associated with sport fishing. This plan should determine the carrying capacity for anglers and guide operations at favored fishing sites and the setting of limits necessary to maintain a high-quality wilderness sport fishing experiences.

9.2.5.4 Recommendations Regarding the Harvest of Plants and Berries

- Develop methods to objectively document annual abundance and availability to bears of vegetation in representative habitats on the Kodiak archipelago.
- Research the impact on bears of commercial use of salmonberries and blueberries.

9.2.6 Recommendations on Regulations and Enforcement

See section 4.6 for background information. Following are those recommendations for regulations and enforcement other than those relating to DLPs (which are discussed in chapter 6, "Bear-Human Interactions").

[25] 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.

- Ensure a level of cooperative state and federal law enforcement deemed essential to achieve compliance with conservation laws, rules, and regulations; preventive education should be the first priority in this regard (see also chapter 8, "Education").
- Provide better funding and staffing of the state Division of Fish & Wildlife Protection to achieve the optimum level of law enforcement presence on the Kodiak archipelago.
- Urge state and federal wildlife protection and enforcement agencies to take appropriate actions under existing law to prevent trade in Kodiak bear parts.
- Identify appropriate elders and leaders to work with village public safety officers (VPSOs) to help educate residents about conservation laws, rules, and regulations (see also chapter 8, "Education").
- To foster cooperation, request that the Alaska Department of Public Safety, Division of Fish & Wildlife Protection, and the U.S. Fish & Wildlife Service conduct annual outreach programs, explaining regulations and enforcement issues (including DLPs) in communities throughout the Kodiak archipelago (also see chapter 8, "Education").
- ADF&G and USFWS work with the USCG to identify those areas and seasons in which bears and hunters are particularly vulnerable to harassment by overflying and to encourage reinforcing USCG policy minimizing low overflight in these areas (see also sections 4.6 and 6.7).
- Continue education cooperation among the agencies annually, or more often as required, to alert new air crews to these concerns and policies and to continue good relations within the communities (also see chapter 8, "Education").
- Encourage USFWS to make enforcement of off-road vehicle (ORV) regulations a priority on the Kodiak National Wildlife Refuge.
- Cross-deputize Division of Fish and Wildlife Protection officers and Kodiak National Wildlife Refuge officers to provide authority for enforcing pertinent state and federal sport fish, wildlife, and refuge laws.

9.3 Chapter 5, "Redefining Kodiak Bear-Management Strategy"

9.3.1 Recommendations on Redefining Kodiak Bear-Management Strategy

Based on the information provided in chapter 5, the CAC makes the following recommendations:

- ADF&G manage bear populations based on carrying capacity and density as well as on harvest objectives (see Figure 5-1 and Table 5-2).
- ADF&G reduce the bear population on northeastern Kodiak Island (i.e., along the road system; area 30 of management subunit #2 on Figure 5-1) by 10–20 percent below the current estimated level through liberalized sport hunting seasons in the spring (see also section 4.3) and issuance of appropriate depredation permits.

- Urge ADF&G and USFWS to dedicate funds to survey Afognak Island and the Kodiak road system (management subunit # 1 and area 30 of management subunit #2) as soon as possible to determine accurate bear populations (also see chapter 7, "Research and Monitoring").
- Encourage ADF&G, USFWS, and village tribal councils to work together to gather data on bear populations and carrying capacity for management purposes.

9.4 Chapter 6, "Bear-Human Interactions"

Based on information provided in chapter 6, regarding various interactions between humans and bears, the CAC makes the following recommendations.

9.4.1 Recommendations about Habituation and Food-Conditioning of Kodiak Bears

See section 6.1 for background information.

- To understand human habituation and its effects on bears, the CAC recommends that ADF&G and USFWS conduct long-term research into the effects of sport fishing and bear viewing on Kodiak bears (see also chapter 7, "Research and Monitoring").
- Enforce regulations prohibiting the feeding of food, garbage, or fish to bears.
- Provide education to prevent food conditioning of bears by humans (see also chapter 8, "Education").

9.4.2 Recommendations Regarding Defense of Life or Property Kills

See section 6.2 for background information.

- Continue to follow state regulations regarding bears killed in DLP.
- The Kodiak Fish and Game Advisory Committee should propose a change in state hunting regulations to establish and authorize use of depredation permits.[26]
- ADF&G should develop strict criteria for issuance of depredation permits for problem bears. These permits should be issued only after reasonable, nonlethal methods to deal with problem bears have been exhausted.
- Conduct research and monitoring to evaluate the effectiveness of depredation permits (see also chapter 7, "Research and Monitoring").
- Encourage village residents, village public safety officers (VPSOs), and appropriate agencies to work together to develop information and education materials and strategies to reduce bear-human conflicts in the villages (see also chapter 8, "Education").
- State troopers and USFWS should provide information to rural residents about the laws, rights, and duties regarding DLPs (see also chapter 8, "Education").

[26] Depredation permits would be issued to an individual, to allow killing of a problem bear, in a specific incident and would only be available after careful consideration by ADF&G's Kodiak area biologist. Reporting and salvage requirements would be the same as under the DLP provisions.

- Through a co-management agreement with the state, use village committees and VPSOs to take responsibility for working on DLP issues in villages, including solid-waste management issues; this should include a significant educational component (e.g., schools, videos, and employing elders) (see also chapter 8, "Education").

9.4.3 Recommendations Regarding Solid-Waste Management and Storage of Human and Pet Food

See section 6.3 for background information.

9.4.3.1 Recommendations about Landfill Management

- Encourage the Kodiak Island Borough (KIB) and individual communities to develop community-specific waste-management plans that include implementation and funding strategies.
- Encourage village governments to seek federal, state, and local funding such that village landfills can meet federal standards and Alaska Department of Environmental Conservation (DEC) regulations and such that those regulations can be enforced at solid-waste disposal sites, thereby reducing their attractiveness to bears.
- Request the State of Alaska to increase funding for the Revenue Sharing/Safe Communities programs, which would provide additional funding to small city governments (see also section 6.3.1.2).
- Encourage cities to utilize additional funding for employment of electric fencing, incineration, and bulldozers for regular and frequent covering of garbage at landfills (see also section 6.3.1.2).
- Enforce DEC regulations at dump sites, thereby reducing their attractiveness to bears.
- Enforce existing landfill regulations from the federal government and for DEC.
- Distribute the ADF&G Policy on Solid Waste Management and Bears in Alaska to agencies and communities and ensure that it is adhered to (see also section 6.3.1.2, and Appendix L).
- Encourage owners of remote cabins and lodges to use properly managed public landfills whenever possible; when private solid-waste disposal sites are necessary, encourage landowners to work with wildlife managers to devise appropriate ways to minimize bear encounters.
- Prohibit, by borough or other local ordinance, bear viewing at solid-waste disposal sites.
- Clear areas adjacent to landfills of trees, brush, and tall grass that can serve as cover for bears (the distance to be cleared depends on the terrain and habitat of the area and should be determined with assistance of wildlife managers).

- Cover landfills often and thoroughly, keeping the active area of waste deposition minimal (at sites where bears are frequent visitors, increased covering and/or compaction of garbage will reduce the area in which bears can search for food; as that active area of garbage gets smaller, competition among bears increases, and subdominant bears opt to find other food sources).
- Encourage recycling programs to reduce the amount of waste deposited in landfills.
- If possible, use incineration to reduce space necessary for landfills and to reduce odors and food sources.
- Install electric fencing around a landfill after the site has been cleared and bear numbers have declined through reduction of active areas. (Electric fences should be well-designed to suit the needs of individual sites and maintained by qualified personnel. Periodic inspections should be scheduled to look for damaged portions of the fences, to remove debris from the fences, and to look for places where bears have tried to burrow under the fences. The fences should remain electrified at all times except during maintenance.)
- Install safe, effective, and easy-to-operate gates (self-closing, if possible) at each landfill and make specific individuals responsible for ensuring that gates remain closed.
- Prior to erecting an electric fence, and immediately after it is up and running, inform residents of the program and the fact that some bears will be displaced (Appendix M). (Note that an increase in bear-human encounters can be expected for the first couple of years the fence is operating.)
- Encourage wildlife managers, residents, and civil officials to work together to devise improvements to keep bears out if they continue to gain access to properly designed landfills.

9.4.3.2 Recommendations Regarding Larsen Bay Solid-Waste Disposal Site[27]

- Remediate the Larsen Bay solid-waste site situation in a stair-step approach:
  - Clear the area around the waste site of alders and brush to create a barren zone to make the bears uncomfortable
  - Quickly bury the garbage.
  - Construct an electric fence around the sited and a with means restricting access to the site.
- Seek funding for the necessary measures to reduce food-conditioning and habituation by humans of bears at the Larsen Bay solid-waste disposal site.
- The CAC recognizes the Larsen Bay waste site is a high-priority area for remediation and should be addressed as quickly as possible.
- Prohibit, by borough or other local ordinance. bear viewing at solid-waste disposal sites.

[27] The CAC identified this issue as being of current concern and one for which the CAC is making recommendations for immediate action.

9.4.3.3 Recommendations about Food Storage and Solid-Waste Management

- Strictly enforce regulations prohibiting feeding of bears.
- Develop better regulations and enforcement regarding food, garbage, and fish-handling in bear areas.
- Vigorously enforce littering laws and laws that prohibit feeding bears. Encourage residents to work within their neighborhoods to identify and correct potential problem areas.
- Encourage residents to keep garbage in enclosed areas and to empty garbage often during the summer months. Plastic trash bags should be used to line garbage cans, and cans should be washed periodically.
- Encourage residents to store pet and domestic livestock food indoors (if pets are fed outdoors, care should be taken to only provide the amount of food that can be eaten within an hour).
- Encourage residents to house pets and domestic livestock in bear-resistant enclosures when not attended (electric fencing has been proved as an effective and inexpensive tool for separating bears and livestock).
- Remove trees, brush, and grass that can serve as cover for bears near residences, bus stops, playgrounds, garbage-storage areas, and pet or livestock pens.
- Ensure that residents have access to information on how to use noise-makers and lighting to chase bears from their yards; rubber bullets, bean-bag shells, and pepper spray are also effective, but should only be used by trained operators (prior to using any deterrents, all potential food sources should be removed from the area).
- Use bear-resistant dumpsters (all metal, designed in a manner that is compatible with existing collection equipment, relatively easy to use by most people, and preferably with self-closing lids) wherever there is dumpster service on Kodiak Island; close coordination with waste-management contractors is essential.
- Locate dumpsters as far as possible from school bus stops and other places where children congregate; do not place dumpsters near natural food sources (such as salmon streams) or domestic livestock; brush-clearing and lighting near dumpsters are desirable.
- Establish appropriate collection schedules to ensure that dumpsters do not become overly full.
- Encourage KIB to monitor waste-collection schedules and take appropriate action, as needed.
- If there are persistent bear problems in an area, temporarily remove the dumpster; if it is removed, a sign should be placed at the site to inform residents of when it was removed, why it was removed, where it was taken, and when it is expected to be returned.
- In villages, assign specific individuals to provide collection services (e.g., emptying dumpsters, if appropriate); these individuals should receive adequate compensation for their duties and should be held accountable for their performance.

- Encourage everyone using remote areas to remove all solid waste from the area: i.e., pack it in and pack it out) (see also chapter 8, "Education").
- As soon as possible, seek funding from local, state, and federal sources to implement appropriate solid-waste management improvements (the KIB program should be developed as a blueprint example of how to keep bears from getting food or garbage from areas of human habitat).
- Recognize the following groups for their efforts to reduce bear-human encounters around Kodiak and encourage continuation and expansion of these activities:
  - Fish processors for collecting garbage from setnet sites
  - Air-taxi operators for taking out garbage for campers, hunters, and anglers
  - Logging camps on Afognak and remote cannery operators for developing effective waste-management techniques
  - Alaska State Parks and Kodiak National Wildlife Refuge for developing and enforcing waste-management policies at remote cabins
  - Kodiak Island Borough and the U.S. Coast Guard for taking leadership roles in establishing effective solid-waste management techniques on the Kodiak road system
- To minimize bear problems, educate people about handling personal property, including chicken pens, drying sheds, food-storage areas, and pet food (see also chapter 8, "Education").
- Develop an intergovernmental working group composed of representatives from wildlife management agencies (ADF&G, USFWS), the Kodiak Fish & Game Advisory Committee, public safety agencies (Alaska State Troopers, local and military police departments), local governments (city, village, and borough), and Alaska State Parks. The working group should meet at least once each spring to review current policies to reduce bear-human encounters and to coordinate efforts for the upcoming year (see also chapter 8, "Education").
- Establish lines of communication among agencies with various areas of responsibility (Appendix J provides an example of how bear reports on the Kodiak road system are handled).
- Provide public information on actions planned by the intergovernmental working group and encourage public input and questions on those actions (see also chapter 8, "Education").
- Make available public information in a variety of media, including print, radio, public television, and personal appearances; attempt to meet the special needs of various cultures and ethnic groups (see also chapter 8, "Education").
- Make the public outreach program ongoing, with emphasis on bear behavior and suggestions on how to minimize negative bear-human interactions (see Appendix K) (comparisons of bear behavior around food and garbage to dog behavior in similar situations can be helpful in improving understanding).

- Advertise laws and regulations relating to leaving food or garbage in a manner that attracts wildlife (see also chapter 8, "Education").
- Encourage agencies to disclose management actions such as moving dumpsters, citing individuals for littering, aversive conditioning of bears, and lethal actions against problem bears (all actions relating to bear-human interactions are matters of public record).
- Encourage the public to report to authorities observations of bears near human habitations (these observations can help to track the activities of individual bears and allow managers to alert school principals and residents of areas in which to be especially cautious; observations should not be advertised to the general public, however, to avoid encouraging peoples' seeking out bears) (see chapter 8, "Education").
- Disseminate to the public information about ADF&G's policy regarding relocation of nuisance bears (see Appendix L), which the CAC endorses.
- Locate on-site bear safety reminders on dumpsters (e.g., "Be Bear Aware") and at collections sites (i.e., public landfills) (see also chapter 8, "Education").
- Ensure that visitors are made aware of the efforts to keep bears away from human food and garbage; individual responsibilities of visitors should be outlined and disseminated so that they recognize their role in preventing problems (see also chapter 8, "Education").

9.4.4 Recommendations Regarding Livestock Ranching

See section 6.4 for background information.

- Support the KIB Commercial Grazing and Conservation Zoning Plan.
- Encourage ranchers to continue practices that minimize bear predation.
- Recognizing the seriousness of foot and mouth disease and chronic wasting disease, the state should continue research about them and develop strategies to prevent their occurrence in Alaska.

9.4.5 Recommendation Regarding Compensation for Property Loss

See section 6.5 for background information.

The CAC decided that the institution of depredation permits, coupled with education about steps to take to minimize problems with bears, was more appropriate than seeking compensation for property loss at this time.

9.4.6 Recommendations Related to Bear-Viewing Activities

See section 6.6 for background information.

9.4.6.1 Recommendation Regarding Public-Use Restrictions on the Kodiak National Wildlife Refuge

See section 6.6.2.2 for background information.

- Recommend that KNWR initiate a step-down re-evaluation process for the PUMP area closures in light of the fact that new data are needed (research data are 12 yr old) and that the public-use potential, on which some of the closures were based has not been fulfilled and likely won't be.

9.4.6.2 Recommendation Regarding Frazer Fish Pass

Recognizing the practical benefits of the solution implemented by USFWS for guided sport fishing, and in order to keep the rules fair and consistent for guided and unguided anglers, the following change should be made to State of Alaska sport fishing regulations: modify waters closed to sport fishing on the Dog Salmon River to prohibit fishing within 200 yd downstream of the Frazer fish pass from June 1 through August 31. (By recommending this closure, the CAC does not imply support for sport-fishing closures in other systems on the Kodiak archipelago to create bear-viewing opportunities.)[28]

9.4.6.3 Recommendations Regarding Bear Viewing

See section 6.6 for background information.

The CAC has requested formation of the Kodiak Unified Bear Subcommittee (KUBS), (see also section 1.4.5). Among its other tasks, KUBS would ensure the implementation of the following recommendations in an open, public forum:

- Evaluate bear-viewing sites around the archipelago using a set of important criteria such as private or public land ownership, number of human users and timing of bear use, accessibility to visitors, existing viewing use, proximity to local communities or dwellings, competing uses, and compatible uses.
- Develop a general set of operational guidelines relating to bear-viewing sites that protect all natural resources.
- Review the following lands within the borders of KNWR to consider suitability for re-opening (access to some of the following public and private lands is restricted or closed to the public, to commercial operators, or to both:
  - Area closed by regulation to all entry:
    - O'Malley River, June 25–September 30 (2,560 acres)

[28] The CAC identified this issue as being of current concern and one for which the CAC recommended immediate action. As a result, the Alaska Board of Fisheries, in January 2002, adopted the recommendation made by the CAC to prohibit fishing within 200 yd downstream of the Frazer fish pass from June 1 through August 31.

- Areas administratively closed to all commercial users and their clients:
  - Connecticut Creek, July 15–August 31 (2,262 acres)
  - Dog Salmon River, June 25–August 31 (960 acres)
  - Humpy Creek, July 15–September 15 (2,879 acres)
  - Seven Rivers, July 15–September 15 (3,796 acres)
- Areas administratively restricted to day-use only by all commercial users and their clients:
  - Red Lake River/lakeshore, July 1–August 31 (1,746 acres)
  - Upper Thumb River, July 1–August 31 (613 acres)
  - Southeast Creek, July 15–August 31 (1,108 acres)
  - Little River Lake/lakeshore, July 15–August 31 (480 acres)
  - Deadman Bay Creek, July 15–August 31 (951 acres)
- Access restrictions imposed by private landowner (permit required):
  - Karluk Lake and River

· Review the following areas, which may also have restrictions or closures to public access, to commercial operators, or to both:

- Frazer fish pass
- Lower Dog Salmon Falls
- Humpy Cover
- Red Lake SE Creek
- Ayakulik River at its confluence with the Red River

· If sites are selected for formal regulation as bear-viewing sites, formulate rules and guidelines for the use of viewing areas to address the following:

- access
- camping
- education
- bear safety
- group size limits
- firearm possession and use by viewers
- food and garbage handling and storage
- sport fishing

· Investigate sites on the northern archipelago for possible bear-viewing locations (e.g., Paul's Lake, Litnik, Portage, Foul Bay, Hidden Lake).

- Determine the optimum number of people who can use any area at any one time and that will best meet the public demand and still be compatible with refuge purposes and conservation. In the case of Frazer fish pass, this determination should be made soon[29].
- USFWS monitor human activities in areas that have come to its attention as being of high interest or use; the amount of total use and the types of users (e.g., guided, unguided, viewers, anglers) should be recorded.
- USFWS encourage only those bear-human interactions that are compatible with maintaining the natural behavior of wild bears and protection of their wilderness habitat.
- Recommend that, if use of an area is found to consistently exceed an acceptable human saturation level or begins to consistently displace bears, the following controls, in descending order of implementation as needed, be implemented:
  1) a site-specific set of use regulations that applies to all users
  2) limitations on group sizes
  3) required back-country permits for unguided users and a prospectus process for commercial operators
- If sites are selected for formal regulation as bear-viewing sites, develop a set of recommended allocation levels for guided and unguided use visitations that is designed to avoid conflict with the following:
  - sport fishing
  - hunting
  - agriculture and livestock ranching
  - commercial fishing
  - weirs
  - setnet sites
  - public-use cabins
  - adjacent private land owners
  - human habitations
- Develop requirements for levels of use, allocation of use, public and commercial access, and permitting based on experience and history of similar existing federal and state programs (see Appendix G for information about existing programs); these requirements should minimize conflicts between bear viewing and other wildland-recreation interest groups.
- Recommend USFWS conduct a needs assessment for bear-viewing opportunities on public land, and, when conditions warrant, establish a unique viewing area, on public land, with the following attributes and conditions

[29] The CAC reminds USFWS and ADF&G that commercial operators and public users require adequate advance notice of regulatory changes and the time to respond.

  - use by tightly controlled small groups (no more than 12 persons per day) and supervised on-site activities
  - permits issued by drawing for off-site overnight stays of no more than three days
  - remainder of permits available for day use by guides, air taxi operators, and individuals
  - unsuccessful applicants and visitors provided with comprehensive information about alternative bear-viewing opportunities on the archipelago

- Recommend USFWS reopen O'Malley Creek area to bear viewers June through September employing a management strategy that allows guided day-use bear viewing.
- Manage any bear-viewing sites on KNWR lands consistent with refuge purposes.
- Prohibit establishing industrial tourism viewing with infrastructure such as that at Brooks Camp.
- Disseminate bear-viewing guidelines for the public and private sector that reflect safety while viewing bears from the ground or by walking, and procedures to alert bears to human presence. These guidelines should stress low-impact bear viewing by all users in all locations and should be similar to those of the North American Nature Photographers Association (NANPA; see Appendix H) (see also section 6.6.3 and chapter 8, "Education").
- Require ADF&G and USFWS training, and oversight of pertinent regulations, for all guided bear-viewing programs.
- Recommend that ADF&G and USFWS conduct annual bear-viewing guide clinics.
- Encourage private landowners that develop bear-viewing opportunities on private land to do so within accepted state and commercial guidelines.
- Create economic incentives for bear management, including bear viewing, in the villages.
- Investigate road-accessible wildlife- and bear-education opportunities that would minimize negative bear-human conflicts (a suggested area is along Buskin Lake near the golf course). The area could include interpretive signs dealing with wildlife management, habitat, track identification, realistic bear-viewing opportunities, and safety. Small spotting scopes, such as those at Fort Abercrombie, could be installed so that visitors can get a close-up view of habitat areas for bears, goats, ducks, eagle, etc. Other areas suggested for bear education/interpretive signing/viewing possibility on the road system are Buskin River State Recreation Site and Fort Abercrombie State Historical Park. (see also chapter 8, "Education").

- Seek funding for islandwide education and regulation of bear-viewing businesses through, but not limited to, the following (see also chapter 8, "Education"):
  - reasonable permit fees
  - sale of Kodiak Wildlife Viewing stamps
  - Wildlife Restoration funds
  - Land and Water Conservation Fund
- Recommend the statewide sale of Wildlife Stamps (similar to Duck Stamps or Colorado Wildlife stamps) to both Alaska residents and nonresidents. Sales should be broad-based and aimed at nonconsumptive users of wildlife rather than at commercial operators.
- Encourage bear-viewing visitors to constantly attend food and garbage or store food in bear-resistant containers and to not display or consume food in a manner that may attract bears.
- Recommend that USFWS make its policies concerning wildlife photographers consistent with those of USDA Forest Service, National Park Service, Bureau of Land Management, and Alaska State Parks.
- Recommend that USFWS and ADF&G continue to research bear viewing on KNWR (see also chapter 7, "Research and Monitoring").
- Recommend that USFWS implement practical, site-specific, and biologically based objectives and compatibility standards for wildlife viewing in bear concentration areas using the best technical information and a stakeholder planning process. Guidelines for development of objectives and standards include the following:
  - sites with established viewing use—based on existing amount and pattern of bear use and public use
  - sites with no established viewing use—based on amount and pattern of bear use before public use introduced

9.4.7 Recommendations Regarding Use of Aircraft on the Kodiak Archipelago

See section 6.7 for background information.

- Enforce federal and state laws and regulations that prohibit disturbance of wildlife with an aircraft.
- Manage aircraft use in wildlife-viewing operations: Develop—through the cooperation among appropriate regulatory agencies, private landowners, and commercial service groups—guidelines describing minimum altitudes, flight paths, horizontal distances, and access points. Following are suggested guidelines:
  - When viewing from an airplane while in the air, remain more than 800 feet from the bear or bears.
  - Prohibit intentional bear viewing by helicopter.

  - While flying near viewing areas, transit the area quickly, avoid circling or directly overflying the viewing area, and be considerate of viewers on the ground.
  - Do not take off or land within 300 feet of visible bears.

- Encourage commercial providers of bear-viewing services to adopt standards of operation.
- Urge commercial operators to ensure that all equipment, guides, pilots, and boat operators meet all federal, state, and local requirements that apply to their operations.
- Enforce state and federal laws regarding the intentional harassment of bears with aircraft.
- To minimize disturbance to bears, develop guidelines for overflying by helicopters for recreational purposes.
- To minimize disturbance to bears, develop guidelines for overflying by fixed-wing aircraft for recreational purposes.

9.4.8 Recommendation Regarding Public-Use Cabins

See section 6.8.1 for background information.

- Proposed new public-use cabins on, or those acquired through land acquisition on KNWR that cause serious adverse impact on important bear habitat or serious conflicts with guides or other user groups should be reevaluated for relocation to more suitable sites.

9.4.9 Recommendation Regarding Other Remote Cabins

See section 6.8.2 for background information.

- All new remote cabins, or land disposals for the purpose of building new remote cabins, that cause serious adverse impacts on important bear habitat or serious conflicts with guides or other user groups should be re-evaluated for location at more suitable sites.

9.5 Chapter 7, “Research and Monitoring”

Based on background information provided in chapter 7, the CAC made the following recommendations about research and monitoring activities.

9.5.1 Recommendations Regarding Monitoring (in priority order)

- 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 4, "Harvest Issues").
- Develop methods to objectively document annual abundance and availability to bears of vegetation in representative habitats on the Kodiak archipelago (see chapter 3, "Kodiak Bear Habitat").
- Monitor the bear population carefully on an annual basis to ensure survival of the optimum sex and age distribution of bears.

9.5.2 Recommendations for Future Research

9.5.2.1 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 chapter 4, "Harvest Issues").
- 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").

9.5.2.2 Research on Habitat

- Kodiak National Wildlife Refuge should detail its management intent for the Mt. Glottof Research Natural Area (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, additional research is needed 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”).

9.5.2.3 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[30] fishing campsites would minimize bear-human conflicts (see chapter 3, "Kodiak Bear Habitat").
- 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).

9.6 Chapter 8, "Education"

9.6.1 Recommendations Relating to Bear-Education

Based on the information provided in chapter 8, the CAC makes the following recommendations:

9.6.2 User Education—General

- Develop an intergovernmental working group composed of representatives from wildlife management agencies (ADF&G, USFWS), public safety agencies (Alaska State Troopers, local and military police departments), local governments (city, village, and borough), the Kodiak Fish & Game Advisory Committee, and Alaska State Parks. The working group should meet at least once each spring to review current policies to reduce bear-human encounters and to coordinate efforts for the upcoming year (see chapter 6, "Bear-Human Interactions").
- Develop a bear education kit, similar to that developed on the Kenai Peninsula (see section 8.2.1), for Kodiak archipelago communities. It would include locally relevant materials that either already exist or need to be developed. A group of educators and biologists, similar to the one working on the Kenai kit, would work together to finalize and field test the Kodiak kit. Upon completion of the kit, ADF&G Project WILD staff and facilitators would develop and facilitate training sessions for teachers in each Kodiak archipelago community.
- Ensure a level of cooperative state and federal law enforcement deemed essential to achieve compliance with conservation laws and regulations; preventive education should be the first priority in this regard (see section 4.6).
- Establish lines of communication among agencies with various areas of responsibility. (Appendix J provides an example of how bear reports on the Kodiak road system are handled.) (See chapter 6, "Bear-Human Interactions.")

[30] 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.

- Strongly encourage education of outdoor recreationists about bear behavior, impacts to bear habitat, bear-human interactions (e.g., resulting from improperly handled food and trash), field safety practices, and use of bear-resistant containers and electric fences, etc.
- To minimize bear problems, educate people about handling personal property, including chicken pens, fish-drying sheds, food-storage areas, and pet food (see section 6.3.2).
- Ensure that visitors are made aware of the efforts to keep bears away from human food and garbage; individual responsibilities of visitors should be outlined and disseminated so that they recognize their role in preventing problems (see section 6.3.2).

9.6.3 User Education—Hunters

- Urge ADF&G, USFWS, and other appropriate groups to develop informational and educational materials to help minimize bear-human conflicts and thereby improve hunter image. These materials should be developed for multimedia use and include the following subjects (see section 4.1):
  - trip planning and physical conditioning
  - meat handling and storage skills
  - bear behavior and safety
  - a safety-in-bear-country video for wide distribution and use
- Encourage guide/outfitters and transporters to make bear-safety educational materials available to all hunters (see section 4.5.1).
- Encourage ADF&G to continue to track the number of bears killed by deer, elk, and goat hunters to minimize such bear mortality. ADF&G should 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 7, "Research and Monitoring").
- Require a mandatory hunter-safety course, which should include bear-safety instruction, before going afield to hunt in GMU 8 (see chapter 4, "Harvest Issues").
- Encourage ADF&G to develop other educational tools (e.g., videos using local people) to educate hunters about hunting in bear country (see chapter 4, "Harvest Issues").
- Submit an article (written by Hank Pennington) about hunting on Kodiak to a sporting magazine (see chapter 4, "Harvest Issues").

9.6.4 User Education—Off-Road Vehicles

- Create an educational program to encourage responsible use of off-road vehicles (ORVs) to minimize negative impacts on bear habitat (see chapter 3, "Kodiak Bear Habitat").

9.6.5 User Education—Anglers

- Develop an educational program for anglers in cooperation with professional organizations, agencies, and sportsmen's groups to include information about proper food and fish storage and cleaning of fish (see chapter 4, "Harvest Issues").
- Include bear biology, behavior, and safety information in the KNWR salmon camp curriculum..

9.6.6 User Education—USCG

- Continue education cooperation between ADF&G and the USCG annually, or more often as required, to alert air crews to their wildlife-conservation responsibilities and to promote good relations within the community (see sections 4.6 and 6.7).

9.6.7 Economic Incentives and Land Management

- Establish an education plan and explore economic incentives aimed at encouraging public and private landowners to consider the effects on bears of motorized access and to continue land-management programs that are consistent with wildlife conservation (see chapter 3, "Kodiak Bear Habitat").
- Encourage private landowners (e.g., via the use of conservation easements, economic incentives, and education) to consider bear habitat when making land-management decisions (see chapter 3, "Kodiak Bear Habitat").

9.6.8 Villages and Rural Residents

- Identify appropriate elders and leaders to work with village public safety officers (VPSOs) to help educate residents about conservation laws, rules, and regulations (see section 4.6).
- Encourage village residents, VPSOs, and appropriate agencies to work together to develop information and education materials and strategies to reduce bear-human conflicts in the villages (see chapter 6, "Bear-Human Interactions").
- Encourage state troopers and USFWS to provide information to rural residents about the laws, rights, and duties regarding killing bears in defense of life or property (DLP) (see section 6.2).
- Through a co-management agreement with the state, use village committees and VPSOs to take responsibility for working on DLP issues in villages, including solid-waste management issues; this should include a significant educational component (e.g., schools, videos, and employing elders) (see section 6.2).

9.6.9 Outreach

- Place educational materials in places (or with people) where they can be readily accessed (Web site, airport, magazines, tourism offices, USCG base, villages, guide/outfitters, public libraries, schools, museums, ferries, tribal council offices, Fish & Wildlife Protection officers, Alaska State Park offices and state parks staff, public radio, and television) (see chapter 4, "Harvest Issues").
- To foster cooperation, the Alaska Department of Public Safety, Division of Fish and Wildlife Protection, and the USFWS conduct annual outreach programs, explaining regulations and enforcement issues (including DLPs) in communities throughout the Kodiak archipelago (see section 4.6).
- Provide public information on actions planned by the intergovernmental working group and encourage public input and questions on those actions (see chapter 6, "Bear-Human Interactions," and chapter 8, "Education").
- Make available public information in a variety of media, including print, radio, public television, and personal appearances; attempt to meet the special needs of various cultures and ethnic groups (see section 6.3.2).
- Make the public outreach program ongoing, with emphasis on bear behavior and suggestions on how to minimize negative bear-human interactions (see Appendix K) (comparisons of bear behavior around food and garbage to dog behavior in similar situations can be helpful in improving understanding) (see section 6.3.2).
- Encourage agencies to disclose management actions such as moving dumpsters, citing individuals for littering, aversive conditioning of bears, and lethal actions against problem bears (all actions relating to bear-human interactions are matters of public record) (see chapter 6, "Bear-Human Interactions").
- Encourage the public to report to authorities observations of bears near human habitations (these observations can help to track the activities of individual bears and allow managers to alert school principals and residents of areas in which to be especially cautious; observations should not be advertised to the general public, however, to avoid encouraging people seeking out bears) (see section 6.3.2).
- Locate on-site bear safety reminders on dumpsters (e.g., "Be Bear Aware") and at collections sites (i.e., public landfill; see section 6.3.2).
- Work with service providers to make available to all visitors educational materials emphasizing bear safety, realistic expectations for bear viewing (including cost of access), Kodiak bear life history, and proper wildlife management. These materials should include ADF&G and KNWR bear-safety brochures and all materials specific to bear viewing (see section 6.6 and chapter 8, "Education").
- Disseminate bear-viewing guidelines for the public and private sectors that reflect safety while viewing bears from the ground or by walking, and procedures to alert bears to human presence. These guidelines should stress low-impact bear viewing by all users in all locations and should be similar to those of the North American Nature Photographers Association (see Appendix H) (see section 6.6 and chapter 8 "Education").

- Investigate road-accessible wildlife- and bear-education opportunities that would minimize negative bear-human conflicts. A suggested area is along Buskin Lake near the golf course. The area could include interpretive signs dealing with wildlife management, habitat, track identification, realistic bear-viewing opportunities, and safety. Small spotting scopes such as those at Fort Abercrombie could be installed so that visitors could get a close-up view of habitat areas for bears, goats, ducks, eagles, etc. Other areas suggested for bear education/interpretive signing/viewing possibility on the road system are Buskin River State Recreation Site and Fort Abercrombie State Historical Park (see section 6.6 and chapter 8 "Education").

9.6.10 Funding

- Seek funding for islandwide education and regulation of bear-viewing businesses through, but not limited to, the following (see section 6.6 and chapter 8 "Education"):
  - reasonable permit fees
  - sale of Kodiak Wildlife Viewing stamps
  - Wildlife Restoration funds
  - Land and Water Conservation Act Fund
- Recommend the statewide sale of Wildlife Stamps (similar to Duck Stamps or Colorado Wildlife stamps) to both Alaska residents and nonresidents. Sales should be broad-based and aimed at nonconsumptive users of wildlife rather than at commercial operators.

10. Resources

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10.2 Online Resources

· Home page for the Kodiak Bear Conservation and Management Plan:

http://www.state.ak.us/local/akpages/FISH.GAME/wildlife/geninfo/planning/kodiakbb.htm.

· Information regarding hunting Kodiak bears:

http://www.state.ak.us/local/akpages/FISH.GAME/wildlife/region2/hunting/kodiak.htm

· “Kodiak Bear Trivia” sheet from ADF&G

http://www.state.ak.us/adfg/wildlife/region2/hunting/trivia.htm

· Statutes governing the Alaska Department of Fish and Game:

http://old-www.legis.state.ak.us/cgi-bin/folioisa.dll/Stattx00/query=*/doc/{t6392}/pageitems={body}?

· Alaska State Parks—Kodiak District:

http://www.ptialaska.net/~kodsp

· Kodiak National Wildlife Refuge Visitors Center:

http://www.r7/fws/gov/kodiak/kodnwr.html

· Information regarding Section 17(b) Easements [Section 17(b) of the Alaska Native Claims Settlement Act of December 18, 1971, 43 USC 1616(b)]:

http://www.ak/blm/gov/sec_17b

· Information on land ownership status on the Kodiak archipelago (search under "Topic" for land status, then select the PDF or image for the Alaska Peninsula):

http://www.dnr.state.ak.us/lris/gis_maplib/maplib_start.cfm

Appendix A
Abbreviations and Acronyms

ACC	Alaska Administrative Code
ADF&G	Alaska Department of Fish & Game
ADNR	Alaska Department of Natural Resources
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
APHA	Alaska Professional Hunters Association
AS	Alaska Statute
ATV	all-terrain vehicle
AVI	Alaska Village Initiatives
BEG	biological escapement goal
BLM	(U.S.) Bureau of Land Management
BOG	Board of Game
CAC	Citizens Advisory Committee
CCP	Comprehensive Conservation Plan
DEC	Department of Environmental Conservation
DLP	defense of life or property
GMU 8	Game Management Unit 8
IPG	Intergovernmental Planning Group
KIB	Kodiak Island Borough
KICVB	Kodiak Island Convention and Visitors Bureau
KMA	Kodiak Management Area
KNWR	Kodiak National Wildlife Refuge
KUBS	Kodiak Unified Bear Subcommittee
MSY	maximum sustained yield
ORV	off-road vehicle
PUMP	Public Use Management Plan
RNA	Research Natural Area
RPT	Regional Planning Team
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFS	USDA Forest Service

USFWS	U.S. Fish & Wildlife Service
VPSO	village public safety officer
VWCC	Village Wildlife Conservation Cooperative

Appendix B
Glossary

air-cushioned vehicle (e.g., Hovercraft®)
A vehicle that rides over water or terrain on a cushion of air generated by downward-thrusting fans and pushed forward by one or more air propellers

airboat
A small, open boat having a very shallow draft and driven by a caged engine mounted above the rear transom, capable of traveling at relatively high speed through shallow water, swamps, etc.

angler day
One day in which an individual sport fished any portion thereof

biological escapement goal (BEG)
Salmon escapement levels that provide the greatest potential for maximum sustained yield

Board of Fisheries and Board of Game
Alaska has two boards that address conservation and development of Alaska's fishery and game resources: the Board of Fisheries and the Board of Game. The boards are the state regulatory authorities that pass regulations to conserve and develop Alaska's fishery and wildlife resources. The Board of Fisheries and the Board of Game meet together as the Joint Board of Fisheries and Game. The Joint Board promulgates some subsistence regulations and all regulations governing advisory committees. The Board of Fisheries and the Board of Game are supported administratively by the Alaska Department of Fish and Game (ADF&G). The boards and the department, however, function independently. The boards are charged with making allocation and regulatory decisions, and the department is responsible for management based on those decisions. The commissioner of ADF&G is the ex-officio secretary of the boards.

carrying capacity
The maximum density of animals that a particular range (habitat) is capable of supporting

co-management
Specific management arrangement authorized in the law that implies co-equal authority, such as the co-management agreements required by the Marine Mammal Protection Act and the protocol amendment to the Migratory Bird Treaty Act

conservation
The planned management of a natural resource to prevent exploitation, destruction, or neglect

cooperative management
A form of collaborative stewardship that is generally less formal and less exclusive than co-management. Under a cooperative management regime, ADF&G (or USFWS) shares with others, *to the greatest extent legally possible*, equal representation, responsibility, and power in all areas relevant to the management of wildlife resources.

drainage
All of the waters making up a watershed, including tributary rivers, streams, sloughs, ponds, and lakes that contribute to the supply of the watershed

drawing permit
A permit to hunt issued to a limited number of people selected by means of a lottery held for all people submitting valid applications for such permits and who agree to abide by the conditions specified for each hunt

easement
A right to use land owned by someone else for access or other use. There are many different types of easements that specify rights of access or use of the land. Examples include the following:

17(b) easements—(Section 17(b)(2) of the Alaska Native Claims Settlement Act) Easements reserved by the Bureau of Land Management (BLM) on Native corporation lands to provide *trails* to public lands or waters and *sites* for temporary camping and changes in transportation (e.g., float plane pullouts). Uses and widths are specified in the conveyance documents; BLM manages 17(b) easements.

Conservation easements—A landowner gives up some rights to use his land (e.g., no development) and transfers management to an agency or organization for some specific purpose (e.g., wildlife habitat), with specified terms and compensation

Section line easements—A public right-of-way reserved along section lines, width based on time federal land is reserved and uses managed by the state

Emergency Order
A fish and game regulatory directive issued by the ADF&G commissioner or his authorized designee that, when conditions require, summarily opens or closes harvest seasons or areas, or changes weekly closed periods for fish and game harvesting. Also, the commissioner or his designee may, under criteria adopted by the Board of Fisheries, summarily increase or decrease sport fish bag limits of modify the method of harvest for sport fish. An Emergency Order has the force of law after field announcement by the commissioner or an authorized designee.

game
Any species of bird, reptile, and mammal, including a feral domestic animal, found or introduced in the state, except domestic birds and mammals; and game may be classified by regulation as big game, small game, furbearers, or other categories

game management unit (GMU)
One of the 26 geographical areas listed under Game Management Units in the codified hunting and trapping regulations and the Game Unit Maps of Alaska

habitat
The physical and biological resources required by an organism for its survival and reproduction; these requirements are species specific. Food and cover are major components of habitat and must extend beyond the requirements of the individual to include a sufficient area capable of supporting a viable population.

habitat linkages
A finite geographical area used by bears for movement between different areas of their range (large areas of habitat). These linkages are often constrained by natural access barriers (e.g., movement around the end of a large lake or through a mountain pass).

hardened campsite
A campsite 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.

human food-conditioning
A behavior learned when a bear receives food, fish, or garbage from people; it is undesirable behavior that may result in property loss or damage, human injury, or defense of life or property (DLP) mortality of bears.

human habituation
Decrease in natural responsiveness upon repeated exposure to a nonthreatening, human stimulus

hunting area
That portion of a game management unit in which a season and a bag limit for a species are set

important bear habitat
That habitat necessary to sustain a population at an optimal level

jet boat
A small, propellerless boat powered by an engine that ejects water for its thrust

large land parcel
Privately owned tract of land more than 1,000 acres in size

low-impact
Strategies or techniques used by recreationists and land-use managers to minimize or even eliminate indications that people have used an area

maximum sustained yield (MSY)
The highest harvest by humans that a wildlife population can withstand without any adverse long-term impacts.

> For fisheries, MSY is the greatest average yield from a stock. In practice, MSY is approached when a level of escapement is maintained within a specific range, on an annual basis, regardless of run strength. The achievement of MSY requires a high degree of management precision and scientific information regarding the relationship between escapement and subsequent return. The concept of MSY should be interpreted in a broad ecosystem context to take into account species interactions, environmental changes, an arrange of ecosystem goods and services, and scientific uncertainty.
>
> For wildlife, “sustained yield” means the achievement and maintenance in perpetuity of the ability to support a high level of human harvest of game, subject to preferences among beneficial uses, on an annual or periodic basis

off-road vehicle (ORV)
A small motorized vehicle designed for use on various types of unroaded terrain; often referred to as an all-terrain vehicle (ATV)

optimal/optimum population (for wildlife)
An optimal population is one that is higher than the minimum viable population at a level that allows for sustained economic and recreational opportunities while accommodating human-caused mortality from hunting, DLP, and other causes.

permit hunt
A hunt for which permits are issued on a drawing, registration, or Tier II hunt basis

personal watercraft
Any inboard motorized watercraft less than 16 feet in length that has a water-jet pump as its primary source of motor propulsion and that is designed to be operated by a person sitting, standing, or kneeling *on* the watercraft, rather than the conventional manner of sitting or standing *inside* the watercraft.

photographers
According to Kodiak National Wildlife Refuge special-use permits, photographers are classified as follows:

> Amateur photographers, or hobbyists, take photographs, or use video cameras, for their own personal use and do not derive income from the sale of photographs and video footage. Amateurs do not need a special permit to access refuge lands open to the general public.
>
> Commercial photographers work for hire or on contract basis. Often consumer products or models are an integral part of their work. Activities that may be potentially disruptive to wildlife, or impact other users, may require special regulations or policies, and a commercial-use permit on a national refuge. Access to areas normally closed to the public, or activities that may harm the natural values of the refuge, require a commercial-use permit.
>
> Professional photographers are those who derive a significant portion of their income from photography but do not work for hire or under contract. Unless working for hire or under contract, professional photographers do not need a special permit to access areas that are open to the general public. Permits are required, however, for photographers accessing areas closed to the public.

quality
Degree of excellence; superiority in kind

regional comprehensive salmon plan
A document that integrates and assembles all relevant information regarding the development and protection of the salmon resource, for a specific long-range period of time, into a strategic plan for an established region of the state

regional planning team (RPT)
A region-specific panel established by the ADF&G commissioner for the primary purpose of developing comprehensive salmon plans for one of various regions of the state. Each RPT consists of six members: three are ADF&G personnel appointed by the ADF&G commissioner, and three are appointed by the board of directors of the appropriate regional aquaculture association, qualified under AS 16.10.380.

registration permit
A hunting permit issued to a person who agrees to the conditions specified for each hunt; permits are issued in the order applications are received and are issued (a) beginning on a date announced by ADF&G and continuing throughout the season or until the season is closed by Emergency Order when a harvest quota is reached; (b) beginning on a date announced by ADF&G and continuing until a predetermined number of permits have been issued

salmon
Any of the following five anadromous Pacific salmon species (*Oncorhynchus sp.*) native to Alaska: Chinook or king (*O. tschawtscha*), sockeye or red (*O. nerka*), coho or silver (*O. kisutch*), pink or humpy (*O. gorbuscha*), and chum or dog (*O. keta*)

salmon enhancement
A specific manipulation (e.g., hatchery augmentation, lake enrichment) to a salmon stock to enhance its productivity above the level that would naturally occur. An enhanced stock can be either an introduced stock, where no wild stock had occurred before, or a wild stock undergoing such manipulation but that is distinguished from a stock undergoing rehabilitation, which is intended to restore a stock's productivity to a higher natural level.

salmon escapement
The annual estimated size of the spawning stock. Quality of the escapement may be judged not only by numbers of spawners, but also by factors such as sex ratio, age composition, temporal entry into the system, and spatial distribution within the spawning habitat.

salmon management plan
A salmon regulatory plan approved by the Board of Fisheries designed to address stock-specific biological and fishery-specific allocation considerations. Details of these management plans are documents in annual produced publications.

salmon rehabilitation
Efforts applied to a salmon stock to restore it to an otherwise natural level of productivity. Distinguished from salmon enhancement, which is intended to augment production above otherwise natural levels.

salmon run
The total number of salmon surviving to adulthood and returning to the natural stream in any calendar year; composed of both the harvest of adult fish and the escapement. The annual run in any calendar year is composed of several age classes of mature fish (except for pink salmon) from the stock, derived from the spawning of a number of previous brood years

small land parcel
Privately owned tract of land less than 1,000 acres in size

sport fishing effort
The sum of angler days (see "angler day")

sustainable
As it pertains to Kodiak bear populations, the maintenance of the bear population at a level where the number of deaths from all causes does not exceed the number of bears produced.

Sustainable Salmon Fisheries Policy (SSFP)
A Board of Fisheries–approved policy that provides guidelines for integrating protection, utilization, and enhancement of fish stocks to meet the needs of present generations without compromising the ability of future generations to meet their needs

villages
In this document, refers to the rural communities of Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions

weir
An artificial blockage of an anadromous fish stream to channel migrating salmon past a counting station in order to measure escapement for upriver spawning; a temporary in-stream structure designed to guide in-stream fish migrations to facilitate species-specific data collection. Commonly, human activity is restricted within 300 feet upstream and downstream of these structures.

weir site
An artificial blockage of an anadromous fish stream to channel migrating salmon past a counting station in order to measure escapement for upriver spawning

wilderness
An area essentially undisturbed by human activity, together with its naturally developed life community

Wilderness
A Wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. A Wilderness area is further defined to mean, in this plan, an area of underdeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value (Wilderness Act of 1964).

wildlife-acceptance capacity
Reflects the maximum wildlife population level in an area that is acceptable to people

wildlife conservation
Planned management of wildlife resources and their habitats to 1) ensure that these resources yield the greatest sustainable benefit to current and future generations and 2) ensure that the development of these resources is in the best interests of the economy and well-being of the state.

world-class bear viewing
A world-class bear-viewing opportunity is one that provides a unique combination of natural phenomena that has worldwide human interest and value. In the case of Kodiak, a thriving population of bears, the largest land carnivore on earth, inhabiting a unique island wilderness, constitutes a spectacle of nature unique in the world. A world-class bear-viewing program should be consistent with perpetuation of this natural phenomena while allowing for high-quality public use and enjoyment.

Appendix C

The Alaska Professional Hunters Association
CODE OF ETHICS

Code of Ethics of the APHA:

- to institute and secure the general adoption of a high and sportsmanlike conception of wildlife and hunting of game
- to promote hunting by fair chase: the pursuit of trophy in a legal and sportsmanlike manner, without herding, driving, or chasing of trophies with the use of mechanically powered equipment
- consistent with the practice of hunting, fishing, and photography, to promote and assist in the conservation of fauna and flora and to cooperate with government officials concerned with the conservation of flora and fauna
- to assist in the prevention of illegal or unsportsmanlike practice by anyone in the practice of professional hunting or by anyone engaged in the sports of hunting, fishing, or photography
- to promote and safeguard the interests of all members of the corporation
- to endorse and foster a code of ethics in accord with the ethical standards and the laws and regulations of the State of Alaska

Appendix D

Big-Game–Guide Permitting Process
Kodiak National Wildlife Refuge

Basic requirements

- business license
- guide license
- certification for appropriate game management unit (GMU)
- commercial use permit

Purpose

To fairly apportion commercial hunting services on the refuge to provide the public with quality services for recreational hunting

Overview

Guide submits an application to Kodiak National Wildlife Refuge (KNWR) with a prospectus that describes his or her interest, experience, and anticipated operations for one or more specific guide areas. Once the application period is closed, the refuge assembles a team of individuals to evaluate the applicants and to select the individuals who most qualify for guiding operations on the refuge.

Applicants who meet the basic requirements are evaluated for knowledge, experience, and performance using eight ranking criteria. Selections are determined by which businesses rank the highest in all factors for a given area. Selected guides are issued special-use permits for all guide activities, subject to terms and conditions of the permits. Permits are in effect for five years.

Selection Criteria (no changes from 1998)

- history of compliance with state and federal fish, game, guiding, and permitting requirements, laws, and regulations (30 points)
- safety (30 points)
- ability to provide a high-quality guiding service to the public (30 points)
- impacts of proposed operation on wildlife resources, including expected harvest and displacement (20 points)
- impacts of proposed operation on other refuge resources such as water quality, vegetation disturbance, and soil disturbance (20 points)
- impacts of proposed operation on other refuge users, including subsistence users (20 points)

- demonstrated experience and knowledge of terrain, climate, and species to be hunted (20 points)
- demonstrated experience and knowledge in area for which applying (20 points)

Limits

Individuals may apply for as many as ten offerings for refuges in Alaska. A guide may submit only one application for a given use area. Guides are only allowed to be permitted for three use areas on USFWS lands at any one time.

Disclosure Requirements of Permittees

At end of year, submit use record that discloses actual number of clients, client-use days, numbers of each wildlife species harvested, and *other* data indicated in special-use permit

Performance Evaluation

Refuge staff will periodically monitor compliance through inspections, discussions with clients, etc. In cases involving violation of use permit, permittee will be notified of deficiency and/or legal action.

Status (2001)

- There are 15 guides distributed in 24 guide areas on the refuge.
- The current five-year permits expire at the end of 2003.
- All areas are open for application.
- The same process will be used to reissue permits.
- There is one vacant area (Afognak Island).
- Successful applicants can renew permits for another five years in 2007 if a good track record of performance is maintained.

Appendix E

Principles for the Conservation of Wild Living Resources[31]

- **Principle I.** Maintenance of healthy populations of wild living resources in perpetuity is inconsistent with unlimited growth of human consumption of and demand for those resources.

- **Principle II.** The goal of conservation should be to secure present and future options by maintaining biological diversity at genetic, species, population, and ecosystem levels; as a general rule, neither the resource nor any other component of the ecosystem should be perturbed beyond natural boundaries or variation.

- **Principle III.** Assessment of the possible ecological effects of resource use should precede both proposed use and proposed restriction or expansion of ongoing use of a resource.

- **Principle IV.** Regulation of the use of living resources must be based on understanding the structure and dynamics of the ecosystem of which the resource is a part and must take into account the ecological and sociological influences that directly and indirectly affect resource use.

- **Principle V.** The full range of knowledge and skills from the natural and social sciences must be brought to bear on conservation problems.

- **Principle VI.** Effective conservation requires understanding and taking account of the motives, interests, and values of all users and stakeholders, but not by simply averaging their positions.

- **Principle VII.** Effective conservation requires communications that is interactive, reciprocal, and continuous.

[31] Mangel et al. 1996, excerpted from the Alaska Board of Fisheries Sustainable Fisheries Policy

Appendix F

Principles and Criteria for Sustainable Salmon Fishing[32]

- **Principle I. Protect wild salmon and their habitat in order to maintain resource productivity**

  - Criteria for Principle I

    - I.1. Salmon spawning, rearing, and migratory habitats are protected.

      - I.1.A. Salmon stocks and habitat are not perturbed beyond natural boundaries of variation.

      - I.1.B. Scientific assessment of possible adverse ecological effects of habitat alternation proceed prior to approval of proposed alteration of salmon habitat.

      - I.1.C. Adverse environmental impacts on wild salmon and their habitats are assessed and corrected when appropriate.

      - I.1.D. All essential salmon habitats in marine, estuarine, and freshwater ecosystems are protected.

        - These include

          i. Spawning beds

          ii. Freshwater rearing areas

          iii. Estuarine/near-shore rearing areas

          iv. Offshore rearing areas

          v. Riparian and coastal zones

    - I. 2 Salmon are protected within spawning, rearing, and migratory habitats.

    - I.3. Collateral mortality resulting from habitat loss is understood and communicated to affected user groups.

- **Principle II. Maintain escapements within ranges necessary to conserve and protect potential salmon production and maintaining normal ecosystem functioning.**

[32] from the Alaska Board of Fisheries Sustainable Fisheries Policy

- Criteria for Principle II

  - II.1. The temporal and geographic magnitudes of spawning escapements are measured.

  - II.2. Escapement goals are established in a manner consistent with sustained yield.

  - II.3. Escapement goal ranges incorporate the uncertainty associated with measurement techniques, observed variability in the population measured, and the varying abundance within related substocks of the population measured.

  - II.4. Escapement goals are achieved in a manner consistent with appropriate geographic and temporal distribution of spawners.

  - II.5. Sources and locations of fishing mortality are understood.

  - II.6. Escapements are achieved in a manner consistent with protection of nontarget stocks or species.

  - II.7. The phenotypic and genetic characteristics of escapement are understood.

  - II.8. The role of salmon in normal ecosystem functioning (fish and wildlife and their habitats) is understood.

  - II.9. The population trends of the salmon and allied species are understood.

- **Principle III. Harvest salmon in a manner consistent with the degree of knowledge and uncertainty regarding the status and biology of the resource.**

  - Criteria for Principle III

    - III.1. A precautionary approach is applied to the regulation of activities that alter essential habitat.

    - III.2. A precautionary approach is applied to the regulation of harvest and other consumptive uses of salmon.

    - III.3. Conservation and management decisions for fisheries take into account the best available information, including environmental, economic, social, and resource-use factors.

    - III.4. The best available scientific information on the status of populations and the condition of their habitats is routinely updated and peer-reviewed.

- III.5. Data collections and research are undertaken in order to improve scientific and technical knowledge of fisheries, including their interactions with the ecosystem.

- III.6. Proposals for salmon fisheries development or expansion document resource assessments and other criteria for sustainable management.

- **Principle IV. Establish and apply an effective salmon-management system to control human activities that affect salmon.**

- Criteria for Principle IV

  - IV.1. Salmon management objectives appropriate to scale and intensity of use are in place.

  - IV.2. Management objectives subject to periodic review are provided in the forms of the harvest management plans, harvest management strategies, guiding principles, and policies for managing mixed stocks, disease, and genetics.

  - IV.3. The effectiveness of habitat-protection laws and regulations intended to sustain productivity of salmon habitats are regularly evaluated and documented.

  - IV.4. Government has an open process for objectively evaluating the effectiveness of fishery management actions.

  - IV.5. Management has the means to separate biological and allocation issues.

  - IV.6. Feedback loops are consistently applied, using post-season management action indicators (e.g., escapement habitat maintenance within current regulations), to verify that the management actions sustain salmon populations, fisheries, and habitat. Where deficiencies are documented, actions are taken to resolve them.

  - IV.7. Fisheries management implementation and outcomes are consistent with board regulations. Board regulations are consistent with Alaska statutes. As an example, subsistence needs receive priority called for by statute.

  - IV.8. Management acts in a timely and adaptive fashion to implement objectives on the basis of best available scientific information.

  - IV.9. Management agency has clear authority (in statute and regulation) to control human-induced sources of salmon mortality, including mortality due to habitat loss (a form of collateral mortality).

  - IV.10. Management takes into account the consequences on natural stocks of artificial propagation.

- IV.11. Management incorporates appropriate procedures for effective compliance, monitoring, control, surveillance, and enforcement.

- IV.12. The transboundary nature of aquatic ecosystems is recognized by encouraging multilateral cooperation in research and management.

- IV.13. For transboundary stocks, appropriate procedures for effective compliance, monitoring, control, and surveillance are coordinated with those of other states or agencies.

- IV.14. Effective joint assessment and management arrangements are in place for stocks that cross jurisdictional boundaries.

- IV.15. Management has access to the resources necessary for collection and dissemination of the information and data necessary to carry out management activities.

- IV.16. Government provides adequate staff and budget for the research, management, and enforcement activities necessary to implement the sustainable fisheries management principles.

- **Principle V. Maintain public support and involvement for sustained use and protection of salmon resources.**

  - Criteria for Principle V

    - V.1. A governmental process incorporates appropriate mechanisms for resolution of disputes.

    - V.2. An open and fair public involvement process addresses management and allocation decisions.

    - V.3. A governmental process provides an allocation across all consumptive user groups of the conservation burden for salmon.

    - V.4. A governmental process provides adequately funded public information and education programs for the public concerning salmon habitat requirements, salmon habitat threats, the value of salmon and habitat to public and ecosystem, natural variability and populations dynamics, value of salmon to other fish and wildlife, current status of Alaska fish stocks and fisheries, and Board of Fisheries process.

    - V.5. Management provides for dissemination of results to all interested parties in a timely fashion.

    - V.6. Management promotes understanding of the proportion of mortality inflicted on each stock by each consumptive user group.

5 AAC 39.222. POLICY FOR THE MANAGEMENT OF SUSTAINABLE SALMON FISHERIES

Statute text

(a) The Board of Fisheries (board) and Department of Fish and Game (department) recognize that

(1) while, in the aggregate, Alaska's salmon fisheries are healthy and sustainable largely because of abundant pristine habitat and the application of sound, precautionary, conservation management practices, there is a need for a comprehensive policy for the regulation and management of sustainable salmon fisheries;

(2) in formulating fishery management plans designed to achieve maximum or optimum salmon production, the board and department must consider factors including environmental change, habitat loss or degradation, data uncertainty, limited funding for research and management programs, existing harvest patterns, and new fisheries or expanding fisheries;

(3) to effectively assure sustained yield and habitat protection for wild salmon stocks, fishery management plans and programs require specific guiding principles and criteria, and the framework for their application contained in this policy.

(b) The goal of the policy under this section is to ensure conservation of salmon and salmon's required marine and aquatic habitats, protection of customary and traditional subsistence uses and other uses, and the sustained economic health of Alaska's fishing communities.

(c) Management of salmon fisheries by the state should be based on the following principles and criteria:

(1) wild salmon stocks and the salmon's habitats should be maintained at levels of resource productivity that assure sustained yields as follows:

(A) salmon spawning, rearing, and migratory habitats should be protected as follows:

(i) salmon habitats should not be perturbed beyond natural boundaries of variation;

(ii) scientific assessments of possible adverse ecological effects of proposed habitat alterations and the impacts of the alterations on salmon populations should be conducted before approval of a proposal;

(iii) adverse environmental impacts on wild salmon stocks and the salmon's habitats should be assessed;

(iv) all essential salmon habitat in marine, estuarine, and freshwater ecosystems and access of salmon to these habitats should be protected; essential habitats include spawning and incubation areas, freshwater rearing areas, estuarine and nearshore rearing areas, offshore rearing areas, and migratory pathways;

(v) salmon habitat in fresh water should be protected on a watershed basis, including appropriate management of riparian zones, water quality, and water quantity;

(B) salmon stocks should be protected within spawning, incubating, rearing, and migratory habitats;

(C) degraded salmon productivity resulting from habitat loss should be assessed, considered, and controlled by affected user groups, regulatory agencies, and boards when making conservation and allocation decisions;

(D) effects and interactions of introduced or enhanced salmon stocks on wild salmon stocks should be assessed; wild salmon stocks and fisheries on those stocks should be protected from adverse impacts from artificial propagation and enhancement efforts;

(E) degraded salmon spawning, incubating, rearing, and migratory habitats should be restored to natural levels of productivity where known and desirable;

(F) ongoing monitoring should be conducted to determine the current status of habitat and the effectiveness of restoration activities;

(G) depleted salmon stocks should be allowed to recover or, where appropriate, should be actively restored; diversity should be maintained to the maximum extent possible, at the genetic, population, species, and ecosystem levels;

(2) salmon fisheries shall be managed to allow escapements within ranges necessary to conserve and sustain potential salmon production and maintain normal ecosystem functioning as follows:

(A) salmon spawning escapements should be assessed both temporally and geographically; escapement monitoring programs should be appropriate to the scale, intensity, and importance of each salmon stock's use;

(B) salmon escapement goals, whether sustainable escapement goals, biological escapement goals, optimal escapement goals, or inriver run goals, should be established in a manner consistent with sustained yield; unless otherwise directed, the department will manage Alaska's salmon fisheries, to the extent possible, for maximum sustained yield;

(C) salmon escapement goal ranges should allow for uncertainty associated with measurement techniques, observed variability in the salmon stock measured, changes in climatic and oceanographic conditions, and varying abundance within related populations of the salmon stock measured;

(D) salmon escapement should be managed in a manner to maintain genetic and phenotypic characteristics of the stock by assuring appropriate geographic and temporal distribution of spawners as well as consideration of size range, sex ratio, and other population attributes;

(E) impacts of fishing, including incidental mortality and other human-induced mortality, should be assessed and considered in harvest management decisions;

(F) salmon escapement and harvest management decisions should be made in a manner that protects non-target salmon stocks or species;

(G) the role of salmon in ecosystem functioning should be evaluated and considered in harvest management decisions and setting of salmon escapement goals;

(H) salmon abundance trends should be monitored and considered in harvest management decisions;

(3) effective management systems should be established and applied to regulate human activities that affect salmon as follows:

(A) salmon management objectives should be appropriate to the scale and intensity of various uses and the biological capacities of target salmon stocks;

(B) management objectives should be established in harvest management plans, strategies, guiding principles, and policies, such as for mixed stock fishery harvests, fish disease, genetics, and hatchery production, that are subject to periodic review;

(C) when wild salmon stocks are fully allocated, new fisheries or expanding fisheries should be restricted, unless provided for by management plans or by application of the board's allocation criteria;

(D) management agencies should have clear authority in statute and regulation to

(i) control all sources of fishing mortality on salmon;

(ii) protect salmon habitats and control non-fishing sources of mortality;

(E) management programs should be effective in

(i) controlling human-induced sources of fishing mortality and should incorporate procedures to assure effective monitoring, compliance, control, and enforcement;

(ii) protecting salmon habitats and controlling collateral mortality and should incorporate procedures to assure effective monitoring, compliance, control, and enforcement;

(F) fisheries management implementation and outcomes should be consistent with regulations, regulations should be consistent with statutes, and effectively carry out the purpose of this section;

(G) the board will recommend to the commissioner the development of effective joint research, assessment, and management arrangements with appropriate management agencies and bodies for salmon stocks that cross state, federal, or international jurisdictional boundaries; the board will recommend the coordination of appropriate procedures for effective monitoring, compliance, control, and enforcement with those of other agencies, states, or nations;

(H) the board will work, within the limits of its authority, to assure that

(i) management activities are accomplished in a timely and responsive manner to implement objectives, based on the best available scientific information;

(ii) effective mechanisms for the collection and dissemination of information and data necessary to carry out management activities are developed, maintained, and utilized;

(iii) management programs and decision-making procedures are able to clearly distinguish, and effectively deal with, biological and allocation issues;

(I) the board will recommend to the commissioner and legislature that adequate staff and budget for research, management, and enforcement activities be available to fully implement sustainable salmon fisheries principles;

(J) proposals for salmon fisheries development or expansion and artificial propagation and enhancement should include assessments required for sustainable management of existing salmon fisheries and wild salmon stocks;

(K) plans and proposals for development or expansion of salmon fisheries and enhancement programs should effectively document resource assessments, potential impacts, and other information needed to assure sustainable management of wild salmon stocks;

(L) the board will work with the commissioner and other agencies to develop effective processes for controlling excess fishing capacity;

(M) procedures should be implemented to regularly evaluate the effectiveness of fishery management and habitat protection actions in sustaining salmon populations, fisheries, and habitat, and to resolve associated problems or deficiencies;

(N) conservation and management decisions for salmon fisheries should take into account the best available information on biological, environmental, economic, social, and resource use factors;

(O) research and data collection should be undertaken to improve scientific and technical knowledge of salmon fisheries, including ecosystem interactions, status of salmon populations, and the condition of salmon habitats;

(P) the best available scientific information on the status of salmon populations and the condition of the salmon's habitats should be routinely updated and subject to peer review;

(4) public support and involvement for sustained use and protection of salmon resources should be sought and encouraged as follows:

(A) effective mechanisms for dispute resolution should be developed and used;

(B) pertinent information and decisions should be effectively disseminated to all interested parties in a timely manner;

(C) the board's regulatory management and allocation decisions will be made in an open process with public involvement;

(D) an understanding of the proportion of mortality inflicted on each salmon stock by each user group, should be promoted, and the burden of conservation should be allocated across user groups in a manner consistent with applicable state and federal statutes, including AS 16.05.251 (e) and AS 16.05.258 ; in the absence of a regulatory management plan that otherwise allocates or restricts harvests, and when it is necessary to restrict fisheries on salmon stocks where there are known conservation problems, the burden of conservation shall be shared among all fisheries in close proportion to each fisheries' respective use, consistent with state and federal law;

(E) the board will work with the commissioner and other agencies as necessary to assure that adequately funded public information and education programs provide timely materials on salmon conservation, including habitat requirements, threats

to salmon habitat, the value of salmon and habitat to the public and ecosystem (fish and wildlife), natural variability and population dynamics, the status of salmon stocks and fisheries, and the regulatory process;

(5) in the face of uncertainty, salmon stocks, fisheries, artificial propagation, and essential habitats shall be managed conservatively as follows:

(A) a precautionary approach, involving the application of prudent foresight that takes into account the uncertainties in salmon fisheries and habitat management, the biological, social, cultural, and economic risks, and the need to take action with incomplete knowledge, should be applied to the regulation and control of harvest and other human-induced sources of salmon mortality; a precautionary approach requires

(i) consideration of the needs of future generations and avoidance of potentially irreversible changes;

(ii) prior identification of undesirable outcomes and of measures that will avoid undesirable outcomes or correct them promptly;

(iii) initiation of any necessary corrective measure without delay and prompt achievement of the measure's purpose, on a time scale not exceeding five years, which is approximately the generation time of most salmon species;

(iv) that where the impact of resource use is uncertain, but likely presents a measurable risk to sustained yield, priority should be given to conserving the productive capacity of the resource;

(v) appropriate placement of the burden of proof, of adherence to the requirements of this subparagraph, on those plans or ongoing activities that pose a risk or hazard to salmon habitat or production;

(B) a precautionary approach should be applied to the regulation of activities that affect essential salmon habitat.

(d) The principles and criteria for sustainable salmon fisheries shall be applied, by the department and the board using the best available information, as follows:

(1) at regular meetings of the board, the department will, to the extent practicable, provide the board with reports on the status of salmon stocks and salmon fisheries under consideration for regulatory changes, which should include

(A) a stock-by-stock assessment of the extent to which the management of salmon stocks and fisheries is consistent with the principles and criteria contained in the policy under this section;

(B) descriptions of habitat status and any habitat concerns;

(C) identification of healthy salmon stocks and sustainable salmon fisheries;

(D) identification of any existing salmon escapement goals, or management actions needed to achieve these goals, that may have allocative consequences such as the

(i) identification of a new fishery or expanding fishery;

(ii) identification of any salmon stocks, or populations within stocks, that present a concern related to yield, management, or conservation; and

(iii) description of management and research options to address salmon stock or habitat concerns;

(2) in response to the department's salmon stock status reports, reports from other resource agencies, and public input, the board will review the management plan, or consider developing a management plan, for each affected salmon fishery or stock; management plans will be based on the principles and criteria contained in this policy and will

(A) contain goals and measurable and implementable objectives that are reviewed on a regular basis and utilize the best available scientific information;

(B) minimize the adverse effects on salmon habitat caused by fishing;

(C) protect, restore, and promote the long-term health and sustainability of the salmon fishery and habitat;

(D) prevent overfishing; and

(E) provide conservation and management measures that are necessary and appropriate to promote maximum or optimum sustained yield of the fishery resource;

(3) in the course of review of the salmon stock status reports and management plans described in (1) and (2) of this subsection, the board, in consultation with the department, will determine if any new fisheries or expanding fisheries, stock yield concerns, stock management concerns, or stock conservation concerns exist; if so, the board will, as appropriate, amend or develop salmon fishery management plans to address these concerns; the extent of regulatory action, if any, should be commensurate with the level of concerns and range from milder to stronger as concerns range from new and expanding salmon fisheries through yield concerns, management concerns, and conservation concerns;

(4) in association with the appropriate management plan, the department and the board will, as appropriate, collaborate in the development and periodic review of an action plan for any new or expanding salmon fisheries, or stocks of concern; action plans should contain goals, measurable and implementable objectives, and provisions, including

(A) measures required to restore and protect salmon habitat, including necessary coordination with other agencies and organizations;

(B) identification of salmon stock or population rebuilding goals and objectives;

(C) fishery management actions needed to achieve rebuilding goals and objectives, in proportion to each fishery's use of, and hazards posed to, a salmon stock;

(D) descriptions of new or expanding salmon fisheries, management concern, yield concern, or conservation concern; and

(E) performance measures appropriate for monitoring and gauging the effectiveness of the action plan that are derived from the principles and criteria contained in this policy;

(5) each action plan will include a research plan as necessary to provide information to address concerns; research needs and priorities will be evaluated periodically, based on the effectiveness of the monitoring described in (4) of this subsection;

(6) where actions needed to regulate human activities that affect salmon and salmon's habitat that are outside the authority of the department or the board, the department or board shall correspond with the relevant authority, including the governor, relevant boards and commissions, commissioners, and chairs of appropriate legislative committees, to describe the issue and recommend appropriate action.

(e) Nothing in the policy under this section is intended to expand, reduce, or be inconsistent with, the statutory regulatory authority of the board, the department, or other state agencies with regulatory authority that impacts the fishery resources of the state.

. . . . .

History

History: Eff. 9/30/2000, Register 155; am 11/16/2000, Register 156; am 6/22/2001, Register 158

Annotations

Authority: AS 16.05.251

Appendix G

Alaska Bear-Viewing Areas

by Tom Walker

"We seek to maintain the high resource values of the area, while balancing those values with economic opportunity for guiding operations, as well as providing recreation and wildlife education opportunities for the general public."

—Stephen Brady, Wrangell District Ranger, USDA Forest Service

Anan Creek Wildlife Observatory

(35 miles southeast of Wrangell. Aircraft or boat access. USDA Forest Service [USFS], Wrangell Ranger District, P.O. Box 51, Wrangell, AK 99929, 907/874-2323)

Pre-history—Anan was used as a summer camp by the Tlingit people who fished, hunted, picked berries, and collected plants and sea life.

1965—An observatory at the falls was constructed.

1967—The existing shelter was constructed on the observatory deck.

1967 and 1977—Alaska Department of Fish and Game constructed a fish pass.

1994—A photo blind was constructed on the fish pass.

Brown bears and black bears rarely utilize the same feeding areas. The largest pink salmon run in Southeast Alaska, sometimes over 100,000 fish, lures both species to Anan Creek. Brown bears fish upstream in early morning and late evening hours; black bears snag salmon in mid-day on the lower river. Dense forest allows this tenuous truce—black bears can climb trees, brown bears cannot.

Even though it is rare to see more than a half-dozen black bears at a time, as many as 40 individual black bears fish here. Many biologists consider this to be one of the best places in North America to watch free-ranging black bears close up.

The covered viewing pavilion located about one-half mile from the Anan trailhead overlooks the stream where it tumbles through a narrow, boulder-lined gorge. Natural vegetation was used to screen activity on observatory. A viewing blind was fashioned at the fish pass from two prefabricated hunting blinds purchased from Cabela's. To decrease the impact of visitor movement to the bears, USFS screened the walkway with hanging camouflage netting. Only females and cubs or juvenile females frequent viewing area. . . . about 20–30 total. Large male black bears or brown bears rarely, if ever, use the lower river in mid-season. These animals use the rest of the river, which is closed to viewers. The Anan Bay public use cabin, about a mile

from the lagoon, is the only overnight accommodation. (Reservations accepted as many as 180 days in advance, with a maximum stay of seven days.) Air and boat charter services in Wrangell and Ketchikan offer full-day and half-day trips.

Management authority: Two agencies with some overlap of jurisdiction - USFS/ADF&G. Not one leader of program but team management. A seasonal coordinator supervises interpreters. USFS management plan closes the watershed to logging but does not close it to hunting or have hunting boundaries. Not a designated state refuge or sanctuary, but managed by Board of Game. Until very recently, entire watershed open to brown bear hunting. Since 1997, a narrow strip, from the mouth of Anan Lake to tidewater (1.5 miles) closed to both brown and black bear hunting, an area described as "minimal specific closed area." Hunting allowed at lake—public-use cabin here—and the rest of the watershed. Existing size of black-bear hunting closure area was **reduced** to match the brown-bear hunting closure.

Visitor limits: Maximum group size is 10. Visitor numbers unlimited.

General regulations: Purpose of rules: to make all human behaviors predictable to the bears and consistent. Strictly designed to prevent ***food conditioning.***

Regulations enforced from June 15 to September 15 by two on-site natural history interpreters who do not accompany visitors but explain rules, biology, natural history. Visitors may ***not*** leave the trail and approach bears. Visitors limited to the trailhead, trails, viewing platform, outhouse and the public recreation cabin. A Forest Closure Order prohibits dogs, food, and camping. Upper falls closed to provide space for "non-viewer–tolerant" bears. Both species utilize the upper falls for fishing. At the lower falls, bears have almost nine daylight hours per day to fish that are not in the core viewing time (10:00 a.m. to 5:00 p.m.). Managers concluded that the current viewing situation is not likely to adversely affect Anan's bear population

Permit fees: Donations; $35.00 per night cabin rental.

Sport fishing: Not allowed in river below the lake.

Trailhead interpreters make a point of stressing that Anan is an inherently wild place (not Disneyland) where visitors enter at their own risk and that bears are inherently unpredictable. Staff trained and cautioned *not* to voice any personal opinions about hunting or neighboring logging practices. Refer questioners to local district ranger. Staffers do not get a lot of negative feedback from public about hunting perhaps because interpreters are particularly directed *not* to assign human qualities to bears. Interpreters monitor bear numbers but assign numbers rather than names. Each year the number is changed. Some tour guides name recognizable bears.

Outfitter/Guides: May accompany and guide clients. Private guides, lodges, and air services transport day users. One summer viewing guide is also a hunting guide and hunts the surrounding area. Guides limited to two separate groups (on site at different times) per day. The Authorized Transfer was established, whereby priority use guides could temporarily transfer service days that they would not be able to utilize, to another priority guide.

Guide workshops: Anan guide workshops periodically held in the spring and fall and well-attended by USFS specialists, guides, and some private individuals. Topics included wildlife, cultural resources, bear ecology, bird identification, etc.

Firearms: Allowed. The Anan rifle policy requires staff to carry a weapon any time they walk the trails (bear spray no longer an option). Weapons are stored either in trailhead storage box or in observatory gun rack while interpreters at their station. Interpreters required to qualify with both a .375 magnum rifle and 12 gauge shotgun and to pick one for personal protection. Air horns sometimes carried as extra means of aversive conditioning.

Habituation/property damage: There have been no break-ins or serious property damage, even though the lake cabin is close by, the public-use coastal cabin is .5 miles away, and the USFS admin and cook cabin is at the trailhead. One bear did rip the door off the outhouse. No human injuries reported.

1991 Season—1,405 Visitors

1992 Season—1,830 Visitors

1993 Season—1,526 Visitors

1994 Season—2,026 Visitors

1995 Season—3,832 Visitors

1996 Season—2,204 Visitors

1997 Season—2,504 Visitors

1998 Season—2,412 Visitors

1999 Season—2,506 Visitors

Brooks Camp, Katmai National Park and Preserve

(4,093,229 acres. Alaska Peninsula, about 290 air miles southwest of Anchorage; 30 air miles from King Salmon. Air access. Contact: Headquarters, Lake Clark/Katmai national parks, 4230 University Avenue, Suite 311, Anchorage, Alaska 99508-4626, 907/271-3751, or 907/246-3305. In King Salmon: Mark Wagner, 907/246-2122.)

Pre-history: Yup'ik hunting and fishing site and residences. A rich archaeological past witnesses human occupation that dates back 7,500 years. Brooks River National Historic Landmark recognizes and protects North America's highest concentration (about 900) of prehistoric human dwellings,.

Established: September 24, 1918. To protect the Valley of Ten Thousand Smokes in wake of the Mt. Katmai eruption of 1912.

Expansion: Repeatedly; last ANILCA, 1980.

2000: New viewing platform and boardwalk constructed.

Once at Brooks River, on the shore of Naknek Lake near the mouth of Brooks River and the park's main destination, all visitors stop at the Brooks Camp Visitor Center, which operates from

June to mid-September. All visitors required to attend the Brooks Camp School of Bear Etiquette, a 15- to 20-minute safety and bear orientation program.

To overnight at Brooks River, visitors must stay in either the campground, located about one mile from Brooks Falls, or in the nearby lodge. The rustic campground has a limit of 60 persons per day. Advance reservations and both day use fees and campground fees must be paid prior to arriving at Brooks Camp.

Despite an array of wildlife, wilderness, and geologic wonders, Katmai has become best known for its bear viewing. During the peak of the sockeye salmon run each July, and during return of the spawned-out salmon in September, 40–60 bears congregate along the Brooks River. Bear watchers—campers, lodge guests, fly-in day users—jam Brooks Camp in July.

Raised platforms along the river enable viewing. Crowding results in waiting lists to access viewing platforms. At peak times, a 2–3 hour wait often necessary to access falls platform. High demand may limit visits to falls platform to as little as 20 minutes. New boardwalk and platform, with capacity of 80, is expected to reduce this unpopular congestion and waiting period. On occasion, especially in July, a few visitors were unable to get to the falls platform due to time constraints or flight schedules.

During peak season, visitors first must check in at the lower bear-viewing platform, or trailhead, before continuing to the Brooks Falls platform. The lower bear-viewing platform is large and often overcrowded, yet the location of this platform does not deter bears from wandering by. Juvenile bears, and some females and cubs, tend to hang out here, the favored fishing spots up river being controlled by more dominant bears. Larger individual bears and family groups dominate fishing sites at the falls. This is the site for Katmai's icon photo of a salmon leaping into a bear's open maw. Large males and other bears intolerant of people begin showing up at Brooks River in mid-September when few visitors are present.

Management authority: National Park Service. No hunting within wilderness park.

Visitor limits: No total day-use. Campground limits set.

General regulations: Except when on the bear-viewing platforms, visitors may not intentionally approach or remain within 50 yards of a single bear, or 100 yards of a female with cubs, and must follow all procedures detailed in the Brooks Camp School of Bear Etiquette. With the exception of the campground, camping prohibited within five miles of Brooks River. Visitors may not carry food of any kind on the trails and paths. Clean-camping techniques strictly enforced. All food must be stored in bear-proof lockers and meals prepared in designated shelters. Strict food and garbage controls enforced. Back country users urged to use bear-proof food containers or tree storage.

Permit fees: $10 per day; $5 per day camping.

Sport fishing: Brooks River is a catch-and-release fishery for trophy-sized rainbow trout. Barbless hooks recommended to prevent needless injury. Each angler is allowed to keep one salmon. Any fish kept at Brooks Camp must immediately be placed in a special bag and taken to the freezer building near the lodge. Fishermen must cut their lines if a bear approaches the fish-

on. Bears have learned to respond to the ***sound*** of a screaming fishing reel as the fish pulls out line. Last bear killed by NPS at Brooks Camp (early 1980s) had regularly taken fish from people and once swam out to a boat in the lake in attempt to get fish.

Ranger/interpreters: Enforce regulations, accompany visitors. May carry firearms and nonlethal deterrents such as rubber bullets, cracker shells, sprays, air horns, and the like.

Outfitter/guides: No special access. May accompany clients as part of a group.

Habituation/property loss and damage: Tents infrequently shredded. Extensive lodge damage due to break-ins after the lodge operator illegally stored food inside. Last human injury: 1991, a seasonal ranger ran from a bluff charge and slightly bitten on the hand.

2000 Season: 9500 Visitors*

*14,000 visitor-days, Brooks Camp only. Majority visiting in July, 75% for bear viewing, 25% for fishing (June and August); 20% of total took Valley of Ten Thousand Smokes tour.

McNeil River State Game Sanctuary

(246,700 acres. 250 air miles southwest of Anchorage, 100 air miles west of Homer. Aircraft access. June–August. Contact: McNeil River Sanctuary manager, Alaska Department of Fish and Game, 333 Raspberry Road, Anchorage, Alaska 99518-1599, 907/267-2182)

Pre-history: No known sites

1911: Charlie McNeil homesteads and prospects here.

1920s: Dense grasslands replaced by alder thickets, possibly as result of 1912 Katmai ash deposits believed to allow bear population expansion

1955: McNeil River Reserve established by USFWS through the aid of Master Guide Slim Moore, Cecil Rhode, Clarence Rhode (USFWS), and photographer Steve McCutcheon.

1959: McNeil River Closed Area

1967: McNeil River Game Sanctuary established by legislature

1973: Permit system and use regulations enacted.

Excessive, uncontrolled public use in the early 1970s endangered this unique area. People sometimes outnumbered bears at the falls. Bears abandoned the river or fished at night. Since preservation of the unique ***concentration*** is the sanctuary's primary goal, managers instituted a permit system. Regulations prohibit solo inland jaunts. Visitors travel in groups lead by a sanctuary employee. These stringent rules work. By being consistent, and going to the same predictable locations, bears view humans as nonthreatening.

Other than a communal cook shack and pit toilets, the only campground is undeveloped. There are no concessions of any kind. The campground is a two-mile walk from the McNeil Falls. Visitors are lead to one of two viewing sites, one at McNeil Falls, and one on Mikfik

Creek. In spring, bears graze the sedge flats and fish for red salmon in Mikfik; in mid-summer they fish for dog salmon in McNeil River. The McNeil Falls impede salmon migration and provide bears with a unique fishing opportunity. The record number in sight at one time within the quarter-mile area at falls is **67**. Now, as many as 144 individual bears utilize the sanctuary each summer. The congregations of bears at the falls are one of Alaska's most famous icons.

McNeil Sanctuary is viewed as one of the world's great wildlife attractions and serves as *the* world's ideal for bear viewing and habituation. Here visitors experience bears close up and with minimal risk. Because visitor numbers are tightly limited and all human behavior conforms to predictable patterns, bears have learned to neither fear nor seek out people. The McNeil Experiment demonstrates that people and bears can co-exist peacefully. McNeil's worldwide fame and publicity, but limited public access, have spawned additional bear-viewing opportunities and benefited regional businesses, such as Chenik Bear Camp.

The majority of human-tolerant bears at McNeil are females with cubs, juveniles, and, rarely, a large male. Large, dominant males do frequent McNeil Falls at the peak of the July salmon run but almost always on the opposite side of the river from the viewing pad; family groups and smaller bears frequent the near side of the river and viewing-pad area. Night-time research observations have revealed an entirely different population, which managers refer to as a subculture, of large dominant males that seldom, if ever, are seen during the day. Some of these animals flee when human presence is sensed.

Management authority: Alaska Department of Fish and Game.

Visitor limits: No more than 10 total per day.

General regulations: Camping in campground only. Visitors may not approach bears and may not access the viewing sites unless in an staff-escorted group. Viewing confined to specific sites, or uncommonly, transient positions enroute. Groups do not approach bears but allow bears to continue their normal behaviors that often bring them within feet of viewers. Typical day at the falls involves 6-8 hours confinement to a small viewing pad, so children are not recommended. No pets. All visitors must sign a liability waiver.

Permit system: Each year 1500–2000 people apply for standard four-day permits, which are awarded by a random lottery, March 1 application deadline. Lottery application fee: $25. Nonresident fees: $350; resident fees: $150. Standby permits: nonresidents, $175; residents, $75. Standby access **not** guaranteed.

Sport fishing: McNeil River closed to sport fishing; commercial fishing occurs outside the markers.

Outfitter/guides: Permit holders only; visitors accompanied by sanctuary staff.

Firearms: All staff carry firearms in the field, visitors advised not to bring weapons, but may do so. Few, if any, do.

Habituation/property damage: In 1970, one visitor, a Kodiak hunting guide, while crawling up on a sleeping female bear to photograph her, shot and killed the bear when she bluff charged. This is the only DLP by a visitor to the sanctuary. No human injuries since the sanctuary was

established. Garbage is shipped out by plane, and food and cooking are restricted to the communal cook shack. Very rare minor property damage.

1995 Season—212 Visitors

1996 Season—219 Visitors

1997 Season—228 Visitors

1998 Season—219 Visitors

1999 Season—208 Visitors

2000 Season—198 Visitors

Stan Price State Game Sanctuary

(60,000-acres. Located at the mouth of **Pack Creek** on the eastern shore of Admiralty Island about 30 miles south of Juneau. Aircraft, boat, or kayak access. USDA Forest Service Information Center, Centennial Hall, 101 Egan Drive, Juneau, Alaska 99801, 907/586-8751; Contact: Admiralty Island National Monument, 907/586-8790.)

Prehistory: Tlingit fishing site

1927: Stan Price arrives in Southeast.

1930: Closed to hunting with support of Territorial Sportsmen and others.

During July and August, brown bears move along the shores and down from the steep slopes of Admiralty Island to the intertidal wetlands at the mouth of Pack Creek to feed on spawning pink and chum salmon and on the sedges found there. The bears tolerate a certain amount of human presence, and visitors may often view and photograph bears fishing for salmon and interacting. Visitors access two different designated viewing sites, a sand spit at the mouth of the creek and a viewing tower located a mile upstream and accessed by a groomed trail through old-growth forest.

Most of the bears seen at Pack Creek are females and female/cub groups. Large males infrequently seen near the upriver viewing tower. Almost all visitors (more than 95%) are successful in seeing at least one bear. During peak viewing periods from mid-July to mid-August, fortunate visitors may enjoy close-up views of five or more bears during the day. Researchers say there are about 30 to 35 bears that use Pack Creek part of the summer. It is neither unknown to see several bears at one time nor to watch for hours without seeing a single bear.

Stan “the Bear Man” Price, spent 39 years on Pack Creek and became a local legend for his ability to live peacefully with the bears. Sailing a boat he’d built in Seattle, Price arrived in Southeast in 1927, and worked as a miner, fisherman, mechanic, and logger before settling at Pack Creek. Price took in several orphaned cubs and raised them. Armed only with a walking

stick, with which he sometimes used to bop the rare troublesome bear, Price wandered freely through the area. His continued presence habituated the bears to humans. The 90-year-old Bear Man once said "if you're friends with the bears, they will be friends with you."

Management authority: Joint USFS and ADF&G. Hunting not allowed.

General regulations: To ensure safety and preserve the bear-viewing opportunities, access to Pack Creek is restricted and limited by permit from June 1 to September 10, with a maximum stay of three days. Permits are especially hard to acquire during peak viewing season of July 10–August 20. No facilities or lodging of any kind exist, and campers are restricted to nearby Windfall and Swan islands. A canoe or kayak needed to reach shore. No food beyond trailhead. Safe storage areas for gear and food at beach landing site. Advance reservations required for peak season, July 10–August 25. Viewing restricted to two sites, visitors may not approach bears.

Visitor limits: 24 permits per day, peak season: unlimited shoulder season.

Permit fees: $20 per day, shoulder season; $50 per day, peak season.

Sport fishing: Not allowed in creek.

Outfitter/Guides: Both guided and unguided visits. All visitors restricted to two viewing sites. USFS recognizes **"Charterers"** who provide transportation to the area but do not accompany clients and **"Guides"** who can provide transportation and accompany clients.

Habituation/Property Damage: No human injuries; no substantial property damage due to restrictive camping rules and food-storage, and -handling techniques.

1995 Season—1403 Visitors

1996 Season—1241 Visitors

1997 Season—1381 Visitors

1998 Season—1392 Visitors

1999 Season—1351 Visitors

2000 Season—1400 Visitors

Summary Point

All managers agree on two points: For a quality experience, visitor numbers must be limited and on-site activities strictly controlled and made predictable and consistent to bears.

Appendix H

North American Nature Photographers Association (NANPA) PRINCIPLES OF ETHICAL FIELD PRACTICES

NANPA believes that following these practices promotes the well-being of the location, subject, and photographer. Every place, plant, and animal, whether above or below water, is unique, and cumulative impacts occur over time. Therefore, one must always exercise good individual judgment. It is NANPA's belief that these principles will encourage all who participate in the enjoyment of nature to do so in a way that best promotes good stewardship of the resources.

Environmental: knowledge of subject and place

- Learn patterns of animal behavior—know when not to interfere with animals' life cycles.
- Respect the routine needs of animals—remember that others will attempt to photograph them, too.
- Use appropriate lenses to photograph wild animals—if an animal shows stress, move back, and use a longer lens.
- Acquaint yourself with the fragility of the ecosystem—stay on trails that are intended to lessen impact.

Social: knowledge of rules and laws

- When appropriate, inform managers or other authorities of your presence and purpose—help minimize cumulative impacts and maintain safety.
- Learn the rules and laws of the location—if minimum distances exist for approaching wildlife, follow them.
- In the absence of management authority, use good judgment—treat the wildlife, plants, and places as if you were their guest.
- Prepare yourself and your equipment for unexpected events—avoid exposing yourself and others to preventable mishaps.

Individual: expertise and responsibilities

- Treat others courteously—ask before joining others already shooting in an area.
- Tactfully inform others if you observe them engaging in inappropriate or harmful behavior—many people unknowingly endanger themselves and animals.
- Report inappropriate behavior to proper authorities—don't argue with those who don't care; report them.
- Be a good role model, both as a photographer and as a citizen—educate others by your actions; enhance their understanding.

Adopted February 3, 1996, by the NANPA board of directors

Appendix I

5 AAC[33] 92.410
Taking Game in Defense of Life or Property

(a) Nothing in 5 AAC prohibits a person from taking game in defense of life or property if

(1) the necessity for the taking is not brought about by harassment or provocation of the animal, or by an unreasonable invasion of the animal's habitat;

(2) the necessity for the taking is not brought about by the improper disposal of garbage or a similar attractive nuisance; and

(3) all other practicable means to protect life and property are exhausted before the game is taken.

(b) Game taken in defense of life or property is the property of the state. A person taking such game shall immediately salvage the meat or, in the case of a black bear, wolf, wolverine, or coyote, shall salvage the hide and shall immediately surrender the salvaged meat or hide to the department. In the case of a brown bear, the hide and skull must be immediately delivered to the department. A surrendered hide and skull of a bear must be completely removed from the carcass. A surrendered bear hide must include attached claws. A person taking game under this section shall notify the department of the taking immediately, and within 15 days after the taking shall submit to the department a completed questionnaire concerning the circumstances of the taking.

(c) As used in this section, “property” means

(1) a dwelling, permanent or temporary;

(2) an aircraft, boat, automobile, or other conveyance;

(3) a domesticated animal;

(4) other property of substantial value necessary for the livelihood or survival of the owner.

[33] Alaska Administrative Code

Appendix J

Reporting Bear Sightings[34]

If a person reports seeing a bear along the Kodiak road system, here's what to do:

First, determine the kind of report it is:

BEAR SIGHTING—The bear is acting normally, doing such things as walking, eating natural foods, etc., and poses no immediate threat to human life or property. The caller just wants to tell someone that the bear is around.

NUISANCE BEAR—The bear is interacting with people in an annoying or potentially threatening way. Examples include hanging out in an area that is frequented by people, rummaging through compost, etc.

PROBLEM BEAR—The bear is a threat to human life or property. This includes any bear that is near human habitation and is acting abnormally, bears that are chasing people, killing or threatening pets or livestock, destroying property, or actually hurting people (maulings).

Next, respond as follows:

BEAR SIGHTING—Fill out a bear-observation form and assure the caller that the information will be forwarded to Alaska Department of Fish and Game. Also inform any on-duty patrol officers of the call so that they are apprised of the situation. Fax the observation form to the ADF&G office at 486-1869.

NUISANCE BEAR—Contact ADF&G (Larry Van Daele) during normal working hours or have the caller contact ADF&G (486-1880). If ADF&G cannot be contacted, fill out a bear observation form and tell the caller that the information will be forwarded to ADF&G and that they will be contacted as soon as a biologist is available. Fax the form to 486-1869. Inform on-duty patrol officers of the call so that they are apprised of the situation. If the caller requests immediate assistance after normal working hours, try to contact Larry Van Daele (ADF&G) at home at 486-8822.

PROBLEM BEAR—Contact on-duty patrol officer immediately to respond to the situation. Advise Sgt. Joanna Roop at 486-4761 during normal working hours or at 486-1987 at home. Fill out a bear-observation form as soon as possible and fax it to ADF&G (486-1869). If the patrol officer needs assistance, contact ADF&G at 486-1880 (work) or 486-8822 (home).

[34] prepared by ADF&G, Kodiak

KODIAK BEAR OBSERVATION FORM

Date: _____ **Time:** _____

Caller Name: _____ **Phone number:** _____

Location: _____

Type of bear: ÿ Adult ÿ Young adult ÿ Female with cubs ÿ Unknown

Number of bears seen (including cubs): _____

What was the bear doing?_____

_____

_____

_____

Response requested by the caller (if any): _____

Type of Observation: ÿ Bear Sighting (bears acting normally)
ÿ Nuisance Bear (bears annoying people)
ÿ Problem Bear (bears threatening people or their property)

Action taken by dispatcher:_____

_____

_____

FAX THIS FORM TO ADF&G at 486-186

9*30 July 1998*

Appendix K

BACKYARD BEARS[35]

October 2000

Our neighbors, the brown bears, will be busy looking for food as they prepare to go to bed for the winter sometime in early November. As days get shorter and kids are back in school, we would like to share a few tips on how to reduce bear problems and what to do if a problem exists.

PREVENTION

Bears are naturally shy animals and prefer to avoid people. Most of the bears that live around towns and villages on Kodiak have shifted their natural patterns so that they sleep during the day and are active at night. Usually the only time there is a problem is when they are attracted to food or garbage or when we surprise them.

Tips to avoid bears

- Make a special effort to keep dog food, meat scraps, and fish secure from curious bears. Keep an eye on your neighbor's yard, too.
- Empty garbage cans often, use trash bags, and close the dumpster lids.
- Keep away from thick brush (especially alders); if you have to go through those areas, make noise to alert bears of your presence.
- Teach children to use extra caution when playing outside during morning and evening hours and while at the bus stop in the morning.
- If you see a bear, don't panic or run. Move away from it slowly. If it starts toward you make noise and wave your arms.

IF YOU HAVE A PROBLEM

If, in spite of your best efforts at prevention, a bear is causing a problem, here are a few things you can do to get rid of him:

- Make sure you and your family are secure in your home.
- Turn on a spotlight and make noise (yell, bang pans, etc.) to scare the bear.
- If the bear is not threatening, continue to watch it and try to figure out why it is coming around. Fix the problem in the morning or call for suggestions.
- If the bear is a threat to a person's life or your property, you may either call the police (911) and/or shoot the bear yourself.

[35] prepared by ADF&G, Kodiak

- Remember, if the bear has been attracted to your yard by improperly stored food or garbage, it can ***NOT*** be legally killed.

KILLING A BEAR FOR DEFENSE—THE RULES

You may kill a bear if you do not provoke an attack or cause a problem by leaving food or garbage lying around, *and* if you have done everything else you can to protect your life and property. Property means your dwelling, means of travel, pets, or other valuable property necessary for your livelihood or survival.

If you have to shoot a bear, be sure you shoot to kill—wounded bears are much more dangerous than healthy bears. Also be very careful of what lies beyond your intended target—stray bullets can travel more than a mile and still be deadly.

If you kill a bear, you must remove the hide (including claws) and the skull and give them to ADF&G. Meat will be donated to anyone who wants it. You must also notify ADF&G as soon as possible and fill out a questionnaire.

BEAR HUNTING SEASON

The bear hunting season along the Kodiak road system is open from October 25 through November 30, and from April 1 through May 15. You need a hunting license, a bear tag ($25), and a registration permit (available at ADF&G) to hunt bears. You are allowed to take one bear every four years, but you may not shoot cubs or sows with cubs. Hunters can keep the bear they kill, but they must have the hide and skull measured and sealed by ADF&G.

State law prohibits bear hunting within one-half mile of the dump or with the aid of any artificial light. City ordinance prohibits the discharge of firearms within Kodiak city limits (except for in defense of life or property).

THE BOTTOM LINE

People here in Kodiak are among the most experienced folks in the world in living with bears. It will be challenging for the next couple months, but with a community effort, we can minimize bear problems. Let’s keep up the good work and be continue to ***BE BEAR AWARE.***

If you have questions, comments, or if you would like to discuss bears or bear problems in more detail call us at:

Kodiak Island Borough
486-9301

City of Kodiak
486-8635

Larry Van Daele
Wildlife Biologist
Alaska Dept of Fish & Game
486-1880

Appendix L

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
March 1990

POLICY ON SOLID-WASTE MANAGEMENT AND BEARS IN ALASKA

INTRODUCTION

Black (*Ursus americanus*) and brown/grizzly (*U. arctos*) bears are common or abundant throughout most of Alaska. Both omnivorous species quickly learn to seek out human food or garbage when provided the opportunity. Polar bears (*U. maritimus*) live in the sea ice environment of the Beaufort and Chukchi seas and are sometimes attracted to human developments along the Arctic coastline. Habituated bears are particularly dangerous and once habituated, generally must be destroyed. As state land disposals, resource development, community expansion, tourism, and outdoor recreation increase throughout Alaska, more bear-human conflicts will occur. Therefore, a consistent and enforceable departmental policy on solid waste-waste management is necessary to minimize impacts on Alaska's bear resources as well as to protect the safety of human residents. This policy addresses human settlements throughout Alaska; however, cities may have special problems that must be dealt with on a case-by-case basis.

OBJECTIVES

The objectives of this policy are to

- reduce garbage/bear interactions, thereby reducing bear-human confrontations that risk human injury or death or result in killing nuisance bears;
- provide consistent guidance for departmental responses to proposed human developments where solid waste and other attractants may affect bears; and
- provide guidelines to other agencies on the solid-waste management practices that should be required prior to issuance of permits under their jurisdictions.

IMPLEMENTATION

To achieve the preceding objectives, interagency cooperation among the Alaska Departments of Fish & Game (ADF&G), Public Safety (DPI), Environmental Conservation (DEC), Natural Resources (DNR), and Transportation & Public Facilities (DOT/PF), and the USDA Forest Service (FS), National Marine Fisheries Service (NMFS), Bureau of Land Management (BLM), National Park Service (NPS), U.S. Fish & Wildlife Service (USFWS), private industry, and private landowners (e.g., Native corporations) will be necessary in developing plans and issuing, monitoring, and enforcing permits and regulations as well as providing public education. The prime elements to accomplish this effort will be

- solid-waste disposal permits issued by DEC;
- DNR, FS, NPS, USFWS, and BLM administration of special use permits for permitted facilities and general prohibitions concerning solid-waste storage and disposal;
- ADF&G, DEC, and DPS regulations for proper storage, transport, and disposal of food, garbage, fish and game waste products, and other associated solid waste;
- coordinated public education efforts by federal and state agencies involved in natural resource management in Alaska;
- cooperation among agencies, interest groups, and the general public involved in management and use of Alaska's natural resources; and
- effective private industry policies that prohibit employees and contractors from feeding bears or improperly disposing of attractants and that punish, with immediate dismissal and refusal to rehire, employees who violate this policy.

GUIDELINES

Bears are attracted to human foodstuffs and garbage because they are easily obtained, occur in large quantities, and are often a nutritious food source. The most effective solution for handling bear problems is to eliminate the attractant from the bear's environment before a problem develops.

The following guidelines should be followed throughout Alaska where bears are or may be attracted to garbage:

- Solid-waste disposal sites for communities and permanent field camps should be located, if feasible, in habitats receiving the least use by bears. For example, traditional movement routes and season concentration areas (such as salmon spawning streams or productive berry areas) should be avoided.
- The preferred alternative for disposal of organic products that may attract bears is incineration at a facility that meets DEC standards for combustible residue (i.e., less than 5% unburned combustibles). In large urban communities or at regional disposal sites, daily landfill is an acceptable alternative to reduce or eliminate attraction to bears, provided that these facilities are secured by a bear-proof fence.
- Existing open-pit sites that use surface burning for disposal should be phased out and replaced by a system of daily incineration meeting the above standards, or by daily landfill.
- Large (more than 15 people), permanent (more than one field season) field camps should dispose of organic products by daily incineration in a fuel-fired incinerator that meets the above standards. Alternatively, organic products could be hauled daily to a DEC-approved regional disposal site. Temporary storage of organic products prior to incineration or back haul should be within a bear-proof enclosure (building or fence).
- These camps should be surrounded by bear -resistant fence. Alternatively, dining halls, kitchens, sleeping areas, and incinerators should be fenced, and no organic wastes allowed to be left in vehicles.

- Small permanent facilities (e.g., lodges, weather stations) or large nonpermanent camps should daily segregate and store organic wastes, and items such as cans and jars that are contaminated with organic waste, in a bear proof container for weekly back hauling to an approved disposal site. Alternatively, (a) organic waste and other combustibles could be incinerated in a locally fabricated incinerator meeting DEC standards for residue, or (b) garbage grinders with disposal to a sewer system could be used to remove organic wastes, while contaminated combustible and noncombustible wastes could be incinerated or temporarily stored as above.
- Food and organic wastes, if stored outside in bear habitat, should be stored in sealed bear proof containers. Although it is not necessary to remove fish or game carcasses from the field, these should not be left at a central site nor should they be left in or near a campsite or other place with high potential for bear-human conflicts.
- Small parties using Alaska's backcountry should burn all combustibles and pack out all noncombustibles. Organic material should not be discarded along trails. Caution and comment sense are required to reduce or eliminate attractants to bears.
- In all new parks, roadside facilities, and temporary construction work sites located in bear habitat, bear-proof garbage cans and regular garbage pickup should be required. This requirement should be phased into all existing facilities as soon as possible.
- Baiting and feeding bears and other wild game by photographers, tourists, hunters, or others is prohibited except for trapping furbearers or hunting black bears consistent with regulations on black-bear baiting [5AAC[36] 92].
- Bears currently accustomed to eating garbage should be handled on a case-by-case basis according to ADF&G guidelines for managing bear-human conflicts.

DEFINITIONS

Combustible: wood, paper, or plastic products that can be c*ompletely burned to ash* with a normal fire (e.g., campfire)

Field camp: a field facility (including cabins, trailers, or tents) used for sleeping and feeding people (e.g., at mines, logging camps, oil and mineral exploration camps, fish camps, lodges, research facilities, remote fish hatcheries, fish weirs, etc.)

Garbage: human refuse including paper and plastic products, glass, metal, aluminum, and a wide variety of organic food material

Habituation: the process by which animals lose their natural fear of humans; habituated bears may be extremely dangerous, especially when they associate people with food

Organic products: all foods or edible plants and animal parts (e.g., meat, vegetables, bread, grain, apple cores, banana peels, lettuce, fish and game animal carcasses, etc.)

Sealed bear-proof container: a container sealed to prevent the escape of attractant odors; bear-proof by means of physical barrier or hanging out of reach (e.g., sealed aluminum containers, pulley system in a tree 15 feet above ground level)

[36] Alaska Administrative Code

Appendix M

BEARS AND The Electric Landfill[37]

The Kodiak Island Borough is improving our landfill so that it meets or exceeds state and federal requirements. An important part of that project is an electric fence that will surround the entire area. The fence, similar to electric cattle fences used throughout the western states, is specifically designed to keep bears out of the landfill. Construction of the fence is scheduled to begin on July 7,1998, and it should be completed by the end of that month.

IS THE FENCE SAFE? The fence is certified by Underwriters Laboratories, and it has been used throughout the world. Although it is very uncomfortable when you receive a shock, it is not life threatening for people (including children), pets, or other animals. The fence will be easy to see, and there will be warning signs all along the fence line.

HOW WILL THE BEARS REACT? Electric fences have been used in other parts of Alaska and in Canada to keep brown/grizzly bears away from dumps and field camps. In most cases, habituated bears (the ones that are accustomed to getting food from people) test the new fence with their nose or paw. Because these parts of their bodies do not have fur, their curiosity is rewarded with a jolt. Most bears will quickly learn that there are easier places to get a meal and will leave the fence alone. Some, however, will continue to test the fence, searching for weak spots. On rare occasions, bears learn to dig under fences or climb trees to go over them.

HOW MANY BEARS USE THE DUMP? There are currently about 6 bears that use the Kodiak landfill. The numbers range from 4 to 11, depending on the year. When natural foods are abundant, fewer bears use the landfill. Even when natural foods are scarce, the bears do not seem to rely on the landfill as a main source of food.

WILL THE ELECTRIC FENCE INCREASE BEAR ACTIVITY IN TOWN? Bears that are prohibited from getting food at the landfill will look for other places to get an easy meal. Fortunately, there seem to be a lot of natural foods for the bears this year and most bears will use those. There will, however, be some bears that will go near homes and into dumpsters in their search for food. Residents in the Monashka Bay area will have to be particularly wary as these dump bears adjust to the change in their diets.

WHAT CAN WE DO TO MINIMIZE BEAR PROBLEMS? As residents of Kodiak, we share the island with one of the densest brown bear populations in the world, and we are proud of our ability to co-exist with them. All we have to do is apply some of these bear-safety precautions we routinely use in the field to our activities here in town:

- Keep human food, pet food, and garbage secured so that bears cannot get to it.
- Before using a dumpster, be bear aware and check for bears in the area.
- Walk in open areas and be cautious when walking at dusk or at night.
- If you walk through the brush, go in a group and make noise to alert the bears that you are coming.
- Avoid jogging or biking along trails that are in thick brush.
- If you see a bear, stay calm. Yell at it. Do not run.

FOR INFORMATION ABOUT BEARS OR BEAR SAFETY:
Larry Van Daele, Alaska Department of Fish and Game..... 486-1880
FOR INFORMATION ON THE LANDFILL OR ELECTRIC FENCING:
Ron Riemer, Kodiak Island Borough 486-9341
IF YOU HAVE AN EMERGENCY INVOLVING A BEAR:
Kodiak Police Department 911

[37] This information was sent to Kodiak Island Borough residents prior to completion of the electric fence at the local landfill.

Appendix N

Best Management Practices—Flightseeing/Wildlife-Viewing Guidelines[38]

Alaska provides a rich environment that supports a wide variety of wildlife. Many of these animals, particularly Dall sheep, mountain goats, bears, moose, and caribou, inhabit the mountains, forested valleys, and tundra areas of the state over which tour operators fly. While most of our customers enjoy seeing and photographing wildlife, getting too close is disruptive and stressful to these animals and also makes them less visible for future flightseeing.

In order to encourage sensitivity to wildlife species of every kind, to ensure their continued viability, and to maintain high-quality viewing opportunities for future visitors, the Alaska Visitors Association (AVA) and its members have consulted with local, state, and federal agencies in developing the following set of guidelines regarding air transportation and flightseeing associated with wildlife. AVA recognizes that particular species and regions of the state may require greater specificity for wildlife-associated flight standards.

- Consistent with aircraft passenger safety, pilots shall take avoidance measure to prevent close overflights of individual animals or groups of animals. However, ad hoc alterations of regular flight paths to try and avoid incidental sightings of animals is not required.
- Hovering near, herding, harassing, or driving wildlife in any way must never be allowed. If an animal, or group of animals, shows signs of disturbance, runs, or takes flight, the pilot is too close.
- Operators will consult with local wildlife authorities to ensure that flight paths avoid known sensitive wildlife areas, including kidding and calving areas, dens, nest sites, haulouts, rookeries, and seabird colonies during critical time periods.
- All flight operators shall comply with FAA restrictions and will consult with wildlife agency recommendations for wildlife flightseeing.
- Consistent with aircraft and passenger safety, operations should establish flightseeing routes that will provide for regular and consistent aircraft operations, which will encourage habituation and minimal disturbance to wildlife.

It is incumbent on tour operators and air taxis to help educate visitors about the importance of adhering to these guidelines. We want Alaska visitors to enjoy their flights and understand, as well as appreciate, the need for responsible flight behavior around wildlife.

[38] as adopted by the Alaska Visitors Association

Appendix O

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION

March 1990

POLICY FOR MANAGING BEAR-HUMAN CONFLICTS IN ALASKA

PURPOSE

This department policy provides guidance to the Alaska Department of Fish and Game, Division of Wildlife Conservation for dealing with bear-human conflicts. The wide range of conditions in Alaska and circumstances leading to conflicts necessitate a flexible policy. The philosophy in these guidelines is to minimize human injury, loss of property, and unnecessary loss of bears, while maintaining the health of the bear populations throughout the state.

BACKGROUND

The Department of Fish and Game, Division of Wildlife Conservation, is the state agency charged with managing black and brown/grizzly bears in the state. As such, the division is responsible for ensuring sustainable populations of these species statewide. The department is also responsible for assisting the public in avoiding and dealing with bear-human conflicts.

Bears are abundant in Alaska, occurring throughout the state, including urban areas. As the human population of Alaska grows and expands further into bear habitat, increased contact with bears will occur, and the number of bears habituated to humans will increase. Circumstances will develop where action must be taken to alleviate real or perceived conflicts between bears and people.

In some areas, bear density is seasonally high, such as on salmon streams or in good berry feeding areas. These congregation sites require special management considerations to protect food resources important to bear populations and to minimize conflicts with human uses of these areas.

Two state regulations deal with bear-human conflicts. One prohibits the feeding of bears and other large predators or intentionally leaving human food or garbage in a manner that attracts these animals (5AAC 92.230). The other defines a person's rights and responsibilities in defending himself or his property from wild animals (5AAC 92.410) (see Appendix I). These regulations give the individual responsibility, guidance, and authority to deal with legitimate bear conflicts. In some instances, particularly those involving black bears for which hunting regulations are liberal, problem bear can oftentimes be taken under normal hunting regulations, and it is the department's policy to promote such legal taking.

RATIONALE

Incidental encounters occurring away from human habitation are the most common bear-human contacts. These are usually brief and do not develop into conflicts. Options for minimizing the frequency with which these encounters become serious conflicts include

- increasing public education on bear behavior and how to deal with bears and garbage in the wild;
- increasing public information about areas of high bear density;
- recommending that people avoid areas of high density or recommend that land managers temporarily prohibit public use of such areas; and
- recommending that private or commercial land-use development not be sited in areas of seasonally high bear concentrations.

Bear-human conflicts are most common where bears regularly acquire human food or garbage. The best way to prevent bears from becoming attracted to human food is to preclude access to these food sources. Once a bear is habituated to human food or garbage, options become limited, expensive, ineffective, and unacceptable to some members of the public. These options include

- rigorous garbage management policies and enforcement of regulations to deny bears access to human foods and garbage;
- aversive conditioning to teach a bear to associate human food with discomfort;
- translocation (moving a bear to a different location);
- capture of a bear and confinement to a zoo; and
- destruction of the “problem” bear.

Denying bears access to human food, garbage, or other attractants is by far the most effective and satisfactory method of minimizing bear/human conflicts. This is the preferred option.

Aversive conditioning means deterring a bear by using loud noises or by inflicting pain. Methods include sirens, cracker shells, rubber slugs, birdshot, and thumper projectiles. Chemicals for taste aversion, irritant properties, or both may also be employed. To be effective on a habituated bear, aversive conditioning should be preceded by removal of the food, garbage, or other reason that the bear was attracted initially.

Translocation is seldom an effective solution. Bears have a proven ability to return to home ranges from long distances and over rugged terrain. Those that do not return are likely to continue to be involved in bear-human conflicts in new locations. Translocation is often preferred by the public, but considering its demonstrated ineffectiveness, human safety concerns, and the high expense, it is generally inappropriate to spend time and funds on such efforts.

Removal to zoos is only occasionally a viable option. Few qualified facilities are willing to take bears from Alaska because they are easy to obtain, breed, and maintain in captivity. Rarely will zoos accept bears older than cubs. Capture can be difficult and expensive.

Killing the bear may be the only effective alternative once efforts to avoid a bear-human conflict have failed. Division personnel lack the time and resources to routinely kill bears involved in such conflicts. Circumstances of time and distance usually require that such situations be handled by individuals on the scene. Alaska hunting regulations can generally accommodate these situations. Hunting regulations in the vicinity of problem may result in habituated bears being killed legally and used by the public; this is preferable to state or municipal agency personnel killing these bears. Bears habituated to human food are probably more vulnerable to hunters than are other bears, and they are often taken early in the hunting season near human settlements. However, liberal hunting seasons are not specific to the individual bears(s) causing the conflict and the resulting increase in the harvest of nontarget animals may reduce the area bear populations more than is desired, so the effect of liberalized seasons should be considered before they are adopted. Liberal hunting seasons are inappropriate if the offending bear(s) include sows with cubs because these bears cannot be legally harvested by hunters. State law also prohibits legal harvest of brown bears within one-half mile of established landfills or dumps, so liberalized regulations may not be effective at reducing brown bears accustomed to feeding in these areas.

In cases where immediate danger to an individual or his property exists, offending bears may be killed by any individual under the provisions of the Defense of Life or Property (DLP) regulations. A person killing a bear under these circumstances is responsible for reporting the incident and salvaging the hide and skull.

POLICY GUIDELINES

- Management efforts will emphasize the prevention of bear-human conflicts. Staff will attempt to anticipate problems that may result from changing human-use patterns in bear habitat and will recommend methods to minimize conflicts to land managers and local authorities. Public information efforts on avoiding bear conflicts will be employed.
- Bears living in proximity to humans and feeding on natural foods will not be considered nuisance animals. If necessary for public safety, the public will be alerted to the presence of bears, and, where feasible, efforts will be made to prevent access by bears to human food or garbage.
- State, municipal, and corporate policies and regulations regarding food storage and garbage disposal should be rigorously enforced. If division staff becomes aware of violations they should notify both the offender and the appropriate enforcement agency. The individual, agency, or corporation responsible for food or garbage stored in a matter that is “attractive” to bears, under provisions of 5AAC92.230 and .410, should be warned or cited. If a bear is killed under DLP provisions, and the taking was brought about by the improper disposal of garbage or a similar attractive nuisance [5AAC92.410(a)(1)], the offender will be warned or cited.
- Nonlethal methods of deterrence should be used before other options are exercised if a new conflict situation develops. If a chronic bear-human conflict exists, aversive conditioning techniques will be employed only after all reasonable efforts have been made to remove or secure the source that may have caused the conflict. These techniques should begin as soon as possible and be employed as consistently as possible. If staffing or funding limitations prohibit division staff from being directly

involved in aversive conditioning, qualified staff from other agencies or private citizens may be used.

- The division generally will not translocate bears involved in bear-human conflicts. Exceptions may be made in cases where bears are uncommon, where translocation funds are generated outside the division, and where acceptable release sites are identified. Translocated bears will be moved only to suitable remote habitat selected by the local area biologist. All translocated bears will be marked to facilitate future identification.
- The division generally will not capture bears involved in bear-human conflicts for confinement in a zoo. Exceptions will be made if suitable zoo facilities are available and the zoo is willing to pay for transportation costs for shipping the bear. Zoos must meet the standards set forth in the division's "Policy on Zoos" (August 18, 1989) prior to receiving bears. The division's headquarters office will be responsible for maintaining a list of qualified zoos willing to accept bears, and they will be contacted prior to capture.
- Orphaned cubs will be left in the wild except in circumstances where qualified zoos are available to accept them. If there is no zoo to accept orphaned cubs and they are likely to become habituated adults or perish if left on their own (<6 months old for black bears or <1 year old for brown/grizzly bears), the cubs will be destroyed.
- Where chronic bear-human conflicts exist and nonlethal options have failed, the problem bear(s) will be killed. Division personnel will kill the bear(s) only in cases where an immediate or recurring danger to the public exists.
- In cases where immediate danger to an individual or his property exists, offending bears may be killed by any individual under the provisions of the DLP regulation (5AAC92.410).
- Division staff, with assistance from the Department of Public Safety, will interview and obtain written statements from all individuals taking bears in DLP instances. Standard DLP report forms shall be used to report circumstances of the kill. Sealing certificates, DLP reports, and hides will be sent to the Regional Sealing Officer in Anchorage. Hides will be disposed of by public auction or provided to recognized scientific or educational institutions (a minimum of $200 handling fee will be charged) under provisions of scientific/educational permits. Skulls may be retained in the area office or disposed of to recognized scientific or educational institutions.
- Division staff will not attempt to hunt and kill bears responsible for human maulings in cases where the attack was unprovoked, the bear continues to pose an immediate threat to human safety, and the offending bear can be identified with a reasonable degree of certainty.

Appendix P

Regulations Pertaining to Littering and to Feeding of Game

13 AAC[39] 02.530
Littering, Depositing Materials, and Dragging Objects Prohibited

No person may throw, deposit or allow to be thrown or deposited upon a highway or vehicular way or area litter, garbage, glass, nails, tacks, wire, cans, oil, or any other substance. A person who throws, deposits, or allows to be thrown or deposited such substances shall immediately remove or cause to be removed those substances. A person removing a wrecked or damaged vehicle from a highway shall remove any glass or other substance dropped upon the highway from that vehicle.

5 AAC 92.230
Feeding of Game

No person may intentionally feed a moose (except under terms of a permit issued by the [Alaska] department [of Fish & Game] bear, wolf, fox, or wolverine or intentionally leave human food or garbage in a manner that attracts these animals. However, this prohibition does not apply to use of bait for trapping furbearers or hunting black bears under 5 AAC 84–5 AAC 92.

[39] Alaska Administrative Code

Appendix Q

Kodiak Bear-Management Plan
Citizens Advisory Committee Charter[40]

Introduction

Brown bears are a significant component of the Kodiak archipelago ecosystem and are important for the economy of Kodiak residents. The purpose of this charter is to guide the Citizens Advisory Committee (CAC) in the development of a Kodiak bear-management plan. The CAC comprises a diverse group that represents various public interests concerned with the management of brown bears on the Kodiak archipelago. The CAC is responsible for developing a comprehensive bear-management plan that has scientific integrity and broad public support. This charter provides the background, purpose, and objectives for the CAC. It also identifies expected committee standards and products, interests represented (to be inserted), available resources, constraints, and authority to implement outcomes of the process.

Background

Kodiak bears, the largest bears in the world, are a unique subspecies of the brown or grizzly bear, having been isolated from other bears for some 12,000 years. The Kodiak bear represents a wildlife image known throughout the world. Currently, the Kodiak archipelago bear population is healthy.

Concern over a reduction in the Kodiak bear population in the early decades of the last century prompted sportsmen to petition the federal government to protect the bears and their habitat. The result was the creation, in 1941, of the Kodiak National Wildlife Refuge (KNWR) to provide habitat for bears, salmon, and other wildlife. While the U.S. Fish & Wildlife Service (USFWS) is charged with conserving wildlife and habitat on the refuge, the Alaska Department of Fish and Game (ADF&G) has primary authority for managing the bears. ADF&G's specific objectives for management of Kodiak bears are 1) to maintain a stable bear population that will sustain an annual harvest of 150 bears, composed of at least 60 percent males; 2) to maintain diversity in the sex and age composition of the bear population, with adult bears of all ages represented in the population and in the harvest; and 3) to limit human-caused mortality of female bears to a level consistent with maintaining maximum productivity. At times, the different missions and objectives of USFWS and ADF&G may result in disparate management policies.

Public interest in Kodiak bears and shared management responsibilities between ADF&G and USFWS have resulted in the need to develop a cooperative Kodiak archipelago bear management plan. The plan will be comprehensive and address human uses of the archipelago relating to bears, negative bear-human interactions, potential habitat degradation, the impact of private land ownership in bear habitat, and any other bear-management issues deemed appropriate by the CAC.

[40] original charter dated January 2, 2001

Input to a Bear-Management Plan

Biologists and management staff from USFWS, ADF&G, and other agencies will provide the scientific, technical, and enforcement elements that must be considered by the CAC when developing the bear-management plan.

Although the natural history and biology of the Kodiak bear form the necessary basis for a bear-management plan, the CAC must also incorporate socioeconomic information. and public input to fashion a management plan with broad public support. Implementation of the bear-management plan may require changes in activities and behaviors among a broad range of agencies, corporations, recreational and resource user groups, and individuals. A bear-management plan based on sound science that has broad public support and acceptance will demonstrate that citizens and local, state, and federal resource managers in Alaska have the foresight and coordination necessary to develop a comprehensive bear-management plan.

Citizens Advisory Committee Responsibilities

Purpose

The *purpose* of the CAC is to develop a bear-management plan that has specific recommendations to help ensure the sustainability of the Kodiak bear population, to respond to the public's desires for uses of this wildlife resource, and to address public safety concerns. The plan will reflect relevant biological and sociological information.

Objectives

The specific *objectives* of the CAC are

- **To review the available biological and socioeconomic information on Kodiak brown bears, evaluate all relevant aspects of bear management that may affect the Kodiak bear population, and prepare, by April 30, 2001, specific recommendations regarding the management of brown bears in the Kodiak archipelago.** The CAC will consider biological and other information to produce a bear-management plan that has scientific integrity and broad public support. Committee members should consider all biological and socioeconomic aspects of bear-management on the Kodiak archipelago that they deem relevant. In developing the management plan, the committee will consider, at a minimum a) issues such as optimal size of the bear populations to be maintained on the archipelago; b) identification of recreational uses of bears on the archipelago; c) recommendations regarding public education and management actions required to minimize negative bear-human interactions; d) other considerations and actions deemed necessary by the CAC; and e) the scope of authorities, responsibilities, and legal parameters of agencies who will implement the plan. The bear-management plan may also contain recommendations for monitoring systems to assess the effectiveness of the plan.
- **To ensure public support for the bear-management plan by involving the public in the development process.** The key to success in this project is building a partnership of those interests that reflect local, state, national, and international concerns and that have a stake in the decisions about brown-bear management. The public will be afforded

opportunities to participate in each CAC meeting, and the CAC will schedule forums to gather knowledge and opinions and to inform the public of the committee's progress.

Expected Standards and Products

The CAC is expected to produce a draft bear-management plan for public comment by April 1, 2001[41]. The CAC will release the final plan to ADF&G for publication by April 30, 2001[42]. The plan will contain recommendations for policies and actions that have broad, public support and acceptance and that are consistent with the mission of each managing agency. The bear-management plan will be developed based on the following considerations: a) sound biological and socioeconomic information; b) prudent management; and, c) public input resulting from an open public process encouraging collaboration among all interested public and private parties.

The CAC is expected to use a consensus-building process facilitated by a neutral party to guide development of the plan. Consensus is defined as an agreement reached by identifying the interests of all of the concerned parties and then building a cooperative solution that maximizes the satisfaction of as many of the interests as possible. Each committee member enters the process with the intention of working cooperatively with other committee members to reach consensus decisions on actions supporting the management of Kodiak bears. In some cases, consensus may not be possible. In these cases, committee members will document the points of disagreement in a minority report. However, it is expected that the facilitator and committee members will work diligently to reach consensus on even the most difficult issues.

Each CAC member is responsible for communicating with his or her constituents throughout the process. For example, CAC members will provide updates regarding the activities and outcomes of the CAC meetings to those individuals or groups that hold similar interests. In addition, CAC members will be encouraged to participate in community outreach efforts coordinated by ADF&G and other participating agencies.

Resources and Constraints

Several people will provide professional support and assistance to the CAC as it develops the bear-management plan. A neutral party will assist the CAC by facilitating meetings and guiding development of the bear-management plan. Larry Van Daele (ADF&G Kodiak area biologist) and Mike Getman (KNWR deputy manager) will attend each CAC meeting and will provide the fundamental biological and management information about bears on the Kodiak archipelago. Cynthia Loker, ADF&G wildlife planner, will serve as a technical advisor to the CAC on planning issues, will coordinate the communication and public outreach effort, and will provide logistic and administrative support. Additional resources (e.g., public safety and enforcement) will be available to the CAC as needed.

Approximately eight, two-day CAC meetings will be held in Kodiak. If necessary, CAC members may be reimbursed for actual expenses. Funds for additional meetings are contingent upon expenses incurred by CAC activities. The CAC will begin work in early January 2001 and

[41] During the course of the project, this date was revised to May 1, 2001.
[42] During the course of the project, this date was revised to February 1, 2002.

will meet until the end of April 2001. All work must be completed and the bear-management plan submitted to ADF&G no later than April 30, 2001[43].

CAC members will limit the scope of their work to bears on the Kodiak archipelago. The Kodiak archipelago, for the purposes of the brown-bear management plan, is limited to Game Management Unit 8, as defined in the codified hunting regulations.

Authority

The public agencies making up an interagency planning group (IPG) have agreed to reconvene after conclusion of CAC activities to develop an implementation strategy for recommendations included in the Kodiak Bear-Management Plan

No assumptions have been made regarding the commitment of other landowners to implement the recommendations of the CAC. However, CAC members are free to include such recommendations in the bear-management plan.

Performance Review

The CAC is asked, as a final task, to evaluate this process to assist ADF&G in refining the methods by which public input and involvement are accomplished. An evaluation process and format is to be determined by consensus.

Citizens Advisory Committee Membership

The following CAC members agree to the provisions of this charter:

Richard Carstens
Dave Cline
Charles Dorman
Wallace Fields
Pam Foreman
Dave Kubiak
Tom Panamaroff
Hank Pennington
Jeff Peterson
Bettye Plyler
Dick Rohrer
Barbara Rudio
Rolan Ruoss
Tom Walker

[43] During the course of the project, this date was revised to February 1, 2002.

Appendix R

Alaska Board of Game

98-127-BOG
Resolution concerning commercial guiding activities in Alaska

WHEREAS, the Board of Game is given authority to manage Alaska's wildlife resources by the state legislature, through establishment of seasons, bag limits, and regulation of methods and means, and

WHEREAS, the board has received requests and concerns from guides and the public regarding the uncontrolled increase of commercial guiding, outfitting, and transporting activities and the negative impact that these activities have on game resources and hunt conditions, and

WHEREAS, the board does not have the regulatory authority to limit the number of guides, transporters, and their clients, and no agency exists with the ability to act on these requests, and

WHEREAS, in the past these issues were dealt with by the Commercial Guide and Services Board, which has been decommissioned by the legislature, and

WHEREAS, continued conflict involving this issue may result in restrictions placed by federal land owners that will shift the pressure to state lands and will result in further user conflict in areas that are deemed to be crowded,

NOW THEREFORE BE IT RESOLVED that the Board of Game requests that the legislature reinstate the Big Game Commercial Services Board or delegate authority over guides, outfitters, and transporters to an existing board or agency.

ADOPTED DATE: October 26, 1998
Ketchikan, Alaska

[signed]

Lori Quakenbush, Chairman
Alaska Board of Game

VOTE: 7–0

Appendix S
Terror Lake Agreement (excerpted)

In 1981, the Terror Lake Hydroelectric Project agreement included the "Cooperative Management Agreement between the State of Alaska, Departments of Natural Recourses (DNR) and of Fish and Game (ADF&G), and the U.S. Fish & Wildlife Service (USFWS)." Accordingly, the state and USFWS agreed to eight provisions to mitigate the impact of the Terror Lake dam on Kodiak National Wildlife Refuge (KNWR) resources.

In provision 1. (a) of the agreement, the state agreed that "certain lands within the Kodiak Island Borough will be designated as replacement land to replace habitat lost to fish and wildlife within the refuge.

In 1. (b), DNR and ADF&G "recognize the desirability of establishing consensus between them on fish and wildlife management and management of other resources on the Shearwater Peninsula generally . . . ."

1 (c) states that "the state and USFWS agree that USFWS may take notice of a management agreement between DNR and ADF&G regarding management of fish and wildlife habitat and other resources on the Shearwater Peninsula for purposes of determining whether there has been appropriate mitigation of the adverse effects of the proposed Terror Lake hydroelectric project on the refuge . . . ."

The second provision of the agreement divided the Shearwater Peninsula into the "Kiliuda Bay Unit" and the "Shearwater Unit." DNR agreed to manage the Kiliuda Bay Unit "in a manner compatible with the purposes of the refuge as long as the project is in operation . . . . Specifically, DNR will manage the lands in consultation with ADF&G and USFWS consistent with the Refuge Administration Act, which defines and governs the National Wildlife Refuge System. . . ." And, "any proposed use found by USFWS to be incompatible with the refuge purposes will not be permitted."

The third provision dealt with lands designated in the Shearwater Unit and how they were to be managed by DNR and ADF&G. In 3 (a), "DNR agrees to propose under AS 38.05.300, that the majority of the land in the unit will be classified as 'wildlife habitat.'"

3 (b) states that the land classified as wildlife habitat would be in a manageable unit. "Its primary resource value will be habitat for bear, other wild animals, birds, fish, or other animals. The primary management goal will be the maintenance of the habitat's productivity, with provisions for human use of the fish and wildlife resources present." ADF&G would have a consulting role to the DNR commissioner.

3 (c) states that "if a major economic use is determined by DNR to be a higher and better use of any portion of lands within the unit classified as 'wildlife habitat,' DNR will consult with ADF&G as to the habitat protection or mitigation measures necessary. DNR agrees to institute

necessary habitat protection or mitigation measures on the lands after a written review by an interdisciplinary team using the best data practicably available. DNR further agrees to consult with USFWS on such matters because of its expertise on wildlife management in the area."

3 (d) of the agreement states that "the land disposal brochure for sale of land on the Shearwater Peninsula under the state land disposal program will include a copy of the version of the ADF&G regulations 5 AAC 81.375 in effect on the date of this agreement . . . ."

The other five provisions of the Terror Lake Agreement dealt primarily with Federal Energy Regulatory Commission licensing issues for the Terror Lake Hydroelectric Project.

Appendix T

Assessment of the Vulnerability of Habituated Bears to Sport Harvest in theKarluk Lake Vicinity of Kodiak National Wildlife Refuge, Alaska

by
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June 2000

I. Relevant Data Sets

1. Composition of bears identified in studies of the O'Malley and Thumb river bear viewing programs

2. Mortality of bears marked in the Southwest Kodiak study area

3. Seasonal and home ranges of bears on Kodiak Island

4. Recoveries of bears marked at Karluk Lake during 1957–1966.

II. Data Assessment

1. Composition

The number of independent (excludes offspring) bears identified during the four-year O'Malley study ranged from 57 to 63; during two years of bear viewing programs (1992–1994) the average was 62.5 bears. Composition of adult males, adult females, and subadults was 11%, 58%, and 30%, respectively. During three years (1996–1998) of study at Thumb River, 17 to 36 independent bears were identified annually; composition of bears averaged 8% for adult males, 59% for adult females, and 33% for subadults. If we assume that about half of the subadults were female (Troyer and Hensel 1969, Smith and Van Daele 1989), roughly 75% of the independent bears at O'Malley and Thumb were females.

Each year, the independent bears were classed according to their level of habituation (high, moderate, low, unknown.) During years of bear-viewing programs at O'Malley, an average of 16.5 independent bears were classed as high or moderate (tolerant of people at $\leq$50 m) and an average of 11.5 were classed as low. Some bears classed as low would undoubtedly become moderate or high habituated bears over time.

Composition of independent bears classed as moderately or highly habituated to bear viewers (bear-viewing programs) varied somewhat between the O'Malley and Thumb areas. Only two adult males became habituated over the five years of study. Among adult females, a lower percent of animals became habituated at O'Malley (n=12; 16%) than at Thumb (n=22; 42%.) Similarly, a lower percent of subadults became habituated at O'Malley (n=20; 53%) than at Thumb (n=19; 66%.) Overall, assuming male and female subadults have approximately an equal likelihood of becoming habituated, females accounted for about 72% (range = 70–74%) of the habituated bears at O'Malley and Thumb.

These composition data suggest that an assessment of vulnerability of habituated bears to sport harvest should focus on adult females. This judgment is based on the following reasons:

Females made up a high percentage of habituated bears at O'Malley and Thumb.

Subadult females tend to remain in and use large portions of the ranges of their mothers, whereas subadult males tend to disperse away from maternal ranges (LeFranc 1987.) Thus, subsequent recruitment of females into the adult population would undoubtedly maintain or increase the high proportion of habituated adult females at O'Malley.

Adult males represent a small proportion of the bear population on Kodiak Island, are unlikely to become habituated, travel widely, and are sought out by hunters because of their large size. Hence, it is biologically impractical to attempt protection for adult males.

2. Female Survival

Survival of adult female brown bears on Kodiak Island is high (Smith and VanDaele 1988, Barnes and Smith 1992, 1997a) even though they are a component of a hunted population. This is a result of protection they are afforded when accompanied by offspring, by having minimum skull size restrictions in some permit areas, and by having generally lower trophy value (small size) compared to males.

Data collected in the Southwest Kodiak study area (Barnes and Smith 1992), located immediately south and west of the Karluk Lake drainage, provide insight into vulnerability of females to sport harvest. Of 63 adult females marked during 1982–1993, nine (14%) have been taken by sport hunters and 19 (30%) are known to have died of natural causes. The estimate of natural mortality is significantly biased because of radiocollar failures during the study and completion of the study. Another 76 females were marked as offspring or subadults and 9 (11%) of those had been taken by sport hunters as of the Fall,

1999 hunting season. These data indicate that females are much more likely to die of natural causes than by sport hunting.

3. Seasonal and Home Ranges

   Ranges of brown bears on Kodiak Island are small. This is especially true of females, whose ranges are generally less than a third the size of male ranges (Barnes 1990, Smith and VanDaele 1990, Barnes 1994, Barnes and Smith 1997.) Overall, the data indicate that most adult females have annual ranges of less than 25 mi2. The largest reported mean annual range for adult females (mean = 35 mi^2) was on the Southwest Kodiak study area (Barnes 1990.) Those larger ranges were a function of summer travel between streams to feed on the diverse and abundant salmon runs of that area. Average spring and fall ranges of those females were much smaller (5–10 mi^2.) Some females radiocollared on Southwest Kodiak made occasional forays into the Karluk Lake drainage, but this use was primarily limited to a small number of animals who had exceptionally large annual ranges (mean = 81 mi^2; Barnes 1990).

   Berns et al.(1980) radiocollared a sample of brown bears on the Karluk Lake drainage and reported very small ranges for both females (4-6 mi^2) and males (9 mi^2.) They attributed the small ranges to the unusual diversity of forage, cover, and denning habitat present in the Karluk Lake drainage.

4. Sport harvest recoveries—Karluk Lake Sample

   From 1957 through 1966, Troyer and Hensel (1969) conducted an intensive capture and marking study in the Karluk Lake drainage. Most of the capture effort was focused on the Thumb and O'Malley river areas. They captured 113 females and 89 males and reported sport hunter harvest of marked bears through 1967. Twenty-six (23%) females were taken a mean distance of 2.8 mi. from their capture/release site. Just three of the females were taken outside the Karluk drainage. Troyer and Hensel (1969) recorded 12 recoveries of females marked in the southern part of Karluk Lake (Meadow Creek to Canyon Creek.) All were harvested in the same general area they were captured except one female killed in Uyak Bay and another taken near Thumb Lake.

   Males were more vulnerable to harvest and moved greater distances to kill sites; 36 were harvested a mean distance of 7.6 mi. from the capture site. Thirteen were killed outside the Karluk drainage.

III. Risk Assessment

A structured bear-viewing program at O'Malley River would result in the habituation of at least 20 bears, and that number would likely increase if the program persisted for several consecutive years (Sellers and Aumiller 1994.) A high proportion of those bears (>65%) would be females; most of the habituated males would be subadults.

The risk of sport harvest of habituated bears would essentially be limited to the Karluk drainage during the fall season. During the early part of the fall season, bears congregate in lowland areas of the O'Malley River area to feed on late-run sockeye (Troyer and Hensel 1969, Barnes 1990.) During the spring hunting season, bears are primarily feeding on vegetation; they are dispersed and generally located in mid-slope habitats (Clark 1957, Troyer and Hensel 1969, Barnes and Smith 1997b.) Thus, during spring in the Karluk Lake drainage, bears typically would not be in the areas where they habituated to people, and, because of denning, probably would be less tolerant because they would not have had recent and predictable exposure to people.

Habituated bears on stream and lakeshore areas of the O'Malley area would be tolerant of people and clearly at risk of sport harvest. The actual number of animals taken would be small because of limited permits, protection of females with offspring, and hunter selectivity for trophy animals. Realistically, the average harvest of habituated bears on the O'Malley area could be expected to be less than one per year.

Additional protection of habituated bears at O'Malley could be accomplished through changes in hunting regulations. One possibility would be regulations to discourage harvest of females. For example, female sport kills could be compensated by reducing subsequent permit allocations on a one-for-one basis in the appropriate residency category (resident, nonresident.) Because females make up such a large component of the bear population at O'Malley, this type of restriction should provide substantial protection to habituated bears. Further, subadult males would receive some measure of protection because of their relative small size.

Habituated bears could be given a high level of protection by closing a portion of the Karluk Lake drainage to sport hunting. Because the focus should be on protection of habituated females, boundaries should conform to expected movement and range of females. The data presented above indicate that an area incorporating about 30 mi^2 of the southern Karluk Lake drainage would accomplish that objective. This area would encompass the Meadow Creek, Cascade Creek, O'Malley Lake, Falls Creek, and Canyon Creek watersheds.

Finally, it should be recognized that the current sport harvest system on Kodiak Island provides for a conservative harvest of animals. The system limits harvest of females and allows for a reasonable composition of large (trophy) adult males (Barnes and Smith 1990.) One consequence of this conservative system, compared to a more intensive rate of harvest, is substantial natural mortality of adult females. If a bear-viewing program was established at O'Malley River, loss of habituated bears would primarily occur because of natural factors rather than sport hunting, regardless of what level of protection was imposed.

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Appendix U

Policy for Statewide Salmon Escapement Goals

(5 AAC[44] 39.223)

(a) The Department of Fish and Game (department) and the Board of Fisheries (board) are charged with the duty to conserve and develop Alaska's salmon fisheries on the sustained yield principle. Therefore, the establishment of salmon escapement goals is the responsibility of both the board and the department working collaboratively. The purpose of this policy is to establish the concepts, criteria, and procedures for establishing and modifying salmon escapement goals and to establish a process that facilitates public review of allocative issues associated with escapement goals.

(b) The board recognizes the department's responsibility to

(1) document existing salmon escapement goals for all salmon stocks that are currently managed for an escapement goal;

(2) establish biological escapement goals (BEG) for salmon stocks for which the department can reliably enumerate salmon escapement levels, as well as total annual returns;

(3) establish sustainable escapement goals (SEG) for salmon stocks for which the department can reliably estimate escapement levels when there is not sufficient information to enumerate total annual returns and the range of escapements that are used to develop a BEG;

(4) establish sustained escapement thresholds (SET) as provided in 5 AAC 39.222 (Policy for the Management of Sustainable Salmon Fisheries);

(5) establish escapement goals for aggregates of individual spawning populations with similar productivity and vulnerability to fisheries and for salmon stocks managed as units;

(6) review an existing, or propose a new, BEG, SEG and SET on a schedule that conforms, to the extent practicable, to the board's regular cycle of consideration of area regulatory proposals;

(7) prepare a scientific analysis with supporting data whenever a new BEG, SEG, or SET, or a modification to an existing BEG, SEG, or SET is proposed and, in its discretion, to conduct independent peer reviews of its BEG, SEG, and SET analyses;

(8) notify the public whenever a new BEG, SEG, or SET is established or an existing BEG, SEG, or SET is modified;

(9) whenever allocative impacts arise from any management actions necessary to achieve a new or modified BEG, SEG or SET, report to the board on a schedule that conforms, to the extent practicable, to the board's regular cycle of consideration of area regulatory proposals so that it can address allocation issues.

(c) In recognition of its joint responsibilities, and in consultation with the department, the board will

(1) take regulatory actions as may be necessary to address allocation issues arising from implementation of a new or modified BEG, SEG, and SET;

[44] Alaska Administrative Code

(2) during its regulatory process, review a BEG, SEG, or SET determined by the department and, with the assistance of the department, determine the appropriateness of establishing an optimal escapement goal (OEG); the board will provide an explanation of the reasons for establishing an OEG and provide, to the extent practicable, and with the assistance of the department, an estimate of expected differences in yield of any salmon stock, relative to maximum sustained yield, resulting from implementation of an OEG.

(d) Unless the context requires otherwise, the terms used in this section have the same meaning given those terms in 5 AAC 39.222(f).

History: Eff. 6/22/2001, Register 158

Annotations

Authority: AS 16.05.251

Appendix V

Responses of Brown Bears to Human Activities at O'Malley River, Kodiak Island, Alaska

(Wilker and V. G. Barnes Jr. 1998)

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Abstract: We classified levels of direct response of brown bears (*Ursus arctos middendorffi*) to aircraft, watercraft, and groups of people on the O'Malley River area of Kodiak Island, Alaska. General public use occurred on the area in 1991 and 1993, whereas structured bear-viewing programs used the area in 1992 and 1994. Brown bears displayed high (running) or moderate (walking away) response on 18 (48%) occasions when fixed-wing aircraft flew over the animals <100m above ground. Three of four helicopter flights <200 m overhead and nine interactions with watercraft at $\leq$ 200 m distance also elicited strong response. Encounters between people and bears resulted in strong responses from bears more frequently (37%, n = 134) during years of general public use than in years of structured bear viewing (6%, n = 72, P <0.0001). We suggest that higher levels of low or neutral response by bears to encounters with guided bear-viewing groups was the result of consistent and predictable patterns of human activity.

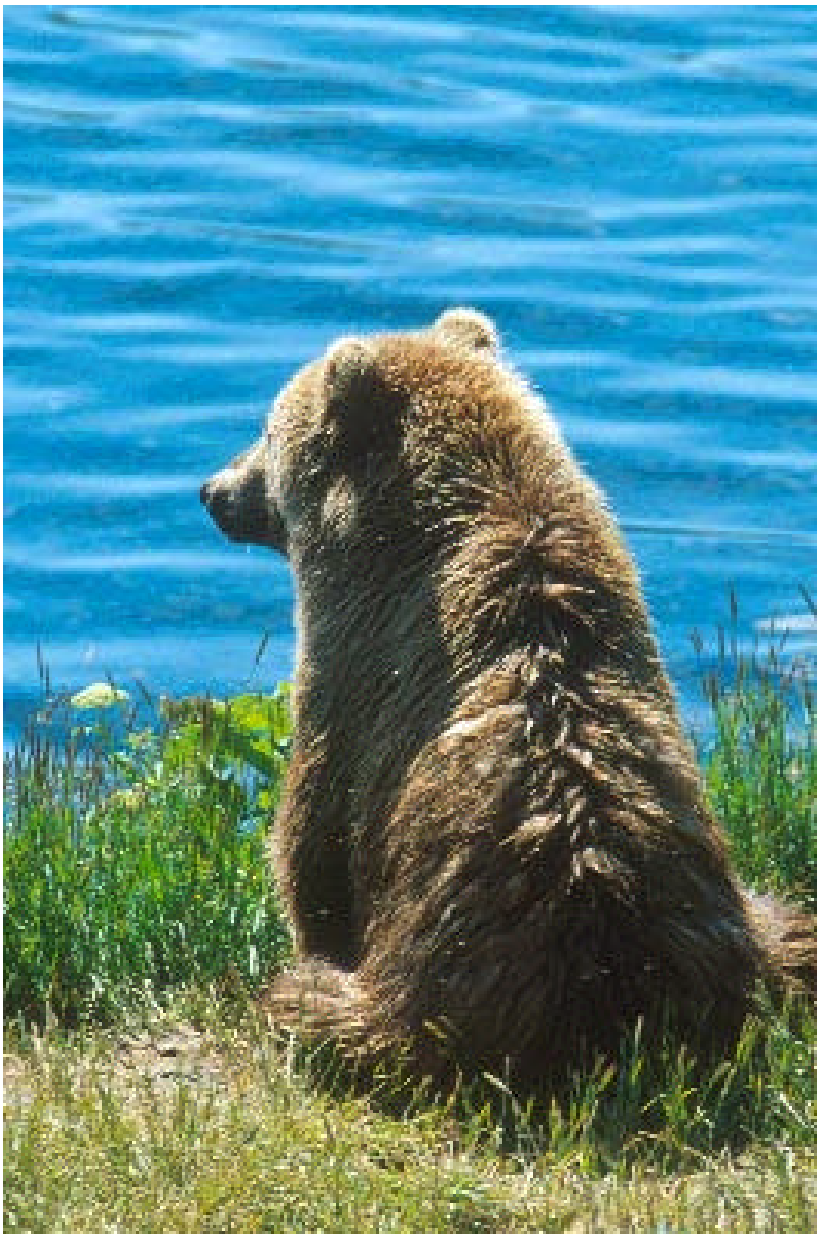

photo by Heather Johnson,
Kiak Arts and Images