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CHAPTER 1: INTRODUCTION

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Alaska is home to more than 98 percent of the brown bears in the United States and 70 percent of the brown bears in North America. The brown bear was once widely distributed and abundant across western North America. Over the last 200 years, the number and range of brown bears south of Canada has declined by more than 95 percent, largely as a result of excessive human-caused mortality and **habitat** loss. In

1975, the brown bear population was declared threatened in the contiguous United States under the federal Endangered Species Act (ESA). Today, that population numbers approximately 800–1,000 bears that inhabit relatively isolated wilderness with limited human development.

Alaskans have developed a special relationship with brown bears that includes a strong commitment to the sound management and long-term conservation of this large carnivore and its **habitat**. Large, undeveloped land masses in Alaska are conducive to the maintenance of stable bear populations. However, as the number of people in Alaska grows, the demands on the land increase. In some areas, this increased demand on the land may impact brown bear **habitat**, populations, and behavior. With the state’s currently healthy bear populations, Alaskans are in the enviable position of being able to work together now to blend economic development needs with sound conservation measures so that the bears and the people of Alaska can coexist and prosper in the future. This Conservation Strategy represents the first collaborative effort to develop a proactive management plan for Kenai Peninsula brown bears. As Alaska continues to develop, it is increasingly important that local, state, and federal governments work closely with the public to ensure that brown bears continue to thrive. This Conservation Strategy reflects input from the general public and from a diverse group of stakeholders, who represented a variety of interests.

I. BACKGROUND

Brown bears represent a significant component of the Kenai Peninsula ecosystem and are enjoyed by local residents and visitors. In November 1998, the Alaska Department of Fish and Game (ADF&G) identified the Kenai Peninsula population of brown bears as a “Species of Special Concern.” The department took this action because the population “is vulnerable to a significant decline due to low numbers, restricted distribution, dependence on limited **habitat** resources, or sensitivity to environmental disturbance.” This administrative designation was a proactive measure designed to focus attention and research efforts on Kenai Peninsula brown bears, an isolated population in an area experiencing steady human population growth and increased human activity.

Presently, ADF&G management biologists believe the Kenai Peninsula brown bear population is stable. However, in some areas on the Kenai Peninsula, human activities such as road construction and commercial, residential, recreational, and industrial developments are altering **important brown bear habitat**. Also, human encroachment into brown bear **habitat** has led to a significant increase in the number of bears killed to protect life and property. This comprehensive Conservation Strategy identifies the policies and management actions that will help ensure the future of brown bears and their **habitat** on the Kenai Peninsula and avoid restrictive actions such as the listing of Kenai Peninsula brown bears under the federal Endangered Species Act (ESA).

II. THE PUBLIC PROCESS

Recognizing the social complexity surrounding Kenai Peninsula brown bear conservation, ADF&G, in cooperation with the Governor's Office and the U.S. Department of the Interior, spearheaded a cooperative process to involve the public in development of a Kenai Peninsula Brown Bear Conservation Strategy. The process included three phases of public involvement:

Phase I: A survey of Kenai Peninsula and Anchorage residents was conducted to provide information about 1) residents' attitudes about Kenai Peninsula brown bears and brown bear conservation; 2) residents' interest in the Conservation Strategy development process; and 3) the most effective ways to reach the public with relevant information. (See survey results in Appendix F.)

Phase II: Members of the public representing primary interests on the Kenai Peninsula and government agency representatives were asked to participate as stakeholders in a group responsible for incorporating biological, management, social, and economic information into a brown bear Conservation Strategy. Broad public support for the Conservation Strategy was considered critical, and the public was encouraged to provide input to the Stakeholder Group through public meetings, workshops, and written comments.

Phase III: A communication and public outreach effort was designed to maximize the ability to reach the public with information about the stakeholder process. The Phase I survey results were used to craft this public outreach strategy. Active public involvement in developing the Kenai Peninsula Brown Bear Conservation Strategy was solicited through the media, public meetings, newsletters, and opportunities for open dialogue with members of the Stakeholder Group. The public outreach effort included a 30-day public review process and public workshops throughout the Kenai Peninsula and in Anchorage (see Appendix I for a more detailed description of the public process and workshop dates and locations). A post-stakeholder-process survey of residents will be conducted in Summer 2000. This will provide information to help determine the success of these efforts in reaching and involving the public.

III. THE STAKEHOLDER GROUP

In Spring 1999, state and federal agencies and the Kenai Borough mayor formed an Interagency and Borough Planning Group to formalize a collaborative planning process for developing the Conservation Strategy. The Planning Group developed the charter (see Appendix D) for the Stakeholder Group, whose purpose was to represent government agencies and diverse private interests having a stake in decisions regarding brown bear conservation. The nongovernment stakeholders were selected by soliciting names from individuals and interest groups representing the broad interests that were to be represented. Stakeholders were appointed jointly by the Kenai Borough mayor, the commissioner of ADF&G, and the special assistant to the secretary of the U.S. Department of the Interior for Alaska.

The stakeholders represented specific interests: timber, sport fishing, hunting, Native, residential property owners, conservation and environmental, oil and mining, and tourism, recreation, and local business. The Stakeholder Group also included representatives of the Alaska Department of Natural Resources (ADNR) and ADF&G, with participation by representatives of the United States Department of Agriculture–Forest Service (USDA-FS), the United States Fish and Wildlife Service (USFWS) and the National Park Service (NPS). Both the USFWS and NPS were represented by the USFWS. In addition, the Stakeholder Group included a Kenai Peninsula Borough representative who withdrew in November 1999 and a representative of the Borough Assembly who joined in January 2000. All stakeholders, except the federal agency representatives and the Kenai Peninsula Borough Assembly representative, signed the charter (see Appendix D). The interests represented and corresponding stakeholders and representatives were

1. **Sport fishing and guides:** Jim Golden
2. **Hunting and conservation:** Joe Hardy
3. **Native interests (co-stakeholders):** Dean Kvasnikoff and Kirk McGee
4. **Residential property owners:** Charles Quarre
5. **Environmental and conservation:** John Schoen
6. **Timber industry:** Mark Stahl
7. **Oil and mining industry:** Faye Sullivan
8. **Tourism and local business:** Kathleen Tarr
9. **Kenai Peninsula Borough Assembly:** Grace Merkes
10. **Alaska Department of Natural Resources:** Patty Bielawski
11. **U.S. Fish and Wildlife Service/National Park Service:** Mark Chase
12. **U.S. Department of Agriculture–Forest Service (co-representatives):**
Mike Kania and Bill Shuster
13. **Alaska Department of Fish and Game:** Mike Thompson

The Stakeholder Group began meeting, with the following specific objectives, in early October 1999:

- To review the available biological and social science information on Kenai Peninsula brown bears, to evaluate all relevant aspects of bear management that may affect the peninsula's bear population, and to prepare, by Spring, 2000, specific recommendations regarding the management and conservation of brown bears
- To ensure public support for the Conservation Strategy by involving the public in the stakeholder process

IV. CONSERVATION STRATEGY DEVELOPMENT

In addition to providing input from the interests they were chosen to represent, the stakeholders were asked to consider various factors in the development of the Kenai Peninsula Brown Bear Conservation Strategy. These included scientific, management, social, and economic input. A detailed discussion of these considerations can be found in Appendices E–G.

A. Scientific Considerations

Biologists from state and federal agencies have studied brown bears on the Kenai Peninsula for many years. In 1984, the Interagency Brown Bear Study Team (IBBST) was formed to ensure integrated management of brown bears and their **habitat** on the Kenai Peninsula by providing information and recommendations to land and resource management agencies. A summary of Kenai Peninsula brown bear biology and recent research findings of the IBBST were presented to the stakeholders. Points that were emphasized during the presentation included the following:

- To date, a scientifically based population census of Kenai Peninsula brown bears has not been conducted.
- Brown bears on the Kenai Peninsula rely heavily on salmon, thus accessibility to salmon is critical.
- Brown bears have large home ranges (tens to hundreds of square miles).
- Because of these large ranges, **habitat** considerations should be addressed on a landscape scale.
- In addition to large blocks of **habitat**, brown bears require **habitat linkages** connecting these blocks. On the Kenai Peninsula, **habitat linkages**, especially those consisting of riparian or streamside habitats, are an important component of brown bear **habitat**. **Habitat linkages** prevent the isolation of bears into “island populations” and provide access to important food sources.

In addition, the IBBST noted that the **cumulative effects** of human encroachment on brown bear **habitat** can adversely affect the brown bear population. The **cumulative effects** of human activities on the Kenai Peninsula are currently being assessed by the IBBST. Additional research is being conducted by the IBBST scientists and will be presented in a Conservation Assessment to be released in Fall 2000. (See Appendix E and Chapter 5 for further discussion of Kenai Peninsula brown bear research.)

B. Management Considerations

A management biologist from ADF&G presented the stakeholders with information regarding Kenai Peninsula brown bear management issues. Much of the information provided to the stakeholders focused on human-bear interactions, particularly brown bear mortality, on the Kenai Peninsula. It was noted that the harvest of brown bears has recently exceeded the number estimated to maintain a sustained yield. As a result, ADF&G closed the fall bear season by emergency order in 1995, 1996, 1997, 1998, and 1999. The number of bears killed in defense of life or property (DLP) has also increased in recent years. For the 17-year period from 1973 through 1989, a total of 38 (2.4 per year) DLP bear deaths were recorded (see Chart 1 on page 41). The rate of DLP deaths more than doubled during the seven-year period from 1990 through 1996, when a total of 40 (5.7 per year) bear deaths was recorded. (See Chapter 2 for a more extensive discussion of human-bear interactions.)

C. Social Considerations

The stakeholders were given the results of a survey (see Phase I discussion, above) regarding general public attitudes about Kenai Peninsula brown bears, brown bear conservation, and residents' interest in the process of developing the Conservation Strategy. The survey was conducted with Kenai Peninsula and Anchorage residents. The results showed that a majority of residents enjoy brown bears on the Kenai Peninsula; however, many worry about problems caused by brown bears. Residents of both areas think it is important that a healthy brown bear population exist on the Kenai Peninsula.

Residents have positive attitudes about the presence of Kenai Peninsula brown bears and desire a healthy population be maintained; a majority of residents in both areas also think that the Kenai Peninsula brown bear population should stay the same.

Both Kenai Peninsula and Anchorage residents were interested, at least to some degree, in the activities of the stakeholder meetings. (See Appendix F for a discussion of the survey results.)

D. Economic Considerations

In considering the many aspects of ensuring the future of brown bears on the Kenai Peninsula, the stakeholders acknowledged that recommendations may have economic consequences. On the other hand, stakeholders recognized the costs of potential federal

restrictions should the Kenai Peninsula brown bear population be listed as either a threatened or endangered species under the ESA. The stakeholders identified four basic categories of economic considerations: 1) the costs of recommendations that may limit development and growth; 2) the costs of implementing bear conservation recommendations; 3) the costs of not conserving bears (i.e., federal ESA restrictions); and 4) economic opportunities related to a healthy bear population. (For a more extensive overview of stakeholder input regarding economic considerations, see Appendix G.)

V. CONSERVATION STRATEGY IMPLEMENTATION

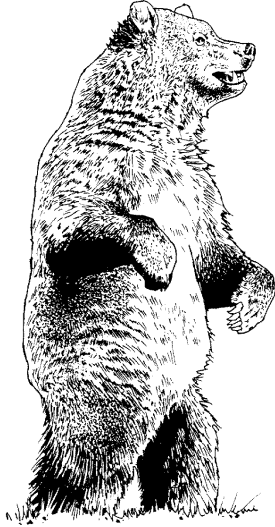
The Interagency and Borough Planning Group will reconvene in Summer 2000 to coordinate an implementation plan for the Conservation Strategy recommendations. In addition, several planning opportunities are either underway or will begin in the near future, making this an opportune time for landowners and resource managers to cooperatively implement a brown bear conservation plan. The ADNR has completed the Kenai Area Plan for state lands, including identification of lands available for selection by the Kenai Peninsula Borough through the municipal entitlement program. Also, the USDA-FS has a major land planning process underway as it revises the Chugach National Forest Land Management Plan. Another major planning effort anticipated in the near future is the USFWS revision of the Kenai National Wildlife Refuge Comprehensive Conservation Plan.

VI. PERIODIC EVALUATION/UPDATE OF THE CONSERVATION STRATEGY

The stakeholders agree that the Conservation Strategy is a dynamic document and will need to be revised as new information becomes available. Specifically, the IBBST is nearing completion of a Kenai Peninsula Brown Bear Conservation Assessment, and the stakeholders suggest that users of this Conservation Strategy reference the Conservation Assessment to provide additional scientific understanding and guidance for implementation of stakeholder recommendations. The stakeholders also suggest that the Conservation Strategy be subject to periodic review to allow incorporation of new research and management information regarding the status of the Kenai Peninsula brown bear population and **important brown bear habitat**. In making such a review, ADF&G shall seek the advice and recommendations of cooperating agencies, the IBBST, other interested organizations, and the public.

CHAPTER 2: HUMAN-BEAR INTERACTIONS

I. INTRODUCTION



When bears and people coexist, human-bear encounters are inevitable and can vary tremendously. The interactions between bears and humans can be positive or negative, depending on the circumstances of the encounter. The growing number of residents and outdoor recreationists on the Kenai Peninsula has contributed to increases in the human-caused bear mortality referred to as “defense of life or property” (DLP) killing of bears. Human-caused mortality results from direct taking of bears through legal hunting, illegal kills (poaching), and DLP kills. Human-caused bear mortality can be reduced through a variety of management techniques.

II. CONSUMPTIVE USE: HUNTING

ADF&G is charged with managing all wildlife on a sustained yield principle. For the Kenai Peninsula, the department’s objective is “to maintain an estimated population of 250 brown bears with a sex and age structure that will sustain a harvest comprising at least 60 percent males.” With the current estimated population being 250 bears, the allowable annual harvest is approximately 14 bears. Of these, no more than six can be adult females (female cubs and sub-adults are calculated as .5 bears). If the number of bears killed (by hunting or in DLP) equals the allowable harvest number, ADF&G closes the hunting season. For example, in each of the past five years, when harvest objectives were met, ADF&G issued emergency orders to close the remainder of the hunt for that regulatory year. A complete review of ADF&G’s management program can be found in Del Frate (1995).

III. DEFENSE OF LIFE AND PROPERTY

Approximately 100 bears have been killed in DLP on the Kenai Peninsula since statehood. In the 1990s, the average number of bears killed in DLP increased from fewer than 2.5 bears per year to more than six bears per year (see Chart 1 on page 41) with higher proportions in Game Management Unit 15C (see Figure 1 on page 43). There was virtually no difference between sexes among those bears killed, and most bears killed were less than four years old.

Kenai Peninsula residents were responsible for nearly 80 percent of the bears killed in DLP. Hunting-related incidents were the most frequently reported cause of bears killed in DLP. Most of these incidents were people hunting for species other than brown bears when they encountered and killed a bear. Some of the hunting-related bear fatalities in DLP occurred when people were hunting near their homes (see Figure 2, on page 45, for locations of known bears killed in DLP); however, most instances of bears killed in DLP near residences occurred when residents were not hunting, but when a bear was thought to be a threat to either their families or their property. If residents were protecting property, that property was a dwelling, a pet, or livestock (primarily poultry). Bears' attraction to residences with livestock or poultry is understandable. Bears can detect food odors at great distances and, because of their curious nature, may be attracted to these odors.

Other bear attractants include garbage, pet food, bird food, fish-cleaning tables, fish smokers, fishing bait, and bee apiaries. Once a bear develops a taste for a certain food, it often continues to seek out that food. Under state law, it is illegal to feed bears. Wildlife managers often use the phrase "a fed bear is a dead bear."

Back-country instances of bears killed in DLP have also been a problem. Generally, bears killed in DLP in back country situations were killed by moose hunters or black bear hunters. Historically, the majority of back-country users have been hunters. Bears killed in DLP in the back country are often the result of a hunter startling a bear inadvertently, the bear charging, and the bear being shot.

The use of the back country by nonhunting recreationists is increasing, and it is anticipated that the number of human-bear encounters associated with this use will increase. Because of insufficient information, predicting the rate of this increase as a function of nonhunting back-country use is not possible at this time. At a minimum, efforts to document the following information are necessary before a predictive model can be developed:

- total number of back-country trips,
- type and location of back-country activity,
- date of back-country trip, and
- presence of a firearm or other defensive materials.

Absent the ability to correlate a direct relationship between an increase in the number of nonhunting back-country users and bears killed in DLP, managers must rely on a qualitative assessment of available information to formulate management decisions, recommendations, or both.

IV. SUMMARY

The purpose of addressing human-bear interactions in this Conservation Strategy is to reduce unmanaged and unnecessary mortality of bears. ADF&G has full management control over brown bear hunting. In addition, ADF&G can investigate managing moose hunters in areas of high bear densities to reduce hunting-related killing of bears in DLP. However, ADF&G has little authority to manage nonhunting activities that contribute to the rising trend in bears killed in DLP. These activities are managed by other federal, state, and local land-management entities or occur on private land.

The stakeholders believe that reducing bear mortality should be addressed in a variety of ways, including education and public outreach, management of hunting and fishing activities, trail management, and implementing or improving garbage management.

V. STAKEHOLDER RECOMMENDATIONS

A. Recreation

Hunting: Hunting-related incidents were the most frequently reported cause of brown bear killed in DLP on the Kenai Peninsula.

Brown bear hunting: Brown bear hunting regulations need to ensure a healthy brown bear population.

R:¹ ADF&G should continue to manage hunting seasons so the mortality rate, including those killed in DLP, of the Kenai Peninsula brown bear population does not exceed **sustainable** levels. The stakeholders further recommend that ADF&G adopt a phased approach to managing the brown bear hunt to achieve this goal. The phased approach suggested is as follows:

- Phase I: Continue registration permit hunts with mandatory hunter orientation class to prevent overharvest of female bears.
- Phase II: If necessary, establish permit registration by sub-unit to reduce hunting effort in specific units where population number is a concern.
- Phase III: If necessary, based on the population numbers, begin a lottery to reduce the total allowable number of hunters and hunting activity.

R: ADF&G should monitor brown bear mortality closely in the areas of the outlet of Skilak Lake and Killey River to minimize the loss of female bears and to ensure that

¹ **R** = Recommendation

harvest is distributed across the Kenai Peninsula (see site-specific recommendations in Chapter 3).

- R:** ADF&G should continue to manage the brown bear population to provide hunting opportunity while maintaining a **sustainable** brown bear population. Management strategies should include options to regulate harvest by time (season of hunt) and hunter opportunity (area of hunt).

Moose hunting: Hunters who reported that they had killed a brown bear in DLP were most often hunting moose versus other species.

- R:** ADF&G should continue to track the location of bears killed in DLP associated with moose hunting. Based on data, ADF&G should consider the following ways to mitigate the problem of DLP bear kills caused by moose hunters:

- Relocate trails.
- Consider a proposal to the Board of Game to manage moose hunting in areas of high bear mortality in DLP (e.g., Game Management Unit [GMU] or partial GMU closures).
- Encourage education for moose hunters on avoiding killing bears in DLP (see Chapter 4).

*Black bear baiting:*² Bait (e.g., fish and meat scraps) intended for black bears may also attract brown bears, increasing the potential for negative human-bear interactions resulting brown bear killed in DLP.

- R:** To reduce the attraction of brown bears to black bear bait stations, ADF&G should petition the Board of Game to prohibit the use of fish and meat scraps (not including cooking oils or fat) for black bear baiting on the Kenai Peninsula (GMUs 7 and 15).

- R:** ADF&G should closely monitor black bear baiting related to brown bear conflicts and take appropriate action, as necessary, in the future.

- R:** In the event of a future spring brown bear season, it should be scheduled to not coincide with black bear baiting season on the Kenai Peninsula (GMUs 7 and 15) (e.g., brown bear season in April to target adult males followed by black bear baiting season in May).

The stakeholders considered a recommendation to petition the Board of Game to eliminate black bear baiting, but did not reach consensus on this issue. (See Appendix A for nonconsensus issues and related recommendations.)

² Black bear baiting is a legal method for hunting black bears. It consists of using attractants or lures such as scents, cooking scraps or oils, and fish or meat wastes. All baits must be biodegradable and removed at the end of the season. All the edible meat, skull, and hide of the black bear must be salvaged. It is illegal to hunt brown bears over bait.

South of Tustumena Lake: Mortality of radio-collared bears was high south of Tustumena Lake.

- R:** Reduce total hunting effort south of Tustumena Lake through GMU or partial GMU closures.
- R:** ADF&G should closely monitor mortality in sub-unit 15C (South Peninsula) and, if mortality is above **sustainable** levels, establish permit registration by sub-unit (see Phase II proposed brown bear hunting regulations, above).

Hunting and fishing camp sites: Camp sites are often sited in areas susceptible to bear conflicts and may create attractive nuisances.

- R:** Where camp-site authorizations are required, stipulations and education efforts should address proper management of food and garbage.

Sport Fishing Impact: In certain bear feeding areas, there is a predictable, seasonal increase in potential human-bear conflicts related to sport fishing activities.

- R:** The stakeholders recognize that ADF&G Division of Sport Fish biologists are not able to write emergency orders to manage a sport fishery to address brown bear conservation. ADF&G Division of Sport Fish and Division of Wildlife Conservation staff should cooperatively prepare an integrated management plan for approval by the combined Board of Fisheries and Board of Game. The primary purpose of the management plan would be to reduce human-bear conflicts associated with sport fishing and should include the following:
- Provide ADF&G Division of Sport Fish biologists with the emergency order authority to manage sport fishing activities to reduce human-bear conflicts. Specific criteria should be developed to establish how this authority will be applied.
 - Evaluate whether increased fishing activity will lead to increased human-bear encounters in existing sport fishing areas such as Goat Creek, upper Anchor River, Ninilchik River, and Nikolai Creek.
 - Identify newly developing sport fisheries and evaluate impacts to **important brown bear habitat** and human-bear conflicts.
 - Outline an education program for anglers in cooperation with professional associations, agencies, etc.

Recreational Cabins: Increasing numbers of cabins and increased cabin usage as well as associated attractive nuisances (e.g., garbage, bird seed) may lead to increased human-bear interactions resulting in bears killed in DLP.

- R:** Encourage public land management agencies, private landowners, and local off-road vehicle (ORV) groups to identify primary access trails and, through education, encourage users to use primary trails and reduce creation of secondary trails that may intrude into bear **habitat**.
- R:** Educate recreational cabin permit holders on proper food and garbage handling (see Chapter 4).

Primitive living facilities in remote areas: Attractive nuisances (e.g., garbage, bird seed) associated with cabins, guide camps, and other primitive residential structures may increase human-bear interactions resulting in bears killed in DLP.

- R:** When processing an application for a new, or reauthorization of an existing, recreational cabin, guide camp, or other **primitive living facility** in a remote area, ADNR should include permit stipulations designed to reduce attractive nuisances.

Hiking Trails and Trail Management: Hiking on trails located in or near **important brown bear habitat** areas may lead to bear encounters. Trail management is one tool that can be used to minimize human-bear conflicts.

- R:** Direct human use away from **important bear habitat** areas through maps and signage.³
- R:** Restrict camping or rest areas in **important bear habitat** areas along trails.⁴
- R:** Require and enforce strict garbage removal and “pack-it-out” policies.
- R:** In selected areas, as appropriate, require registration, limit the number of users allowed in high bear-concentration areas, or both.
- R:** Provide for selective trail closings at times of high risk.
- R:** On selected high-risk trails, brush out trail corridors to increase visibility and reduce sudden encounters.

³ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

⁴ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

Recreational Facilities: Some **recreational facilities** are located in **important brown bear habitat** areas.

R: Depending on the situation at a particular facility and the brown bear concern, apply appropriate management tools to address the concern. Possible management tools and actions include the following:

- Redesign or modify facilities to mitigate impacts, as practical and appropriate.
- Consider temporary use restrictions when bear conflicts occur.
- Encourage agencies to consider ways to minimize human-bear conflicts in their site selection and design of future facilities.

Camping: Some campsites are located within **important brown bear habitat** or **significant habitat linkages**. If managed poorly, food and garbage in developed and undeveloped campsites attract scavenging bears.

R: As needed, temporarily close **important brown bear habitat** to overnight camping.⁵

R: Determine other **important brown bear habitat** that should be closed seasonally to overnight camping.⁶

R: Enforce existing regulations regarding campsite limits, food and garbage management, and personal property storage in Kenai National Wildlife Refuge, Chugach National Forest, Kenai Fjords National Park, and Alaska state parks.

R: Use bear-proof trash receptacles, provide “hide-a-meal” metal lockers in campgrounds, and remove dumpsters and trash receptacles where bears have been a problem.

B. Other

Dump Sites/Waste: Food-conditioned bears are a substantial and irreversible threat to human safety and are at increased risk of being killed in DLP; however, with proper management of garbage, this problem can be prevented. Responsible garbage management and education are some of the

⁵ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

⁶ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

simplest and most cost-effective tools for reducing human-bear conflicts and ensuring the conservation of bears (see Chapter 4).

- R:** Encourage management of garbage and other attractants to minimize attracting bears to residential areas, work sites, and recreational areas throughout the Kenai Peninsula.

Government: Bears attracted to the Kenai Borough and municipal landfills and waste transfer sites become acclimated to humans and recognize garbage as an available food source. This problem is made worse with discarded fish carcasses.

- R:** The Kenai Peninsula Borough should enforce contracts with waste management contractors to keep waste transfer sites (e.g., McNeil Canyon) clean, in accordance with their contracts.

- R:** Recommend that municipalities and industrial facilities

- site facilities appropriately;
- utilize methods to avoid attracting bears (e.g., fencing, bear-proof dumpsters, and/or incinerators); and
- develop and implement bear-friendly regulations or guidelines for waste management.

Residential: When residents do not adequately take care of their garbage, bears may be attracted to residents' homes, which ultimately may lead to bears killed in DLP.

- R:** Encourage adequate education regarding garbage and management of other bear attractants throughout the Kenai Peninsula.

- R:** Resource agencies should request that the Alaska Interagency Bear Safety Committee consolidate information about the following:

- different types and applications of bear-proof containers;
- instructions on how to use the containers;
- where these containers can be acquired; and
- plans and instructions to help residents build their own bear-proof containers.

Storage of Pet, Livestock, and Bird Feed: When residents place or store bird feed and dog food outside, bears may be attracted to residences and may ultimately be killed in DLP.

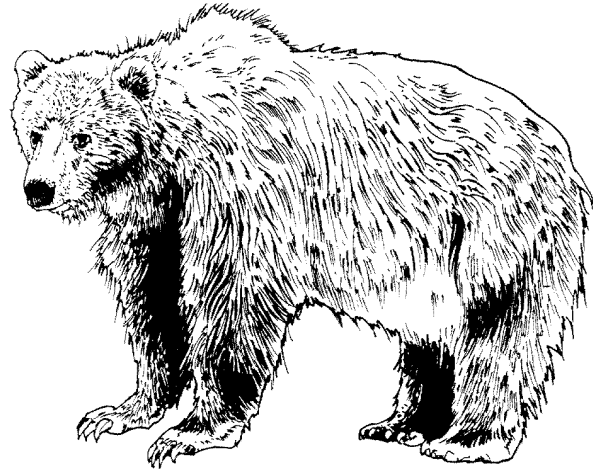
- R:** Encourage property owners to cooperate on actions to mitigate bear encounters through proper storage of pet and livestock food and bird seed and the use of bear-proof containers.

The stakeholders considered recommending Kenai Borough and municipal ordinances regarding garbage management, storage of pet food, livestock feed, and bird seed and the use of bear-proof containers. The Stakeholder Group did not reach consensus on this issue. (See Appendix A for nonconsensus issues and related recommendations.)

CHAPTER 3: LAND PLANNING, MANAGEMENT, AND AUTHORIZATIONS

I. INTRODUCTION

Historically, management of the brown bear population has focused primarily on annual harvest levels with little attention given to management of **habitat**. Wildlife managers are now concerned that the **cumulative effects** of increasing land-use activities may ultimately result in an irreversible decline in brown bear numbers on the Kenai Peninsula. Accordingly, conservation of the brown bear population should be considered in comprehensive land-use planning as well as in development-specific planning.



Land managers and landowners will play important roles in the successful implementation of the Kenai Peninsula Brown Bear Conservation Strategy. Land and resource managers have many different management objectives, ranging from economic development to low-density recreational use. Pressure to provide recreational and commercial opportunities will continue to increase as a function of human population growth in Southcentral Alaska. Issues that may affect the health of the Kenai Peninsula brown bear population that will be addressed by land and resource managers include the following:

- Maintaining **habitat** along salmon streams used by brown bears
- Active management of the wildlife refuge, national forest, national park, and state conservation areas for the benefit of brown bears and brown bear **habitat**
- Home construction and residential land development
- New road and trail construction and other access such as utility corridors
- Residence and recreational cabins, including trespass cabins
- Kenai Peninsula Borough land selections
- Oil and gas exploration and development
- Tourism and development of outdoor recreational opportunities (including hunting and fishing)
- Timber harvest activities

- Forest land conversions
- Management in response to spruce bark beetle infestation
- Fire management
- Mineral entry
- Grazing and agricultural development

Planning efforts provide opportunities to address issues related to Kenai Peninsula brown bears. Plans that have recently been adopted, are underway, or are slated for update in the near future are

- the Kenai River Special Management Area Plan,
- the Kenai Area Plan for state lands,
- the Chugach National Forest Land Management Plan revision, and
- the Kenai National Wildlife Refuge Management Plan revision.

The stakeholders agreed that activities such as resource extraction and timber management are not necessarily detrimental to bears, if measures are taken to avoid or minimize impacts on bears and their **habitat** (e.g., timber harvest timing sensitivity near **important bear habitat** and protection of **anadromous** fish streams). It is often the uses of land that follow resource development, particularly increased access, that impact bears.

Based on the biological information provided by the IBBST, the stakeholders approached land-use recommendations in both a general and a specific fashion. Some issues, such as access and waste management, cross a wide spectrum of land ownership and land-use activities. Recommendations were developed for the entire Kenai Peninsula regarding these types of activities.

Stakeholders qualitatively evaluated radio-telemetry information and subjectively identified some discrete areas of high bear use. This activity helped the stakeholders to visualize specific areas used by bears and to generate site-specific recommendations. However, it was recognized that these areas only reflected 1995–99 data from a small segment of the brown bear population that was radio-collared. Therefore, no inferences should be made about the value of these areas compared to other areas where no data were available. Land ownership and land-use activities were discussed for each area and specific recommendations were made.

The stakeholders also agreed that when evaluating a proposed project located in an area that is both developed and located in **important brown bear habitat**, permitting agencies should acknowledge that bear **habitat** protection measures applied to undeveloped areas may not provide the same benefit in, and therefore may not be appropriate to, developed areas.

II. STAKEHOLDER RECOMMENDATIONS

The stakeholders developed recommendations that apply to land-use planning, land management, and use authorizations. These recommendations are general (i.e., may apply to the entire Kenai Peninsula), site specific, or project specific.

A. General Recommendations

Options for Land Acquisition: The options available for land acquisition of **important brown bear habitat** include conservation easements, exchanges, and land purchases from willing sellers. (Cook Inlet Region Inc. [CIRI] has noted that it is only interested in land trades for other waterfront property.)

R:⁷ When a public agency is considering acquisition of private lands through purchase or exchange, such efforts should focus on land that contains **important brown bear habitat** in order to minimize loss of private property taxes resulting from land acquisition by public agencies in areas not necessary for conservation of brown bears. Private landowners should not be threatened with eminent domain.

Habitat Linkages: Significant habitat linkages for brown bear movement on the Kenai Peninsula need to be identified and protected. Based on experiences in the contiguous United States and British Columbia, it is apparent that **habitat fragmentation** and reduced effectiveness of brown bear **habitat** will result in a steady decline in bear populations. If significant barriers to bear movements between **habitat** areas develop, the probability of sustaining smaller isolated populations of bears on the Kenai Peninsula may decline, and the risk of losing bears due to isolation and mortality in DLP may increase.

R: Maintain significant linkages through specific land-use actions. Land-use actions for public lands may include the following:⁸

- develop criteria for preserving **linkages** and apply to potential development projects;
- develop **recreational facilities** that minimize impact on **significant habitat linkages**; and
- consider the land acquisition options (see Options for Land Acquisition, page 19) for **significant habitat linkages** as well as for **important brown bear habitat**.

⁷ R = Recommendation

⁸ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

Residential Growth: Residential development and expansion required on the Kenai Peninsula to support the growing population and economy may, in some areas, encroach into brown bear **habitat**, resulting in possible displacement of bears, more human-bear interaction, and possible bear mortality in DLP.

Public land: Much of the **important brown bear habitat** on the Kenai Peninsula is on public lands.

- R:** Bear **habitat** considerations need to be part of public land-use planning efforts at the local, Kenai Borough, state, and federal levels.
- R:** Local, state, and federal land planners should avoid residential and recreational **disposals in important brown bear habitat** and design developments to minimize impacts on brown bear in moderately valued **habitat**.⁹
- R:** Local, state, and federal land planners should concentrate new development near existing developed areas.
- R:** Prescribed burning should be encouraged on public land to reduce fuel loads and to improve moose and bear **habitat**.

Private land: The stakeholders recognize the importance of private property rights and do not want to infringe on these rights; thus, these recommendations are entirely optional for private property owners and developers. These general recommendations are for private lands within or contiguous to **important brown bear habitat**.

- R:** Consider brown bear conservation in development plans.
- R:** Work with developers to design developments that minimize impacts on **important brown bear habitat** (e.g., encourage **nodal** development and minimize bear attractants such as livestock and easy-access garbage sites).
- R:** Incorporate garbage and pet and livestock handling safeguards in covenants.
- R:** Where private development exists (e.g., Kenai Keys), ADF&G should work with homeowner associations and other organizations to develop localized plans for addressing bear concerns.

⁹ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

Recreation and Tourism:

Facilities: Some **recreational facilities** have been developed in **important brown bear habitat** on public lands (e.g., Russian River).

- R:** When planning developed **recreational facilities**, consideration should be given to minimizing impacts on **important bear habitat** and **significant habitat linkages**.¹⁰
- R:** Develop specific areas and guidelines for fish-cleaning activities at heavily used recreational sites.

Recreational use of private roads: Recreational use of private roads contributes to human-bear interactions and may result in bears killed in DLP.

- R:** Encourage owners of large tracts of private land to continue the practice of closing private roads except by use permit. Recommend that, in conjunction with issuing such permits, private landowners consider increasing public education efforts (e.g., by distributing brochures) to prevent DLP killing of bears.

Hiking and biking trails: Some hiking and biking trails occur in **important bear habitat**.

- R:** Work with the Kenai Borough Trails Commission to convene a workshop of bear experts, trail managers, and trail users to recommend a systematic process for evaluating trails and setting guidelines for minimizing or mitigating problems associated with human-bear interactions.
- R:** Identify trails with existing human-bear conflicts or the high potential for human-bear interactions.
- R:** Relocate trails that are located in areas of high human-bear conflict and consider brushing out trails.
- R:** Apply siting and design criteria to new trail plans and locate trails in low conflict areas.
- R:** Consider temporary trail restrictions to lower hiker-bear risks related to human-bear encounters.

¹⁰ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

Commercial and Resource Development: Commercial activities, including industrial resource extraction, forestry, and oil and gas development, 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 the development of a resource, particularly increased access, that impact bears; this includes displacement from important **habitat**, increased human presence in bear **habitat**, or DLP killing of bears (see Access and Roads recommendations, below).

- R:** Where possible, locate development away from **important bear habitat**; if not possible, mitigate impacts through timing, siting, rehabilitation, and other measures (e.g., public access, company firearms policy, garbage management).¹¹
- R:** Encourage all public and private landowners to address forest and wildlife management objectives, including brown bear concerns, when developing logging plans and **silvicultural prescriptions**.
- R:** Increase the coordination between ADF&G and USFWS regarding known denning locations and develop coordinated bear interaction plans when authorizing proposed oil and gas seismic surveys.
- R:** In general, use mitigation measures such as seasonal flight restrictions on certain operations, as determined on a site-specific basis, as part of permit review.
- R:** Manage access during and after logging activities in order to minimize bear impacts.
- R:** When planning timber management activities, consider that, in general, enhancing moose **habitat** through forestry practices such as revegetating with hardwoods is beneficial for moose and, by extension, bears.
- R:** Continue to plan and locate state timber sales with bear conservation as a consideration.

Access and Roads: As discussed in Chapter 2, Human-Bear Interactions, 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 human-bear encounters and DLP mortality.

¹¹ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

R: New road construction on public lands should be avoided in **important brown bear habitat**. However, where roads are necessary within **important brown bear habitat**, the following measures are recommended:¹²

- Include consideration of impacts on bears and bear **habitat** in the decision-making criteria regarding access on or to public lands.
- Work with adjacent landowners to minimize duplicative routes.
- If possible, schedule road construction and maintenance activities in **important brown bear habitat** during less intense bear-use periods.
- Construct roads with no greater impact than necessary to achieve their function, complete construction as quickly as possible, and consider closing roads (put to bed or with physical barriers), if appropriate.
- Where considering removal or closure of roads, evaluate risks and benefits, including highest and best use.
- On private lands, encourage owners to consider applying the preceding recommendations in their decisions on access and roads to and through their property.

R: Encourage ADF&G to work with private landowners on advising potential public users that access to certain private land is restricted.

Access and Trails: ORV trails, not including snowmachine trails, in **important bear habitat** areas may increase impacts on bears and their **habitat**.

R: Encourage public land management agencies, private landowners, and local ORV groups to identify primary access trails and, through education, encourage people to use primary trails and reduce creation of secondary trails that may intrude into bear **habitat** (see Chapter 4).

R: Encourage the Kenai Peninsula Borough Trails Commission to work with local communities and user groups regarding ORV access and bear conservation when identifying existing trails and planning for and designing trails in **important brown bear habitat**.

R: Include ORV users as a recommended audience for education and outreach (see Chapter 4).

¹² Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

Utilities: New or expanded utility corridors will be needed for continued growth and development on the Kenai Peninsula. There is concern that these corridors may increase access to **important brown bear habitat**, which may result in higher bear mortality due to DLP.

- R:** Public land managers should plan and site new utilities to minimize or avoid impacts to **important brown bear habitat**. Route utilities in established utility corridors or along roadsides where possible.¹³
- R:** In the planning process for utility sites and routes, where viable alternative routes exist, consider selecting the route with the least negative impact to bears and **important bear habitat**. The stakeholders recognize that economic considerations are also an important part of this decision-making process.

Landfills, Waste-Transfer Facilities, and Dumpsters: In some areas of the Kenai Peninsula, bears feed on garbage at landfills, waste-transfer facilities, and dumpsters, resulting in increased potential for human-bear encounters. Poor design and/or management of facilities can increase the occurrence of encounters.

- R:** Suggestions for the Kenai Borough, municipalities, the Alaska Department of Environmental Conservation, and unincorporated areas include the following:
- Locate, design, construct, maintain, and operate these facilities to eliminate bear access to landfills and waste-transfer facilities and bear habituation to garbage. Measures include fencing, lighting, attendants at landfills, bear-resistant dumpsters, and regular cleanup around dumpsters.
 - Encourage and provide incentives for use of fuel-fired incinerators.
 - The Kenai Peninsula Borough should enforce contracts with waste management contractors to keep waste transfer sites (e.g., McNeil Canyon) clean in accordance with their contracts.

Land Management Plans:

Chugach Forest Plan: The USDA-FS is presently updating the Chugach Forest Land Management Plan with a draft for public review that was expected in Spring of 2000.

¹³ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

- R:** The USDA-FS should apply the general as well as site-specific recommendations contained in this Conservation Strategy to **important brown bear habitat** on the Kenai Peninsula that is in the Chugach National Forest.

Kenai National Wildlife Refuge Management Plan: The USFWS will revise the Kenai Refuge Management Plan within the next several years which will be an opportunity to integrate brown bear considerations.

- R:** The USFWS should apply the general as well as site-specific recommendations contained in this Conservation Strategy to **important brown bear habitat** on the portions of the Kenai Peninsula that are in the Kenai National Wildlife Refuge.

- R:** Develop management prescriptions for **important bear habitat** areas on the refuge.

Kenai Area Plan: ADNR recently adopted the Kenai Area Plan for state lands.

- R:** ADNR has agreed to consider the recommendations outlined in this Conservation Strategy and to incorporate consensus recommendations via their amendment process.

B. *Site-Specific Recommendations*

(See page 18 for explanation of how the stakeholders identified the following site-specific areas.)

Swanson River area (“A” in Figure 3)

- R:** Continue (and increase, if necessary) education for oilfield workers.

Kasilof River, Nikolai/Crooked Creek, and Ninilchik River areas

- R:** Support continuation of road use/access restrictions on public access to CIRI land.
- R:** Explore with CIRI options, such as conservation easements, land exchanges, including trades for other waterfront property, for maintaining open space in the Crooked Creek area (“B” in Figure 3) and the area west of Tustumena Lake (“C” in Figure 3).
- R:** Encourage public land managers to maintain open space, through a variety of options, west of Tustumena Lake (“C” in Figure 3), except on CIRI land, where trades for other waterfront property should be encouraged. (see Options for Land Acquisition, page 19).

Deep Creek, Clam Creek, and Anchor River areas

- R:** New road construction on public lands should be avoided in **important brown bear habitat**, which includes the area south of Tustumena Lake. Where roads are necessary within **important brown bear habitat**, the following measures are recommended:¹⁴
- Include consideration of impacts on bears and bear **habitat** in decision criteria regarding access on or to public lands.
 - Work with adjacent landowners to minimize duplicative routes.
 - If possible, schedule road construction and maintenance activities occurring in **important brown bear habitat** during less intense bear use periods.
 - Construct roads with no greater impact than necessary to achieve their function, complete construction as quickly as possible, and consider closing roads (put to bed or with physical barriers), if appropriate.
 - When considering removal or closure of roads, evaluate risks and benefits, including highest and best use.
 - On roads that are managed by private landowners, encourage landowners to consider applying the preceding recommendations in their land management activities.
- R:** The stakeholders endorse and acknowledge that ADNR Division of Forestry (DOF) and ADF&G have already agreed to no permanent road construction in the Caribou Hills II, Center Plateau, and South Ninilchik timber sales. In the proposed Dome View timber sale, DOF plans some permanent roads. The stakeholders recommend that DOF minimize new permanent road construction to that necessary to support timber sales or planned forest management activities.
- R:** On public land, use signage to advise users of bears' presence on well-used seismic trails in areas with high bear densities.
- R:** The state should retain its existing ownership of large parcels on the southern Kenai Peninsula, as specified in the Kenai Area Plan, as adopted on 1/7/00. (Adopted Kenai Area Plan Units 45B, 48A, 260C, 260D, 266B, 271A, 277, and that portion of Unit 45A that has not been logged over. Logged-over portions of 45A are available for conveyance to the Kenai Peninsula Borough.)

¹⁴ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

- R:** Encourage ADF&G to continue to work with willing Kenai Borough, Native, and other private landowners to address brown bear concerns in logging plans.
- R:** Promote the use of conservation easements to provide for brown bear **habitat**.
- R:** When and if the extension of East End Road to connect with logging roads on Upper Deep Creek and to Ninilchik is completed, the state should work to maintain, through a variety of options, an undeveloped corridor between Caribou Hills and Center Plateau (“D” in Figure 3) (see Options for Land Acquisition, page 19).
- R:** Remove unauthorized cabins in Caribou Hills. NOTE: ADNR supports this recommendation on the condition of its having citation authority (see Chapter 2).

Northeast Tustumena

- R:** Kenai National Wildlife Refuge should reroute and maintain primitive trails away from Moose and Bear creeks (“E” in Figure 3) to minimize human-bear encounters. Monitor and re-evaluate in 5–10 years.
- R:** USFWS should acquire land via the land-acquisition options listed on page 19 for inholdings on Bear Creek.

Hidden Lake, Cooper Creek, Russian River/E. Skilak Lake, Upper Russian Lake (Goat Creek)

- R:** Encourage continuing prohibition of low-level use of helicopters for recreational purposes in **important brown bear habitat** during periods of brown bear concentration.
- R:** The USFWS should investigate acquisition of private parcels on Upper Russian Lake.
- R:** Use existing road and utility corridors where possible to avoid creating a new corridor through the Russian River and Resurrection River valleys.

Cooper Creek

- R:** ADF&G should analyze the potential impacts related to bears and human-bear interaction if the Cooper Lake dam is not reauthorized and the salmon fishery is restored.

Hidden Lake

- R:** Recommend that USFWS analyze why there is a low level of human-bear conflict around the Hidden Lake campground. Findings from the analysis may be applied elsewhere.

Chikaloon River/Mystery Creek, Resurrection/Juneau Creek areas

- R:** Offer bear safety education to users of the Resurrection Trail (Hope to Sterling Highway), and encourage USDA-FS to include bear safety education materials when issuing permits for Resurrection Trail cabins
- R:** Maintain seasonal road-access restrictions for public use on any utility-related projects on Mystery Creek Road.

Crescent Lake/Placer River, Snow River, Quartz Creek areas

- R:** Identify **important brown bear habitat areas** and provide this information to local planning groups on the Kenai Peninsula.
- R:** Identify and protect the **significant habitat linkage** from Kenai Lake to Russian River Campground and to Quartz Creek (“F” in Figure 3).¹⁵
- R:** The USDA-FS should consider brown bear management concerns in the area south of Kenai Lake near Primrose to Bear Lake, including Snow River.

Slikok Creek, Outlet of Skilak Lake/Killey/Funny River areas

- R:** Public land managers should restrict development of new campgrounds, associated roads, and boat launches in **important brown bear habitat** on refuge land in the Killey River area.
- R:** When a public agency is considering acquisition, through purchase or exchange, of private lands in this area, such efforts should focus on land that contains **important brown bear habitat** in order to minimize loss of private property taxes resulting from land acquisition by public agencies in areas not necessary for conservation of brown bears. Private landowners should not be threatened with eminent domain. In the case of CIRI land, trades for other waterfront property (as opposed to conservation easements or purchase) should be encouraged.

¹⁵ Federal land managers concur with this recommendation for federal lands. ADNR concurrence with this recommendation for state land is provisional. Final concurrence by ADNR is dependent on agreement by the Brown Bear Conservation Strategy Planning Group on the spatial extent of important bear feeding areas (e.g., distance from the stream bank) and the significant habitat linkages referenced in the Conservation Strategy definition of important brown bear habitat.

- R:** To protect **important brown bear habitat** and the **significant habitat linkage** area on public lands west of Skilak Lake, including the outlet of Skilak and Killey River (“G” in Figure 3) below the fork, the following actions are recommended:
- The USFWS should manage and enforce its regulations regarding human use and camping in this area.
 - Restrict permanent development on public lands.

C. *Project-Specific Recommendations*

Sterling Highway Upgrade at Cooper Landing

1. Background

The Alaska Department of Transportation and Public Facilities (ADOT/PF) is studying upgrading the Sterling Highway in the vicinity of Cooper Landing. The existing route is narrow with no passing or turnout lanes. One section of the road by the Russian River ferry is highly used by the public for parking and walking while going to and from fishing on the Kenai River. Alternatives being evaluated include upgrading the highway along its current route along the Kenai River, rerouting the highway from its current location to a location along a bench above and to the north of the Kenai River, and, possibly, variations of these two alternatives. Some of the issues that will be evaluated and balanced as the evaluation of alternatives proceeds are potential to reduce pedestrian and motorist risk; community preferences; degree of construction impact to fish **habitat**; relative potential of routes for fuel spills into the Kenai River; land-use classification and development and preservation opportunities; relative loss or gain of economic opportunities, including tourism and recreation; and relative impact to wildlife **habitat**, including brown bear **habitat**.

2. Stakeholder Process

The Stakeholder Group sought to identify issues pertaining to possible impacts on brown bears on the Kenai Peninsula and to make recommendations for measures that may mitigate negative impacts. During the course of issue identification and data review, stakeholders reviewed specific IBBST information on brown bear use in the Juneau Creek falls and drainage area. Consideration of these data resulted in stakeholder questions regarding the particulars of the bypass alternative and the potential impacts of this alternative versus upgrading the existing route. Information provided in response to stakeholder questions follows.

- **Bypass Alternative Proposal:** The bypass reroute would begin at milepost 45 of the existing highway and rejoin it at milepost 60. The proposed reroute is approximately three miles north of the existing route at one point in order to traverse upstream from the Juneau Creek falls. (See ADOT&PF Sterling Highway MP 37–60 Project,

F-02102[15/53014], Draft Environmental Impact Statement and Section 4F Evaluation, March 1994.)

- **Brown Bear Use:** Based on current IBBST data, ADF&G has determined that at least six known, collared adult female brown bears use the stretch of Juneau Creek below the falls for feeding during the salmon run. An unknown number of bears travel through the area bounded by the existing highway and the bypass alternative route. ADF&G biologists believe that the highway upgrade has the potential to adversely impact brown bears occupying and using the Cooper Landing region of the Kenai Peninsula. Impacts to brown bears could be caused by impeded access to the salmon resource at Juneau Creek, increased bear-vehicle accidents, increased bear-human encounters resulting in increased DLP kills, and/or displacement of bears from the area of development between and adjacent to the two roads. (Source: IBBST, ADF&G)
- **Land Classification:** The State of Alaska owns several parcels of land within and immediately adjacent to the existing route and the proposed bypass reroute. The land-use classification of these lands, and their resulting availability to the Kenai Peninsula Borough for development, will depend on where the upgrade is ultimately located. (Source: ADNR Kenai Area Plan)
- **Community Comments:** The stakeholders held one meeting in Cooper Landing. Residents advised that they have been working on reviewing various ADOT/PF plans for and studies of the highway upgrade for many years and that there is no community consensus regarding a preferred alternative. (Source: Stakeholder Meeting, Cooper Landing, 12/2/99)
- **Additional Study and Alternative Selection:** ADOT is preparing a new environmental impact statement document and has been working on the scoping phase of this document preparation. The draft environmental impact statement will be circulated for public review and will provide the basis for decisions on the federally required permits for any construction. (Source: ADOT/PF)

3. Stakeholder Recommendations

The Kenai Peninsula Brown Bear Conservation Strategy Stakeholder Group does not advocate for any one of the ADOT/PF-considered alternatives over another.

- R:** During the process of developing the environmental impact statement, ADOT/PF should carefully evaluate, in collaboration with ADF&G, USDA-FS, and USFWS biologists, the potential risks to brown bears resulting from the proposed highway upgrade and consider all location alternatives, including upgrading the existing

highway in or near its current footprint. Issues that should be addressed for each alternative include loss of bear **habitat**, displacement of bears, and increased mortality of bears from DLP kills. Specific recommended evaluations follow:

- **Loss of habitat:** Evaluate the potential of each alternative to fragment **habitat** and to pose physical barriers to bear movement from the surrounding areas into and through the area of the upgrade.
- **Bear Displacement:** Evaluate the potential of each alternative to increase human-bear contact and whether such contact would discourage bears, particularly sows with cubs, from traveling to and feeding along the lower stretch of Juneau Creek.
- **Increased Mortality:** An additional issue which should be addressed for the Juneau Falls bypass alternative is the potential impacts of new development in the area between the bypass route and the existing roads and potential for increased mortality of bears (in DLP or by other causes) associated with this development and its location in bear **habitat**.

CHAPTER 4: PUBLIC EDUCATION AND OUTREACH

I. INTRODUCTION

The stakeholders agreed that education and public outreach were critical to brown bear conservation on the Kenai Peninsula. Education was, by far, the stakeholders' strongest area of consensus. All of the stakeholders agreed that a well-informed public was the most important ingredient for conserving brown bears on the Kenai Peninsula. The purpose of such an educational effort is to provide clear and useful information about bears to people who live, work, and recreate on the Kenai Peninsula.



Bear education will help people on the Kenai Peninsula work and recreate more safely, minimize negative human-bear interactions, reduce the rate of bears killed in DLP, and help people understand the importance of supporting and implementing the Conservation Strategy. Safety in bear country is largely an issue of prevention. Knowledge and an understanding of bears empower people by increasing their skill at avoiding unnecessary problems and conflicts. Knowledge also provides important tools for conserving bears while minimizing the likelihood of needless federal restrictions. With understanding and preparation, people can avoid bear encounters and react wisely when they do occur.

II. STAKEHOLDER RECOMMENDATIONS

Although designing an effective educational program with measurable objectives was beyond the scope of the stakeholder charge, the following recommendations are made:

- R:** Resource agencies should consult with public education and public relations specialists to develop a professional strategy for a public education and outreach campaign. This strategy should be developed cooperatively by the state and federal land and resource management agencies in conjunction with the Kenai Peninsula Borough and interested members of the public. It was stressed that ADF&G staff should be the coordinating body of the education effort and serve as a liaison between the education and public relations specialists and the other agencies and organizations participating in the education and outreach effort.

- R:** The Kenai National Wildlife Refuge should expand its current elementary educational outreach efforts to grades 7 through 12 and work with schools throughout the Kenai Peninsula.

The stakeholders stressed that the public education and public relations specialists should determine the types of communication and messages that would be most effective and the types of audiences that would be most appropriate. Depending on the audience, education might include the following types of information or messages:

- The importance of keeping Kenai Peninsula brown bears from being listed as threatened or endangered under the federal ESA or any other regulatory program and the ramifications of such a listing on land use and public access
- Bear biology, behavior, and **habitat**
- How to coexist with bears and reduce DLP killing of bears
- How to minimize negative encounters with bears
- How to minimize negative impacts to bear **habitat**
- Tools available for protecting brown bears
- History and reasons for bear decline elsewhere
- Importance of the Conservation Strategy to the people of Alaska

The stakeholders recommend the following options be considered by the education specialist:

A. Options

- O:**¹⁶ A presentation, or series of presentations, outlining Kenai Peninsula brown bear conservation issues and specific actions necessary to minimize the probability of human-bear interactions (the most relevant issues to be determined by the education specialist in consultation with the participating agencies and members of the public) might be given to communities and organizations (e.g., snowmachine clubs, hunting and fishing groups) throughout the Kenai Peninsula.
- O:** A flier with a brief overview of Kenai Peninsula brown bear issues (education specialist will help determine the target audience for fliers) might be distributed. The “Living with Bears” pamphlet that already exists may be sufficient for a general audience.
- O:** Brochures and other informational tools targeted at specific groups (e.g., hunters, anglers, recreationists, tourists) might be given to vendors who sell fishing and hunting licenses.
- O:** Brochures might be made available to help people on the Kenai Peninsula live more compatibly around bears (e.g., garbage management and storage of pet food). Some brochures are available (e.g., “Living with Bears” and the “Bear Facts”) and may

¹⁶ O = Option

- need to be reassessed for appropriate modification. A more comprehensive booklet, similar to that done for moose (“Living In Harmony with Moose”), is currently in production.
- O:** ADF&G’s hunter education program should include information on bear safety awareness and how to reduce DLP killing of brown bears.
 - O:** To help minimize attractive-nuisance problems, develop a one-page handout that can be distributed with dog food, bird seed, livestock and poultry feed, and fish-processing products.
 - O:** To help minimize the likelihood of bears breaking into cabins, develop a brochure that shows or tells people how to bear proof their cabins, especially in regard to food storage and garbage handling.
 - O:** Enhance and expand the bear awareness program for trailheads (e.g., bear awareness pamphlets and boards for posting bear sightings), campgrounds, and boat launches, including signs and pamphlets-brochures explaining bear behavior, avoidance strategies, and food and garbage management. The USDA-FS, USFWS, Alaska State Parks, and ADF&G should develop this program cooperatively and use consistent signage.
 - O:** Educate campers about food and garbage management using signage and other techniques.
 - O:** Develop a brown bear education outreach and training program for the visitor industry. Work with Kenai Convention and Visitors Bureau and others (e.g., Kenai Peninsula businesses) to distribute bear brochures to tourists. Information might be included in the promotional materials for visitors to Alaska.
 - O:** Develop a brown bear education outreach and training program for real estate licensees. Work with professional REALTOR[®] organizations to distribute brochures and educational materials to prospective property owners.
 - O:** Develop an educational program for residential areas focusing on avoiding bear attractants around dwellings and subdivisions.
 - O:** Use posters, the media, fliers, slide programs, and video cassettes to disseminate educational messages.
 - O:** Work with the school system, especially teachers, to develop a curriculum for students in kindergarten through grade 12. Appoint a liaison from ADF&G to work with the public school system in this effort. Continue to provide support for and encourage use of the curriculum.
 - O:** Develop teaching aids that can be used by home-school students and private school educators.

- O:** To educate people about appropriate responses to brown bear encounters, short public service announcements describing simple, appropriate action plans should be seasonally broadcast on television and radio and printed in magazines, association newsletters, and newspapers.
- O:** Agencies should consider hiring a brown bear specialist to work (i.e., the “Montana model”) on the Kenai Peninsula with private landowners to address brown bear problems
- O:** Work with businesses, chambers of commerce, the Kenai Borough service clubs, recreationists, and other associations to help distribute educational information.
- O:** Provide hiker-safety education programs.
- O:** Work with private property owners to protect **habitat** and discourage brown bears in subdivisions.
- O:** Offer brown bear orientations to users of **recreational facilities** located in brown bear **habitat**.
- O:** Encourage public land management agencies, private landowners, and local ORV groups to identify primary access trails and, through education, encourage people to use primary trails and reduce creation of secondary trails that may intrude into brown bear **habitat** (see Chapter 3).
- O:** Include ORV users as a recommended audience for education and outreach.
- O:** On the ADF&G web site, maintain a link with comprehensive information about Kenai Peninsula brown bears (e.g., summary of IBBST research, photos, information about brown bear **habitat**, important feeding areas, attractive nuisances, how to avoid brown bear contact, the Conservation Strategy,).
- O:** Create a temporary traveling exhibit on Kenai Peninsula brown bears that would rotate among the Kenai Visitors & Cultural Center, the Pratt Museum, the Seward Visitor Center, and public and school libraries the Kenai Peninsula.
- O:** Develop a talk for kids and schedule public speaking times in various classrooms.
- O:** Organize a presentation summarizing the stakeholder recommendations and schedule this presentation for every chamber of commerce on the Kenai Peninsula, service organizations, etc.
- O:** Use radio spots during the summer months to explain that garbage and trash are attractive nuisances, how to avoid camping in brown bear corridors, and how to avoid brown bear conflicts.

CHAPTER 5: FUTURE RESEARCH

I. INTRODUCTION

Biologists from state and federal agencies have cooperated in brown bear management and coordinated research efforts for brown bears on the Kenai Peninsula for many years. The **cumulative effect** of human encroachment on brown bear **habitat** was identified as a potential management issue in the late 1970s. The USFWS, USDA-FS, and ADF&G formed the IBBST to foster cooperative collection of information needed to manage Kenai Peninsula brown bears. The NPS joined the effort in 1990. These biologists work cooperatively to ensure integrated management of brown bears and their **habitat** on the Kenai Peninsula by providing information and recommendations to land and resource management agencies.



The goals of the IBBST are to 1) act as a clearinghouse for information gathered on brown bears, their **habitat**, and population management actions on the Kenai Peninsula that may affect this species; 2) identify, develop, and execute data collection efforts that are responsive to agencies' management needs; and 3) provide a mechanism whereby the agencies can work on a cooperative brown bear study across jurisdictional boundaries. Research was initiated in 1984, and Jacobs (1989) introduced several land-use recommendations for the peninsula. These recommendations did not include a means to evaluate the effects of human development and modification on brown bears and their **habitat**. The IBBST took the next logical step and designed a **habitat** capability model to assess the cumulative effects of management practices on the **habitat** essential to sustain brown bears (Suring et al. 1994). The cumulative effects model is a statistical model designed to evaluate the effects of land management activities (e.g., logging, mining) on brown bears on the Kenai Peninsula. The cumulative effects model should not be confused with the stakeholders' definition of **cumulative effects** (see Appendix B).

The **habitat** capability model for brown bears on the Kenai Peninsula provides an analytical tool to simultaneously evaluate the effects of human actions on brown bear **habitat**. **Habitat** capability models for brown bears have been created for other populations and are being used frequently by land and wildlife management agencies (Christensen and Madel 1982, Christensen 1985, Weaver et al. 1985, Young 1985, Schoen et al. 1994).

A summary of Kenai Peninsula brown bear biology and recent research findings of the IBBST were presented to the stakeholders (see Appendix E).

In 1993, ADF&G management biologists estimated there were 277 brown bears on the Kenai Peninsula. This estimate was based on 13,848 square kilometers (km²) of **habitat** and an average density of 20 brown bears per 1,000 km². While this estimate is used for managing the brown bear harvest, biologists agree that additional research is needed to determine a more reliable and scientifically valid population estimate.

Knowledge and understanding of Kenai Peninsula brown bears has increased substantially in the decade and a half since formation of the IBBST. The quality and quantity of research on the Kenai Peninsula have provided an understanding of Kenai Peninsula brown bears that is second only to that of the threatened Yellowstone brown bear population. Many unanswered questions remain, however, about the ecology, numbers, and distribution of brown bears on the Kenai Peninsula and the viability of their population.

The IBBST has identified several key areas of brown bear ecology that require additional research on the Kenai Peninsula. The Stakeholder Group supports future research into these and other areas, as described below.

The stakeholders suggested that ADF&G, USFWS, USDA-FS, and NPS work cooperatively to fund and coordinate future research efforts. The Stakeholder Group recognizes that research is a slow and ongoing process. The stakeholders further recognize the need for a dynamic conservation strategy that can be continuously updated as new information becomes available.

II. QUESTIONS TO BE ANSWERED BY FUTURE RESEARCH

A. Brown Bear Population and Habitat Analysis

The dynamics (population size, distribution, etc.) of brown bears on the Kenai Peninsula is not known. Related information about brown bear **habitat** was identified by the stakeholders as an area that needed additional research.

Information needed

- I:**¹⁷ Determine a quantitative estimate of the Kenai Peninsula brown bear population size and distribution.
- I:** Conduct population viability analysis for Kenai Peninsula brown bears.
- I:** Continue analysis and testing of the cumulative effects model.
- I:** Through population viability modeling, estimate levels that would trigger “Threatened” and “Endangered” Species listing.
- I:** Develop methodology for an annual population trend index.

¹⁷ I = Information needed

- I:** Determine if brown bears cross the isthmus from the mainland and if Kenai Peninsula brown bears are genetically unique.
- I:** Determine if southern Kenai Peninsula brown bears are demographically isolated.
- I:** Delineate brown bear range and mortality rates across the Kenai Peninsula.
- I:** Continue efforts to collar brown bears in areas where they have not previously been collared (specifically the east and west sides of Trail Lake, Snow River drainage, and Cooper Landing).
- I:** Continue analysis of brown bear **habitat** selection data and probability use patterns.
- I:** Determine temporal use patterns, especially regarding stream use.
- I:** Generate data on male brown bears to understand distribution, seasonal biology, and nutritional ecology.
- I:** Evaluate effects of **habitat fragmentation** on radio-collared brown bears (e.g., south of Tustumena Lake).
- I:** Identify and further refine **significant habitat linkage** areas.
- I:** Evaluate and define **important brown bear habitat** and identify these areas on the Kenai Peninsula.

B. *Human-Bear Interactions*

Additional resources should be earmarked for collection and analysis of information about bears killed in DLP (location, timing, type of brown bears, and cause). More precise information will help evaluate methods for reducing DLP mortality.

Information needed

- I:** Continue and improve (i.e., make more systematic) DLP mortality analysis efforts and determine ways to reduce killing of bears in DLP.
- I:** Examine impacts of winter human activities on denning brown bears (sows with cubs, etc.) and impacts of snowmachine activity (especially south of Tustumena Lake).
- I:** Develop a monitoring plan to evaluate the effectiveness of mitigation measures such as those in the Conservation Strategy.
- I:** Analyze why there is low level of human-bear conflict around the Hidden Lake campground. Findings from the analysis may be applied elsewhere.

- I:** Analyze the potential impacts related to brown bears and human-bear interaction if the Cooper Lake dam is not reauthorized and the salmon fishery is restored.