Glacier Bay

National Park Service
U.S. Department of the Interior

Glacier Bay National Park
And Preserve

Bear Management Plan

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TABLE OF CONTENTS

Introduction

Overview of Glacier Bay

Glacier Bay National Park and Preserve contains 3.28 million acres, of which 2.66 million, or 80%, is designated Wilderness. Glacier Bay proper was covered in ice during the Little Ice Age which began retreating approximately 250 years ago, while portions of the outer coast of the park remained ice-free providing refugia to land plants and animals. For this reason, terrestrial ecosystems range from newly de-glaciated barren rock to old growth Sitka Spruce and Western Hemlock forest. Similarly, bear habitat varies greatly across the landscape. While both black bears (*Ursus americanus*) and brown bears (*Ursus arctos*) live in the park, brown bears seem to dominate the most recently deglaciated portions of Glacier Bay as well as the outer coast while black bears are more common in the lower forested portions of the bay. There is considerable overlap between the two species in many parts of the park.

The majority of park visitation occurs by motorized vessel in Glacier Bay proper. Of the roughly 350,000-440,000 visitors per year, over 90% come by cruise ship and never set foot on the ground within the park. Approximately 2000-3000 visitors camp in the park every year in the Bartlett Cove campground, the Glacier Bay backcountry, or along the Alsek River.

For the purposes of this plan, we have divided the park into 7 management zones differentiated by level and types of human activity, level of infrastructure development, and accessibility (Figure 1). These areas have been defined for the purposes of this document and may or may not correspond to management zones in other park plans or documents. Full descriptions of each bear management zone in Glacier Bay National Park and Preserve can be found in Appendix A.

Bear Management Zones:
1) Bartlett Cove Developed Area (BCDA)
2) Bartlett River
3) Glacier Bay Proper Backcountry
4) National Preserve – Dry Bay
5) Alsek River
6) Other: Icy Strait, Outer Coast, Excursion Ridge/Inlet
7) Gustavus

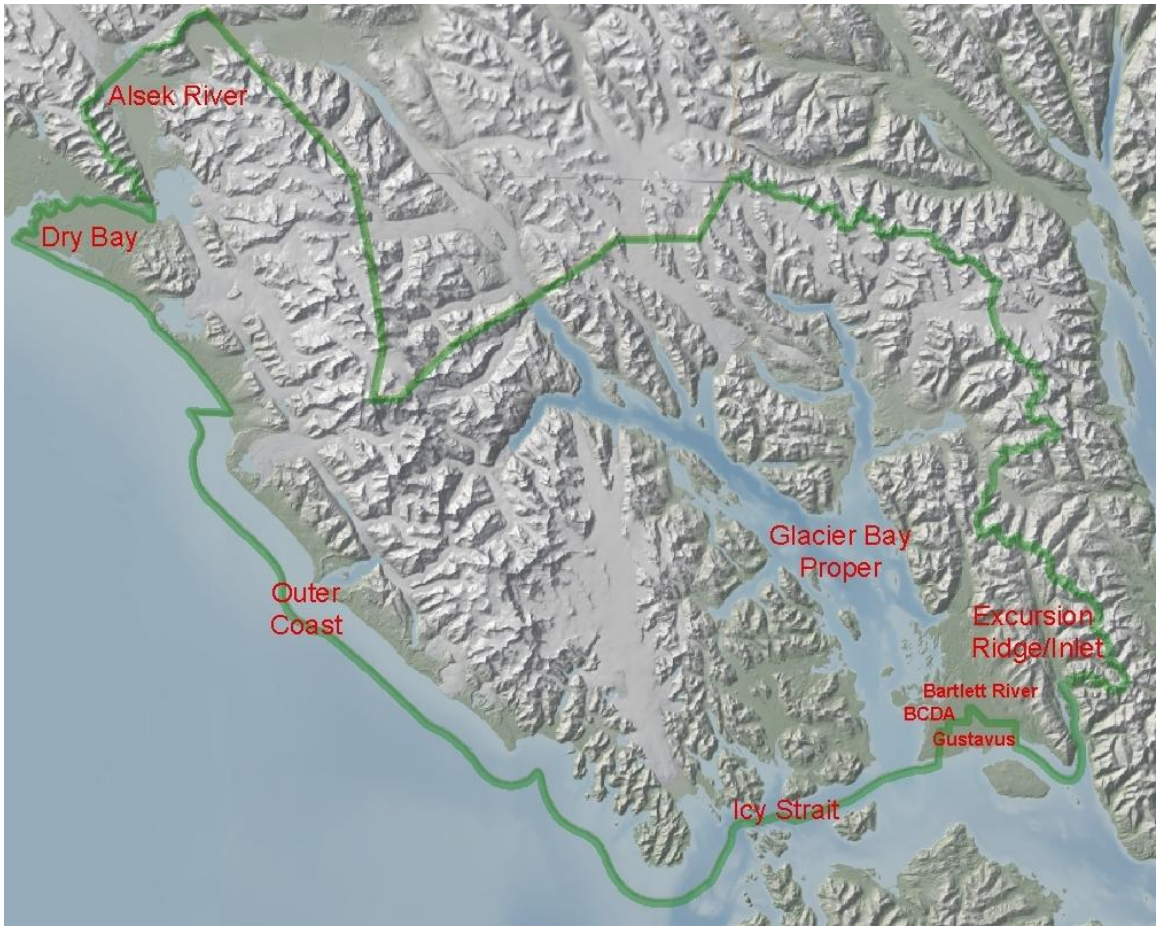


Figure 1. Map of Bear Management Zones in Glacier Bay National Park and Preserve.

Purpose, Need, Current Condition, Future Desired Condition

A comprehensive Bear Management Plan is essential for minimizing and mitigating bear-human conflict as well as summarizing information regarding bears and identifying future research needs. While various levels of bear management and research have been conducted, Glacier Bay National Park has been operating without a formal Bear Management Plan since its conception. The desired future condition is a completed and approved document that outlines park measures to minimize conflict between bears and humans, details park response to such conflicts and encounters, organizes existing information of bears in the region, and outlines future research needed to effectively protect and manage bears within the park.

Importance of Bear Management in Glacier Bay National Park and Preserve

Bear management is important for Glacier Bay National Park and Preserve because visitors greatly value bear-viewing opportunities, bears are long-lived animals with low reproductive rates, and bear–human conflicts are a major safety concern. Due to public outcry over questionable state game management laws, Glacier Bay National Monument (established in 1925), was significantly expanded in 1939 to create a brown bear

sanctuary (Catton 1995). In 1980 Glacier Bay became a National Park and Preserve under the Alaska National Interest Lands Conservation Act (ANILCA) to "preserve wilderness resources and related recreational opportunities" while providing a "large sanctuary where fish and wildlife may roam free, developing their social structure and evolving over long periods of time as nearly as possible without the changes that extensive human activities would cause" (ANILCA 1980). Currently, black and brown bears in the park and preserve are considered species of management concern under the Government Performance and Results Act, and thus the park is mandated to "…attempt to acquire funding to learn more about the park populations of each species [of management concern], their distribution in the park, and factors affecting them, and to integrate this knowledge into park management." (GPRA/Strategic Goal Ia2B).

Glacier Bay Bear Management Plan Guiding Principles

Bear-human conflicts can lead to injury and loss of life for both humans and bears. Conflict between bears and humans must be minimized to ensure that bears retain natural habits and optimize longevity and reproduction, and to protect people and property. Park managers believe that bear-human conflict can be minimized through preventive, responsive, and informative management.

Preventive management is the first and most important step towards minimizing bear-human conflict. Food conditioning is the primary factor associated with bear-human conflicts and bear-caused human injury in national parks (Herrero 1985, Herrero and Fleck 1989). Human attractants (human food and trash) must be controlled in ways that physically deny access by black and brown bears throughout all habitats. Requirements for securing attractants should be based on the best available science and experience and adaptive to new innovations in technology. A food storage enforcement plan should be integral to implementation of any requirements for securing attractants. Public information and education, including how to secure attractants, should be an integral part of any efforts to reduce bear-human conflicts.

Effective response to bear-human conflicts can decrease human injury and bear mortality. When preventive measures fail to prevent conflicts, a bear-human conflict reporting procedure and detailed response protocols allow rangers and biologists to quickly respond to the situation with a variety of bear management tools. Bear behavior during conflicts will be classified as either defensive or threatening. Defensive behavior is considered natural and the resulting management response will be geared towards controlling human activities. Threatening behavior is considered unacceptable and resulting management response will be geared towards modifying the bear's behavior. Predatory behavior towards human is also unacceptable and resulting management response will be geared toward eliminating the bear. In all other cases, relocating or destroying the bear will be a last resort.

Information on bear biology and bear-human interactions is important for managing bears and reducing bear-human conflicts. Bear observation and bear-human interaction

information from visitors can be used to reduce conflicts through proactive management, and to gain biological information about bears.

Management Goals

- **Keep bears and human attractants (food and trash) separate to reduce conflicts and ensure bears retain their natural habits.**

- **Ensure opportunities for present and future generations of visitors to view and encounter bears safely.**

- **Obtain information on black and brown bears in the Park and Preserve necessary to manage bears and inform policies to minimize conflicts.**

- **Preserve and perpetuate natural bear populations.**

Objectives

Preventive

- Develop clear and consistent food/trash storage policy and an enforcement plan to ensure that all unnatural food sources are unobtainable to bears.

- Educate all visitors, employees, researchers, contractors, and other park users about bear behavior, ecology, safety around bears, and ways to minimize bear-human conflict. Make educational materials accessible and interesting. Informational materials should be distributed in a variety of methods and incorporate consistent content and definitions.

- Provide park staff with yearly bear safety training. Depth of training will increase with visitor interaction and bear management duties of staff.

Responsive

- Develop a systematic means of quickly obtaining bear-human conflict reports.

- Develop and follow specific protocols of responding to bear-human interactions and conflicts according to the location and nature of the interaction.

Informative

- Collect bear observations and interactions from as many park users as possible.

- Establish a standardized method of bear-human interaction data management, analysis, and yearly reporting.

- Initiate research investigating key aspects of bear biology and bear-human interactions. Particularly encourage research projects that investigate bear ecology, habitat use, species distribution, abundance, and bear-human interactions.

Responsibilities

Superintendent
- Approves bear management plan and policies.
- Approves changes to bear management policies.
- Approves/disapproves major bear management actions.

Chief of Resource Management
- Jointly oversees bear management program with chief ranger.
- Approves/disapproves major bear management actions.
- Supervises Wildlife Biologist.

Wildlife Biologist
- Develops and revises bear management plan.
- Coordinates and monitors bear management program.
- Develops content of bear safety educational and training materials.
- Provides bear safety training to park staff, concession staff, and researchers.
- Jointly coordinates response to bear-human conflicts with district ranger.
- Oversees bear observation and interaction data collection and management.
- Initiates, oversees and/or conducts bear research.
- Supervises bear/wildlife technician, if applicable, and oversees other RM staff assisting in bear management duties.
- Serves on bear management committee.

Bear/wildlife technician
- Coordinate communication and public information regarding bear safety and bear-human conflicts.
- Helps coordinate and participates in hazing and monitoring efforts.
- Assist with bear and other RM research projects.
- Enter and analyze bear-human interaction data.
- Write a yearly report of bear-human conflicts.

Other Resource Management Staff
- Assist with bear management duties as needed.
- Respond to bear-human conflicts in the park under guidance of District Ranger and Wildlife Biologist

Chief Protection Ranger
- Jointly oversees bear management program with chief of resource management.
- Approves/disapproves major bear management actions.
- Supervises District Rangers.

District Protection Ranger
- Coordinates and oversees enforcement of food storage regulations
- Jointly coordinates response to bear-human conflicts with wildlife biologist.
- Supervises protection staff assisting with bear-human conflict response.
- Oversees writing and distribution of case incident reports involving bears.
- Serves on bear management committee.

Protection Rangers
- Enforce food storage regulations in the National Park and Preserve
- Inform district ranger and wildlife biologist of potential and actual bear-human conflicts in the Park
- Respond to bear-human conflicts in the park under guidance of District Ranger and Wildlife Biologist

Visitor Information Station (VIS) Supervisor
- Oversees bear safety orientations to park visitors.
- Coordinates communications between visitors, rangers, and wildlife biologist.
- Supervises staff that may assist with bear-human conflict response.
- Serves on bear management committee.

Interpretive Educational Specialist
- Oversees bear safety education and outreach to visitors.
- Prepares new posters, presentations, videos, brochures, etc. regarding bear safety.
- Serves on bear management committee.

Chief of Maintenance
- Insures that all park facilities and generated attractants are secure from bears.

Chief of Concessions
- Insures that concessionaires keep all concession facilities and generated attractants secure from bears.
- Insures that concession employees receive appropriate bear safety and food storage training.

All NPS Employees
- Keep all food and waste secure from bears within Park and Preserve land.
- Report food, waste, or other human attractants in the Park or Preserve that are not secured from bears and other wildlife.

Review of Bear Management Plan

This plan should be reviewed by members of the bear management committee on a yearly basis, and updated as needed. Major policy changes must be reviewed and supported by all members of the committee, Chief of Resource Management, Chief of Protection, and the Superintendent.

Part I. Preventive Management

CONTROL OF HUMAN FOOD AND ATTRACTANTS

Regulations regarding human food, trash and other unnatural bear attractants are governed by the Code of Federal Regulations for National Parks, the Glacier Bay National Park and Preserve compendium, and the State of Alaska fish and game regulations (Appendix C). The central theme of these regulations is to make all human derived food, waste and other potential attractants unavailable to bears and other wildlife. Securing anthropomorphic attractants will be achieved with the following methods.

NPS and Concession Facilities

All human food, trash, waste, recyclables, petroleum products, or other potential bear attractants must be stored in a bear-proof facility or container. Potential attractants include: food, beverages, garbage, food and beverage containers, harvested fish and game, pet and bird food, food waste, and dirty dishes and food storage containers, and scented personal items. All trash sheds, cans or bins in Bartlett Cove Developed Area will be made of solid wood or steel construction with secure doors and latches. Employees will not be allowed to store compost or recyclables on their porch. Employees and visitors will not be allowed to store food or other attractants unattended in backpacks, vehicles with windows down, or unsecured in the bed of pick-up trucks. Employees living in park housing outside the boundaries of the National Park will be held to the same food and trash storage standards at their housing units.

Kitchen facilities at the lodge and concession employee housing will keep all food and outdoor trash in bear-proof containers at all times. Any non bear-proof trash container, refrigerators, and freezers containing food will be kept inside or within a bear-proof shed. Doors to kitchen areas will be kept closed with secure latches.

Bear-proof trash and recycling bins will be available to visitors in the dock parking lot next to the Visitor Information Station (VIS). VIS, protection, and maintenance staff will insure daily that the lids of these waste cans are closed, not overflowing, and that there is no trash surrounding the bins. Staff members will also check picnic tables near the VIS and the administration building to ensure that no food is left unattended.

All trash and recyclables will be sorted, stored, and disposed of from the depot, which is surrounded by a 10 foot metal fence. The gate leading into the depot will be closed and locked unless the facility is attended by staff.

All employees, contractors, visiting employees, guests, and outside researchers staying and/or working in Bartlett Cove must adhere to food and trash storage policies. ***All NPS employees are responsible for reporting food, waste, or other attractants in the Park or Preserve that are not secured from bears and other wildlife.***

Campground
All food, trash and other potential attractants not being transported, prepared, in use, or being consumed must be stored in one of the food storage caches provided. All cooking and eating will be done in the intertidal zone below the campground. Campers are encouraged to only take out items that they will be using for each meal, and be prepared to quickly stow these items should a bear approach. Campers are encouraged to store clean dishes, toiletries, and fuel products with their food in the food storage cache.

Backcountry
All food, trash, toiletries, and other scented items not being transported, prepared, used or consumed must be stored in Bear Resistant Food Containers (BRFC) or hung in a tree (at least 10 feet above the ground and 4 feet away from any tree trunk or branch) at least 100 yards from tents. All cooking and eating must be done in the intertidal zone. Campers are encouraged to only take out items that they will be using for each meal, and be prepared to quickly stow these items should a bear approach. Campers are encouraged to store clean dishes and fuel products with their BRFCs 100 yards from their camp.

National Preserve, Dry Bay
Glacier Bay National Preserve is governed by different enabling legislation than that the National Park (see Appendix A). However, Park and State food storage regulations (Appendix C) apply to the National Preserve except where specifically stated otherwise. Commercial fisherman in the National Preserve must secure attractants from bears as a condition of their permits with the NPS. Condition #20 states: "Trash and garbage must be removed from the Preserve. Garbage and fish wastes must be handled responsibly in such a way as not to be an attractant to bears and other wildlife, or become a public nuisance or a threat to public health. Burning of all combustibles is recommended, prior to compacting and removal. Garbage and trash may not be buried in the temporary fish camp zone. The permittee agrees to keep his/her land assignment in a clean and orderly state, free of junk, garbage, litter and trash. Disposal of human waste must meet the standards of the Alaska Department of Environmental Conservation." In addition to commercial fisherman, lodge owners and park employees who reside in Dry Bay during the summer season must also keep all food, trash and other attractants inaccessible to bears.

Alsek River
Due to the nature of visitor use on the Tatshenshini Alsek river corridor (generally long rafting trips with large parties), users are exempt from the park compendium food storage regulations. They are instead guided by food storage recommendations as outlined in the document "Environmental and safety standards and ethics for expeditions on the Tatshenshini and Alsek Rivers" (Appendix O). Tat-Alsek River managers from all parks established these food storage recommendations for commercial and private groups in 2007 with the potential of making these recommendations mandatory in the future. All parks purchased two electric fence kits each to use for management trips and acquired two bear-resistant food coolers to loan out for trial during the 2008 season.

Private land within and adjacent to Park and Preserve

The NPS has no jurisdiction on privately owned land in or near National Park or Preserve lands. However, since bears frequently cross jurisdictional boundaries, NPS staff will make efforts to collaborate with local and state managers to educate residents about proper food and trash storage techniques as well as help prevent and resolve bear-human conflicts. A memorandum of understanding (MOU) should be pursued between Glacier Bay National Park, ADF&G, and the City of Gustavus to work together on bear-human issues. The NPS Wildlife Biologist and the ADF&G Area Biologist will collaborate on educational campaigns and response to conflicts.

ENFORCEMENT

Protection rangers are responsible for identifying and responding to food and trash storage violations. Rangers will look for improperly stored or unattended food and garbage. Unsecured food or trash will be collected or disposed of immediately and violators of food/trash storage regulations will be issued warnings or citations as appropriate.

Food storage violations involving the concessions operations will be reported to the Chief of Concessions for immediate correction. Violations involving NPS operations will be reported to the Chief of Maintenance for immediate correction. Protection rangers will document all food storage violations and subsequent actions.

The Superintendent may close an area or restrict an activity on an emergency, temporary, or permanent basis for reasons regarding public health and safety, resource protection, protection of cultural or scientific values, subsistence uses, endangered or threatened species conservation, and other management considerations necessary to ensure that the activity or area is being managed in a manner compatible with the purposes for which the park area was established under 36CFR13.50 (Appendix D). These closures will be subsequently enforced by Protection rangers.

EDUCATION

Educational materials regarding bear awareness and safety will be distributed in a variety of venues and locations to reach and appeal to as many visitors as possible. Potential visitors will be sent bear safety materials by mail in advance of their trips, and will be referred to bear safety information on the park web-site. Currently bear safety materials are in English only, but in the future materials in other languages popular among visitors, including French, German, Spanish, and Japanese, will be pursued. Bear awareness and safety will be taught with the following distribution methods:

Fairweather Visitor Guide

The Fairweather Visitor Guide contains bear safety information applicable to all people visiting, traveling, working and/or camping in Glacier Bay. The basic bear safety message covers basic differences between black and brown bears, how to minimize potential conflicts with bears, and what to do if you encounter a bear (Appendix E). The

Fairweather will be distributed on tour boats and cruise ships, and at the Visitor Information Station (VIS) to all visitors boating, camping, and hiking in Glacier Bay. The Fairweather will be updated yearly.

Regional brochure
The NPS Alaska Region brochure titled "Bear Safety in Alaska's National Parklands" contains the basic information offered in the Fairweather Visitor Guide with additional details specifically for visitors who will be hiking and/or camping in the backcountry. This brochure will be distributed at the VIS to visitors who are going into the backcountry and/or desire more detailed information on bear safety.

VIS video and orientation
Visitors planning to camp in the backcountry of Glacier Bay are required to first watch a video and receive an orientation at the VIS. The video covers the main points of the basic bear safety message. VIS staff will inquire about the visitor's experience level and destination, and tailor a personalized orientation based on these responses. VIS staff will also answer any further questions visitors may have regarding bear awareness and safety.

Signs
Educational and/or advisory signs may be placed in locations around Bartlett Cove such as trailheads, kiosks, and the VIS. The content and location of bear educational or advisory signs will be determined by the Interpretation division under advisement of the wildlife biologist and bear committee. Protocols for putting up and taking down advisory signs are found in the Responsive Management section of this document.

Talks
Bear awareness and safety may be covered by interpretive rangers during daily hikes and nightly presentations to visitors. If a bear advisory has been issued and/or there is a specific bear management concern, the bear committee may request that interpretive rangers communicate specific information to the public during their walks and talks. In addition, the wildlife biologist will present a bear safety talk for the public at least once near the beginning of the visitor season. NPS staff will also travel to Dry Bay at least once per summer season to consult with residents about bear safety and management.

Website
The Glacier Bay National Park website contains the basic bear safety message as well as links to additional information regarding bear safety, biology, research, and management.

Alsek River Environmental and Safety Standards
This document (Appendix O) outlines food storage and camping requirements for boaters traveling on the Alsek River in the preserve, which differs from the park compendium.

TRAINING

It is extremely important that NPS, concession staff, researchers, and contractors are trained yearly in bear awareness and safety because many of them work and live in the park, and often have daily visitor contact. This training should be done near the beginning of each visitor season shortly after seasonal employees arrive at work, with additional training opportunities available for latecomers. The amount of the bear safety training will vary according to the employee's duties as follows:

All NPS and concession staff

All NPS staff and concession staff should receive an oral presentation of the basic bear safety message by a bear management specialist. Additional information on living and/or working with bears in Bartlett Cove will be provided to employees by division with an emphasis placed on controlling food, trash and other potential bear attractants to minimize bear-human conflicts.

NPS staff with visitor contact

NPS staff having direct visitor contact (Interpretative rangers, Protection rangers, and VIS staff) should receive additional training detailing all elements of the bear safety message so that employees can effectively teach it to visitors. Additional information on bear research and management will also be provided for employees to pass on to visitors.

NPS staff with bear management duties

NPS staff having duties involving responsive bear management actions will receive additional training from GLBA and regional wildlife biologists and protection rangers. This additional training will include an overview of bear behavior and bear management techniques including the safe use of bear pepper spray. NPS aversive conditioning training, including a firearm qualification, is required for employees participating in hazing or aversive conditioning bears with the use of firearms. Non-Law Enforcement (LE) staff members must also fill out the appropriate paperwork and get approval from their supervisors and the Superintendent to carry firearms. Training requirements for staff conducting hazing and aversive conditioning are further outlined in Appendix F.

Researchers

NPS and outside researchers who will be camping in Glacier Bay will get bear safety information from the VIS during their backcountry orientation. As a condition of their research permit, researchers who will be traveling on the ground and/or camping extensively will consult with the Wildlife Biologist or other bear management specialist before going into the field to discuss ways to minimize potential for bear-human conflicts within the scope of their projects. Topics will include camp setup/food storage, electric fencing, responding to bear encounters, and the use of bear deterrents. NPS researchers traveling and/or camping in bear country will be trained in the proper use of bear pepper spray.

Contractors and temporary work crews

Contractors and other crews working in Glacier Bay National Park should receive training from a bear management specialist regarding bear safety and awareness geared specifically towards the type of work they will be doing. The training will cover the bear safety basics with additional attention to control of human food and other attractants, and dealing with bear encounters.

FACILITY AND DEVELOPMENT PLANNING

All new front or backcountry development and changes to existing developments should consider bear habitat, travel corridors, and seasonal bear activity levels in their planning stages. In addition, management plans and actions that will focus or change patterns of human use should take into account bear use of the area and mitigate future potential bear-human conflicts. Bear habitat quality and activity level assessments performed by trained personnel are useful tools in determining current and potential bear use levels and should be conducted prior to the initial planning stages of front and backcountry developments. Changes to the NPS Bartlett Cove Vegetation Management Plan should be implemented in consultation with the Wildlife Biologist in order to minimize bear-human conflicts.

Part II. Responsive Management

COMMUNICATION

Bear Information Network

Throughout this document, initiation of the "information network" is listed as a response to various situations. The information network has been established to quickly communicate to all interested parties, including the public, information regarding closures, and other changing situations. The information network also provides the framework for managers to quickly assess and take action on serious incidents.

The primary tool of the information network is the "GLBA bear committee" mailing list on e-mail (see Appendix G for names and phone numbers). The Visitor Information Station (VIS) staff is responsible for collecting and disseminating the information on Lotus Notes. Once information has been posted on Notes it is the responsibility of the District Ranger and Wildlife Biologist to promptly pass on the information to all Park and Lodge employees.

Regional wildlife biologist at the Alaska Regional Office (AKRO) and Douglas Area Biologist with the Division of Wildlife Conservation in the regional office of ADF&G have agreed to be consultants when needed (see Appendix G for names and phone numbers). Situations when AKRO and ADF&G biologists should be contacted are clearly indicated in the Responsive Management portion of this document.

A general schematic has been designed to show the flow of information regarding bear management (Figure 2). Most observations or incident reports come directly from campers to interpreters, rangers, or the VIS. Employees who receive a bear report should notify the VIS. Depending on the nature of the report the VIS staff will: 1) notify District Ranger and Wildlife Biologist, 2) post a message on e-mail ("GLBA bear committee"), or 3) for more serious incidents, contact the bear management group, a division head, or the Superintendent directly as indicated by this document. After a decision has been made regarding the appropriate management action the VIS will be informed and a message will be posted on e-mail. Again, it is the responsibility of the District Ranger and Wildlife Biologist to pass this information on to all employees in a timely manner. Special considerations apply for bear reports originating in the National Preserve. See operating procedures for "National Preserve-Dry Bay" and "National Preserve – Alsek River" for details.

Bear Information Network

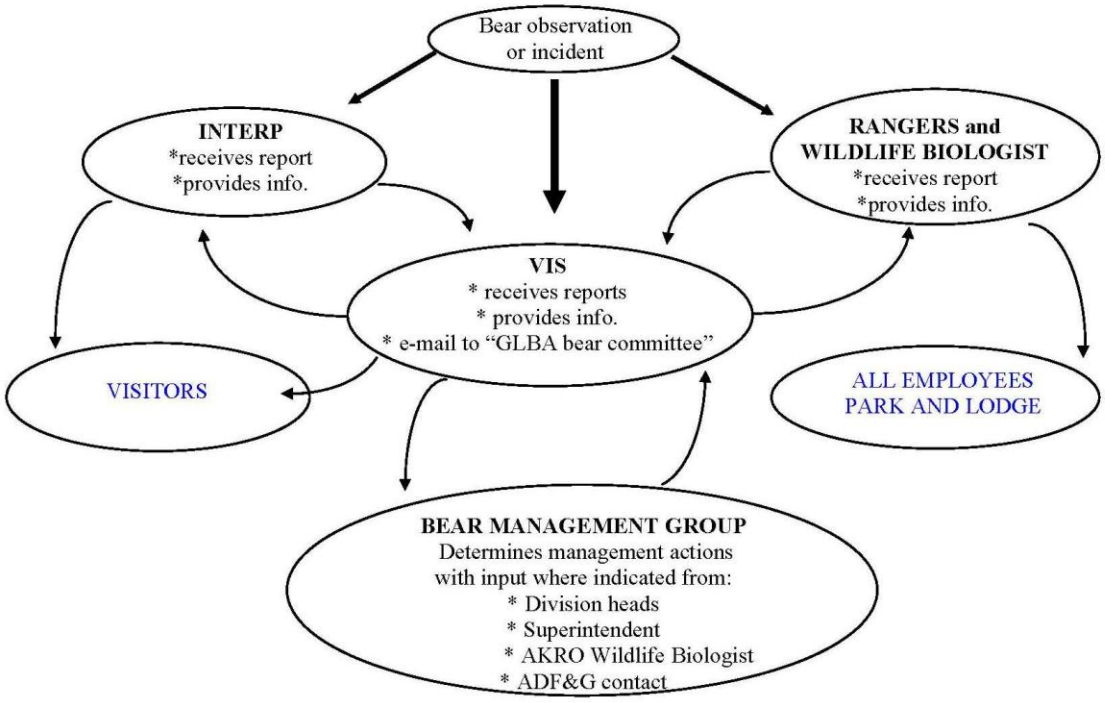


Figure 2. Schematic of how bear management information is communicated.

DOCUMENTATION

All reports, decisions, and actions regarding bear management in the park must be documented in order to quickly and appropriately respond to current bear-human conflicts and proactively minimize potential future bear-human conflicts.

Documentation occurs with the following methods:

Bear Management Log

A copy of this form can be found in Appendix H. This log is on a clipboard in the RM office should be filled out by park staff for general bear observations and management actions including:

- Visitor or staff reporting bear activity in the park
- Staff monitoring bear(s) in the developed area
- Staff hazing bear(s) out of developed areas with low level techniques.

The wildlife biologist or bear technician will collect the completed logs regularly.

Bear Information Management (BIM) Form
A copy of this form can be found in Appendix I. These forms can be found at the VIS and should be filled out if a bear:

- Behaved threateningly/aggressively.
- Obtained food.
- Damaged gear.
- Approached people/entered camp.
- Mid-high level aversive conditioning techniques such pyrotechnics, projectiles, or bear pepper spray were used.

Staff and/or visitors (with help of staff) can fill out this form. Completed forms should be given to the wildlife biologist.

Case Incident Reports
Law enforcement personnel complete case incident reports after serious incidents in which the bear behaved threateningly/aggressively, damaged property, and/or obtained food. Case incident reports may also be filled out if aversive conditioning techniques were used. A copy of each bear case incident report will be given to the wildlife biologist.

Alsek River Bear Reporting Form
A copy of this form can be found in Appendix J. These forms are sent to private and commercial groups traveling down the Tatshenshini and Alsek river systems. Thes forms are collected by park staff in Dry Bay and copies of all reports in which the groups traveled through Kluane National Park should be sent to the Kluane headquarters.

Bear Human Information Management System Database
All reports of bear encounters from the Bear Management Log, BIM form, and Case Incident Reports will be entered into the bear-human information database by the end of the calendar year. The Wildlife Biologist/Resource Management Division is responsible for ensuring data entry.

BEAR AND HUMAN BEHAVIOR

Details of each incident should be reviewed to determine if the bear's behavior was tolerant, aggressive, or a defensive response to protect young or food. Actions of the human participant should also be reviewed to determine if the person caused or provoked the incident and if a citation is necessary. The following table, adapted from Denali National Park and Preserve's Bear-Human Conflict Management Plan (USNPS 2003), serves as a general guideline to defining bear behavior and determining management actions (Table 1).

Table 1. Bear Behavior and Management Response Table

Bear Behavior	Human Bear Interactions	Management Response
DEFENSIVE		
Intolerant	Bear leaves area when it becomes aware of people.	None
Protective	Bear challenges intruder of its personal space by approaching, charging, or body language.	Advisory
Surprise	Close encounter, bear reacts, then leaves once person is no longer a threat.	Advisory Closure
Provoked	Person intentionally approaches close to bear, bear reacts then leaves area.	Advisory Closure Consider citation to person
TOLERANT		
Curious	Bear shows inquisitiveness one time to identify scent or object, then leaves.	None
Habituated	Bear frequents area used by people, ignores people, food, and gear.	Advisory Monitor bear Haze bear in high human-use areas
Possibly conditioned or rewarded	Repeated interest in people, facilities, food and/or gear.	Advisory or closure Hazing Aversive conditioning
Rewarded or food-conditioned	Bear damages gear/property and/or obtains food or trash	Advisory or closure Consider citation to person Aversive conditioning Consider relocation, destruction
AGGRESSIVE		
Threatening with no contact	Bear makes non-defensive charge or stalk but does not make physical contact	Closure Consider aversive conditioning, relocation, destruction
Threatening with contact	Bear makes non-defensive charge or stalk with physical contact	Destroy
Predation	Kills/consumes victim in non-defensive attack	Destroy

BEAR MANAGEMENT ACTIONS

1) Bear Advisory

Bear advisories contain specific information pertaining to bear management and are designed to be distributed immediately targeting people who may be affected by bear activity and/or bear-human interactions in a certain location. Advisories fulfill two purposes: 1) to inform visitors of the situation and potential risks, and 2) to educate people how to behave to minimize these risks. The content of a bear advisory may include information about recent bear activity or bear-human conflict, and may include a

"not-recommended" zone delineating an area where hiking and/or camping is not recommended due to bear activity. Bear advisories can be distributed in a news release, flyer, posted sign, e-mail, ranger talk/presentation and/or directly by word of mouth from park staff. Front-country areas of bear advisories should be monitored by park staff and reevaluated every 2 weeks to ensure that the advisory is still warranted. Backcountry (including the Bartlett River) advisories will stay in effect for up to 30 days, at which time the advisory will expire unless there is information indicating the advisory is still warranted. Press releases regarding advisories should clearly state the day in which the advisory will expire. When the date of the advisory expires and/or the decision is made to lift the advisory all posted signs must be removed. Sample advisories can be found in Appendix K.

2) Monitoring

Monitoring can be directed at either individual bears as they pass through an area of human use, or an area in which bear activity is of concern. General procedures for:

Monitoring an individual bear:

- Always carry a park radio and bear pepper spray.
- Determine location of people, number of bears, species, ages, and bear's behavior and travel route.
- Contact people in the area to alert them to the bear's presence.
- Keep bear in view while maintaining a comfortable distance between you and the bear so that the bear's behavior is unaltered by your presence.
- Ensure that people do not get close enough to the bear to jeopardize their safety or alter the bear's behavior.
- Continually look for any unsecured human food or trash.
- Document all actions.

Monitoring areas for bear activity:

- Always carry a park radio and bear spray.
- Determine location of people, number of bears, species, ages, and bear's behavior and travel route within area.
- Look for fresh bear sign including scat, digs, beds, and tracks. Record bear sign in field notes and/or GPS.
- If possible, conduct a brief habitat assessment looking for available/ripe bear foods in the area and evidence of grazing by bears.
- Continually look for any unsecured human food or trash.
- Document all actions.

Safety

A minimum of two people is recommended when monitoring brown bears. Extreme caution is advised when a carcass is present or suspected.

3) Area Closures

Short-term closures (30 days or less) in the backcountry of Glacier Bay have been issued in response to bear-human conflict successfully since the 1970s under the authority of 36CFR13.50 (Appendix D). Temporary closures to human use and/or overnight camping can successfully minimize bear-human conflict by protecting humans from potential bear-human conflict, allowing a potential problem bear to move out of the area without further temptation from human attractants, and/or allowing time for bear habitat conditions to change such that bear activity in the area decreases. Temporary closures also allow managers to conduct aversive conditioning safely. Area closures are communicated to the public through press releases and at the VIS. Closure press releases should contain a map with Lat/Long coordinates defining the closure and the distance from the shoreline that the closure extends. For general shoreline incidents, ½ mile is a suggested inland distance. The following guidelines are used to determine the establishment of temporary camping closures and the process of re-opening these areas to overnight camping.

Criteria for issuing temporary area closure:

- One incident involving a human injury or fatality caused by a bear.
- One incident involving a bear with predatory and/or aggressive behavior.
- One or more incidents involving a bear obtaining human food or trash.
- One or more incident involving major property damage.
- Multiple minor incidents involving a bear approaching people and/or minor property damage.
- Bear on a carcass, or a carcass located near a potential camping area.
- Other identified wildlife risk.

Managing the temporary area closure:

- Allow 30 days for most closures following bear incidents. Closures following major incidents, such as a human injury or death, may be longer.
- Attempt aversive conditioning if applicable as soon as possible after the incident in the exact location if possible.
- Monitor the area for bear habitat and activity as often as possible over the 30 days.
- Near the end of the closure time, trained resource protection and/or resource management staff should camp at the incident location for a minimum of one night to test if the bear is still in the area.
- Near the end of the closure time, bear management specialists should conduct a brief bear habitat and activity survey to assess the risk of further bear encounters in the area.
- Near the end of the closure time, the GLBA Bear Committee should meet and discuss the incident and subsequent management actions and data to decide if the area is safe to open.

Criteria for re-opening a temporary area closure area:

- 30 days has passed, and

- The bear involved in the original bear incident(s) was either effectively aversively conditioned or was not seen again in the closure area, and
- Habitat quality and bear activity levels were found to be normal for the season and location.

OR

- Wildlife risk that was identified is no longer present.

4) Hazing and Aversive Conditioning (AC)

Hazing and aversive conditioning of bears can be used to change individual bear behavior by conditioning with negative stimulus.

General Procedures

Define your goals

What do you want the bear to do and/or learn?

List objectives

- How can you best achieve the goals?
- Evaluate the situation and possible risks.
- Discuss all options including; do nothing, monitor bear, issue an advisory for the area, close the area, launch an educational campaign, haze bear, attempt aversive conditioning, relocate bear, destroy bear.

Make a plan

- Carefully plot a course of action to deal with the specific situation – consider all techniques and tools available.
- Make the plan realistic with available personnel, time and resources.
- Outline ways to measure the success of management actions – how are you going to tell if the plan is working?
- Establish times to regroup and discuss how the plan is going and how to improve or change tactics.

Conduct hazing and/or aversive conditioning with the following guidelines:

- Make sure the scene is safe and visitors are informed or removed from area.
- Ensure that all unnatural attractants have been secured from bears.
- Always provide the bear an escape route.
- Use the minimum tool that will accomplish your objective.
- Only trained personnel should use pepper spray, flare launchers, and/or bear deterrent ammunition.
- Ensure adequate staffing is present for safe execution of the planned action: 1-2 people for hazing of black bear, 2 people required for any work with brown bear, 3 people recommended for hazing or AC on brown bear: 1 w/ AC rounds, 1 w/ lethal rounds, and 1 w/ bear spray.
- Several interactions with the bear may be required to effectively haze or aversively condition bears.

Document decisions and actions
Keep a running record of all management meetings and decisions and well as all interactions with the bear(s).

Safety
Safety is the most important factor to consider during hazing/AC. Pyrotechnics and 12 gauge projectiles are dangerous and potentially lethal to people and wildlife as misplaced shots could cause severe injury to eyes and even kill. Pyrotechnics (screamers, bangers, and cracker shells) should NEVER be fired directly at the bear, and care must be taken to avoid starting a fire with certain cartridges. Projectiles (rubber bullets, rubber buckshot and beanbag rounds) should only be fired with a clear line of sight at reasonable range, and aimed for muscle mass, NOT head and soft tissue.

Bears may react defensively so personnel should be prepared at all times to respond to a charge or even attack. Personnel conducting hazing and AC on brown bears MUST have at least one 12 gauge shotgun containing lethal slugs as a back-up. Shotguns containing deterrent projectiles vs. lethal rounds should be clearly marked and lethal rounds should NEVER be combined with AC projectiles in the same shotgun.

Training
Only trained personnel may conduct hazing and aversive conditioning. Other staff members may assist only under close supervision of trained personnel. Training procedures are outlined in Appendix F.

Techniques and Tools
In general, begin with the minimum, least invasive tool that accomplishes the objective, and increase the severity of the tool if and when necessary. In situations where a bear is likely to be difficult to deter, such as a bear who has obtained food from humans, the team may chose to skip the low level techniques and begin aversive conditioning with pyrotechnics and projectiles.

<u>*Low Level*</u>
Yelling and clapping – Useful within hearing range of bear.
Throwing rocks – Can be effective at close range.
Squirt gun "Super Soaker" – Can be effective at close range.

<u>*Mid to High Level*</u>
Pyrotechnics-

- *Bear deterrent flare launcher "bear banger"* – Launches 6mm cartridge pyrotechnic projectiles ("screamers" and "bangers") at ranges of 25-75 yards. Shoot in the air or at the ground between you and the bear – training and practice required.
- *12 gauge cracker shell* – Produces a very loud bang at about 75 yards. Do not aim at bear – training and practice required.

Projectiles-

- *Paint ball gun* – Use at close range (15-25 yards) to mark and/or scare bears.
- *12 gauge rubber buckshot* – Shoots rubber pellets that sting at a range of 20-30 yards.
- *12 gauge bean bag* – Shoots beanbag that stings and may mark animal with colored dye at range of 10-20 yards ("Aero sock" tail can increase range).
- *12 gauge rubber slug* – Shoots soft rubber baton that stings at range of 30-50 yards.
- *12 gauge lethal slugs* – Used for back-up, NEVER mixed with AC rounds. Not shot at bear unless bear is posing imminent threat to person.

Passive
Electric fence – Useful/effective in remote areas and/or for bears who damage property or gear when people are not present.

Specific Procedures
Hazing is conducted in order to keep bears out of a certain area and/or away from people. It should be used with human tolerant bears that repeatedly travel through or linger in high human use areas designated as "no-bear" zones.

a. Clearly define the boundaries of the "no-bear" zone
b. Maximize monitoring and reporting efforts in order to catch bear in no-bear zone as soon and often as possible
c. At least one, ideally two or more, trained personnel should be present, both should have bear pepper spray and radios. A minimum of two people are required for hazing brown bears. Depending on the situation and the bear you may consider shotguns with one person carrying bear deterrent rounds and one with lethal rounds.
d. If you catch a bear heading into a no-bear zone, attempt to deter him from entering.
e. If bear is already in the no-bear zone, determine which direction you would like the bear to go and make sure that this area is clear of people.
f. Initiate hazing by yelling and clapping from the direction that you do NOT want the bear to go. If the bear is difficult to move, recruit more staff or volunteers to help make noise and attempt to herd the bear in the right direction. It is not always possible to control the direction of travel. Bears may have their own agenda and it can be more effective to go with their general flow instead of trying to get them to go a certain way. The overall goal is to get them out of the no-bear zone, whichever direction possible. If bear is still difficult to move, consider the use of bear spray, beanbag or rubber bullets, and/or cracker or flare shells.
g. Keep the pressure on until the bear has crossed the boundary out of the no-bear zone. Continue monitoring and conducting people/traffic control as necessary and remain with bear until confident that the bear will remain outside the zone.

Hazing bear from high quality natural foods (e.g., berry patches, animal carcasses) can be extremely difficult and is only recommended where it is determined that bear presence poses a significant risk to bear and human safety, such as high human use zones (trails, parking lots, housing, etc.) within the BCDA. It can be especially difficult to move the bears through the berry bushes because 1) vegetation impairs visibility and can be dense and slippery, 2) there may be 2 or 3 animals in family groups to keep track of and they don't always stick together, and 3) they are on an extremely valuable food source so the energetic benefits to the bears remaining in the area often outweighs the negative affects of our hassling them. The best strategy is one of patience and persistence. Follow the bears through the bushes (sticking towards the more open areas) and try to keep them moving until they get to the edge of the "no-bear" zone and then attempt to haze them out of the area. It can be slow but often proves successful. During times when bears cannot be moved successfully off of high quality natural food sources, continue to monitor bears as long as possible until they have departed the no-bear zone.

Hazing or aversive conditioning of a female with dependent young requires more forethought and patience due to the number of animals and the potential vulnerabilities of the young animals. Black bear cubs usually retreat from danger up tall trees and may be difficult to get down (when this occurs it is pointless to try to haze the mother from the area because she will undoubtedly return for her cubs eventually). Brown bear mothers can be extremely protective of their cubs so there is an added safety concern for personnel. In both species the cubs are vulnerable to becoming separated from their mothers and bear deterrent rounds such as rubber bullets and beanbags could kill cubs due to their small size. Listed below are some general guidelines:

- Focus hazing/AC efforts on the mother and the cubs will likely follow.
- Try to keep the family group together.
- Back-off when cubs are up a tree or away from mother. Try to get the mother to go to the cubs and take them with her.
- Exercise extreme caution and try not to position yourself between a mother and her cubs, especially when working with brown bears.

<u>*Aversive conditioning (AC)*</u> is conducted to teach bears that a certain action elicits an uncomfortable or painful consequence. It should be used with food-conditioned bears or bears that destroy property. The bear may approach people to get their food or property or it may be cryptic and come in the night and/or when people are absent. AC can also be used on a bear that is beginning to approach people or investigate property, but has not obtained items yet. Employees conducting aversive conditioning with firearms must be in Park Service uniforms or otherwise clearly identified.

If bear is approaching people to obtain food or property:

a. Stage a scenario similar to one in which the bear has approached people previously. Make sure area is closed to the public.
b. At least 2 trained personnel should be present, one with bear deterrent rounds and one with lethal rounds. Both should have bear pepper spray and radios.
c. If bear approaches, attempt to deter by waving arms and yelling

d. If bear continues to approach, one person should ready bear deterrent rounds, preferably a beanbag (consider a marking beanbag for future identification) or rubber bullet followed by a cracker shell. The other person should stand by with bear spray and lethal back-up. Continue yelling.
e. When bear gets within range and is in good position, fire rubber bullet or beanbag round at bear's shoulder or rump followed immediately by cracker round fired at ground immediately behind or to the side of bear.
f. If bear runs, immediately discontinue conditioning.
g. Repeat as necessary

If bear is focusing on property and/or is cryptic (remains hidden, only comes out when people are not present):

a. Hide out within view, but downwind, of a place where the bear has been obtaining human food or destroying property during typical time of bear's visits. Make sure that you are within range for firing bear deterrent rounds at bear and that the area is closed to the public.
b. At least 2 trained personnel should be present, one with bear deterrent rounds and one with lethal rounds. Both should have bear pepper spray and radios.
c. When bear approaches human property, one person should ready bear deterrent rounds, preferably a beanbag (consider a marking beanbag for future identification) or rubber bullet followed by a cracker shell. The other person should stand by with bear spray and lethal back-up. Both people should attempt to be quiet and undetected.
d. When bear comes into contact with human property and is in good position, fire rubber bullet or beanbag round at bear's shoulder or rump followed immediately by cracker round fired at ground immediately behind or to the side of bear.
e. If bear runs, immediately discontinue conditioning.
f. Continue to be quiet and repeat as necessary

6) On Site/"Hard" Release

Hard release is a management tool that has proven quite effective in several National Parks. The problem bear is trapped in the location where it is not allowed (such as a picnic area of campground), tranquilized, and "worked up" (tooth pulled, samples drawn, etc.). The bear is then released at the same location with a large amount of negative reinforcement such as projectiles, cracker shells, and Karelian bear dogs if available. Currently in Glacier Bay National Park there are no employees trained or equipment available to capture and immobilize bears. If it is determined that a hard release in the park is necessary, the park will rely on the availability and expertise of Alaska Region (AKRO) and ADF&G personnel.

7) Translocations

Glacier Bay National Park has no employees trained or equipment available to capture, immobilize and relocate a bear. If it is determined that relocating a bear in the park is necessary, the park will rely on the availability and expertise of Alaska Region (AKRO) and ADF&G personnel. All decisions and operations would be under advisement from AKRO and ADF&G biologists.

8) Destruction
A bear may be killed immediately if it poses an immediate and critical hazard. In all other situations, the Superintendent must authorize destroying a bear under advisement of the Chiefs of Resource Management and Protection, Wildlife Biologist, and District Ranger in consultation with Regional Wildlife Biologist and/or Protection Ranger and the Alaska Department of Fish and Game Area Biologist.

Destroying a bear will only be conducted if identification of the bear is absolutely positive AND one of the following criteria is met:

- The bear poses an immediate and critical hazard, or
- Aversive conditioning has been attempted and failed, or
- Translocation has failed or is not an option, or
- The bear is responsible for an injury or fatality from a non-defensive or unprovoked attack, or
- The bear is mortally injured in an area of human use.

The destruction of bears should be conducted by park rangers or resource management personnel proficient in the use of either high caliber rifles or 12 gauge shotguns. It is recommended that at least two armed personnel be present when bear is destroyed.

HUMAN INJURY OR FATALITY

Bear-human conflicts resulting in human injury or death require immediate activation of the information network and additional notification of the Superintendent, Chief of Protection, District Ranger, Chief of Resource Management, and Wildlife Biologist. The incident command system will be activated and an incident commander will be identified. Responders will follow the NPS Alaska Region Bear/Human Attack Protocols Checklist and follow protocols and reporting procedures in the NPS Alaska Region Bear/Human Attack Report (Appendix L). One person will be assigned to conduct public relations with the media during the investigation.

Initial response to the incident will focus on the safety of the victim, responders, and other people in the area. Bears seen in the area will be actively hazed out of the area during the investigation. If a bear in the area interferes with the investigation or acts aggressively and cannot be deterred or hazed from the area, staff may consider destroying bear. If a bear is seen consuming human flesh, the bear will be destroyed.

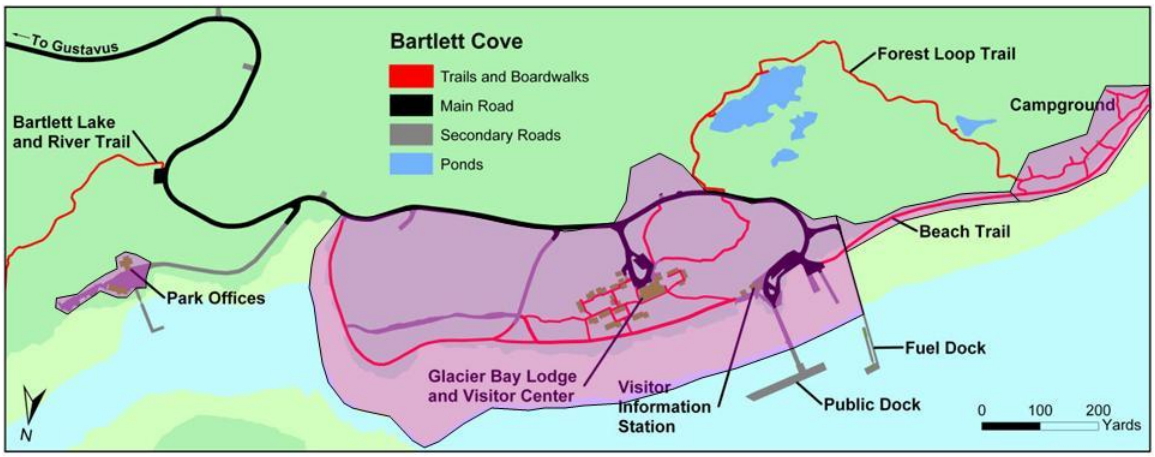
Initial investigation of the attack will be aimed at determining if the attack was defensive, provoked, or aggressive/predatory (non-defensive and unprovoked). If the attack is determined to be defensive or provoked, the area may be closed and no further action taken. If the attack is determined to be aggressive or predatory, further action will be taken to positively identify the bear involved in the incident and destroy it. All reports, decisions, and actions must be documented in detail.

OPERATIONAL PROCEDURES BY MANAGEMENT ZONES

Different areas of Glacier Bay National Park and Preserve will be managed according to type/level of human use and accessibility to park personnel. Management zones include: 1) Bartlett Cove Developed Area, 2) Bartlett River, 3) Glacier Bay proper backcountry, 4) National Preserve – Dry Bay, 5) Alsek River, 6) Other Areas, and 7) Gustavus. More information about the different management zones can be found in the introduction of this document and Appendix A.

1) Bartlett Cove Developed Area (BCDA)

Because Bartlett Cove is the access point for nearly all land visitors to Glacier Bay, a distinction has been made between the Bartlett Cove Developed Area and the rest of the Park based on the unfeasibility of closing the Bartlett Cove area to visitors. Areas of high human use in the BCDA have been designated as places where elevated bear management will be conducted (Figure 3). Daily walks through housing and lodge areas by patrol rangers, technicians, supervisors, and managers are recommended to insure that food and trash are being stored properly. Protocols are outlined below.



Areas of Elevated Bear Management:
- Bears in this area will be monitored whenever possible.
- Bears lingering on roads, trails, boardwalks or immediately adjacent to buildings within these areas will be actively hazed away whenever possible.

Figure 3: Map of Bartlett Cove Developed Area with "no-bear" zones in purple. Bears will be managed intensively within the no-bear zones when feasible during the visitor season (May 1-August 31) and during other times of high human use.

a) Bear is sighted in the BCDA.

- Ensure food and trash are secure in all locations including:
    1. Park administration
    2. Park staff housing
    3. Lodge area (kitchen, deck, vending machines, etc)
    4. Lodge staff housing
    5. VIS and campground

- Monitor bear's movements, establish if it is traveling or lingering.
  Definitions:
  Traveling – Bear is walking or running in one direction with only short stops (less than 5-10 minutes) in any one location. Bear may be feeding but it is doing so while moving in one general direction.
  Lingering – Bear is stationary (more than 5-10 minutes) and/or milling about in an area feeding without moving in one consistent direction. A traveling bear that is seen in the same general location for 3 days or more in a row may also be considered lingering.

- Document all communications and actions.

b) Bear travels or lingers outside of the "no-bear" zone:

- Initiate information network
- Make sure food and trash are secure.
- Monitor bear as it travels through the BCDA if possible.
- Prevent people from getting close to and/or harassing the bear as staffing allows.
- Document a description of the bear's appearance and behavior for future encounters as well as all communications and actions.

c) Bear lingers in a "no-bear" zone.

- Initiate information network.
- Make sure food and trash are secure.
- Attempt to haze bear from area if possible.
- Repeat as necessary until the bear leaves the "no-bear" zone.
- Continue to monitor the bear as long as possible if it remains in the BCDA if possible.
- Document all communications and actions.

d) Bear continues to linger in the BCDA over the course of 3 days.

- Initiate information network.

- Make sure food and trash are secure.
- Monitor and continue to haze bears when it enters the "no-bear" zones when possible.
- Meet to discuss strategy: elevate level of tool as necessary as decided in meeting.
- Consider issuing an advisory for park staff, lodge staff, and visitors. Include the following:
    1. Keep food and trash secure.
    2. Avoid surprise encounters.
    3. Do not approach bear(s). Consider a minimum approach distance.
- Document all communications and actions

e) Bear shows interest in human food or property, obtains human food, destroys property, and/or behaves threateningly.

- Initiate information network
- Secure all food and trash.
- Issue advisory
- Aversively condition bear to attempt to alter bear's behavior if possible. If repeated attempts to aversively condition the bear fail, consider other options such as hard release, relocation, and destruction.
- Document all communications and actions.

f) Bear attack causing human injury or fatality.

- Regional protocols for responding to a bear attack will be followed.
- Campers in the area are notified and re-located.
- Information network is initiated.
- Bear management group is convened along with state contact, division heads, and superintendent as soon as possible following incident for a review and written instruction for further action.
- Document all communications and actions.

2) Bartlett River

The Bartlett River and trail system are managed with special considerations pertaining to bear-angler interactions. Bear use on the river is common when salmon are present, and bear-human encounters should be expected. The river and trail system will be considered for closure if a threat to resources or human safety is perceived.

a) Repeated observations of a bear or bears near areas of human use.

- Document all communications.

*b) Observations of bear in vicinity of people but not showing obvious signs of interest in fisherman or other people***.**

- Initiate information network.
- Monitor area and people's observations as possible.
- Document all communications and actions.

c) Observations of bear not showing fear of humans and showing interest in fisherman/fishing activity.

- Initiate information network.
- Consider issuing an advisory.
- Monitor area and people's observations as possible.
- Consider sending a crew of trained personnel to conduct aversive conditioning.
- Document all communications and actions.

d) Bear obtains food or fish from angler despite angler's attempts to deter bear.

- Initiate information network.
- Consider issuing an advisory.
- Monitor area and people's observations as possible.
- Send a crew of trained personnel to conduct aversive conditioning if possible.
- Consider closure based on bear's and human's behavior.
- Document all communications and actions.

e) Bear repeatedly damages property despite presence of people, obtains human food, and/or shows threatening/aggressive behavior towards humans.

- Superintendent may authorize immediate closure of trail and river.
- Initiate information network.
- Send a crew of trained personnel to conduct aversive conditioning if possible.
- Document all communications and actions.

f) Bear attack causing human injury or fatality.

- Regional protocols for responding to a bear attack will be followed.
- Immediate closure and evacuation of area.
- Information network is initiated.
- Bear management group is convened along with state contact, division heads, and superintendent as soon as possible following incident for a review and written instruction for further action.
- Document all communications and actions.

3) Glacier Bay Proper Backcountry

The backcountry of Glacier Bay proper contains areas of moderate human use and is relatively accessible to management response actions. Temporary advisories and beach closures have proven successful as the primary action to mitigate bear problems in the backcountry.

a) Repeated observation (not associated with a camp) of bears in an area.

- Initiate information network.
- Document all communications and actions.

b) Observations of bear near a camp not showing obvious signs of interest in the camp or people.

- Monitor area and campers' observations as possible.
- Initiate information network.
- Consider an advisory.
- Document all communications and actions.

c) Major property damage attributed to bear discovered. Bear is not seen, or if seen, flees at approach of humans. Threatening behavior not displayed and food not obtained.

- Rangers and/or Wildlife Biologist monitor area.
- Initiate information network.
- Consider issuing an advisory, camping-not-recommended zone, or beach closure.
- Document all communications and actions.

d) Bear causes minor property damage or repeatedly shows interest in camps without fear of humans.

- Initiate information network.
- Monitor area and campers' observations.
- Consider issuing an advisory, camping-not-recommended zone, or beach closure.
- Consider sending a crew of trained personnel to conduct aversive conditioning.
- Document all communications and actions.

e) Bear obtains human food, and/or displays threatening behavior towards humans, and/or repeatedly damages property.

- Initiate information network.
- Superintendent may authorize immediate beach closure or a camping not-recommended advisory.
- Convene bear management group as soon as possible to review closure size and duration.
- Consider changing camper drop-off location to move use away from bear.
- Send a crew of trained personnel to conduct aversive conditioning if possible.
- Document all communications and actions.

f) Bear attack causing human injury or fatality.

- Regional protocols for responding to a bear attack will be followed.
- Immediate closure and evacuation of area.
- Campers in the area are notified and re-located.
- Information network is initiated.

- Bear management group is convened along with state contact, division heads, and superintendent as soon as possible for a review and written instruction for further action.
- Document all communications and actions.

4) National Preserve – Dry Bay

A distinction has also been made for Dry Bay in the National Preserve because of special circumstances including commercial fisherman living and working in the area, rafters camping at the end of their Alsek River trips, legal trapping and hunting (including bears), and limited park personnel available for bear management. Closing Dry Bay to human use is not a realistic option. The information network for Dry Bay relies on communication from the Dry Bay Ranger(s) to the Yakutat District Ranger and members of the Glacier Bay Bear Committee (see Appendix G for names and phone numbers). The VIS may or may not be involved.

a) Repeated observations of a bear near areas of human use.

- Dry Bay Ranger notifies District Ranger and GLBA Bear Committee and monitors situation as possible.
- Make sure food and trash are secure.
- Document all communications and actions.

b) Property damage attributed to bear discovered. Bear is not seen, or if seen, flees at approach of humans. Threatening behavior not displayed and food not obtained.

- Dry Bay Ranger notifies District Ranger and GLBA Bear Committee.
- Rangers and/or Wildlife Biologist monitor area as possible.
- Consider issuing an advisory.
- If bear repeats behavior, rangers and/or wildlife biologist may attempt aversive conditioning.
- Document all communications and actions.

c) Bear shows interest in property and shows no fear of humans.

- Dry Bay Ranger notifies District Ranger and GLBA Bear Committee.
- Consider issuing an advisory.
- Rangers and Wildlife Biologist attempt to haze bear to move bear from the area and aversively condition the bear when it approaches people and/or property, if possible.
- Document all communications and actions.

d) Bear shows interest in property and/or shows no fear of humans. Bear is not responsive to hazing.

- Dry Bay Ranger notifies District Ranger and GLBA Bear Committee.
- Issue an advisory.
- Rangers and Wildlife Biologist monitor bear and haze bear as possible.
- Aversive conditioning is also applied at every opportunity.
- Document all communications and actions.

e) Bear damages property, obtains human food, and/or shows threatening behavior to humans. Hazing ineffective.

- Continue active monitoring.
- Initiate the information network.
- Consider issuing advisory to campers and residents.
- Convene bear management group as soon as possible.
- Bear management group may consult with ADF&G contact and AKRO wildlife biologist to formulate management action.
- Discuss options including aversive conditioning, relocation, and destruction of bear.
- Document all communications and actions.

f) Bear incident involving human injury or fatality.

- Regional protocols for responding to a bear attack will be followed.
- Campers and residents in the area are notified.
- Area is closed to camping and campers are re-located.
- Information network is initiated.
- Bear management group is convened along with state contact, division heads, and superintendent as soon as possible following incident for a review and written instruction for further action.
- Document all communications and actions.

5) Alsek River

The Alsek River corridor, with the exception of Dry Bay, is accessible only by raft/kayak from Canada, motor boat as far as Alsek Lake, or helicopter. Therefore management actions focus on obtaining reports of bear-human conflicts in a timely manner and initiating the Tat-Alsek information network. The information network for the Alsek River Corridor relies on communication from the Dry Bay Ranger(s) to the Yakutat District Ranger and members of the Glacier Bay Bear Committee. GLBA staff will pass on bear information to other agencies involved in managing the river system (Parks Canada, BC Parks, and Yukon Parks) on e-mail: "Alsek River Managers". For more serious encounters, these managers will be notified by phone (see Appendix G for names and phone numbers). The VIS may or may not be involved.

a) Repeated observations of a bear near areas of human use.

- Dry Bay Ranger notifies District Ranger and GLBA Bear Committee
- Rangers and/or Wildlife Biologist notify other river managers by e-mail.
- Document all communications and actions.

b) Property damage attributed to bear discovered. Bear is not seen, or if seen, flees at approach of humans. Threatening behavior not displayed and food not obtained.

- Dry Bay Ranger notifies District Ranger and GLBA Bear Committee
- Rangers and/or Wildlife Biologist notify other river managers by e-mail.
- Document all communications and actions.

c) Bear shows interest in property and shows no fear of humans.

- Dry Bay Ranger notifies District Ranger and GLBA Bear Committee
- Rangers and/or Wildlife Biologist notify other river managers by e-mail.
- Consider issuing an advisory at river put-ins.
- Document all communications and actions.

d) Bear damages property and/or obtains food, and/or shows threatening behavior to humans.

- Initiate the information network – contact river managers by phone.
- Convene bear management group as soon as possible.
- Consider issuing an advisory.
- Consider campsite closure.
- Bear management group may consult with ADF&G contact and AKRO wildlife biologist to formulate management action.
- Document all communications and actions.

e) Bear incident involving human injury or fatality.

- Regional protocols for responding to a bear attack will be followed.
- Campers may be contacted and re-located.
- Information network is initiated – contact all river managers by phone.
- Bear management group is convened along with state contact, division heads, and superintendent as soon as possible following incident for a review and written instruction for further action.
- Document all communications and actions.

6) Other: Icy Strait, (Dundas and Taylor Bay), Outer coast, Excursion Ridge and Inlet

Other areas of Glacier Bay National Park and Preserve will be managed according to low human use and limited logistical access for response by park personnel.

a) Repeated observations of a bear near areas of human use.

- Initiate the information network.
- Document all communications and actions.

b) Property damage attributed to bear discovered. Bear is not seen, or if seen, flees at approach of humans. Threatening behavior not displayed and food not obtained.

- Initiate the information network.
- Monitor area and campers' observations as possible.
- Document all communications and actions.

c) Bear shows interest in property and shows no fear of humans.

- Initiate the information network.
- Monitor area and campers' observations as possible.
- Consider issuing an advisory.
- Document all communications and actions.

d) Bear damages property and/or obtains food and/or shows threatening behavior to humans.

- Initiate the information network.
- Convene bear management group as soon as possible.
- Consider issuing an advisory.
- Consider camping closure if feasible.
- Bear management group may consult with ADF&G contact and AKRO wildlife biologist to formulate management action.
- Document all communications and actions.

f) Bear incident involving human injury or fatality.

- Regional protocols for responding to a bear attack will be followed.
- Campers are contacted and re-located.
- Information network is initiated.
- Bear management group is convened along with state contact, division heads, and superintendent as soon as possible following incident for a review and written instruction for further action.
- Document all communications and actions.

7) Gustavus

Gustavus is outside the jurisdictional boundaries of Glacier Bay National Park. Although bears move in and out of Gustavus from park lands, the Alaska Department of Fish and Game has full management control of bears while they are in Gustavus. For this reason

the park's role in management outside of its boundaries will focus on education and information transfer. Park service personnel working in conjunction with the ADF&G area biologist may issue educational materials to residents of Gustavus in efforts to reduce bear-human conflicts. Any reports or observations of food storage violations and/or bear-human conflicts in Gustavus should be reported to the ADF&G area biologist and no further action taken without the request of this individual. Glacier Bay National Park should pursue a Memorandum of Understanding (MOU) with the state to formalize this agreement.

Part III. Information Management

HISTORY OF BEAR-HUMAN CONFLICTS

Historical accounts of bear-human conflict in Glacier Bay date back to 1912 when Allen Hasselberg was mauled by a brown bear as he was hunting up the Bartlett River (Howe, 1996). Settlers raising cattle in Gustavus in the 1920s - 50s were challenged by "marauding" brown bears when, according to homesteaders' recollections, bears of both species were shot on sight (Mackovjak 1988, Kurtz 1995, Streveler, pers comm.). In 1939 Bert Parker shot and killed a brown bear that he claimed stalked him at his mining camp above Ptarmigan Creek. (Been 1940). Bear incidents were minimal (1-2 per year) and minor from 1960-1975 (Figure 4). In 1976 a lone kayaker camping in the east arm was killed and consumed by a brown bear. In 1978, Glacier Bay National Monument staff wrote the first bear management plan and made attempts to bear-proof garbage cans and the dump in Bartlett Cove to deal with an estimated 25 black bears in the front country that were partially or entirely dependant on human food sources (Ritter 1978). The plan defined methods to reduce bear-human conflicts as well as protect and maintain natural habitat for black and brown bears.

After the first bear management plan was written, numbers of bear-human conflicts continued to increase, and another lone kayaker was killed by a black bear in Sandy Cove in 1980. These events led to repeated yearly seasonal camping closures of two large sections of coastline: Sandy and Spokane Coves; and West Tarr/North Johns Hopkins Inlet, referred to from here on as the Sandy Cove and Tarr Inlet closure areas. In addition to the camping closures, these areas were subject to periodic monitoring of bear distribution, habitat, and abundance through the 1980s.

In 1988 Glacier Bay, now a National Park, completed its second bear management plan which further detailed methods of reducing bear-human conflict while preserving bears and their habitat and allowing for visitor education and enjoyment (USNPS 1988). Although the bear management plans of 1978 and 1988 both outlined specific methods of eliminating all human food sources for bears as an important step to reducing bear-human conflict, bears continued to obtain human food and trash in the backcountry throughout the 1980s and into the early 1990s. In 1991 the park began to mandate the use of bear-proof food storage techniques such as Bear Resistant Food Canisters (BRFC) in the backcountry and incidents in which bears obtained food dropped over the next few years. In the front-country, bears continued to get food regularly despite the bear-proof garbage cans until the summer of 1992 when a black bear with 3 cubs of the year repeatedly obtained food from people in Bartlett Cove and was subsequently relocated to Geikie Inlet (see Appendix A.1). After this season, food storage in the developed area improved significantly and overall numbers of bear-human conflicts decreased throughout the park for several years.

Bear-human conflict numbers began to rise again after 1995, peaked at 22 in 2000, and then slowly fell to 5 incidents in 2005. Most of the conflicts during this time occurred in

the backcountry. There was a gradual increase in backcountry visitation from 1992-1996, leveling off to about 1,600 campers per season through 1998, and then slowly decreasing to below 1,200 people in 2003 (Kralovec et al. 2007). Increases in backcountry use and bear-human conflicts in the late 1990s led to the initiation of several bear research projects from 2000-2005 designed to minimize bear-human conflicts, evaluate the ongoing Sandy Cove and Tarr Inlet closure areas, and inform a comprehensive bear management plan. Lessons learned in the first few years of this phase of bear research led to an overhaul of the parks bear safety message beginning in 2003. The new safety message taught campers how to interpret basic elements of bear behavior, how to react accordingly during bear encounters, and encouraged campers to maintain control of their gear and stand their ground to approaching bears in most situations.

For a more detailed historical bear research and management timeline, see Appendix M.

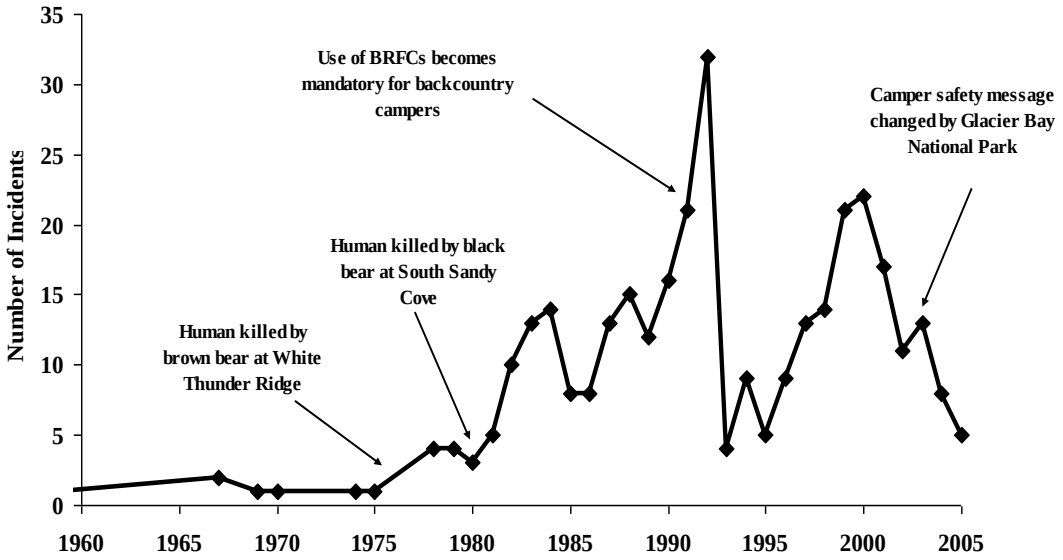


Figure 4: Number of Bear Incidents by year 1959-2005

RESEARCH

Bear distribution, abundance, and habitat in closure areas, 1980s

Increasing bear-human conflicts, including two fatalities and multiple incidents involving bears obtaining campers' food, led to repeated seasonal camping closures in the 1980s. Several research projects were initiated in the late 1980s to attempt to gain information on bear habitat and activity in the Sandy Cove and Tarr Inlet closure areas. Observations in Sandy and Spokane Coves indicated high concentrations of black bears using the beach, especially in the spring and early summer (Sharman et al.1982a, 1982b, and 1983, Publicover 1985, Blackie 1989). High numbers of black bears in the area were attributed to: a natural funnel of low elevation terrain of three creek systems leading to the coast

and surrounded by steep mountains; the successional stage of the vegetation being prime for black bear forage (high density of salmon berries and devil's club); and increasing human use of Gustavus and the Beardslee Islands potentially driving bears northward (Publicover 1985).

Several studies were conducted in the West Arm to evaluate brown bear movements, habitat and number of bears using various sections of shoreline including Tarr Inlet, northern Johns Hopkins Inlet and Russell Island areas (Warburton 1988, Wolfe 1989, and Climo and Duncun 1991). Habitat was found to vary greatly between sections of shoreline with habitat quality and bear numbers highest on the mainland north of Russell Island and lowest on the west side of Tarr Inlet and north side of Johns Hopkins Inlet. Studies showed that during the years of research, a minimum of 4-7 bears resided in the Tarr Inlet closure area and traveled regularly between beach segments. Wolfe suggested requiring the use of bear-proof food canisters, maintaining the camping closure for a minimum of two years, increasing camper education and bear sighting collection efforts, and expanding upon research of bear distribution in the upper west arm.

Bear Sightings and Incidents Database, 2000

In response to rising numbers of bear incidents through the late 1990s and to begin informing the creation of a new bear management plan, a database of bear sightings and incidents was constructed and populated with data from records dating back to 1932. All records from the original Access/GIS database are currently being imported into a new database called the AKRO Bear-Human Information Management System (BHIMS).

Bear Campsite Risk Assessment Project, 2001-2002

One hundred and sixty one campsites were assessed in 2001-2002 for bear habitat potential, bear encounter potential, and bear displacement potential. Subjective encounter risk ratings were assigned to each site in the field (Figure 5) and a statistical analysis was conducted to test which site variables are best indicative of bear activity levels. Seventy-three percent (n=117) of the campsites were subjectively rated as moderate bear encounter risk, twenty percent (n=33) were rated as low encounter risk, and seven percent (n=11) were rated as high encounter risk (Lewis et. al 2006).

Statistical analysis involved deriving human use levels for specific areas from the park's camper database and identifying relative bear usage and bear-human conflict histories for specific areas by constructing a database of park records. Three variables were selected to model bear activity and incident rates at camp sites: bear-human incident rate (number of bear-human incidents derived from park records), bear use (site use by bears as derived from park records), and bear sign within 100 m of campsites. Classification models used sites with no occurrences of bears or conflicts as one group, and those with at least one occurrence of bear use or conflict as the other. Models indicate that the likelihood of bear use of any given site is most closely predicted by: subjective rating of the site's habitat potential, amount of human use, and the assessment of fall habitat quality. The study found that the probability of bear-human conflict was best predicted

by the following variables in decreasing importance: distance to salmon streams, amount of bear sign, and the ability of bears to bypass the site (Smith et al. 2006).

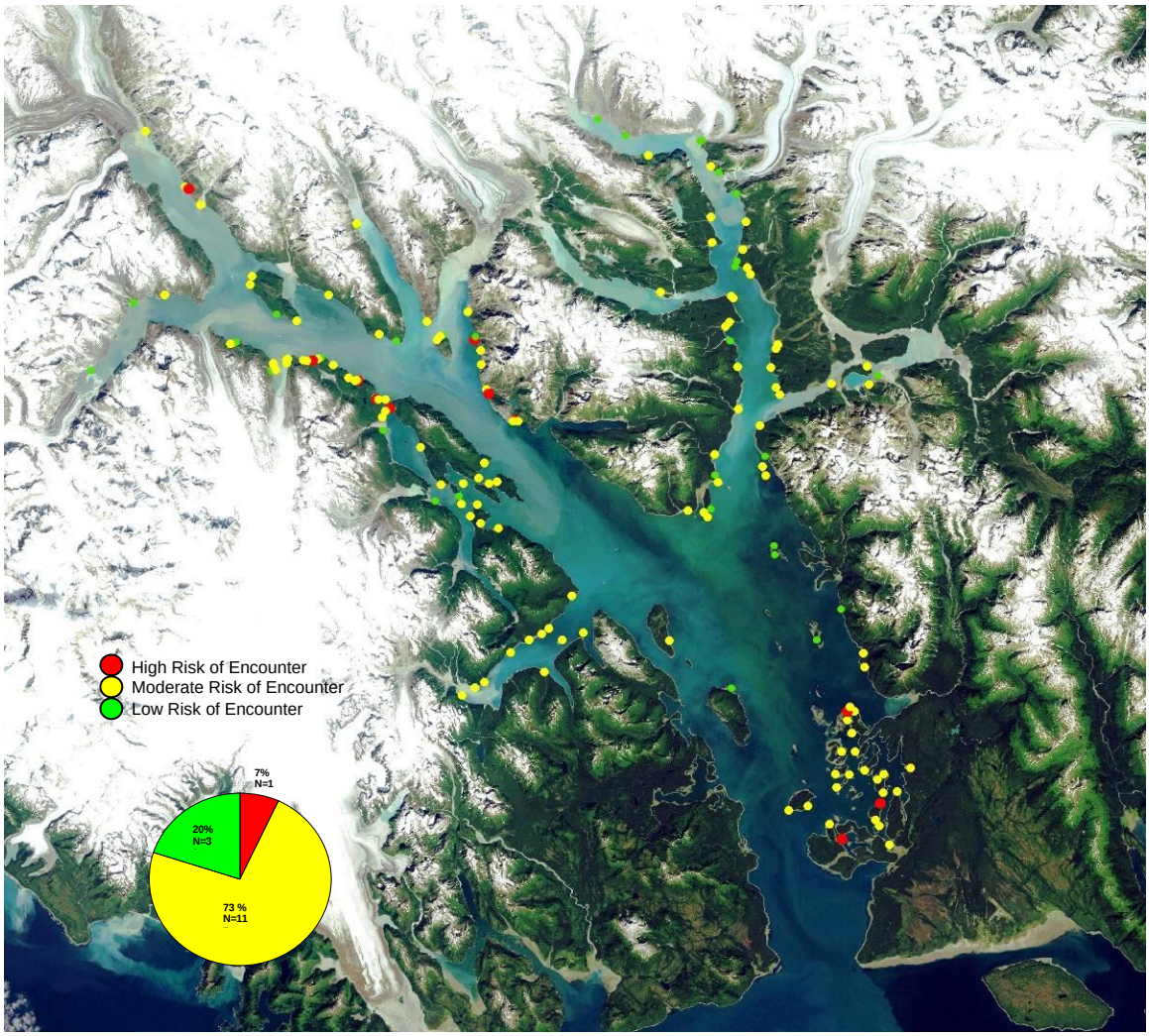


Figure 5: Subjective Bear Encounter Risk Assessment Ratings of Campsites in Glacier

Bear Activity and Habitat Project, 2004-2005

In 2004 the park and USGS initiated a study to quantitatively evaluate the two large (28 and 29 km) sections of shoreline in Sandy Cove and Tarr Inlet that had been closed to the public for camping for over 20 years. Park managers needed information on bear use in these areas to determine whether the long-term camping closures remained warranted. They also needed information on effective methods for evaluating bear activity and habitat quality for future conflict sites. Several non-invasive methods were tested to assess bear activity and habitat quality within these closure areas as well as within other areas of historic high numbers of bear-human conflicts. In June, July and August of 2004 and 2005 researchers conducted bi-weekly surveys of 8 study areas (6 predominantly brown bear areas, and 2 black bear areas) to quantify bear activity using remote time-lapse videography, bear sign abundance surveys, and genetic testing of hair samples (2005 only). They also evaluated bear habitat quality by mapping and classifying

habitats and determining the abundance and diversity of bear foods using vegetation plots on random transect lines within each habitat type.

Results from remote videography indicate that average bear activity among sites varied from 1 to 49 minutes per day, with seasonal averages peaking in July and consistently falling to low levels in August. Similarly, numbers of scats varied among sites from 0.04 to 1.47 scats per field day with peak numbers in July falling to low levels in August. Genetic analysis of hair samples collected in 2005 showed that bear numbers varied among sites from 0 to 13 brown bears, and 0 to 8 black bears. Habitat classification and quantification revealed 8 habitat types with bear forage ranging from <2.5% to 46.2 $\pm$ 8.9% coverage among types. Total bear forage coverage among study areas ranged from 7.1% to 73.1%. The sites were ranked according to the measured variables. Overall, site rankings at the low and high end were consistent. One camping closure area ranked consistently low in bear activity and habitat quality, while the other ranked consistently high. These results led park managers to open the closure area with low bear activity/habitat quality (Tarr Inlet) for the 2007 visitor season, while the closure containing high bear activity and habitat quality (Sandy Cove) remains closed to camping. This work suggests that habitat evaluation, bear sign mapping, and periodic scat counts will provide a useful index of bear activity for future sites of interest (Partridge et al. in review).

Movements

Genetic identification of individual animals during this project revealed the following movements of brown bears between hair sampling locations:

1) A male brown bear was identified in the middle of the east side of Tarr Inlet and then again just west of Rendu Inlet within an unknown time frame (~15 miles).

2) A male brown bear was identified at the head of Giekie Inlet and then again on the west side of Reid Inlet within an unknown time frame (~ 30 miles).

3) A male brown bear identified in mid to late June on the east side of Queen Inlet was also identified in north Russell Passage during late June to mid July (10-20 miles depending on route, and probably involving swimming across the West Arm). The same bear was identified again from mid to late August back in east Queen Inlet.

4) A male brown bear identified in late June to mid July on the west side of Tarr Inlet was identified in mid to late July on the east side of Reid Inlet (~10 miles, again probably involving a considerable swim).

Diet

During this study, researchers examined evidence of bear grazing and conducted a cursory analysis of the gross contents of all scats encountered in the study areas (Partridge et al. in review). Based on these analyses, graminoid and forb species were found to be the most prevalent bear foods, particularly early in the season. Graminoid species such as rye grass and sedge were commonly found in scats throughout the season

in brown and black bear study areas, while alkali grass was also commonly found in scats in black bear areas. Horsetail was also found in most study sites throughout the season. Based on grazing evidence and scat contents, both bear species used many umbels such as seacoast angelica, cow parsnip, and pacific hemlock parsley, particularly during the mid summer. The roots of alpine sweet-vetch were dug extensively in Russell Passage and to a lesser degree in Queen Inlet and Reid Inlet. The flowers, stems, and seeds of field oxytrope were a large component of scats in Queen Inlet and Russell Passage. Strawberries were utilized extensively in all study areas where they were available. Soapberry was also a main late summer diet component in most brown bear study areas in the West Arm. In Tlingit Point and Sandy Cove study areas, groundcone was grazed when available and berry use was high, starting in June with the maturation of strawberry and salmonberry and continuing through July and into late August when devils club, nagoonberry, high-bush cranberry, and other species became prevalent.

There was little evidence of a dependence on terrestrial meat sources by Glacier Bay bears, although scats were occasionally found with hair and connective tissue. The use of barnacles and mussels was common across study areas and seasons. Barnacle shells were more commonly observed in bear scats than mussels, although both occur in intertidal areas. In late August 2005 salmon became common in scats from specific areas such as Wolf and Tlingit Points. Unfortunately, field work terminated just as salmon were entering streams, making evaluation of salmon dependence difficult. An unexpected source of terrestrial food for bears in many of the study areas was wasps. In Sandy Cove, Wolf Point, and Russell Passage, the remains of several predated nests of paper wasps were found in 2004, along with wasp exoskeletons and nest material in scats.

Effectiveness of Hazing and other Management Techniques, 2006-2007

Bear management actions in Bartlett Cove in 2006 and 2007 were analyzed to determine the effectiveness of various techniques. Bear management events are defined as periods of time in which NPS staff are in the presence of a bear or bears for management purposes such as monitoring and/or hazing. Bear management events lasted anywhere from 30 seconds to several hours. If the event involved solely monitoring the bear(s), it was considered a monitoring event, and if any hazing occurred during the event, it was then considered a hazing event. Since hazing is largely a method to move bears out of areas of high human-use, overall success of a hazing event is defined as accomplishing this objective. There were 34 bear management events (28 hazing and 6 monitoring) in Bartlett Cove in 2006 and 41 (22 hazing and 19 monitoring) in 2007. 27 out of 28 hazing events were successful in 2006, while 21 out of 22 hazing events were successful in 2007. Of the 50 hazing events over the two years combined, 37 involved family groups (mother with dependant cubs) of bears while 13 involved non-family groups (individual bears or multiple bears with no dependant cubs). Thirty-five out of 37 (95%) events involving family groups were successful, while all 13 (100%) of the hazing events involving non-family groups were successful.

The reason for the decrease in hazing and increase in monitoring of bears between 2006 and 2007 was likely because park managers decreased the size of the “no bear zone” in the developed area between the two years. In 2006 bears were hazed from a large area

between the main dock and Alder Creek, including the wooded areas and the beach meadows. Many staff hours were spent attempting to haze bears away from prime grass and berry resources within this large zone. In 2007 park managers decided to decrease this area of the "no-bear zone" to roads, trails, housing developments, and parking lots, while allowing bears to travel and feed on the beach and wooded areas between the high human-use areas. Due to the close proximity of human activity, it was decided that bears in this area would be continually monitored by park staff to increase human safety and decrease the chances of bears obtaining human food or trash. Monitoring bears instead of hazing them decreases overall staff time because one or two people can easily monitor a bear while it usually requires two or more people to haze them effectively. Monitoring bears instead of hazing them also allows the public to view bears safely in their natural environment, and provides an opportunity for education.

In addition to examining the overall success of hazing events, we also determined the success of hazing techniques on bears in both family and non-family groups. Hazing techniques are defined as individual actions taken by NPS personnel to move bears. A hazing action is considered successful if the bear(s) stops its activity and/or moves in the desired direction immediately after the hazing action. Data from 2006 and 2007 were combined to increase the sample size of each hazing technique evaluated. Over the two year period 56 hazing actions were recorded involving family groups of bears of which 26 (46%) were successful. The following hazing techniques were used on family groups: Air horn was successful 0 out of 1 times (0%); Pyrotechnic bear deterrent launcher was successful 1 out of 1 times (100%); Speaking softly to the bears was successful 3 out of 3 times (100%); Throwing objects was successful 3 out of 8 times (38%); Banging objects was successful 0 out of 1 times (0%); Approaching aggressively was successful 6 out of 11 times (55%); bear pepper spray was successful 3 out of 4 times (75%), Vocalizing and waving was successful 1 out of 1 times (100%); Yelling and clapping was successful 7 out of 22 times (32%); "Super soaker" squirt gun was successful 1 out of 3 times (33%); and Vehicle noise was successful 1 out of 1 times (100%). 21 hazing actions were recorded with non-family groups of which 17 (81%) were successful. The following hazing techniques were used on non-family groups over the two year period: Throwing objects was successful 1 out of 1 times (100%); Approaching aggressively was successful 5 out of 6 times (83%); Yelling and clapping was successful 10 out of 13 times (77%); and Vehicle noise was effective 1 out of 1 times (100%).

Although sample size was small for most hazing techniques, overall results indicate that family groups are generally harder to move than bears without dependant young. Yelling and clapping was the most common technique used and was 77% successful on non-family group bears but only 32 % successful on family groups. Cubs of the year will often flee up a tree when frightened, which is counter productive to efforts to move a family group out of the area since the mother will not leave the area without her cubs and the cubs will not come down until the threat has diminished. Talking softly, while only used 3 times on family groups, was 100% successful, possibly because bears could be slowly coaxed out of the area without frightening the cubs enough to climb a tree. This technique of "gentle herding" may offer the most promise of keeping family groups, particularly with cubs of the year, away from areas of high human use. Bear pepper

spray was also effective (75%) in hazing family groups but its use was discontinued in 2007 due to unknown long-term effects on individual bears and cubs.

Related Bear Research

Brown Bears

Brown bears range throughout the Southeast Alaska mainland and on many of the the northern islands including Admiralty, Baranof and Chichigof (ABC Islands). Brown bear densities are highest on the ABC Islands at ~1 bear/mi^2. Although mainland brown bear densities are unknown, they are estimated to be highest on the Yakatat Forelands (between Dry Bay and Yakatat Bay), second highest in upper Lynn Canal and Chilkat River Valley, and lowest in Glacier Bay (Schoen and Gende, 2006). Alaska Department of Fish and Game (ADF&G) believe that the mainland population of brown bears is stable (Porter 2005).

Preliminary genetic comparison of Glacier Bay proper brown bears showed that they have a closer genetic relationship to adjacent mainland bears in Kluane, Yukon, than to Chichagof Island bears (Paetkau 2004). This is somewhat expected since ABC Islands bears are known to be somewhat genetically isolated (Paetkau 1998), but still surprising since Chichagof Island is only a short swim away from GB for a bear, using the Icy Strait islands as stepping stones. Because Glacier Bay lies directly between Kluane and Chichagof, a more detailed analysis of the genetic relatedness of Glacier Bay bears may answer some interesting questions about the transfer of individuals between these populations. Rodney Flynn of ADF&G in Juneau has recently initiated a genetic study of brown bears in northern southeast Alaska, BC and the Yukon to further examine genetic relatedness among populations. He will be using approximately 30 hair samples from brown bears in Glacier Bay National Park for his analysis.

Another interesting study utilizing brown bear hair samples from seven individuals in Glacier Bay was conducted by Garth Mowat and Douglas Heard, investigating major components of grizzly bear diet across North America (Mowat and Heard 2005). Using stable isotope analysis, Mowat and Heard analyzed the proportion of assimilated carbon and nitrogen coming from plant, marine and terrestrial meat sources from in Glacier Bay brown bears. Their results indicated a diet of 69% plants, 31% marine derived nutrients, and 0% terrestrial meat. The proportion of marine derived nutrients found in the diets of Glacier Bay brown bears is low compared to diets of brown bears along the coastline of British Columbia and Alaska. For example brown bear diets on Chichagof Island were found to be 46% plants and 54% marine derived, and in Katmai National Park 37% plants and 63% marine. Marine carbon and nitrogen is assumed to have come from salmon, although bears obviously use other marine sources (e.g., barnacles, mussels, rock gunnels, clams). It is also important to remember that the value of 31% represents the assimilated carbon and nitrogen coming from marine sources and does not indicate the total biomass consumed. Thus, based on Mowat and Heard's work, marine derived nutrients are an important part of the yearly diet of bears in GLBA, but vegetation likely comprises the majority of the biomass consumed by bears (Partridge et al., in review).

Salmon have been found to be one of the most important factors determining the population productivity of coastal bears in Alaska (Hilderbrand et al. 1999). Due to the relatively recent deglaciation of GLBA, salmon resources are less substantial than other areas of southeast and coastal Alaska. Based on field observations and crude scat analysis, it is likely that much of the marine derived nutrients found in the diets of Glacier Bay brown bears originate from barnacles, mussels, and other invertebrates (Partridge et al., in review). Hilderbrand et al. (1999) found a positive correlation between contribution of dietary meat (particularly salmon) and North American brown bear body mass, litter size, and population density. Using the estimated value of 31% of the marine derived meat contribution and the equations of Hilderbrand, we can estimate several average individual and population parameters. Based on Hilderbrand's work, the mean female and male mass of GLBA bears would be approximately 154.4 kg and 256.1 kg, respectively. The mean litter size of females would be 2.14 and the overall population density would be approximately 200 per 1000 km^2 (0.2 bears per $km^{2)}$. However, these numbers are possibly lower since a large source of marine derived meat in Glacier Bay is likely invertebrates, a widely dispersed resource with smaller dietary reward per unit of effort than salmon. Intertidal foraging by brown bears has not been widely investigated, but Smith and Partridge (2004) found on the Alaska Peninsula that smaller bears were more likely to harvest clams in the intertidal than larger males or females with cubs of the year. They concluded that since large males and females with young cubs have the highest nutritional requirements, the nutritional reward of harvesting individual clams is simply not worth the time and effort required to obtain them.

Black Bears

Black bears in Southeast Alaska are common along the mainland coast and the southern islands. Although no population studies on black bears have been conducted in northern southeast Alaska, ADF&G estimates densities of approximately 1.3-1.5 bears per mi^2 in forested habitat throughout the region, except where displaced by brown bears on the Yakatat Forelands (Barten 2005 a and b, Hessing 2005). Black bears in Southeast Alaska have been the least studied of all big game species (Schoen and Peacock 2006).

Black bears in the region exhibit a wide range of colors, including black, cinnamon, and blue (glacier bears). Black and cinnamon color phases are both common in Glacier Bay, and glacier bears are also reported regularly. Lt. Wood reported a "silvertip" glacier bear in the area in 1877, and one was shot in Dry Bay October of 1917 (Home 1973). Joe Ibach, a miner in Reid Inlet from the 1920s to the 1950s, shot two glacier bears in 1930 (Home 1973) and a number of others as a big game guide up until the early 1960's (Ken Youmans as related to Greg Streveler). As further related to Youmans, Ibach described glacier bears to be quite different in appearance and behavior than other black bears: smaller, rangier, more secretive, tending to favor high, barren country (Greg Streveler, pers. comm.). Ibach claimed that glacier bears were a separate species based on the small size of his specimens and a thin covering of bone on the rear molars (Home 1973), but whatever their former status, they are now likely thoroughly introgressed into the black bear population. Bears with "glacier bear" pelage have reported sporadically in the park from the 1950s to present, mostly on the southwest side of Glacier Bay, Dundas Bay,

Taylor Bay, and the outer coast including Lituya Bay and Dry Bay, often in mixed litters with other pelage colors. They do not generally fit Ibach's description.

Black bears from Glacier Bay to Yakatat Bay, including glacier bears, are recognized as a subspecies *Ursus americanus emmonsii*, while most other black bears in Southeast Alaska are recognized as belonging to subspecies *Ursus americanus pugnax* (MacDonald and Cook 1999, Schoen and Peacock 2006). It appears that the two subspecies are likely mixing somewhere in the vicinity of Glacier Bay as evidenced by the increase in cinnamon colored individuals. Cinnamon colored black bears are common to the northeast of Glacier Bay in Lynn Canal where glacier bears are very rare (Hessing 2005). Meanwhile, cinnamon colored bears are very rare northwest of Glacier Bay on the Yakatat forelands where glacier bears are the most abundant (Barten 2005). The first cinnamon colored black bear reported in Glacier Bay was in 1967 (Home 1973), and are now common on the lower portion of the bay. Stone and Cook (2000) found genetic evidence of two distinct lineages, coastal and continental, that converge near Windham Bay south of Juneau. Further genetic analysis is needed to determine genetic variation and subspecies designation of black bears in the region.

Brown and Black Bears Species Distribution

Until relatively recently, it was believed that brown bears colonized Southeast Alaska from the north, and black bears from the south after the end of the last great ice age ~10,000 years ago (Klein 1965). However, black and brown bear fossils found in caves on Prince of Wales Island in the 1990s dated up to 40,000 years old indicate that both species coexisted in the area through at least part of the Late Wisconsin glaciation, thus further substantiating the theory that a habitable coastal refugia existed in Southeast Alaska during this time (Heaton et al. 1996).

Species distribution in the park has changed significantly over the past 100 years. Brown bears were commonly reported in Gustavus and Bartlett Cove in the 1920s and 30s, were essentially absent in these areas from the 1960's through the late 1990's, and have become more regular there since that time. Conversely, black bears were more prevalent on the lower outer coast in the 1960s and 1970s (Streveler, et al., 1974, 1975), where as now brown bears appear to predominate, at least in the Dixon Harbor/Torch Bay area. A similar increase in brown bear frequency is noticeable over the last decade in western Dundas Bay, at Point Carolus, and in the Bartlett Cove - lower Beardslee area. Currently black bears appear to predominate in the forested regions of the lower bay while brown bears predominate in the open recently deglaciated upper bay and along much of the outer coast to Dry Bay, with wide mixing zones of the two species in the mid portions of Glacier Bay and in bays and inlets along Icy Strait and the outer coast. The changes in bear distribution over time are likely caused by a range of factors including receding glaciers providing access to new territory, subsequent plant and stream succession, immigration of individuals through travel corridors, colonization of new areas, and competition between species. Streveler and Smith (1987) describe two immigration corridors into Glacier Bay besides the shoreline: the Tarr Inlet – Melbern corridor in the upper west arm, and the Goddess River – Endicott River, otherwise known as the Endicott Gap, in the lower east arm. They inferred that the Endicott Gap corridor has

played a large role in the establishment of mammals, including brown and black bears, in upper Glacier Bay. Competition between the two species has been hypothesized to play a major role in colonization success when there is a large dietary overlap between the species (Mattson et al. 2005). Mattson et al. conclude that brown bears have an advantage over black bears when high quality foods are concentrated at predictable times, allowing brown bears to dominate foraging through interference, or resource defense, competition. But when food resources are more dispersed and less predictable, black bears with smaller body size (less dietary requirements) and higher densities are able to dominate foraging opportunities through exploitation competition. This theory could explain the general absence of brown bears in the lower forested areas on Glacier Bay, where berries and forb resources are dispersed and black bear populations are well established. Exceptions may occur at salmon streams where brown bears are able to dominate a high quality resource. The current distribution of black and brown bears in the park will undoubtedly continue to change as plant and stream communities continue to mature.

HUMAN CAUSED BEAR MORTALITIES ON AND AROUND PARK LANDS

Hunting is not allowed within the boundaries of Glacier Bay National Park, but bears can be harvested legally within the preserve, on private in-holdings within the park, and on all lands adjacent to the park and preserve in accordance to ADF&G hunting regulations. Bears can also be killed legally in defense of life and property (DLP) in the preserve and other areas surrounding the park if the bear was not attracted by garbage or other attractants and all other means of deterring the bear were attempted before it was killed. DLP kills must be reported to ADF&G and parts of the bear (hide and brown bear skulls) must be submitted. Other potential human caused mortalities include poaching and road-kills.

National Preserve - Dry Bay

Sport hunting of both brown and black bears occurs in the preserve, although brown bears are much more prevalent and thus more commonly hunted. Harvest data shows that black bear harvest has declined since 1971 in the Preserve while brown bear harvest is increasing at a rate of 13.8% per year since 1960 (Figure 6 and 7). Although Dry Bay is remote, there are several airplane landing strips that hunters utilize as well as a public use cabin in which hunters can stay. There is also a lodge in Dry Bay that specializes in guided bear hunts, both in and out of the preserve. There has been only one reported DLP kill in the preserve, although there have been numerous anecdotal reports over the years of nuisance bears killed in Dry Bay illegally. The park has recently committed to increasing education and enforcement in Dry Bay to attempt to minimize illegal nuisance bear kills. In addition, the park will document and update bear harvest numbers based on Alaska Department of Fish and Game data in the bear management plan periodically.

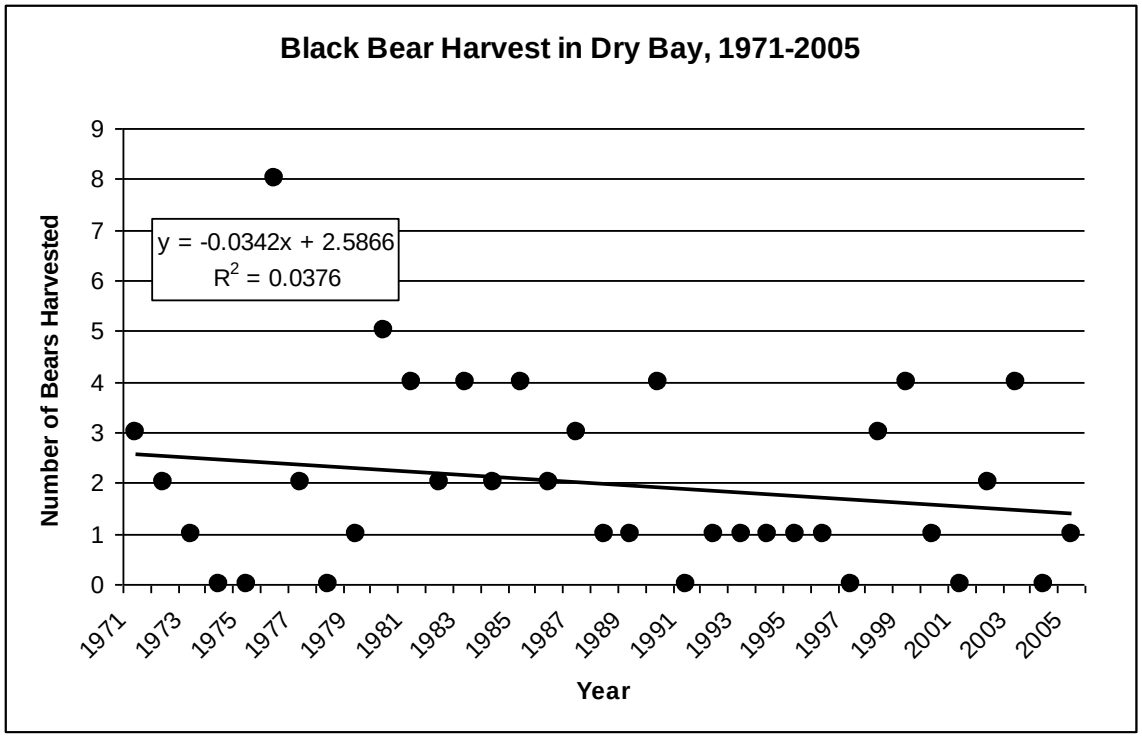


Figure 6: Number of black bears harvested by year in Dry Bay, Glacier Bay National Preserve, 1971-2005. Mean = 1.97± 0.31, n=35.

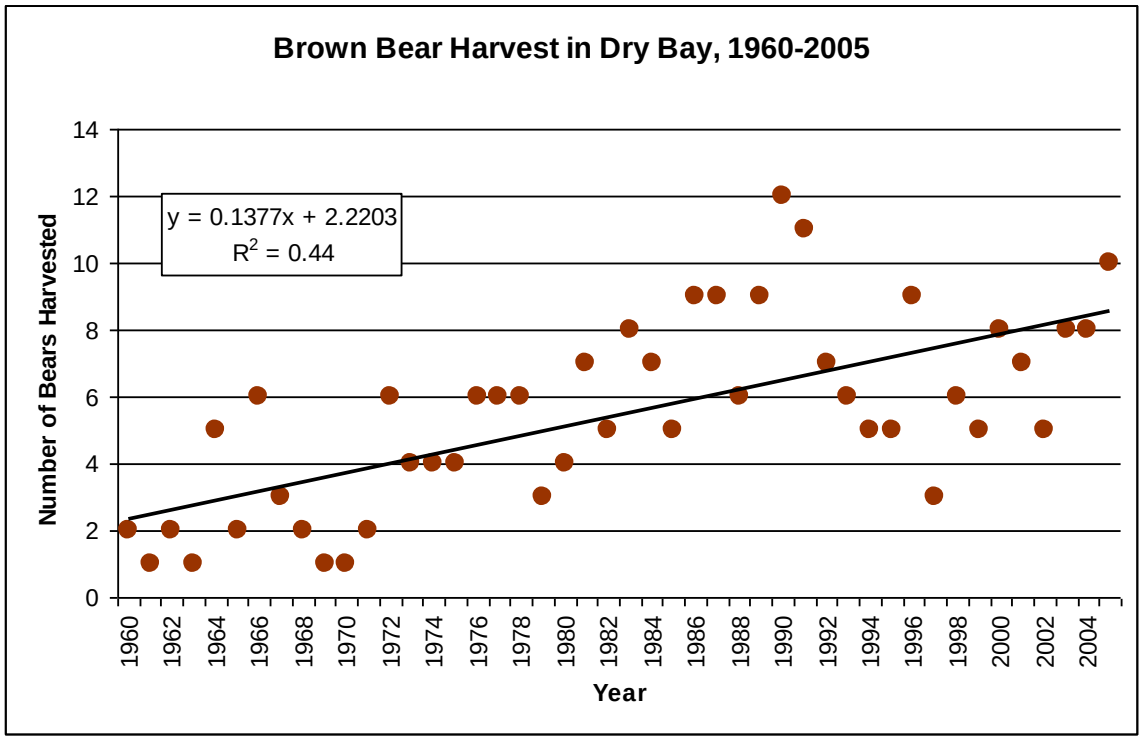


Figure 7: Number of brown bears harvested by year in Dry Bay, Glacier Bay National Preserve, 1960-2005. Mean = 5.46 ± 0.41, n = 46.

Lands Surrounding the Park

The northern side of Glacier Bay National Park borders a Canadian Provincial Park, where hunting is prohibited. The United States Forest Service administers the land on the northwest, northeast, and east sides of Glacier Bay National Park where hunting is permitted by state regulations in Game Management Units (GMUs) 05A, 01D, and 01C respectively (Figure 8). The following graphs show the harvest trends for black and brown bears in these GMUs from 1960-2005 (Figures 9, 10, and 11).

Figure 8. Game Management Units (GMU) surrounding Glacier Bay.

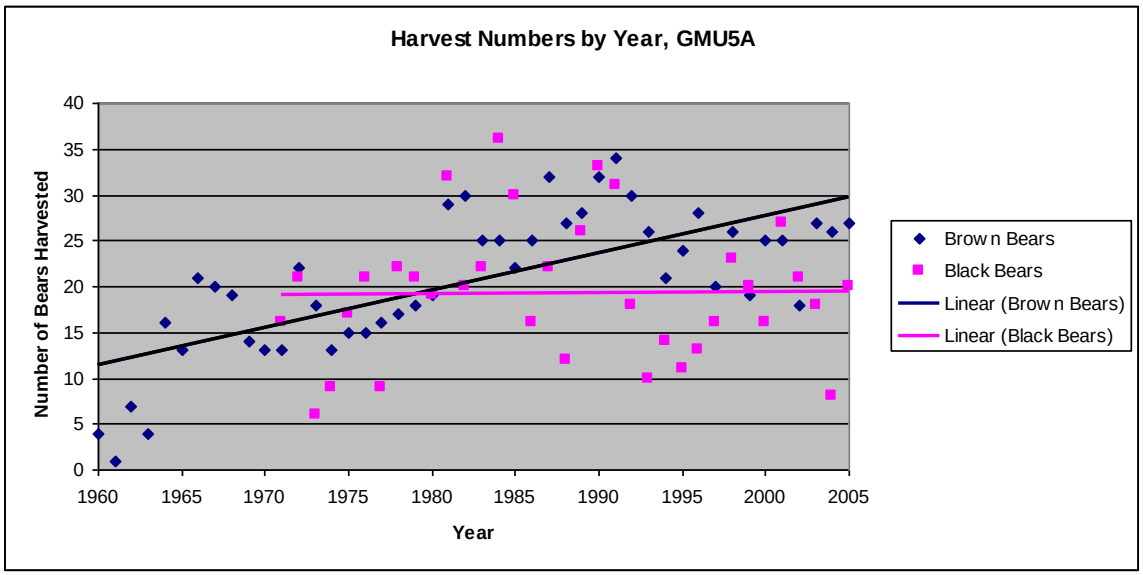


Figure 9. Numbers of black and brown bears harvested by year in GMU 05A.

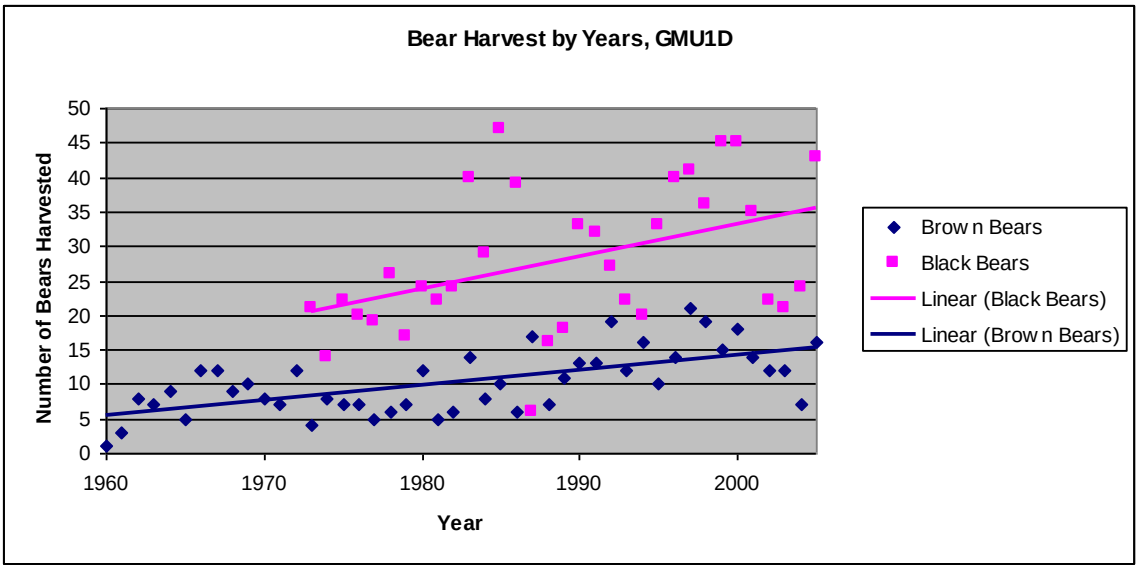


Figure 10. Numbers of black and brown bears harvested by year in GMU 01D.

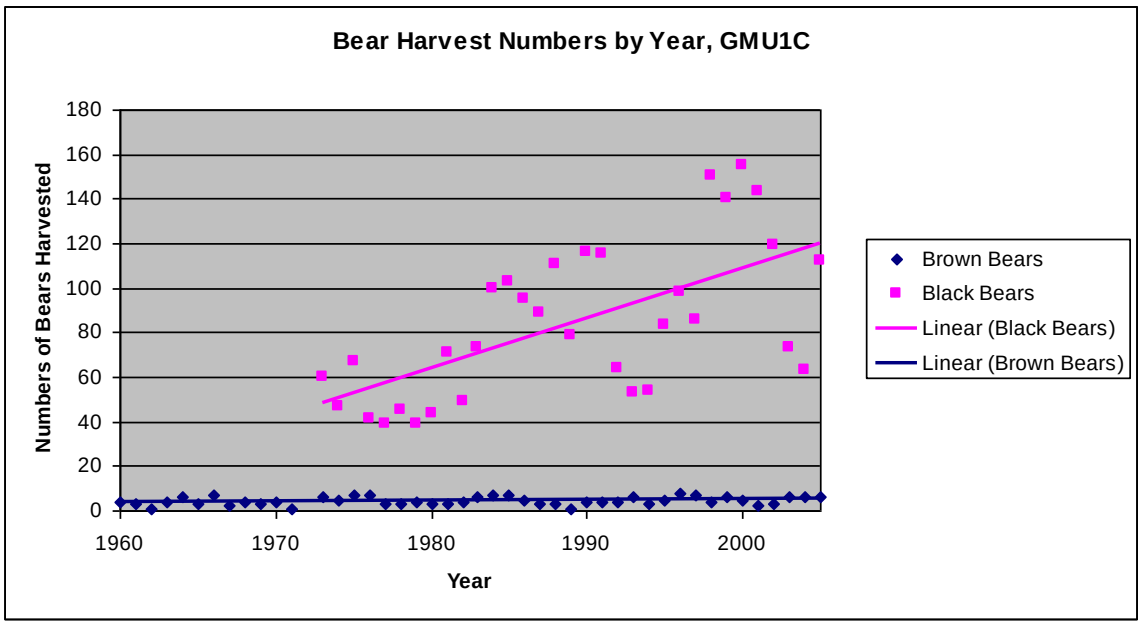


Figure 11. Numbers of black and brown bears harvested by year in GMU 01C.

Gustavus

Black bears are killed legally in Gustavus almost every year (Figure 12). Although most bears are harvested by licensed hunters during the legal season, it is important to recognize that many of these bears are shot in people's yards after investigating garbage, livestock, and other human attractants. Hunters often choose to harvest nuisance bears instead of declare them DLP kills so that they do not have to forfeit the hides. For example in 2002 many bears were killed after getting into people's outdoor refrigerators and freezers, but only 2 out of the 14 bears killed were reported as DLPs. The Gustavus landfill is surrounded by an electric fence and has been essentially bear-proof for over 10

years, but garbage and other human attractants at people's homes and cabins continue to be the cause of many, if not most, black bear deaths in Gustavus.

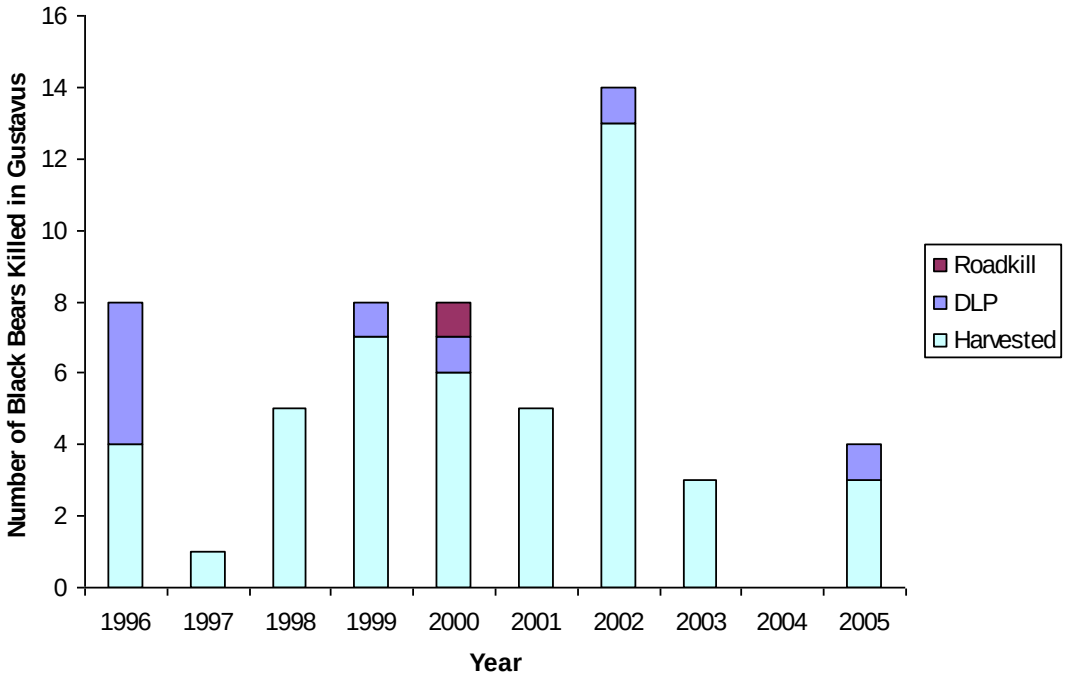


Figure 12: Number of bears killed by year in Gustavus by category: roadkill, defense of life or property (DLP), or harvested/hunted, 1996-2005 (Neil Barten ADF&G).

FUTURE RESEARCH

Information needs regarding bears in Glacier Bay National Park were assessed informally in 2001 (Appendix N). Several of these identified information needs have been addressed in consequent research projects but most research questions remain. The vast majority of Glacier Bay National Park and Preserve is comprised of intact Wilderness, and human development and hunting are allowed in only a very small fraction of the land. For this reason there is little management motivation or need to conduct invasive research (such that requires capturing and collaring animals) for the purposes of managing and maintaining bear populations. Historically the park has leaned towards less intrusive methods of research that seek to answer specific management questions or threats. The following research projects have been identified as important for bear management in Glacier Bay National Park.

Bear/Human Interaction

Yearly analysis of bear-human interactions are important in order to continue providing the most relevant bear safety messages and other preventive management techniques and thus minimize bear-human conflicts.

Bear Behavioral Response to Vessels

There have been numerous observed accounts and anecdotal reports of wildlife harassment involving people on vessels disturbing and/or displacing bears along the shoreline. Similarly, there have been many observations of vessels approaching bears at close range with little overt reaction from the bear. The shoreline is believed to contain the most abundant food resources in the Bay, particularly for brown bears in the upper arms where rock and ice comprise the majority of the inland land-cover, so displacement from prime shoreline resources could negatively impact individual bears. There have been few studies testing the effects of vessel approaches on the behavior of bears. A study such as this would be useful to help determine how bears react to vessel-based bear viewing and how park managers might minimize disturbance with viewing recommendations or regulations.

Current and Predicted Trends in Black and Brown Bear Distribution

Glacier Bay serves as a model for climate change where physical and biological processes resulting from warming trends can be observed over a relatively short period of time. Several plant species believed to be important to brown bears thrive in soils that have been free from ice approximately 50-100 years, creating a moving front of brown bear habitat that advances as the glaciers continue to retreat. This habitat will likely decline as ice-fields eventually disappear and less productive scrub and conifers replace prime brown bear foods. Black bears are able to utilize these early conifer forests and may out-compete brown bears in these areas. A current baseline of black and brown bear distribution as it relates to glacial retreat and post-glacial plant/stream succession is important for modeling future distribution. This model will serve two main functions: 1) to help better understand the effects of climate change on brown bears in peri-glacial and/or sub-arctic regions; 2) to help park managers predict future brown bear activity in order to minimize bear-human conflicts when developing regulations and/or planning infrastructure.

Glacier Bears

There has been concern of hunters targeting the rare glacier-pelage black bears in the preserve. Harvest data from GMU 5A does not show an increase in glacier bear harvest since 1965 (Figure 13) and only seven of the 78 (9%) were taken from the Preserve. This proportion may increase in the future if black bear numbers increase in the Preserve, so harvest levels should be monitored. In addition to monitoring harvest, baseline data on the distribution and relative abundance of glacier bears would be of interest to the Park. Further genetic analysis is also needed to determine genetic variation and subspecies designation of glacier bears and other black bears in the region.

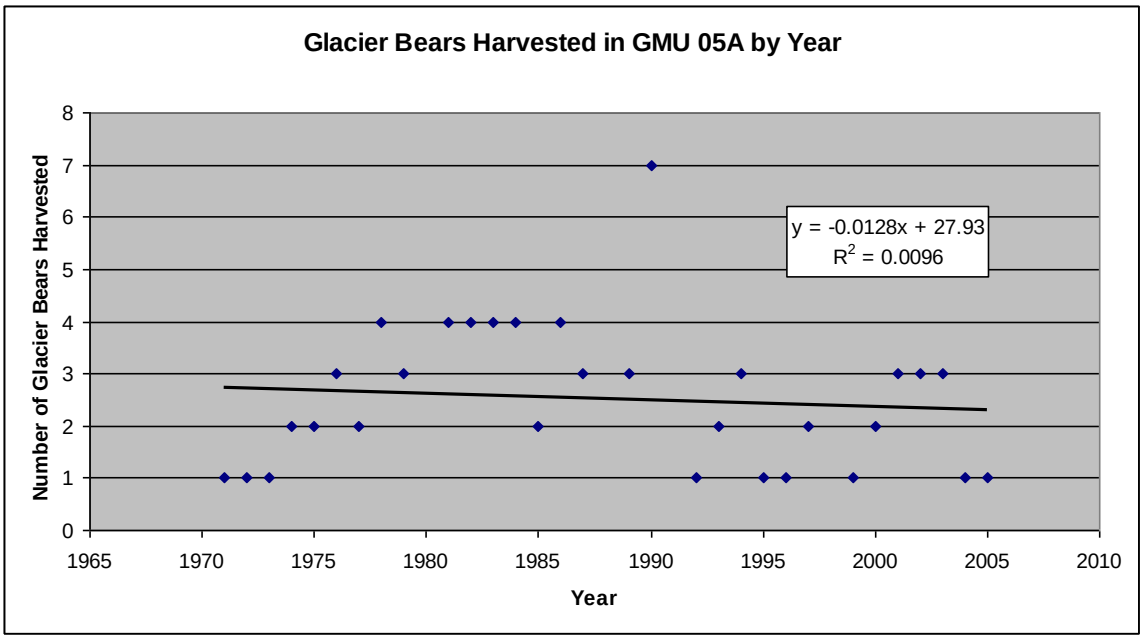


Figure 13. Harvest rates of glacial-pelage black bears in GMU 05A.

Population Trends

Presently there is little known about the populations of black and brown bears in Glacier Bay National Park and Preserve. However, the populations of both species are believed to be at a natural level due to the large amount of natural habitat and low hunting pressure. Population monitoring could be warranted in the future if human caused bear mortality increases significantly due to increased harvest or DLP kills in the Preserve, or if human use increases significantly along the shoreline of the Park.

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Glossary

Aggressive Behavior: Bear charges and/or attacks person. Behavior may be threatening or predatory.

Attractants: Human derived objects that may attract bears, including; food, beverages, garbage, food and beverage containers, harvested fish and game, pet and bird food, food waste, and dirty dishes and food storage containers, and scented personal items.

Aversive Conditioning: Management action that uses negative stimuli to attempt to train a known bear to stop a certain activity or behavior.

Bear-human conflict: Bear-human encounter in which the person was injured, gear was damaged, and/or the person had to deter the bear. Synonymous with incident.

Bear-human encounter: Bear and human interact in some way.

BRFC: Bear Resistant Food Container. An item constructed to prevent access by a bear.

Charge: Bear runs towards a person.

Cryptic Behavior: Bear attempts to remain unseen by people.

Curious Behavior: Bear displays interest in a person, gear, or facilities.

Defensive Behavior: Bear reacts to a perceived threat to themselves or their cubs. Defensive behaviors range from body language and approaching to charging or attacking. Reaction may be intolerant, protective, surprised, or provoked.

Dominance Behavior: Bear attempts to assert dominance over a person.

Encounter: A bear and a human are mutually aware of each other and interact in some manner.

Food-conditioned Behavior: Bear seeks human food, trash, and other attractants. Habituated Behavior: Bear has become tolerant of people (or vehicles, boats, buildings, etc.) due to repeated exposure with no negative consequences.

Hazing: Management action that uses negative stimuli to move bears from certain locations.

Incident: Bear-human encounter in which the person was injured, gear was damaged, and/or the person had to deter the bear. Synonymous with bear-human conflict.

Intolerant Behavior: Bear does not tolerate people or human activity.

Low Level Hazing/AC Techniques: Mild aversive stimuli such as yelling, clapping, and throwing objects.

Mid-High Level Hazing/AC Techniques: More severe aversive stimuli such as pyrotechnics and projectiles fires from shotguns.

Monitoring: Management action in which observers look for and/or watch a bear or bear activity in a specific location.

Observation: A person sees a bear but has no interaction.

Predatory Behavior: A bear stalks or attacks a person in order to consume them.

Protective Behavior: Bear challenges intruder of its personal space by responding defensively.

Provoked Behavior: Bear responds defensively after person approaches, follows, or otherwise harasses the bear.

Rewarded Behavior: Bear has received a positive reward (usually food or trash but could also include gear or other property) from people and seeks more.

Surprised Behavior: Bear is surprised in a sudden encounter with people and behaves defensively.

Threatening Behavior: Bear makes a non-defensive charge, stalks, or attacks a person in an aggressive and/or predatory manner.

Tolerant Behavior: Bear tolerates people and human activity.

Appendices

APPENDIX A. MANAGEMENT ZONE DESCRIPTIONS

1) Bartlett Cove Developed Area (BCDA)

The park headquarters is located in Bartlett Cove near the mouth of Glacier Bay. The vast majority of land visitors in the park pass through the Bartlett Cove Developed Area (BCDA), which includes all NPS administered lands, structures, facilities, and waters within 1 mile of any Bartlett Cove facility, including buildings, structures, park roads, parking lots, campground, picnic areas, paved trails. Lester Island and the remaining undeveloped area in Bartlett Cove are managed as backcountry. The Glacier Bay Lodge provides overnight accommodations for visitors with a range of approximately 4,000-13,000 visitor use nights (number of people x number of nights) per year since 1995. A park service campground provides camping opportunity for visitors with a range of 400-1,100 visitor use nights per year from since 1995. In addition to overnight visitors, park and lodge staff housing and park administrative facilities are located in the BCDA. Day users include visitors, locals from neighboring Gustavus, and from private boats and tour ships. The total number of user-days in Bartlett Cove is unknown.

The vegetation in the BCDA is composed primarily of young spruce forest, beach upland meadows and intertidal zone. These habitats contain abundant seasonal bear forage including grasses, forbs, and berries. Based on foraging observations and crude scat analysis the following plant foods appear highly important: Spring/early summer – sedges, Pacific alkali grass, common horsetail, and dandelion flowers; Midsummer - Angelica, cow parsnip, Pacific hemlock parsley, and strawberries; late summer/Fall – Nagoonberries, Devil's club berries, blueberries, and salmonberries. The Bartlett River, about a mile to the northeast, is a productive salmon stream containing sockeye, pink, and coho salmon runs, and intertidal food resources such as barnacles and mussels surround the BCDA. Detailed bear food descriptions can be found in Appendix B.

Black bears are common in Bartlett Cove and regularly pass through the BCDA. Sometimes individual black bears linger in the BCDA or multiple bears frequent the area when rich food resources such as devil's club or blueberries are abundant. Brown bears are rarely sighted in Bartlett Cove, but occasional reports suggest that sometimes they pass through the area.

In 1992, a cinnamon colored black bear, called "Ursula", with 3 cubs-of-the-year frequented Bartlett Cove. The bear and cubs approached people for food, became regular dumpster visitors, and began to steal packs from the porch of the Visitor Information Station and the lodge luggage room. In mid-August, one of the cubs disappeared. The remaining bears got into the fenced area near the lodge kitchen and into the lodge itself. Hazing was attempted and the bears were repeatedly sprayed with bear spray, only to return. In early September it was decided that the female and her remaining 2 cubs must

be relocated. An ADF&G wildlife biologist was called in, the female was immobilized and cubs captured and the family group was transported to the north side of Geikie Inlet.

Improvements in storage of human trash and food were made following this experience, and conflicts decreased dramatically. Black bears regularly passed through the developed area and were occasionally hazed from human-use zones, but few bears obtained human food or became a nuisance. In the summer of 2006 a small black bear with 3 cubs-of-the-year frequented the BCDA. The bears were tolerant of human presence at close range but did not approach people and were not aggressive. Law enforcement rangers and the wildlife biologist repeatedly hazed these bears from human-use areas, and the intensive management of these human-tolerant, yet not food-conditioned bears, helped shape the development of the BCDA bear response protocols.

Single black bears regularly pass through the BCDA but rarely linger. The vast majority of bear use is by female black bears with dependant young. Human use has been shown to displace large males that can be a threat to young bears (Nevin and Gilbert 2004), so it is possible that BCDA serves as a refuge with safe feeding opportunities for mothers with cubs and other subordinate bears. In addition, human activity likely deters brown bears from the area, thus further increasing the benefits of the refuge for subordinate black bears (Mattson 1990). Black bear family groups frequenting the BCDA create both challenges and benefits to management and visitor experience. The potential for habituated black bears coming into contact with people is high which creates concern for public safety as well as the potential for bears to become food conditioned if food or trash is stored improperly. The benefits include enhanced bear viewing opportunities for visitors and increased educational opportunities for the park to teach the public bear safety and awareness.

2) Bartlett River

The Bartlett River is an approximately 20 mile long watershed that flows into Glacier Bay about a mile north of the Bartlett Cove Developed Area. Visitor access to this popular fishing stream is via a 2.8 mile developed trail. The exact number of visitors using the Bartlett River trail system is not known, but results from opportunistic angler counts mid August- mid October 1996-2007 indicate that use has increased from an average of 1-2.5 anglers to 4.5-5 anglers on the river at a time (Murdoch and Soiseth, 2007).

The vegetation and bear forage opportunities along the Bartlett River are similar to the BCDA with spawning pink salmon, chum salmon, sockeye salmon, and Dolly Varden available seasonally. Bear use of the area is high, particularly when fish are available. Most bears observed are black bears but brown bears have occasionally been sighted along the river and trail.

There have been numerous reports of individual bears obtaining fish and other food from anglers, and nearly every year advisories are issued for the river warning fisherman of rewarded/persistent bears. The Bartlett River trail has been closed to foot traffic due to aggressive bears intimidating fisherman as recently as 1999. Since then, park managers

have focused efforts on educational campaigns and advisories before and after bear-human conflicts and the trail and river have not been closed to human use.

3) Glacier Bay Proper Backcountry

Glacier Bay proper is a recently deglaciated marine fjord that extends more than 60 miles northward. Most visitors to the shores of Glacier Bay travel by kayak and camp at any number of non-designated campsites. On average 900-1200 visitors per year have camped in the backcountry of Glacier Bay since 1995.

Plant communities in Glacier Bay range from young spruce forest in the lower portion of the bay to sparsely vegetated and even barren land in the upper, most recently de-glaciated part of the bay. Bear forage species in the Bay include most of the bear foods listed in Appendix B. Black bears tend to live in the forested areas of the lower bay, while brown bears predominate in the more open upper reaches of the bay, with considerable overlap between the species in the mid portions of the bay.

Two people have been killed by bears in the Glacier Bay backcountry (1976 and 1980). Both were single kayakers in a time when bears were obtaining food from campers regularly. No person has been injured by a bear in the Park since 1980 and BRFCs (or hanging food) became mandatory in the backcountry in 1991. Presently, bear-human interactions in the backcountry are common with about 10-20 incidents (conflicts) per year. Backcountry conflicts range from mild to severe. The most common scenario involves a curious bear approaching a camp, the campers either absent or back away from their gear, and the bear proceeds to play with and/or destroy anywhere from a single item to an entire camp. Aggressive behavior is rarely reported and defensive behavior is also uncommon. Bears usually do not obtain food from people, but on occasion bears are able to gain access to some sort of food reward. It is believed that jumping on and tearing into tents, bags, and kayaks may be a type of reward for the bear, even if no actual food is obtained. For this reason, campers are encouraged strongly to defend their gear unless they feel their safety is at imminent risk.

Management response to backcountry bear-human conflicts has generally consisted of issuing advisories and camping closures. Two long term seasonal camping closures were initiated in the 1980's in response to bear-human conflicts. A bear research study from 2004-2005 found that one of the closure areas (Sandy Cove) was necessary, while the other (Tarr/Johns Hopkins Inlet) was shown to be unnecessary and was subsequently opened to camping in 2007. Park staff members with bear management responsibilities have been trained in aversive conditioning since 2006, and although AC has been attempted several times in the Glacier Bay backcountry since then, crews have never successfully located the perpetrating bear and applied AC. For this reason, advisories and closures appear to be the most efficient and effective management responses to incidents in the backcountry.

4) National Preserve – Dry Bay

The National Preserve in Dry Bay encompasses approximately 57,000 acres of land on the northwest side of Glacier Bay National Park and Preserve where the Alsek River

flows into the Gulf of Alaska. Glacier Bay National Park acquired the National Preserve at Dry Bay from the US Forest Service in 1980 under the Alaska National Interest Land Conservation Act (ANILCA). Under ANILCA, more uses are allowed in the preserve than are generally allowed in the park such as hunting, trapping, subsistence uses, commercial fishing, cabins, off road motorized vehicles, and airplane landings on existing airstrips. A small group of commercial gill net fishermen live in permitted cabins during the summer months, there are 3 fishing and hunting lodges, and people visit to fish, hunt, trap, take photos, camp and hike. In addition, approximately 800 rafters and kayakers who travel the Tatshenshini and Alsek Rivers take out in Dry Bay for transport home every summer. The total number of summer residents and yearly visitors is unknown and likely variable.

A majority of the preserve is a flat rapidly uplifting landscape that has originated from a glacial outwash plain over 200 years ago (Dry Bay ORV EA). Habitat types include cottonwood and spruce forests, open and closed low and tall scrub, wetlands, bare ground with sparse herbs and scrub, sand dunes, open meadows, estuaries, riparian, and intertidal zones. This diversity of vegetation types in addition to multiple anadromous fish streams creates an area of overall high quality bear habitat. Based on foraging observations and crude scat analysis the following plant foods appear highly important: Spring/early summer – alpine sweet-vetch roots, sedges, dandelion flowers, horsetail; Midsummer - angelica, cow parsnip, strawberries, field locoweed, creeping spike rush; late summer/Fall – alpine sweet-vetch roots, angelica roots, high-bush cranberries, lupine roots, beach carrot roots, and salmon. The Alsek River and several other drainages in the area including the East Alsek River, the Doame River, Dog Salmon Creek and other unnamed creeks, provide important spawning and rearing habitat to various salmonid species. In addition to salmon, bears have access to fish and marine mammals that are washed upon the shore by the surf. Brown bears predominate in Dry Bay while black bear sightings are rare. The majority of the brown bears observed or reported near cabins and trails are mothers with cubs and subadults, possibly due to a refugia created by the wariness of adult males to human habitation, particularly in a hunted population (Nevin and Gilbert 2004).

Bear-human conflicts in Dry Bay are common. Although no person has been killed by a bear in Dry Bay, bears have caused extensive property damage to boats, fishing nets, equipment, and cabins. Problem bears in Dry bay have historically "disappeared", and the NPS and Alaska Department of Fish and Game (ADFG) strongly suspect that residents regularly kill problem bears but fail to report these kills and turn over the skull and hide to ADFG officials. In 2005 at least four different sub-adult brown bears were involved in breaking into five cabins, partially destroying two of them. On one particularly alarming occasion, two bears attempted to enter a cabin by breaking windows and tearing at walls while a woman and her small child were inside. The four bears involved in property destruction disappeared. Law enforcement personnel and park biologists suspect that these bears were able to obtain human food and trash and thus became food-conditioned, growing more bold and destructive until local residents shot them. This presents both a law enforcement problem (illegal killing of wildlife in the preserve) and a bear management problem (how to manage for losses from a population

when the magnitude of losses is unknown). Because brown bears have one of the lowest reproductive rates of any terrestrial mammal (Bunnell and Tait 1981), unknown human mortalities could cause concern for the preservation of the population in the National Preserve.

5) Alsek River

The Alsek and Tatshenshini Rivers originate in the Yukon Territory, Canada, flow southwest to merge together in British Columbia, and then flow into Glacier Bay National Park, Alaska. The Alsek River enters the Pacific Ocean at the northern boundary of the National Preserve in Dry Bay. The Tatshenshini and Alsek River systems offer world renowned 7-12 day rafting and kayaking expeditions for private and commercial groups. Visitor numbers are limited by maximum group sizes, put-in restrictions on the Alsek, and take-out restrictions in Dry Bay. The Alsek River Visitor Use Management Plan (USNPS, 1989) guides visitor use for Glacier Bay National Park. Approximately 700-1300 visitors float down the Alsek River into Glacier Bay National Park every year.

Bear food resources along the Alsek River as it enters GLBA are similar as in Dry Bay, with abundance and variety of foods tending to increase as the river gets closer to the Pacific. Both black and brown bears are seen along the river corridor, but brown bears are the most common species reported below Alsek Lake. Bear habitat and bear-human encounter potential was assessed at known campsites along the river in 1999 (MacHutchon, 2000). Two of these campsites in Glacier Bay National Park were "not-recommended for camping" by researchers due to potential bear-human conflicts, mostly as a result of high bear forage quality in combination with travel corridor and poor visibility issues. No management action has been taken in GLBA as a result of these campsite recommendations. The report is available to the public on the Glacier Bay website.

Historically there have been few bear-human conflicts along the Alsek, possibly due to relative low visitation and strong river ethics education as outlined in Appendix O. Although bears are rarely reported getting food from rafters, the Alsek River is the only portion of Glacier Bay National park where storing food and trash in bear-resistant manner is NOT required. Due to concerns over this and other bear management issues, river managers from GLBA, BC Parks, Yukon Parks, and Kluane National Park created the "Tat-Alsek Bear Group" in 2006 to focus efforts on improving food storage techniques as well as obtaining information from rafters on bear-human interactions. This group has purchased food storage electric fences and bear-resistant coolers for loan and trial, created a new bear-human interaction reporting system that has increased reporting dramatically, and initiated the creation of an interagency bear-human conflict management plan.

6) Other: Icy Strait, Outer Coast, Excursion Ridge and Inlet

These management areas are geographically and biologically diverse. Visitation to these areas is characterized as low, but the yearly number of visitors is unknown. Research, management actions, and law enforcement efforts in these areas have been minimal

compared to the other management areas where visitation is higher. Bear food resources likely include all of the bear foods listed in Appendix B. Excursion Ridge appears to support more black bears, the Outer Coast more brown bears, and Icy Strait appears to have a mix of both, but little information has been collected about species distribution in these area. Reports of bear-human conflicts in these areas are very rare, most likely due to low visitation.

7) Gustavus

Over 200 years ago about 35 square miles of land that make up the current Gustavus was a flood plain for the large glacier at the mouth of Glacier Bay. Gustavus is now a city of approximately 420 residents surrounded by Glacier Bay National Park and the waters of Icy Strait. Gustavus is the primary gateway community to Glacier Bay National Park, and summer workers and visitors likely double the population from May to September.

Gustavus is flat and wet, especially where development ditching has not occurred. Habitat types include cottonwood, pine and spruce forests, open and closed low and tall scrub, wetlands, open meadows, riparian zones, recently uplifted beach fringe, and intertidal zones. The following plant foods appear highly important: Spring/early summer – sedges, dandelion flowers, horsetail; Midsummer - angelica, cow parsnip, strawberries, nagoonberries; late summer/Fall – high-bush cranberries, blueberries, and salmon. Black bears are most prevalent in Gustavus, but occasionally brown bears pass through.

Bear-human conflicts in Gustavus tend to involve obtaining or trying to obtain food from people, particularly near the later part of the summer. The town has a secure landfill that bears cannot access, but bears are still able to obtain food, livestock, and trash from residents regularly. Every year bears that become food conditioned are shot in Gustavus, but no one has been killed or injured by a bear to date. Alaska Department of Fish and Game manages bears in Gustavus.

APPENDIX B: BEAR FOODS IN GLACIER BAY NATIONAL P&P

ID Code	*Common Name*	*Scientific Name*	*Habitat Type; Targeted Part; Season*
	Herbs		
ACRU	Baneberry	*Actea rubra*	Forest; Unknown; Unknown
ANSP	Sea watch/white angelica	*Angelica* spp.	Meadow; Stalk, flower, roots; Spring, ,summer
ARUV	Bearberry	*Arctostaphylos uva-ursi*	Open dry; Berry: Fall and spring
ARDI	Goatsbeard	*Aruncus dioicus*	Forest; Unknown; Summer
ASSP	Vetch	*Astragulus* spp	Open Dry; Root; Summer
ATFI	Lady Fern	*Athyrium filix-femina*	Forest; Leaves; Summer
BAOR	American Wintercress	*Barbarea orthoceras*	Meadow; Unknown; Unknown
BORO	Groundcone	*Boschniakia rossica*	Alder; Bulb; Summer
COCH	Pacific Hemlock-Parsley	*Conioselium chinense*	Meadow; Leaves and flowers; Summer
EQSP	Horsetail	*Equisetum* spp.	Wetlands; All; Spring and summer
FRCH	Strawberry	*Fragaria chiloensis*	Meadow; Berries; Summer
GLLI	Beach Carrot	*Glehnias littoralis*	Sand dunes; Root; Late summer
HEAL	Alpine Sweet-vetch	*Hedysarum alpinum*	Meadow; Roots; Spring, summer, fall
HELA	Cow Parsnip	*Heracleum lanatum*	Meadow; Stalk, flower, seed; Summer
LAMA	Beach Pea	*Lathyrus maritimus*	Meadow; Unknown; Unknown
LIHU	Beach Lovage	*Ligusticum hultenii*	Meadow: Leaves and flower; Summer
LUSP	Lupine	*Lupinus* spp.	Meadow; Roots; Late summer
OPHO	Devil's Club	*Oplopanax horridus*	Forest; Berries; Summer and fall
OSDE	Licorice Root	*Osmorhiza depauperata*	Forest; Unknown; Unknown
OXCA	Field Locoweed	*Oxytropis campestris*	Meadow; Flowers, seeds, roots; Summer
PLMA	Goose Tongue	*Plantago maritima*	Intertidal; Leaves; Unknown
RISP	Currant	*Ribes* spp.	Forest; Berry; Summer and fall
RUAR	Nagoonberry	*Rubus arctica*	Meadow and forest; Berry; Summer
RUSP	Salmonberry	*Rubus spectabilis*	Forest; Berry; Summer
SARA	Red-elderberry	*Sambucus racemosa*	Forest; Berry; Summer and fall
SHCA	Soapberry	*Shephardia canadensis*	Open dry; Berry; Summer and fall
STAM	Twisted Stalk	*Streptopus amplexifolius*	Forest; Stalk; Spring and summer
TASP	Dandelion	*Taraxacum* spp.	Meadow; Flower; Spring and summer
TRMA	Sea Arrow-Grass	*Triglochin maritimum*	Intertidal; Leaves; Unknown
VASP	Blueberry/Huckleberry	*Vaccinium* spp.	Forest; Berry; Summer and fall
VIED	High-bush Cranberry	*Viburnum edule*	Forest and open; Berry; Fall
	Grasses		
ELAR	Rye-grass	*Elymus arenarius*	Beach meadow; Blade; Spring
ELPA	Creeping spike rush	*Eleocharis palustris*	Wetland; Blades; Summer
CASP	Sedges	*Carex* spp.	Wetland; Blades; Spring and summer
PUNU	Pacific Alkaligrass	*Puccinellia nutkaensis*	Intertidal: Blades; Spring and summer
UNGR	Unknown graminoid	N/A	Variable: Blades; Spring and summer
ID Code	***Common Name***	***Scientific Name***	***Habitat Type; Targeted Part; Season***
	Animals		
BASP	Barnacles	*Balanus* spp.	Intertidal; Inside; All seasons
MYED	Blue Mussels	*Mytilus edulis*	Intertidal; Inside; All seasons

ONSP	Salmon	*Onchorynchus* spp.	Streams; All parts; Summer and fall
TRSP	Amphipods	*Traskorchestia spp.*	Intertidal; All parts; Spring and summer
PHSP	Gunnels/Sticklebacks	*Pholis/Xiphister spp.*	Intertidal; All parts: All seasons
MISP	Voles	*Microtus/Clethrionomys spp*	Meadow; All parts; All seasons
VESP	Wasps/Bees	*Vespula/Bombous spp*	Variable; All parts; Summer
ALAL	Moose	*Alces alces*	Variable; Calves; Spring
ORAM	Mountain Goat	*Oreamnos americanus*	Variable; All Parts; All seasons

APPENDIX C. FOOD STORAGE REGULATIONS APPLICABLE TO GLACIER BAY NATIONAL PARK AND PRESERVE

Glacier Bay National Park and Preserve Compendium 2006

2.10(d) Food storage: designated areas and methods

(1) Definition: A *bear resistant container* (BRC) means an item constructed to prevent access by a bear. BRFC's include—

- Items approved by the Department of Interior and Agriculture's Interagency Grizzly Bear Committee (http://www.fs.fed.us/r1/wildlife/igbc/);
- Items approved by the National Park Service's Sierra Interagency Black Bear Group (http://www.nps.gov/seki/snrm/wildlife/sibbwg.htm);
- Any additional items listed by the State of Alaska, Department of Fish and Game, Division of Wildlife Conservation (http://www.wildlife.alaska.gov/aawildlife/containers.cfm#lightweight), with the concurrence of the Superintendent; and
- Items approved by the Superintendent.

(2) Throughout the park, all food (except legally taken game) and beverages, food and beverage containers, garbage, harvested fish and equipment used to cook or store food must be stored in a bear resistant container (BRC) or secured—

- Within a hard sided building;
- Within lockable and hard sided section of a vehicle, vessel, or aircraft; or
- By caching a minimum of 100 feet from camp and suspending at least 10 feet above the ground and 4 feet horizontally from a post, tree trunk or other object on a line or branch that will not support a bear's weight.

Note: This does not apply to:

- Clean dishes and cooking equipment that are free of food odors. We strongly recommend that these items be securely stored; but clean and odor free items are not required to be stored in secure containers.
- Food that is being transported, consumed or prepared for consumption.
- The use of bait for trapping and hunting under the provisions of state and federal law.

For the Bartlett Cove Developed Area, see 13.1124(b)-(c).

The intent of these designations is to prevent bears and other wildlife from obtaining food and garbage and becoming food conditioned, thus protecting wildlife and park visitors alike. We strongly recommend that dishes and cooking equipment be securely stored; but clean and odor free items are not required to be stored in secure containers. Ice chests and coolers, tents, dry bags or stuff sacks, plastic packing boxes (Totes, Action Packers, etc) and unmodified kayaks are not generally approved as BRC. The park offers bear resistant containers for temporary use to the public. The containers are free of charge and can be picked up at the park's visitor center in Bartlett Cove.

See also 13.1124

Federal Code of Regulations, National Parks

Title 36: 2.10 (d)
Food storage. The superintendent may designate all or a portion of a park area where food, lawfully taken fish or wildlife, garbage, and equipment used to cook or store food must be kept in a sealed vehicle, or in a camping unit that is constructed of solid, non-pliable material, or suspended at least 10 feet above the ground and 4 feet horizontally from a post, tree trunk, or other object, or shall be stored as otherwise designated. Violation of this restriction is prohibited. This restriction does not apply to food that is being transported, consumed, or prepared for consumption.
http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=324ee9e8c5fbb2c9001e73091e6bfb65&rgn=div8&view=text&node=36:1.0.1.1.2.0.1.6&idno=36

Title 36: Parks, Forests, and Public Property
PART 13—NATIONAL PARK SYSTEM UNITS IN ALASKA
13.1124 Bartlett Cove Campground.

(b) Cooking, consuming, or preparing food in the Bartlett Cove Campground is prohibited except in designated areas.

(c) *Food storage.* In the Bartlett Cove Developed Area, storing food in any manner except in a sealed motor vehicle, a vessel (excluding kayaks), a building, an approved bear-resistant food container, a bear-resistant trash receptacle, or a designated food cache is prohibited.

http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=8bd70f09b438a2ad2e90a1025830dba7&rgn=div5&view=text&node=36:1.0.1.1.13&idno=36#36:1.0.1.1.13.14.37.13

State of Alaska
5 AAC 92.230
Except under the terms of a permit issued by the department, a person may not intentionally feed a moose, deer, elk, bear, wolf, coyote, fox, or wolverine, or negligently leave human food, animal food, or garbage in a manner that attracts these animals. However, this prohibition does not apply to the use of bait for trapping furbearers or hunting black bears, wolf, fox, or wolverine under 5 AAC 84-5 AA C92.
http://www.legis.state.ak.us/cgi-bin/folioisa.dll/aac/query=%5bjump!3A!275+aac+92!2E230!27%5d/doc/%7b@24755%7d/hits_only?

APPENDIX D. CODE OF FEDERAL REGULATIONS TITLE 36, 13.50: CLOSURE PROCEDURES.

a) *Authority.* The Superintendent may close an area or restrict an activity on an emergency, temporary, or permanent basis.
(b) *Criteria.* In determining whether to close an area or restrict an activity on an emergency basis, the Superintendent shall be guided by factors such as public health and safety, resource protection, protection of cultural or scientific values, subsistence uses, endangered or threatened species conservation, and other management considerations necessary to ensure that the activity or area is being managed in a manner compatible with the purposes for which the park area was established.
(c) *Emergency Closures.* (1) Emergency closures or restrictions relating to the taking of fish and wildlife shall be accomplished by notice and hearing.
(2) Other emergency closures shall become effective upon notice as prescribed in paragraph (f) of this section; and
(3) No emergency closure or restriction shall extend for a period exceeding 30 days, nor may it be extended.
(d) *Temporary closures or restrictions.* (1) Temporary closures or restrictions relating to the taking of fish and wildlife, shall not be effective prior to notice and hearing in the vicinity of the area(s) directly affected by such closures or restrictions, and other locations as appropriate;
(2) Temporary closures shall be effective upon notice as prescribed in paragraph (f) of this section; and
(3) Temporary closures or restrictions shall not extend for a period exceeding 12 months and may not be extended.
(e) *Permanent closures or restrictions.* Permanent closures or restrictions shall be published as rulemaking in the Federal Register with a minimum public comment period of 60 days and shall be accompanied by public hearings in the area affected and other locations as appropriate.
(f) *Notice.* Emergency, temporary, and permanent closures or restrictions shall be:
(1) Published in at least one newspaper of general circulation in the State and in at least one local newspaper if available, posted at community post offices within the vicinity affected, made available for broadcast on local radio stations in a manner reasonably calculated to inform residents in the affected vicinity, and designated on a map which shall be available for public inspection at the office of the Superintendent and other places convenient to the public;
(2) Designated by the posting of appropriate signs; or
(3) Both.
(g) *Openings.* In determining whether to open an area to public use or activity otherwise prohibited, the Superintendent shall provide notice in the Federal Register and shall, upon request, hold a hearing in the affected vicinity and other locations as appropriate prior to making a final determination.
(h) *Facility closures and restrictions.* The Superintendent may close or restrict specific facilities for reasons of public health, safety, and protection of public property for the duration of the circumstance requiring the closure or restriction. Notice of facility closures and restrictions will be available for inspection at the park visitor center. Notice will also be posted near or within the facility, published in a newspaper of general circulation in the affected vicinity, or made available to the public by such other means as

deemed appropriate by the Superintendent. Violating facilities closures or restrictions is prohibited.
(i) Except as otherwise specifically permitted under the provisions of this part, entry into closed areas or failure to abide by restrictions established under this section is prohibited.

http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=8bd70f09b438a2ad2e90a1025830dba7&rgn=div5&view=text&node=36:1.0.1.1.13&idno=36#36:1.0.1.1.13.2.21.8

APPENDIX E. BEAR SAFETY IN GLACIER BAY

Glacier Bay National Park is home to brown (grizzly) bears (*Ursus arctos*) and black bears (*Ursus americanus*). Black bears are found primarily in the forested regions of the lower bay, including Bartlett Cove, while brown bears live mainly in the open, recently deglaciated regions of the upper bay.

Black Bears vs. Brown Bears

Determining the difference between the two species can be tricky. Simply looking at color doesn't help. Black bears can be black, brown, blonde, and even blue/gray -- as is the case of the rare color phase found in Southeast Alaska called the "glacier bear." Brown bears can be any shade from honey blonde to black. A few key physical characteristics can help to clarify just what type of bear you have spotted:

Black Bears:

- Straight facial profile
- Lack of a shoulder hump
- Prominent ears
- Short, curved claws
- 3 feet at the shoulder
- 125 to over 300 pounds

Brown Bears (also called "grizzlies" in Interior Alaska):

- "Dish-shaped" facial profile
- Prominent shoulder hump
- Long, straight claws
- 3.5 feet at the shoulder/up to 9 feet when standing on hind legs
- Average 500 to 1000 pounds

Be Bear Savvy:

While walking, hiking or camping in Glacier Bay, you may encounter a bear. The vast majority of these encounters do not result in human injury or property damage. You can help prevent injury to yourself or to the bear by taking a few basic precautions.

- Be alert
- Make noise, particularly in windy conditions or near rushing water
- Choose routes that offer good visibility
- Travel in a group of two or more
- Keep your personal items and food within your immediate reach
- Do not pursue or approach bears for photographs
- Avoid streams with spawning fish

Be a smart camper:

Both campers and bears frequent the beaches of Glacier Bay. Bears only have 6-8 months to acquire the calories and fat reserves needed for the entire year, and the shoreline is essential for food and travel. The following guidelines will minimize your disruption of bears and help keep them wild.

Cooking and storing food:

- Cook at least 100 yards from your tent and food storage area
- Cook and eat in the intertidal zone
- Wash cooking gear in marine waters
- Be prepared to quickly stow all food should a bear suddenly approach
- Keep all food, trash and other scented items in a bear resistant food container (BRFC)
- Store BRFCs and clean cooking gear in brush or behind rocks away from animal trails 100 yards from your camp

Choosing a campsite:

- Avoid areas with bear sign including an abundance of scat, animal trails and chewed or clawed trees
- Avoid active salmon streams
- Pull your kayak and pitch your tent clear of the beach
- Select a site that would allow bears room to pass at high tide

Control your gear:

- Keep gear together. The more spread out your gear is the more difficult it is to defend.
- To minimize potential bear damage to gear, consider breaking down your campsite daily.

Be aware of what goes on around your campsite.

When encountering humans, most bears will run away, approach curiously, appear to ignore the situation or act defensively. By staying alert, calm, and tailoring your reaction to the bear's behavior and species, you increase the odds of a positive outcome for both you and the bear.

If You See a Bear

The Bear	What You Can Do	
May or may not be aware of you	*What is your activity and degree of mobility?* *You are hiking or kayaking (mobile):* • Change your course to avoid bear. • Monitor bear's movement. • If bear is close, talk calmly to avoid surprising it.	*You are camping or eating (not mobile):* • Keep all gear under direct control. • Group together without blocking bear's route. • Talk calmly to make bear aware of you. • Stand your ground.
Moves toward you	• Monitor bear's movement. • Stand your ground and talk calmly. • Allow bear to pass peacefully.	
Becomes focused on you	• Stay together and stand your ground. • Be assertive and elevate your defense: clap your hands, wave your arms, use noisemakers, such as air horns or bang pots together.	
Charges	• Continue to stand your ground and look big. • Use pepper spray if you have it. • Few charges end in contact.	
If a bear makes contact	• Fight back vigorously. • This is likely a predatory attack.	

If You Surprise a Bear

The Bear	What You Can Do
May react defensively and may snort, huff, pop its jaw, or charge	• Stand your ground and talk calmly to the bear. • Attempt to move away slowly.
Begins to follow you	• Stand your ground.
Charges	• Use pepper spray.
Enters your tent	• Fight back.
Is a brown bear and makes contact	• Play dead—lie flat, face down on the ground, and lace your fingers behind your head. Do not move.
Is a black bear and makes contact	• Fight back.

Bear Safety While Fishing the Bartlett River:

- If a bear approaches while you have a fish on the line, cut the line.
- Clean fish in the river discarding remains in the mid-channel current.
- Keep your catch on your person at all times in a backpack to allow for quick retreat from approaching bears.
- Never yield your catch or other food items.

APPENDIX F. FIREARMS TRAINING

36 CFR 2.4 prohibits people from carrying firearms in Glacier Bay National Park (firearms are allowed in the Preserve) with the exception of LE rangers and other staff authorized by the superintendent. 36 CFR 13.1 defines a firearm as "any loaded or unloaded pistol, revolver, rifle, shotgun or other weapon which will or is designated to or may readily be converted to expel a projectile by the action of expanded gases, except that it does not include a pistol or rifle powered by compressed gas. The term "firearm" also includes irritant gas devices." Non-law enforcement personnel may obtain a firearms certification for non-law enforcement personnel with the signature of the superintendent. The chief of resource management and the wildlife biologist will determine which non-law enforcement personnel should obtain this certification for bear management purposes. All park LE and non-LE staff authorized to carry firearms for bear management actions should attend a yearly training that covers the following:

1. Bear behavior
2. Review of GLBA bear management plan
3. Hazing/Aversive conditioning tools and techniques (to include bear spray, pyrotechnics, rubber and bean bag projectiles.
4. Basic firearms safety review
5. Familiarization/Competency test of pyrotechnic pistol
6. Shotgun shooting proficiency

Other topics/scenarios:

- Shoot or no shoot scenarios;
- Shotgun nomenclature, operation and cleaning;
- NPS policy on weapon accountability and security as well as legal aspects of firearm use;
- A mock scenario that involves an aversive conditioning incident.

Shotguns for Bear Management

12 gauge shotguns, preferably Remington 870 with a 3 inch chamber, is the preferred weapon for high level bear management activities and lethal back-up. Only employees who have attended a park approved aversive conditioning training by a wildlife biologist AND a firearms training session covering wildlife management situations by a certified firearms instructor, should use a shotgun in hazing/AC activities. All personnel carrying shotguns must also pass a shooting proficiency course as part of their firearms certification, which requires the shooter to accurately shoot 4 (80%) of 5 rounds in a target at 15 yards within 25 seconds, twice. All personnel carrying firearms in the park will observe federal, state, and local laws regarding firearms and ammunition, and safe firearm handling must be conducted at all times. In addition, employees carrying firearms in the view of the public will be in NPS uniform. Firearms and ammunition will be stored locked and out of sight in the protection division offices.

Bear Deterrent Pyrotechnic Launcher

Bear deterrent pyrotechnic launchers can be effective tools to haze and/or aversively condition bears. They are not to be used for the purposes of self defense. The park currently owns 6mm RG-3 Six Shot Clip Magazine Launcher used with 6 mm Hot Acorn RWS Blanks and pyrotechnic cartridges: "Flamers", "Screamers" and "Flaming Whistlers". Products were purchased from Margo Supplies LTD., Alberta Canada: http://www.margosupplies.com/american/scare/launchers_pyro_new.htm.

APPENDIX G. BEAR MANAGEMENT CONTACTS

Title	Name	Phone Number
GLBA Squad		
Superintendent	Cherry Payne	907-697-2616
Chief or Resource Management	Craig Smith	907-697-2640
Chief of Visitor/Resource Protection	Randy Larson	907-697-2621
Chief of Interpretation	Kris Nemeth	907-697-2620
Chief of Maintenance	Mark Foster	907-697-2626
Chief of Concessions	Dave Nemeth	907-697-2624
GLBA Bear Committee		
Wildlife Biologist	Tania Lewis	907-697-2668
District Ranger	Gus Martinez	907-697-2628
VIS Supervisor	Margaret Hazen	907-697-2608
Interpretive Ranger	Tom VandenBerg	907-697-2619
National Preserve Rangers		
Dry Bay Ranger	Jim Capra	907-784-3295
Yakutat District Ranger	VACANT	
NPS Alaska Region		
AKRO Wildlife Biologist	VACANT	
AK Dept. of Fish and Game		
Area Biologist	Ryan Scott	907-465-4359
Tatshenshini-Alsek Managers		
Kluane Nat. Park (Parks Canada)	Tom Elliot	867-667-3915
Tat-Alsek Park (BC Parks)	Janice Joseph	250-847-7316
Tat-Alsek Park (Yukon Parks)	Afan Jones	867-667-3048
Champaign-Aishihik 1st Nations	Michael Jim	867-634-4248
Other Important Numbers		
Visitor Information Station	VIS	907-697-2627

APPENDIX H. BEAR MANAGEMENT LOG

GLACIER BAY BEAR MANAGEMENT LOG - 2007					
1) Person(s) involved	**Date**	**Begin Time**	**Total Time**	**Location**	**Description of Bear(s)**
Describe Encounter and/or hazing methods used - successful? what worked, what didn't? **Circle one:** Bear report Monitoring Hazing/AC					
Staff taking report:					
2) Person(s) involved	**Date**	**Begin Time**	**Total Time**	**Location**	**Description of Bear(s)**
Describe Encounter and/or hazing methods used - successful? what worked, what didn't? **Circle one:** Bear report Monitoring Hazing/AC					
Staff taking report:					
3) Person(s) involved	**Date**	**Begin Time**	**Total Time**	**Location**	**Description of Bear(s)**
Describe Encounter and/or hazing methods used - successful? what worked, what didn't? **Circle one:** Bear report Monitoring Hazing/AC					
Staff taking report:					
4) Person(s) involved	**Date**	**Begin Time**	**Total Time**	**Location**	**Description of Bear(s)**
Describe Encounter and/or hazing methods used - successful? what worked, what didn't? **Circle one:** Bear report Monitoring Hazing/AC					
Staff taking report:					

APPENDIX I. BEAR INFORMATION FORM (BIM)

20. Where did you learn how to behave in bear country?

A. Interpretive program.	E. Warning signs
B. Backcountry orientation	F. Previous knowledge
C. Park Ranger	G. Other publications/media
D. Park publication	H. No information received

21. Description of bear-human interactions:

22. Exact Location of Encounter (mark on map if possible):

GPS coordinates: Lat: **Long:**

Datum (WGS 84 or Other):

23. Report taken by:_____(NPS Staff)

Management Use Only

1. Bear database Incident #: _____

2. Case Incident Number (if applicable): _____

3. Detailed Location Description (if necessary):

_____

_____

4. Observation Type (circle one)

A. Incident B. Sighting C. Bear sign

5. Management Action taken:

_____

_____

Bear Information Management

Glacier Bay National Park & Preserve

Glacier Bay Nat'l Park & Pres.

1.People Involved: Names/Address **Phone**

2.Group Type (circle one)

A. Park visitor
B. Concession employee
C. Contractor
D. Researcher
E. NPS Employee
F. Other:_____

4. Group Size_____
(#people encountering the bear)

3. Visitor Activity (circle one)

A. Day kayak
B. Overnight kayak
C. Walking on road
D. Hiking
E. Camping
F. Boating/Rafting
G. Other

5. Date/Time of Encounter:

_____

Duration: _____

6. Location (circle one)

A. Backcountry

1. Pt. Gustavus
2. Bartlett River
3. Beardslee Islands
4. Beartrack Cove
5. Sandy Cove (North/South)
6. Muir Point
7. Adams Inlet
8. Muir Inlet
9. Wachusett Inlet
10. Charpentier Inlet
11. Hugh Miller Inlet
12. Fingers Bay
13. Dundas Bay
14. Outer Coast
15. Tlingit Pt. (Sebree)
16. Tidal Inlet
17. Queen Inlet
18. Rendu Inlet
19. Russell Island
20. Tarr Inlet
21. John Hopkins Inlet
22. Reid Inlet
23. Scidmore Bay/Cut
24. Blue Mouse Cove
25. Geikie Inlet.
26. Berg Bay
27. Taylor Bay
28. Alsek River

B. Developed Area

1. Bartlett Cove -Headquarters
2. Bartlett Cove - Lodge
3. Bartlett Cove - Residential area
4. Bartlett Cove - Recycling Center
5. Bartlett Cove - Campground
6. Forest Loop Trail
7. Bartlett River Trail
8. Bartlett Lake Trail
9. Gustavus
10. Dry Bay

7. Description of Bear		Second Bear	Third Bear
A. Species	1. Brown 2. Black 3. Unknown	1. Brown 2. Black 3. Unknown	1. Black 2. Black 3. Unknown
B. Color	1. Blonde 2. Lt. Brown 3. Dark Brown 4. Cinnamon 5. Black 6. Unknown	1. Blonde 2. Lt. Brown 3. Dark Brown 4. Cinnamon 5. Black 6. Unknown	1. Blonde 2. Lt. Brown 3. Dark Brown 4. Cinnamon 5. Black 6. Unknown
C. Size	1 Small 2. Medium 3. Large 4. Unknown	1. Small 2. Medium 3. Large 4. Unknown	1. Small 2. Medium 3. Large 4. Unknown
D. Age	1. Cub of the year 2. Yearling 3. Sub-adult 4. Adult 5. Unknown	1. Cub of the year 2. Yearling 3. Sub-adult 4. Adult 5. Unknown	1. Cub of the year 2. Yearling 3. Sub-adult 4. Adult 5. Unknown
E. Sex	1. Male 2. Female 3. Unknown	1. Male 2. Female 3. Unknown	1. Male 2. Female 3. Unknown
F. Description Markings, Radio collar, Tags or scars			

10. Vegetation Type

A. Meadow	D. Forest	G. Unvegetated
B. Low Brush	E. Glacier	H. Intertidal Zone
C. High Brush	F. In water	I. Other

11. What was the bear doing when first observed?

A. Feeding on vegetation	H. Mating
B. Feeding on carcass	I. Playing with_____
C. Hunting	J. Traveling
D. Digging	K. Walking toward people
E. Standing	L. Running toward people
F. Resting	M. Investigating property
G. Running away from people	N. Other_____

12. What were you doing prior to seeing bear?

A. Sleeping	F. Sitting
B. Eating/cooking	G. Photographing
C. Hiking	H. Breaking/setting up camp
D. Running	I. Paddling
E. Boating	J. Other_____

13. What was the bear's initial reaction?

A. Not aware of people	G. Watched people
B. Stood up	H. Walked towards people
C. Growled/woofed/gnashed teeth	I. Circled around people
D. Walked away	J. Bluff charged
E. Ran away	K. Made contact with person
F. Remained in area ignored people	L. Investigated property
	M. Other_____

14. What did you do then?

A. Walked/backed away	F. Made noise
B. Ran away	G. Threw something at bear
C. Followed the bear	H. Photographed the bear
D. Continued hiking-same direction	I. Abandoned property
E. Remained still/quiet	J. Used pepper spray
	K. Other_____

15. How did the bear react?

A. Not aware of people	G. Watched people
B. Stood up	H. Walked towards people
C. Growled/woofed/gnashed teeth	I. Circled around people
D. Walked away	J. Bluff charged
E. Ran away	K. Made contact with person
F. Remained in area ignored people	L. Investigated property
	M. Other_____

16. How close were you to the bear? _____

17. Was food present?

A. Presence unknown	E. Food hung in tree
B. No food present	F. Food outside of bear canister
C. Food odor only	G. Preparing/consuming meal
D. Food in bear resistant canister	H. Other_____

18. Was food eaten by the bear? A. No___ B. Yes___ C. Unknown____
If so, what?
_____

19. Was property damaged? A. No___ B. Yes___ If so, list property & estimate cost: _____

APPENDIX J: ALSEK RIVER BEAR REPORT FORM

Guide to Bear Reporting for River Travelers

Attached are bear report forms. We ask that you record all bear sightings on your trip (Bear Report Form 1) and provide additional information if a bear enters camp, approaches you, damages gear, obtains food, and/or acts in an aggressive or threatening manner (Bear Report Form 2). Refer to the back of this page for help in filling out the forms. ***Please mark the location of any bear sightings made by your group and also mark the locations of your campsites with a "C" on the provided map. GPS locations are especially helpful, please be sure to record the datum in which the points were collected.***

At the end of your trip please return your bear report forms along with your trip survey form to the Dry Bay Ranger, Glacier Bay National Park, or Kluane National Park, ***whether you saw a bear or not***. If you encounter dirty campsites left by previous users or observe unsafe or inappropriate behavior by other groups please report this information as well. **If you have a serious conflict with a bear such as a bear causing injury to a person, obtaining food, or causing major property damage, call the appropriate phone number listed below on a satellite phone if possible or immediately after returning.** The continued safety of future visitors and bears along the Tatshenshini Alsek River corridor is the responsibility of all users.

CONTACTS:

In Kluane National Park:

To report bear-human conflicts, call:
1-867-634-7279. 8am to 5pm, leave message.

24hrs Emergency:
1 -877-852-3100 (toll free)

Mail bear reports to:
Kluane National Park
P.O. Box 5495
Haines Junction, Yukon
Y0B 1L0

In Glacier Bay National Park and Tatshenshini-Alsek Park:

To report bear-human conflicts, call:
1-907-697-2627. 7am to 9pm, leave message.

24hrs Emergency:
1 -907-697- 2651

Mail bear reports to:
Glacier Bay National Park
Attn: Tania Lewis
P.O. Box 140
Gustavus, AK. 99826

GUIDE FOR RAFTER'S BEAR SIGHTING FORM

Group Name	- Please indicate your group name and/or trip leader's name along with your start date.
Sighting Number	-Use the Sighting Number to identify the bear location on the map provided on the back of the sighting form.
Date	-Enter the date using Day/Month/Year format.
Time	-Enter the time using 24-hr clock format.
Species	-If you are certain of the species circle the appropriate option, otherwise circle unknown. Note: grizzly includes both interior grizzly and coastal brown bears
Total Number	-Enter the total number of bears seen together.
Bear Unit Type	-If you can determine that the bear(s) were adult or subadults or family groups circle the appropriate option. If you are uncertain circle unknown, if the available options do not describe the bears that you saw also circle unknown and describe in Comments.
Distance to Bear	-Estimate the minimum distance between you and the bear(s) in meter.
Bear Aware of Group	-Was the bear(s), at any point aware of you? Circle Yes or No
Bear Reaction to Group	-If the bear(s) was aware of you circle the appropriate option describing its reaction. If the bear(s) reaction does not fit any option circle other and describe in Comments.
Activity of Group	-Circle the option describing your activity at time of sighting the bear(s). If you were involved in an activity other than the available options circle other and describe in Comments.
Number in Group	-Enter the number of people in your group observing the bear(s).
Comments	-If you choose the option "other" describe here. Please describe location and if bear was observed from camp, please indicate which campsite. Also any further comments that you feel are important can be entered here.

Your cooperation in reporting bear observations and interactions on the river will enhance the safety of future rafters as well as protection of bears. Bear sighting data helps us determine bear movements, habitat use, and species distribution, as well as gain valuable insight on population dynamics. First hand accounts of how bears respond to people are important in understanding and detecting changes in bear behavior and identifying potential problem areas. We value any comments and insights you may have based on your experience on the Tatshenshini and Alsek River. Thank you for your participation!!!

If you would like this bear report mailed to you after the data is copied, please provide a return address here: _____

_____

_____

_____

Tatshenshini – Alsek River Bear Report Form 1 **Group Name: _____ Take-out Date: _____**

Please fill out one line for every bear sighting and mark locations on corresponding maps.

******If bear entered camp, approached people, damaged gear, obtained food, and/or was aggressive, also fill out Bear Report Form 2.******

Sight No.	Date (D/M/Y)	Time in 24 hr Clock	Species	Total No. Seen	Bear Unit Type	Dist to Bear(m)	Bear Aware Group?	Bear Reaction to Group	Activity of Group	No of Observers	Location Description/ Campsite Name/ GPS position/ Other comments. Please note if bear was on opposite side of the river.
1			GR/BL/UN		1 2 3 4 5		Y/N/?	1 2 3 4 5 6	1 2 3 4 5		
2			GR/BL/UN		1 2 3 4 5		Y/N/?	1 2 3 4 5 6	1 2 3 4 5		
3			GR/BL/UN		1 2 3 4 5		Y/N/?	1 2 3 4 5 6	1 2 3 4 5		
4			GR/BL/UN		1 2 3 4 5		Y/N/?	1 2 3 4 5 6	1 2 3 4 5		
5			GR/BL/UN		1 2 3 4 5		Y/N/?	1 2 3 4 5 6	1 2 3 4 5		
6			GR/BL/UN		1 2 3 4 5		Y/N/?	1 2 3 4 5 6	1 2 3 4 5		
7			GR/BL/UN		1 2 3 4 5		Y/N/?	1 2 3 4 5 6	1 2 3 4 5		
8			GR/BL/UN		1 2 3 4 5		Y/N/?	1 2 3 4 5 6	1 2 3 4 5		
9			GR/BL/UN		1 2 3 4 5		Y/N/?	1 2 3 4 5 6	1 2 3 4 5		
10			GR/BL/UN		1 2 3 4 5		Y/N/?	1 2 3 4 5 6	1 2 3 4 5		

Codes:

Species
GR= Grizzly
BL=Black
UN=Unknown

Bear Unit Type
1=Subadult(s)
2=Adult(s)
3=Female/cubs of year
4=Female/older cubs
5=Other or Unknown

Bear Reaction to Group
1=No Reaction
2=Walked Towards
3=Ran Towards
4=Walked Away
5=Ran Away
6= Other or Unknown

Activity of Group
1=In Raft on River
2=In Camp
3= Rest Break
4= Hiking
5= Other or Unknown

Tatshenshini – Alsek River
Bear Report Form 2

1. Primary person involved in bear interaction (Park staff may contact for additional information):

Name: **Phone#:**

2. Number of people who encountered the bear:

3. Sighting number on Bear Report Form 1:

4. What was the bear doing when first observed?

A. Feeding on vegetation	H. Mating
B. Feeding on carcass	I. Playing with_____
C. Hunting	J. Traveling
D. Digging	K. Walking toward people
E. Standing	L. Running toward people
F. Resting	M. Investigating property
G. Running away from people	N. Other/Unknown_____

5. What were you doing prior to seeing bear?

A. Sleeping	F. Sitting
B. Eating/cooking	G. Photographing
C. Hiking	H. Breaking/setting up camp
D. Running	I. Paddling
E. Boating	J. Other/Unknown_____

6. What was the bear's initial reaction?

A. Not aware of people	G. Watched people
B. Stood up	H. Walked towards people
C. Growled/woofed/gnashed teeth	I. Circled around people
D. Walked away	J. Bluff charged
E. Ran away	K. Made contact with person
F. Remained in area ignored people	L. Investigated property
	M. Other/Unknown_____

7. What did you do then?

A. Walked/backed away	F. Made noise
B. Ran away	G. Threw something at bear
C. Followed the bear	H. Photographed the bear
D. Continued hiking-same direction	I. Abandoned property
E. Remained still/quiet	J. Used pepper spray
	K. Other/Unknown_____

8. How did the bear react?

A. Not aware of people	G. Watched people
B. Stood up	H. Walked towards people
C. Growled/woofed/gnashed teeth	I. Circled around people
D. Walked away	J. Charged
E. Ran away	K. Made contact with person
F. Remained in area ignored people	L. Investigated property
	M. Other/Unknown_____

9. How close were you to the bear? _____

10. Was food present?

A. Presence unknown	E. Food hung in tree
B. No food present	F. Food outside of bear canister/fence
C. Food odor only	G. Preparing/consuming meal
D. Food in bear resistant canister/fence	H. Other_____

11. Was food eaten by the bear? A. No___ B. Yes___ C. Unknown____

If so, what? _____

_____

12. Was property damaged? A. No___ B. Yes___

If so, list property & estimate cost: _____

_____

13. Description of interaction:

14. Description of bear(s) including color, markings, scars, tags, etc.:

15. Date and Time:

16. Exact Location (mark on map):

Lat/Long: **Datum:** WGS84, NAD27, NAD83, or Other

Management Use Only

1. Park (circle one): **Kluane** **Tat-Alsek** **Glacier Bay**

2. Bear database Incident #: _____

3. Case Incident Number (if applicable): _____

4. Management Action taken:

APPENDIX K. SAMPLE BEAR ADVISORIES

Glacier Bay

National Park Service
U.S. Department of the Interior

Glacier Bay National Park and Preserve

Bears in the Area

Please be on the lookout for black bears as you explore the beaches and trails in and around Bartlett Cove. They often feed and travel through this area.

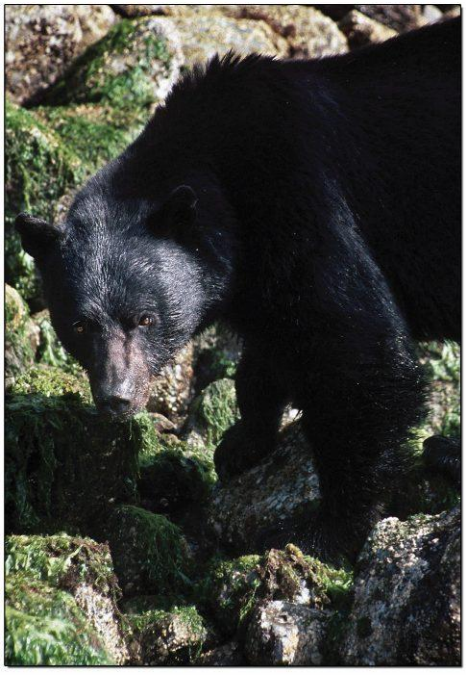
The Park's Bear Management Team is actively discouraging these animals from frequenting areas of high human concentrations.

Help protect yourself and the bears by following these simple guidelines

Never allow bears to obtain human food or trash . Always keep your food and personal items within your reach.

Be alert and aware of your surroundings. Avoid surprise encounters by making noise as you hike.

Respect bears' space. Never pursue or approach a bear, even for a great photograph. We ask that you keep a distance of 50 yards from these bears at all times.



National Park Service
U.S. Department of the Interior

Glacier Bay National Park
and Preserve

P.O. Box 140
Gustavus, AK 99826

907 697-2230 phone
907 697-2654 fax

Glacier Bay News Release

Release Date: **June 11, 2007**
Contact(s): **Gus Martinez, Chief Ranger (Acting)**
Phone number: **(907) 697-2230**
Date: **June 11, 2007**

SIGNIFICANT BEAR ACTIVITY AT STRAWBERRY ISLAND ADVISORY

This notice is to advise kayakers of an incident involving a black bear that occurred at Strawberry Island in the Beardslee Island complex in Glacier Bay National Park & Preserve, on June 08, 2007. A single kayaker was camped on Strawberry Island. During the morning the kayaker saw an adult black bear approaching his camp. The bear was walking along the beach, the camper made noise to announce their presence. At this point the bear became focused on the kayaker, and moved directly towards the kayaker. The kayaker walked around a large log, putting it between the kayaker and the bear. At this point the bear ran around the log, and forced the kayaker to the waters edge. The bear displayed signs of dominance and aggression (stomping feet, deep huffing, and posturing, urinating on campsite) before turning away. The bear then went down the beach approximately 40 yards away. The kayaker was then able to gather up their gear and get off the island without further incident. The bear did not display any other signs of aggression while this happening. The kayaker left without any further incident and no property damage was reported.

The National Park Service is recommending that campers avoid using Strawberry Island for overnight camping. The area will be monitored by NPS staff for bear activity to determine if a closure is warranted. This advisory will expire on July 11, 2007.

APPENDIX L. NPS ALASKA REGION BEAR/HUMAN ATTACK PROTOCOLS

Checklist

Purpose: This protocol serves as a guideline for Alaska park areas to use as a guideline when initially managing a serious bear or other wildlife-related incident involving death or injury to humans. It is understood that each incident will require specific actions that may differ according to location, time of year, and a variety of other circumstances. Variations to this protocol may be necessary to address these differences.

1) Establish need for Protocol:

A) Protocol to be used for the following wildlife-related incidents:

- ☐ Fatality
- ☐ Major Injury
- ☐ Minor injury

B) Protocol optional for the following wildlife-related incidents:

- ☐ Charge not ending in physical contact
- ☐ Animal displaying aggressive and/or threatening behavior
- ☐ Serious property damage
- ☐ Wildlife fatality caused by human

2) Stabilize and secure the scene to prevent public access/preserve evidence

- ☐ Establish Incident Command System
- ☐ Ensure safety of all responders
  -Briefing, weapons, backup, training, accountability
- ☐ Establish safety/investigation scene boundary
- ☐ Define area by geography and time-Avoid letting the area grow larger
- ☐ Notify additional divisions/agencies
  - 0 Protection Rangers
  - 0 Resources Management/Bear Management
  - 0 Superintendent
  - 0 Regional Office (Reg. Chief Ranger, Public Information Officer)
  - 0 Alaska State Troopers
  - 0 Alaska Department of Fish and Game
  - 0 Alaska Office of the State Medical Examiner
- ☐ Trail and road closures
- ☐ Aircraft landing restrictions
- ☐ Vessel access restrictions

3) Ensure safe evacuation of Victims and public from the area

- ☐ Check camping permit databases

- ☐ Check Air Taxi manifests
- ☐ Aviation sweep
- ☐ Boat patrols
- ☐ Evacuate visitors and non-essential staff from area, debrief
- ☐ Ensure no other unauthorized persons enter the area (signs, media, barriers)

4) Investigation

- ☐ Utilize NPS Alaska Region Bear/Human Attack Report *(attached)*
- ☐ Consider possibility of other incidents
- ☐ Evidence collection
- ☐ Interviews
- ☐ Photos
- ☐ Video
- ☐ GPS
- ☐ Sketch layout

5) Disposition of Animal

- ☐ Description of animal
- ☐ Location
- ☐ Consult park Bear Management Plan and Regional Wildlife Biologist
- ☐ Destruction - Avoid shooting offending animal in head or abdomen to preserve samples for lab analysis.
- ☐ Transport
- ☐ Evidentiary considerations

NPS ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 1
ATTACK SUMMARY
(completed by On-Site Incident Commander)

1. Case Incident Record #: _____
2. Regional Bear-Human Information Management Reporting System ID #: _____
3. Incident Command (PERSON IN CHARGE): _____
   Phone: _____ Park: _____
   _____
4. Assisting Ranger _____
   Phone: _____ Park: _____
   _____
5. Assisting Resource personnel: _____
   Phone: _____ Park: _____
   _____
6. Media contact person: _____ Phone: _____
7. Park contact person: _____
   Phone: _____ Division: _____
   Address: _____
8. Other agency contacts:
   Name: _____ Agency/Title: _____
   Address: _____ Phone: _____
   Name: _____ Agency/Title: _____
   Address: _____ Phone: _____

9. Location of attack (detailed description): _____
   _____
   GPS coordinate; datum: _____
10. Attack date: _____ Attack time: (24 hr): _____
11. Person reporting attack: _____ Phone number: _____
    Date reported: _____ Time: _____ How reported? _____
    _____
12. Field investigation date(s): _____ Times: _____ to _____
    _____ Times: _____ to _____
13. Species: Grizzly bear Black bear Polar bear Unknown Other: _____
14. Management action: No action Relocated Destroyed Date: _____
    Other: _____ Provide details: _____
    _____
    _____
    _____
    _____

NPS ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 1
ATTACK SUMMARY
(completed by On-Site Incident Commander)

15. Attack summary: **(BE OBJECTIVE; INCLUDE DATES AND PERTINENT HISTORY)**

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

16. DEBRIEFING:
The incident command, resource biologist, rangers, other staff, and the regional public affairs co-ordinator met on:

Date: _____ Place: _____

Attendees:

Title: _____ Name: _____
Title: _____ Name: _____
Title: _____ Name: _____
Title: _____ Name: _____
Title: _____ Name: _____
Title: _____ Name: _____
Title: _____ Name: _____
Title: _____ Name: _____
Title: _____ Name: _____
Title: _____ Name: _____
Title: _____ Name: _____

Summary:

NPS ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 2
SITE INSPECTION FORM

(completed by On-Site Incident Commander)

Incident Command: _____

Phone: _____ Park: _____

Address: _____

TREAT AREA LIKE A CRIME SCENE. AFTER ENSURING THE SAFETY OF VICTIM AND RESPONDERS, THE FOLLOWING SEQUENTIAL STEPS MUST BE TAKEN:

1. Secure attack site with investigation scene tape (use caution normally exercised at crime scene).
2. Ensure that only authorized personnel are present.
3. Describe tracks present:
   (a) bear: _____ length (mm): _____ width (mm): _____
   bear: _____ length (mm): _____ width (mm): _____
   bear: _____ length (mm): _____ width (mm): _____
   (b) human: _____ length (mm): _____ width (mm): _____
   human: _____ length (mm): _____ width (mm): _____
   human: _____ length (mm): _____ width (mm): _____
   Use the track diagram on the next page to indicate measurements of tracks found at the attack site. Identify the species and portion of track that was measured (e.g., pad only, pad and toe, pad and toe and claws).
4. Describe presence and location of animal hair/tissue/blood/feces: _____
   _____
5. Collect and label animal hair/tissue/blood/feces, in designated container according to protocols.

Label ID #	Tissue Type	Location	**Label ID #**	Tissue Type	Location

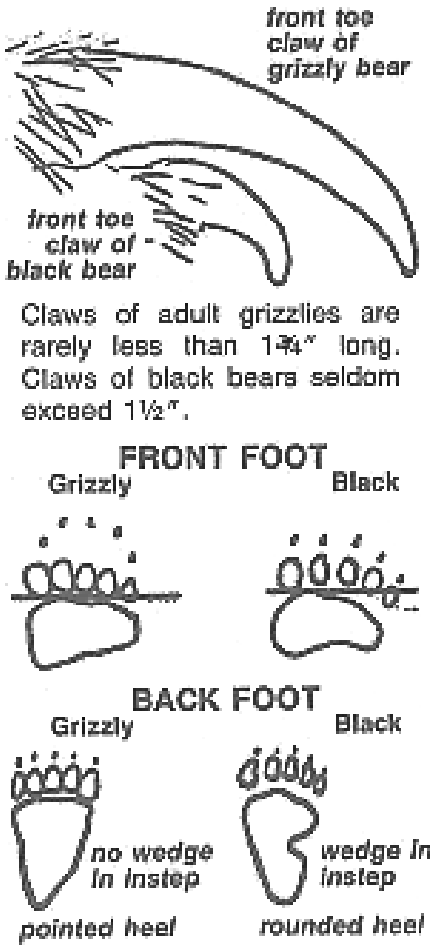
6. Describe and list attack victim's equipment, clothing, etc.: _____
   _____
7. Describe and attach analogue photographs of attack scene (duplicate or archive digitals):
   - no. of photographs: _____
   - scene location: _____
   - animal tracks: _____
   - human tracks: _____
   - articles (tent, BRFC, etc.): _____
   - tissue/blood/feces: _____
   - debris: _____
   - food sources (natural and human):_____
   - summary: _____
8. Draw sketch of attack scene and tracks (attached page).

FORM 2
SITE INSPECTION FORM

(completed by On-Site Incident Commander)

Black Bear Tracks – The prints of the black bear are distinguished by toes that are splayed in a more rounded arc. Draw a line, or use a straight edge, across the bottom of all the toes. If the upper half or more of the little toe line up below the line it's likely a black bear. If the toes line up above the straight line, then it's likely a brown bear (see diagram below).
Grizzly Bear Tracks - The prints of the grizzly bear are distinguished by an oval pad with closely spaced toes in a relatively straight toe arc. Claw marks over twice as long as the toe pads are usually evident. In general, but not always, grizzly bear tracks are larger than black bear.

Indicate on the diagram the exact measurement of track found at the site by showing which portion of the track was measured (i.e., pad only, pad and toe, pad and toe and claws).



FORM 2
SITE INSPECTION FORM

(completed by On-Site Incident Commander)

Sketch of Attack Scene

Include path of animal(s), location/movement of people, key features, north arrow, and distances. Also note vegetation type and locations of bear sign (beds, trails, digs, mark trees, etc) and food sources (natural and human).

NPS ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 3
VICTIM EVIDENCE

(completed by On-Site Incident Commander)

Incident Command: _____
Phone: _____ Park: _____
Address: _____

1. No. of humans involved: _____ No. of humans injured: _____
   No. of humans killed: _____
2. (a) Victim's name: _____
   Address: _____
   Phone: _____ Age: _____
   (b) Victim's name: _____
   Address: _____
   Phone: _____ Age: _____
   (c) Victim's name: _____
   Address: _____
   Phone: _____ Age: _____

3. (a) Witness' name: _____
   Address: _____
   Phone: _____ Age: _____
   (b) Witness' name: _____
   Address: _____
   Phone: _____ Age: _____
   (c) Witness' name: _____
   Address: _____
   Phone: _____ Age: _____

4. Summarize victim 2(a)'s activity before the attack (attach statement): _____
   _____
   _____
   Summarize victim 2(b)'s activity before the attack (attach statement): _____
   _____
   _____
   Summarize victim 2(c)'s activity before the attack (attach statement): _____
   _____
   _____

NPS ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 3
VICTIM EVIDENCE

(completed by On-Site Incident Commander)

5. Summarize victim 2(a)'s account of attack (attach statement): _____

_____

_____

Summarize victim 2(b)'s account of attack (attach statement): _____

_____

_____

Summarize victim 2(c)'s account of attack (attach statement): _____

_____

_____

6. Summarize witness 3(a)'s account of attack (attach statement): _____

_____

_____

Summarize witness 3(b)'s account of attack (attach statement): _____

_____

_____

Summarize witness 3(c)'s account of attack (attach statement): _____

_____

_____

7. Collect the following injury information from the attending physician(s):
Injuries indicative of claw? Yes _____ No _____ Teeth?: Yes _____ No _____
Wound measurement and locations - victim (a): _____
Wound measurement and locations - victim (b): _____
Wound measurement and locations - victim (c): _____
Number of wound pictures attached - victim (a): _____
Number of wound pictures attached - victim (b): _____
Number of wound pictures attached - victim (c): _____
Physician's name(s): _____
Address(es): _____
Phone number(s): _____
Collect and preserve victim tissue sample. Label Identification Nos.: _____

_____

Collect samples from under victim's fingernails. Label Identification Nos.: _____

_____

Collect saliva sample from victim's bite marks. Label Identification Nos.: _____

_____

8. Comments: _____

_____

_____

NPS ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 3
VICTIM EVIDENCE

(completed by On-Site Incident Commander)

9. Name of lab analyzing tissue, fingernail, saliva, etc. samples: _____
   Samples/Purpose of analysis: _____
   Lab analyst's name: _____
   Address: _____
   Phone: _____

   Samples/Purpose of analysis: _____
   Lab analyst's name: _____
   Address: _____
   Phone: _____

   Samples/Purpose of analysis: _____
   Lab analyst's name: _____
   Address: _____
   Phone: _____

10. (a) Next of kin of Victim 2 (a): _____
    Address: _____
    Phone: _____ Relationship: _____
    Date and time contacted: _____ Contacted by: _____
    (b) Next of kin of Victim 2 (b): _____
    Address: _____
    Phone: _____ Relationship: _____
    Date and time contacted: _____ Contacted by: _____
    (c) Next of kin of Victim 2 (c): _____
    Address: _____
    Phone: _____ Relationship: _____
    Date and time contacted: _____ Contacted by: _____

11. When possible, attach a copy of any additional/further report (such as CIR, Coroner's report) or treatment information/documentation (such as the report of the attending physician or emergency medical treatment). Identify the attached documentation here:
    _____
    _____
    _____
    _____
    _____

ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 4
ANIMAL EVIDENCE

(completed by On-Site Incident Commander)

If it is determined that the bear should be destroyed, avoid shooting animal in head or abdomen to preserve samples for lab analysis. To preserve evidence, immediately place plastic bags on head and paws, before moving animal from kill site.

Incident Command: _____
Phone: _____ District: _____ Region: _____
Address: _____

1. Bear/animal species:_____ Sex:_____ Offspring present?_____
   If offspring, describe: _____
   Estimated age of offending animal: _____ How determined? _____
   Physical description of animal: _____
   _____

2. Animal behavior before, during, and after attack:_____
   _____
_____

3. Was animal behavior consistent with:
   - predatory attack: Yes_____ No_____
   - defensive reaction: Yes_____ No_____
   - non-defensive reaction: Yes_____ No_____
   Describe why you believe this:_____
_____
_____

4. Did offending animal have complaint history? Yes_____ No_____
   Bear Management Report System ID / CIR / BMRF reference #:_____
   Comments: _____
   _____

5. Describe other animals directly involved:_____
_____

6. Animal photo numbers:
Live animal: _____
Body:_____
Head:_____
Paws:_____
Teeth:_____

ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 4
ANIMAL EVIDENCE

(completed by On-Site Incident Commander)

7. Was offending animal destroyed? Yes _____No _____If yes, date and time_____
Location of dead animal:_____
_____
GPS coordinate; datum: _____

8. Animal description (metric measurements):
Body length (cm) from tip of nose to base of tail:_____ Chest girth (cm):_____
Weight (kg):_____
Any tags, tattoos, special marking, etc? _____

9. Teeth (refer to attached diagram) - **cover head with plastic bag**
- Ensure lab collects material attached to teeth.
- Ensure lab collects victim's DNA sample from gum line, along teeth.
- Upper inter canine distance: tip-to-tip _____mm.; maximum _____ mm
- Lower inter canine distance: tip-to-tip _____mm.; maximum _____ mm
- Upper inter-3rd incisor distance: tip-to-tip _____mm.; maximum _____ mm
- Lower inter-3rd incisor distance: tip-to-tip _____mm.; maximum _____ mm
- Teeth condition: sharp:_____worn:_____broken:_____missing:_____

10. Paws - **cover paws with plastic bags**
- Collect material attached to paws. Identification tag no.:_____
- Claw condition: sharp:_____worn:_____broken:_____missing:_____

11. Paw description - **cover paws with plastic bags**
- left front paw, width measurement: _____mm
- right front paw, width measurement: _____mm
- left back paw, width measurement: _____mm
- right back paw, width measurement: _____mm
- describe abnormalities: _____

12. Hair samples. Identification tag no.: _____

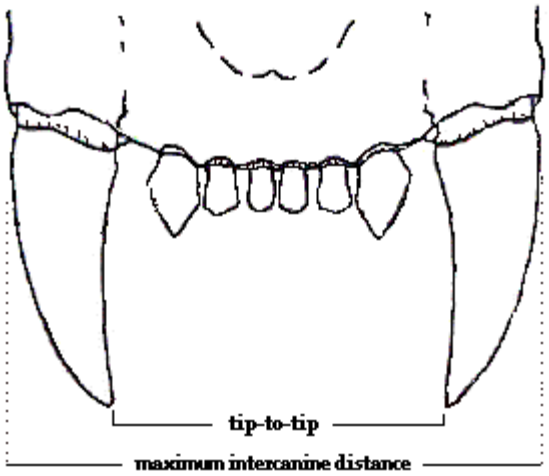
13 Carcass. **Place plastic bags over head and paws and place carcass in plastic bag at kill site and in storage.**

ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 4
ANIMAL EVIDENCE

(completed by On-Site Incident Commander)

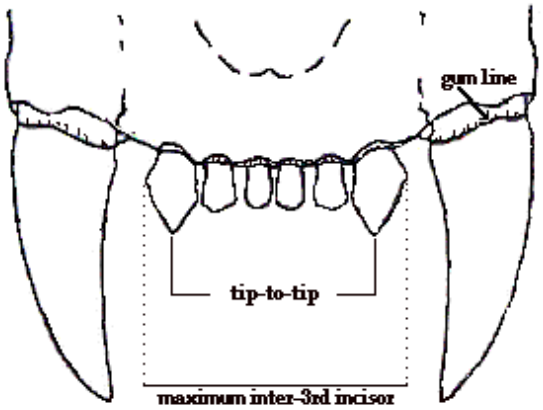
There are two measurements involved with the intercanine distance. This includes the tip-to-tip distance (distance from the tip of the upper right canine to the tip of the upper left canine). The second measurement is the maximum distance (measured from the point of greatest convexity on the lateral or outward surface of the right upper canine to the corresponding point on the outward surface of the upper left canine). The same measurements are made for the lower canine teeth.



Note: In the case of worn canines, measure from the center of the tip.

INTER-3RD INCISOR DISTANCE MEASUREMENT:

Two measurements are made for the inter-incisor distance: tip-to-tip distance (measured from the tip of the upper right 3rd incisor to the tip of the upper left 3rd incisor) and the maximum inter-incisor distance (measured from the lateral or most outward edge of the upper right 3rd incisor to the lateral edge of the upper left 3rd incisor). The same measurements are made for the lower 3rd incisors.



NPS ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 5A
TRANSPORT - ANIMAL NECROPSY

(Form 5A is to be completed by Incident Command and is attached to a blank Form 5B. Forms 5A and 5B accompany the animal/body parts to the lab.)

NOTE: DIFFERENT LABS MAY BE USED FOR DIFFERENT ANALYSES. CONTACT NPS ALASKA REGIONAL WILDLIFE BIOLOGIST FOR LIST OF CURRENT LABS TO BE USED.

Incident Command: _____
Phone: _____ Park: _____
Address: _____

Alaska Police contact name: _____
Phone: _____ Address: _____
Unit: _____

TRANSPORT ANIMAL WITH THE HEAD, PAWS, AND BODY IN PLASTIC BAGS.
Species: _____
Date of capture: _____
Physical condition: _____
Wounds: _____
Injuries: _____

List samples and identification label numbers of body parts sent to lab:

Description	ID Label No.
1.	
2.	
3.	
4.	
5.	
6.	

Analysis instruction to lab as to parts and specimens to preserve and analysis to be conducted (e.g., identify stomach contents, collect tissue samples from teeth and claws). NOTE: ADDITIONAL TESTS MAY BE REQUIRED BY OTHER LABS. _____
_____

NPS ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 5B
LABORATORY REPORT
ANIMAL NECROPSY

(Form 5A is to be completed by Incident Command and is attached to a blank Form 5B. Forms 5A and 5B accompany the animal/body parts to the lab.)

Laboratory name:_____

Address:_____

Phone number:_____

Date animal received:_____

Reference number:_____

Necropsy date:_____

EXTERNAL EXAM
Physical condition:_____
_____

Wounds:_____
_____

Plastic bags covering feet? Yes _____ No_____
Plastic bags covering head? Yes _____ No_____
Plastic bags covering carcass? Yes _____ No_____
Collected material attached? Yes _____ No_____

Claw condition: sharp:_____worn:_____broken:_____missing:_____
Collected material attached? Yes _____ No_____

Hair:
Collected material attached? Yes _____ No_____

Carcass weight (kg):_____ Sex:_____
Nose to base of tail length (cm):_____
Photograph (on reverse side, note file # and date): Yes _____ No_____

FORM 5B
LABORATORY REPORT
ANIMAL NECROPSY

(Form 5A is to be completed by Incident Command and is attached to a blank Form 5B. Forms 5A and 5B accompany the animal/body parts to the lab.)

INTERNAL EXAM
Date:_____
Brain submitted for rabies analysis? Yes ____ No_____Expected results date_____

Circle "N" for normal or "A" for abnormal, then explain in "Findings".

Skin	N	A
Musculoskeletal system, skeletal muscles, bones	N	A
Oral cavity	N	A
Respiratory system - air passages, lungs	N	A
Circulatory system - heart, major vessels	N	A
Digestive tract - esophagus, stomach, intestines	N	A
Liver	N	A
Urogenital system - kidneys, bladder, gonads	N	A
Spleen	N	A
Lymph nodes	N	A
Adrenal gland and other glands	N	A
Nervous system	N	A
Other	N	A

Visible abnormalities:_____
_____
_____
_____
_____

If female, was she lactating? Yes _____ No_____
Pregnant? Yes_____ No_____
Additional Analysis:_____
_____
_____
_____

Collect saliva or other tissue for DNA analysis? Yes_____ No_____
Tissue collected:_____
_____
_____

FORM 5B
LABORATORY REPORT
ANIMAL NECROPSY

(Form 5A is to be completed by Incident Command and is attached to a blank Form 5B. Forms 5A and 5B accompany the animal/body parts to the lab.)

Collect animal hair for DNA analysis? Yes_____ No_____Results (attach additional reports):

Findings:

Necropsy summary:

Veterinary Pathologist:
Name:
Signature:
Witness(es): Date:

NPS ALASKA REGION BEAR/HUMAN ATTACK REPORT

FORM 5B
LABORATORY REPORT
ANIMAL NECROPSY

(Additional Notes)

APPENDIX M. BEAR MANAGEMENT AND RESEARCH TIMELINE

Early 1900's – Brown bears reported in Muir Pt area (Streveler 1987).
1912 – Allen Hasselborg attacked by and killed a brown bear on Bartlett River. He later collected the skull of "ursus orgilos".
1916 – W.G. Cooper reported a brown bear on Russell Island (G. Streveler pers. comm. In Warburton, 1988).
1932 – Dixon reports brown bear in Berg Bay.
1939 – Bert Parker shot brown bear at his mine camp at Ptarmigan Creek. Was the first reported in the region (Been, 1940).
1939 –Glacier Bay National Monument expanded for brown bear habitat: http://www.nps.gov/glba/adhi/adhi4.htm
1965 - Dump established in Bartlett Cove.

1970's
1973-75 – Dixon Harbor large mammal surveys.
1976 – Fatality on White Thunder Ridge - September 11.
1976-77 – Lituya Bay large mammal survey.
1977- Bear-proof garbage cans installed in Barco at dock and trail to campground. Garbage in housing, lodge and campground enclosed. (Ritter, 1978).
1978 – Endicott Gap mammal survey.
1978 – Bartlett Cove Dump closed with wire mesh fence. Previous estimates of 25 black. bears partially or entirely dependent on human food sources in Barco and Gustavus (GLBA Bear Management Plan 1978).
1978 – First Bear Management Plan.

1980's
1980 – Fatality in Sandy Cove August 1, area closed August 2.
1981-86 – Sandy Cove closed and opened throughout visitor seasons. Generally closed for the first half of the summer.
1982-84 – Sandy Cove beach surveys.
1984 – Black bear killed in Barco as a result of AC attempts, after being "peppered" by Don Chase on 9/1. 2 bears in Barco most of the summer drawn by halibut carcasses from fish cleaning station – both bears soon obtained human food and trash. (Baron, 1984).
1985 – Sandy Cove photographic ID from raft June-July, Spokane Cove research by Publicover.
1986 – Tarr Inlet closed to camping.
1987 – Sandy Cove and Tarr Inlets closed to camping May 1(?) – Aug. 15th**.**
1988 - "Spirit of Adventure" tour boat began regular camper drop-offs in the West Arm, Tarr closed through July.
1988 - Research brown bears in West Arm closure area by Warburton.
1988 – Second Bear Management Plan. Bear Sighting program implemented.
1989 - Research brown bears in West Arm closure area by David Wolfe.
1989 – Research black bears in east GB by Barbara Blackie. Tarr and Sandy Inlets closed in compendium every year from this year until 2007.

1990's

1990 – Bear Resistant Ford Canisters (BRFC) made available and "strongly recommended" to backcountry users.

1991 – BRFCs become mandatory in backcountry as defined in the Compendium.

1991 - Research brown bears in Tarr Inlet closure area by Lisa Climo and Tim Duncan, found 6-7 brown bears using area including 2 family groups.

1992 – Black bear "Ursula" with 3 cubs of the year who repeatedly obtained food from people in Bartlett Cove was relocated to Geikie Inlet.

1996-97 – Research creel survey and bear-human interactions on Bartlett River by Chad Soiseth and Liz Adamson.

2000's

2000-2001 – Bear Sightings and Incidents database created and populated.

2001-2002 – Bear Campsite Risk Assessment data collection.

2003 – Bear safety message revised.

2004-2005 – Bear Activity and Habitat project data collection.

2006-2008 – Bear Management Plan Developed.

APPENDIX N: BEAR INFORMATION NEEDS

Bear Information Needs Results of an Informal Discussion at Glacier Bay National Park and Preserve, August 2001

During a field trip to Glacier Bay National Park and Preserve, the opportunity presented itself for an informal discussion among participants regarding bear information needs. On the Russell Island raft the following individuals informally discussed perceived information needs and research possibilities:

Rusty Yerxa (NPS-GLBA): writer-editor
Nat Drumheller (NPS-GLBA): bear-human conflicts research technician
Tania Lewis (NPS-GLBA): bear-human conflicts research technician
Terry D. DeBruyn (NPS-AKSO): regional wildlife biologist
Steve T. Partridge (USGS-ASC): bear biologist
Tom Smith (USGS-ASC): bear biologist

The discussion progressed in 3 segments. The first segment explored bear research needs at GLBA as perceived by the group. The second segment examined each of the aforementioned research needs and suggested scientific methodologies for addressing each need. The third, and final, segment presented management input that would be expected as a result of the research having been performed.

Following are results from the discussion.

I. ***What questions exist regarding bears at Glacier Bay?***

1. What is the bear population size for both black and grizzly bears at Glacier Bay?
2. What are bears' temporal and spatial movement patterns within Glacier Bay?
3. What are the current and predicted trends in bear populations at Glacier Bay?
4. What role does the marine environment play in the ecology of Glacier Bay bears?
5. Area closures: are current ones appropriate (temporally and spatially) and are any additional ones needed?
6. How do bears respond to the various modes of human activity occurring in the bay?
7. What comprises bear seasonal diets at Glacier Bay?
8. Can we predict bear activity and use distributions?
9. Can the effects of terrestrial and marine community succession be predicted for bears?
10. What are the limiting factors (type and priority) for bears within Glacier Bay?
11. Can we better define bear behavior so that the public can conduct themselves more safely within Glacier Bay?

II. ***What scientific methods might be employed to answer these research questions?***

1. What is the bear population size for both black and grizzly bears at Glacier Bay?

a. hair-snaring at bait sites for gathering hairs to provide follicular DNA for molecular genetic analysis for identification of unique individuals (K.Kendall et al., Glacier NP)
b. CMR (capture-mark-resight) techniques using radio-collars have been used in a number of places to estimate bear numbers (R. A. Sellers et al., Katmai NP).
c. track census approaches have been used in various locations to estimate total bear numbers (H. Black, LaSalle Mountains of eastern Utah).
d. aerial surveys (including stream surveys) have been used for establishing trend data (W. Troyer, Katmai NP).
e. photo identification of unique individuals as a variation of the traditional CMR technique (T. DeBruyn, Brooks Camp, Katmai NP).
f. fecal DNA as a variant of the traditional CMR technique for population estimation (S. Talbot and T. Smith, Katmai NP)
g. photo identification at bait sites using movement triggered cameras

2. What are bears' temporal and spatial movement patterns within Glacier Bay?
   a. deployment of GPS (or VHF) radio-collars allows determination of even hourly movements of bears within study area (Farley and Hildebrand, Kenai NWR).
   b. hair snares can be used with DNA analysis to determine the movements of individual bears.
   c. fecal DNA analysis could be used to identify range of movements of individual bears
   d. aerial surveys could provide insight as to where bears are seasonally across the park

3. What are the current and predicted trends in bear populations at Glacier Bay?
   a. and understanding of bear habitat needs (diet study) and seasonal movements (radio-collars) could be linked to successional models in order to predict trends in bear movements, habitat use and even population.
   b. could use the established database of Glacier Bay bear sightings to see if patterns have shifted over the past 70 years.

4. What role does the marine environment play in the ecology of Glacier Bay bears?
   a. scat analysis (diet determination)
   b. analysis of stable isotopes in bear tissue (e.g., hair and blood)
   c. radio-telemetry to determined seasonal movement patterns and habitat usage

5. Area closures: are current ones appropriate (temporally and spatially) and are any additional ones needed?
   a. conduct habitat assessments to determine the temporal-spatial importance of Glacier Bay habitat for bears
   b. deploy test camps to observe bear response to them
   c. document bear activity before instituting a closure and afterwards, assuming that changes would be directly attributable to changes in human activity levels

6. How do bears respond to the various modes of human activity occurring in the bay?
   a. direct observation of areas where bear-human conflicts would be most likely to occur (e.g., Reid Inlet, etc.)

b. experimental perturbation of bears for each mode of activity (e.g., directly approach in kayaks and record response data, etc.)
c. establish observers on-board the various vessels (e.g., cruise-liners, SOA) to collect data regarding bear responses to them

7. What comprises bear seasonal diets at Glacier Bay?
   a. collect scats and analyze them
   b. collect hair samples and perform isotopic analyses
   c. directly observe bear foraging habits
   d. conduct analysis of foraging locations

8. Can we predict bear activity and use distributions?
   a. construct habitat suitability models (J. Schoen's HSI model or T. Smith's PATREC approach)'
   b. extensively sample bear activity sites and build a model for Glacier Bay from field input (current work of T. Smith et al.)

9. Can the effects of terrestrial and marine community succession be predicted for bears?
   a. utilize existing models for terrestrial and marine community succession in conjunction with existing knowledge of bear habitat needs to construct a predictive model for bear response to habitat changes.

10. What are the limiting factors (type and priority) for bears within Glacier Bay?
    a. document spatial-temporal changes in the nutrient contribution to bears of each discrete habitat unit comprising Glacier Bay and model bear carrying capacity.

11. Can we better define bear behavior so that the public can conduct themselves more safely within Glacier Bay?
    a. conduct a special management workshop at Glacier Bay which seeks consensus from bear-human conflicts specialists regarding situations unique to this area.
    b. develop a suite of educational materials which will better educate the public as to how to conduct themselves safely while at Glacier Bay. This would include web-based education, a bear safety video, a brochure, special VIS displays and periodic offering to the public of information through lectures.

III. ***How will research results from each area provide direction to management? (i.e., how would the results of this research assist the NPS in managing people and bears?)***

1. What is the bear population size for both black and grizzly bears at Glacier Bay?
   a. results from this work would directly address the NPS mandate to be informed regarding populations over which they have been established as stewards.
   b. results from this work would enable the NPS to monitor effects of management decisions regarding bear and people management in the backcountry

2. What are bears' temporal and spatial movement patterns within Glacier Bay?
   a. results from this work would help the NPS establish appropriate temporal-spatial

closures for areas when problems arise, thus better protecting bears and people.
   b. results could be used to establish effective refuges for bears in unique areas

3. What are the current and predicted trends in bear populations at Glacier Bay?
   a. this information could provide feedback regarding the effects of management
   b. could help predict hot spots for bear-human conflict now and in the future

4. What role does the marine environment play in the ecology of Glacier Bay bears?
   a. results would prioritize the importance that marine environments have in maintaining the current bear population
   b. results could address the issue of state verus federal control of marine waters within Glacier Bay NP.

5. Area closures: are current ones appropriate (temporally and spatially) and are any additional ones needed?
   a. results from this work would provide management important insight as to how to effectively manage areas experiencing bear-human conflict

6. How do bears respond to the various modes of human activity occurring in the bay?
   a. results of this work would provide guidance to management as to how to manage the various modes of human activity presently occurring in the bay.

7. What comprises bear seasonal diets at Glacier Bay?
   a. results from this work would establish the relative importance of seasonal habitats in the park and would provide insight as to how they could be best managed.

8. Can we predict bear activity and use distributions?
   a. results from this work would enable managers to direct human activity away from sensitive areas during sensitive times of year

9. Can the effects of terrestrial and marine community succession be predicted for bears?
   a. results from this work would provide predictive capability to NPS and could be used, as needed, in planning

10. What are the limiting factors (type and priority) for bears within Glacier Bay?
    a. this information would highlight resources in need of special protection (if any)

11. Can we better define bear behavior so that the public can conduct themselves more safely within Glacier Bay?
    a. results from this work would feed information directly to Glacier Bay managers who, in turn, could use it to better tailor the bear safety message for the public.

APPENDIX O: ENVIRONMENTAL & SAFETY STANDARDS AND ETHICS FOR EXPEDITIONS ON THE TATSHENSHINI AND ALSEK RIVERS

These standards represent the most current practices applied to the river corridors. They have been assembled by concerned professional outfitters, from comments by private boaters, and the managing agencies. Proper practices will ensure that each succeeding generation of travelers will be able to enjoy a relatively "untouched" appearance of the river.

The concerns fall into five basic categories:

- **Site impacts**
- **Interactions with others**
- **Interactions with and impacts on wildlife**
- **Safety**
- **Cultural considerations**

SITE IMPACTS

Human Waste

The combination of use in a restrictive river corridor and an environment that does not promote the speedy decomposition of waste creates a problem. It is **mandatory** that solid human waste be packed out and disposed in a proper manner. There is a human waste dump station at the take-out in Dry Bay and dump stations are also available in Haines, Haines Junction, Whitehorse and Juneau. For all expeditions ending before Dry Bay (at Lowell Lake and Turnback Canyon), all solid human waste must be flown out. For proper disposal at the dump station at Dry Bay, solid human waste must be kept in a liquid/semi-liquid state. Biodegradable deodorants and digesters are ok, but no bleach or ammonia or formaldehyde-based or bacteria-destroying chemicals are allowed. (These destroy the bacterial action in the septic system.) There are attachments for “rocket box”, “Jon-ny Partner” and other portable toilets. Toilet paper may be burned in a very hot fire or carried out with the solid waste and disposed of at the dump station. No other materials should go into the toilets and the septic system at Dry Bay. Urinating on the land or in the river current does not present the same problems as solid waste. Do so away from the camp areas and preferably below the high water line so that the area is flushed annually.

Fires, Fire Rings and Firewood

Regulations specify that fire pans, blankets or boxes **must be used** to contain any fires built within 1/2 mile (800 m) of the river. Fires should not be positioned near large rocks, rock walls or logs as they leave long-lasting scars. There should be no evidence of fire rings along the river. If you find someone else's fire ring please remove it and toss any scarred rocks into the river.

While "warming fires" continue to be part of the river experience, the use of stoves is recommended for cooking to minimize impacts. Check with your air carrier regarding

flight requirements for fuels. Dutch ovens should be heated on smaller fire pans. Carry and fly out any unused fuels.

All parties who utilize campfires should collect wood from drift piles while traveling on the river and bring it to camp if staying at popular campsites. Regulations prohibit cutting dead limbs or felling trees-- only dead and down wood may be used for fires. It is recommended that you stop during the day and get your night's supply of firewood away from camp. Firewood may be scarce at popular sites.

Maintain your fire so as not to leave pieces of charred wood. Any pieces of charred wood should be taken to the next camp and used. If this isn't possible, it should be thrown into the main river current. Fine ash should be dumped out in the main current as well.

Surplus firewood should not be left in a pile. It should be carried to the next camp, laid out along the beach in a natural waterline fashion or thrown into the main current. Only at the Dry Bay take-out should firewood be left in compact piles.

Alterations to the Environment

A growing problem is the proliferation of rings of stones used as tent anchors. There are high winds along the river corridors, but with the use of strong 12" tent pegs or spikes there should be no need to move rocks to anchor tents. If stones are moved for any purpose they should be loose river stones--and they should be returned when camp is broken. The moving of stones destroys vegetation and other organisms and may retard the growth of plants and accumulation of soil on the glacial outwashes that are favored campsites. It is recommended that planks, lawn chairs and other imported items be used for seating and other purposes.

Outfitters and others have noticed that the initial impacts to a campsite happen quickly by trampling of the fragile vegetation. The spots hardest hit are the landings, kitchen areas and paths linking tents. Unless a group is very small, it is better to use a previously established campsite rather than impacting an untouched area. Sticking to existing pathways and placing tents in an existing site is helpful. Avoid wearing lug-soled boots in camp. High traffic areas such as kitchens should be located on sand/gravel or other non-vegetated sites.

If hiking on an existing trail, do not short cut. This causes unnecessary damage to the vegetation and soil. Other routes should be on level, dry ground, on rock, sand or gravel. Hike in small groups and avoid wet, erodable, vegetated areas. **Group sizes are limited to 15 persons**, but some commercial groups are currently permitted to operate with up to 25 persons.

Garbage

Conscientious garbage management is critical to avoid bear encounters with your group and the people who camp in your site the following nights. We have received many comments about "micro-trash" in the campsites—please pick up and pack out all litter

and make sure lightweight items are not loose on windy days. Make a final check around any site before you leave. **All garbage must be carried along and flown out with you.** There is no garbage disposal at Dry Bay and extra food left by rafters has led to several bears becoming food conditioned and subsequently causing damage to property.

Proper garbage management begins with thorough pre-planning to minimize garbage and smells. Plan menus carefully to avoid leftovers and odiferous foods. **Nothing should be buried, nothing should remain on the land, and only strained liquid go into the river.** Carry out washed foil, other metals, glass and heavy plastics. Organics/food scraps can be burned in a hot fire and what's left carried out in a sealed odor-proof container. All strained dishwater and other gray water should go in the river rather than concentrating the food smells on shore. Oil or grease such as bacon grease must either be flared off in a hot fire or carried out in sealed container. All garbage and food waste destined to be carried out must be secured from bears along with food when campers are sleeping or away from camp.

Remember--it is up to you to manage your garbage in order to maintain a wilderness environment and to prevent bear incidents with your group or following groups.

INTERACTIONS WITH OTHERS

With a limited season and the popularity of these rivers it is critical that all river users adhere strictly to the scheduling regulations. The permit date is the date for **arriving at Dry Bay**. We suggest scheduling your air taxi for the following day to allow time for packing and to enjoy Dry Bay.

Kluane National Park (upper Alsek): You must obtain a put-in date and camping permit. There are special restrictions and regulations. Contact Kluane wardens.

Sediments Creek: Recommended limit of two nights. Commercial trips may not stop if two other commercial trips are already at the site. Be prepared for other rafters stopping to hike and/or camp at this campsite.

Walker Glacier, Alsek Spit/Peninsula, Gateway Knob: May stay two nights at <u>one</u> of these three sites. Limited to one night at the other two. Be prepared for other rafters stopping to hike and/or camp at Walker Glacier.

If there are other groups at or near your site, observe reasonable "quiet hours" and be courteous when passing through another group's camp. Parties that "leapfrog" each other should communicate to work out their respective schedules.

Sensitivity should be exercised with respect to air access (Turnback Canyon, Lowell Lake) as well as fly-overs to and from Dry Bay. Ask the pilot to maintain a minimum altitude of 2000' above the river, and to not fly along the river corridor if possible.

Commercial flight service companies are required to have a park use permit to land in the parks. Flying out from Alsek Lake is prohibited except in case of an emergency.

INTERACTIONS WITH AND IMPACTS ON WILDLIFE

The Tatshenshini-Alsek corridor has a large and diverse bear population. Brown bears, called grizzly bears in the interior, are common from the interior to the coast. Black bears, sometimes in the rare glacier or "blue" color phase, are also common along the rivers. Visitors to the river should realize that most animals in the north only have a short summer season to gain the weight necessary for winter survival and approaching too closely may be cause stress to wildlife that could affect their well being. Try to avoid changing their behavior - Use scopes, binoculars and long lenses to get good views and photos.

Look for signs of recent bear activity in any proposed campsite. Watch for bear tracks, droppings, signs of recent grazing, dug-up ground, wildlife trails and salmon-spawning areas. When hiking make lots of noise (singing, bells, etc.), avoid brushy areas and "blind" areas. Over the past several years a group of researchers working with the managing agencies have rated campsites on the Alsek and Tatshenshini according to the likelihood of a bear encounter at most of the sites on the rivers, including recommendations to reduce potential conflicts. This report is available at http://www.env.gov.bc.ca/bcparks/explore/parkpgs/tatshens/parkinfo.html#riverraftingandkayaking

By keeping a clean camp and observing a few basic precautions, you can minimize the chance of having a negative experience with **bears** and other wildlife. Food conditioning (bears becoming accustomed to human food and trash) creates a dangerous situation for visitors when bears approach them looking for food. Most often it is the bear that suffers the most as it continues to pursue food from people and is ultimately killed. All food, cooking utensils, garbage and any other items that may smell interesting to a bear (toothpaste, soap and lotion) must be packed separately from your other camping gear. Minimize odors by your choice of foods. While in camp, the only time food should not be cached is when you are actually preparing and eating a meal. When feasible, kitchen and food storage should be at least 100' (downwind) from the sleeping area.

Storage recommendations for food, trash, beverages, and other attractants:

Option 1) Store in bear-resistant containers certified by the Interagency Grizzly Bear Committee or otherwise approved by the Tat-Alsek Bear Group. ***Bear-resistant food containers are highly recommended as the most reliable method of securing food and other attractants from bears.***

Option 2) Store inside a secured dry box (latches shut), cooler (strapped closed), or rubber tote (strapped) surrounded by an activated electric fence that adheres to US Forest Service specifications (Karsky, D., K. Barber, J. Gookin, G. Kees, and J. Claar. January 2007. Specifications for portable electric fences as a potential alternative method for

food storage. Recreation Tech Tips Report, Technology and Development Program, United States Department of Agriculture Forest Service.)

Option 3) Suspend at least 10 feet above the ground and 4 feet horizontally from a post, tree trunk or other object on a line or branch that will not support a bear's weight.

SAFETY

The Tatshenshini and Alsek Rivers flow through a rigorous and demanding environment. The cold water, unpredictable turbulence, large water volume and extreme weather conditions all place high demands on safety equipment, systems and knowledge. Hypothermia can kill in a very short time.

Each group must have experienced leaders. Every group should have a leader trained in Basic Trauma Life Support, river rescue, cold weather survival and wilderness group leadership. Each boat requires a skilled leader with training and experience specific to their craft in Class IV whitewater. (International scale, Class I-VI.)

Suggested equipment: rafts, 12' or larger, Class III or V PFD's (1 per person plus 1 per boat). PFD's should be worn at all times. Rigid kayaks and whitewater canoes with flotation are suitable for the river provided the paddler is skilled in navigating Class III-IV water. Folding kayaks and open canoes are not recommended. Currently very few aircraft are available that can fly a rigid hulled boat

Emergency signaling equipment such as a PLB, EPIRB, ELT, aircraft radio and single side band radios with appropriate channels, satellite telephones, signaling panels and mirrors are required for all outfitted groups and should be carried by any group on the river. Cell phones do not work anywhere along the river.

Emergency phone numbers: BC Parks: (867) 634- 7043; RCMP at 1-800-663-3456; Kluane: (867) 634-7207; U.S. Coast Guard: 1-800-478-5555; Glacier Bay NP: (907) 697-2627, Dry Bay Ranger at (907) 784-3295 or (907) 784-3296 (radiophone).

Comprehensive First Aid Kits for advanced wilderness first aid are essential. Rescue equipment including carabiners, pulleys, rope and prussics (and the ability to use them) should be on board.

Plan to treat all of your drinking water with a mechanical or chemical system that is sufficient to remove Giardia.

Firearms

The carrying of firearms for protection purposes has not been shown to be effective in bear encounters. Canadian firearms regulations changed drastically in January 2001. **Some** of the applicable regulations are:

No handguns may be brought into Canada.

Possession of any firearm in Kluane National Park and Tatshenshini-Alsek Park by rafting groups is prohibited.

Firearms are allowed in the area of Glacier Bay National Park/Preserve along the Alsek River.

The use of bear spray (OC or pepper spray) and other non-lethal bear deterrents are suggested in case of close encounters with bears. Please check customs regulations for transport across the border. If you plan to fly with bear spray please check with your flight company for their preference on how to transport it.

CULTURAL CONSIDERATIONS

Throughout the Canadian portion of a Tatshenshini or Alsek River trip, travelers are in the traditional lands of the Champagne and Aishihik First Nations (Southern Tutchone and Tlingit origin). This includes the lands within the Province of British Columbia that have recently been declared a provincial park. Within the Yukon and British Columbia, the Champagne and Aishihik First Nations own large areas of rural land and have management and other interests in neighboring lands. The Alaskan portion of the river trip lies within the traditional lands of the Tlingit. You are guests on their traditional lands.

Until the early twentieth century, numerous Aboriginal fishing villages were located along the Tatshenshini River and lower Alsek River. Klukshu, Yukon is the only Aboriginal fishing village that is still occupied. Visitors are encouraged to visit Klukshu prior to their river departures to learn something of the area's rich Aboriginal cultural heritage. Close to Sha'washe (Dalton Post) at KM 163 on the Haines Road, an interpretive display on the basin's human history is available for viewing.

The departure point for most Tatshenshini River trips is at Sha'washe (Dalton Post). Sha'washe is on lands owned by the Champagne and Aishihik First Nations. Visitors must respect their land use regulations and requirements. Archeological studies of the Alsek and Tatshenshini river corridors have only recently begun. If a visitor comes across a site or artifacts of cultural significance which they believe is not widely known, they are encouraged to report its location to one of the river management agencies. **It is an offense to dig or disturb any cultural/archeological site or artifact.**

If you have any questions concerning these environmental standards, please contact one of the managing agencies.

Kluane National Park & Reserve
Box 5495
Haines Junction, Yukon YOB 1LO
Phone: (867) 634-7250

Tatshenshini-Alsek Provincial Park
British Columbia Parks
Postal Bag 5000
Smithers,BritishColumbia,VOJ 2NO
Phone: (867) 634-7043 - summer
(250) 847-7320 – winter

Glacier Bay National Park & Preserve
Box 137
Yakutat, AK 99689
Phone: (907) 784-3295

Champagne and Aishihik First Nation
Box 5309
Haines Junction, Yukon Territory
Y0B 1L0
(867) 634-2331