



## **Atmospheric Radiation Measurement Climate Research Facility/ North Slope of Alaska/Adjacent Arctic Ocean (ACRF/NSA/AAO)**

### **Bear Safety Plan**

#### **Background**

As a major part of DOE's participation in the US Global Change Research Program (USGCRP), the North Slope of Alaska (NSA) and Adjacent Arctic Ocean (AAO) Climate Research Facility (ACRF) exists on the North Slope of Alaska with its Central Facility near the town of Barrow. A secondary facility exists at Atkasuk, a town 100km inland from Barrow. Other instrumentation locations in more remote areas on the North Slope may be established in later stages of the project. Polar bears, and to a lesser extent, brown bears (barren ground grizzly) are significant hazards within the ACRF/NSA/AAO region. Signs are posted in public places on the North Slope warning about the polar bear hazard, and urging that certain recommended precautions be taken. As a result, arrangements have been put in place for project personnel likely to be at risk to be trained in the use of firearms, and to be armed with 12 gauge shotguns loaded with slugs at such times and places that the bear risk is considered to be significant. (Also, see the Activity Specific Firearm Safety Plan for ACRF/North Slope of Alaska/AAO).

Because the bear hazard is well-recognized in the Arctic, and because the Arctic has experienced greatly-enhanced development over the last two decades in connection with North Slope oil, there are excellent reference materials available on the subject. Three were used in the preparation of this plan: Guidelines for Oil and Gas Operations in Polar Bear Habitats, Safety in Bear Country, a Reference Manual, and Safety in Polar Bear Country (References 1-3). Relevant excerpts from each are included as appendices.

#### **The Law**

Polar bears are protected under the Marine Mammal Protection Act of 1972. The Act prohibits the "taking" of marine mammals. "Take" is defined to mean, "harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal." Polar bears are considered marine mammals because they spend most of their lives hunting seals on Arctic Ocean sea ice. The use of force against polar bears in defense of human life, and even the use of deterrent devices such as cracker shells by unauthorized

persons are both technically illegal under the Act. The Act and supporting regulations, however, make provision to "take" marine mammals in the course of scientific research and other legitimate work in polar bear habitat. The organization granting such authorization for the North Slope of Alaska is the US Fish and Wildlife Service Marine Mammal Management Office in Anchorage.

At the present time, such an authorization in connection with ACRF/NSA/AO activities is currently being sought.

The legal situation regarding polar bears described above raises questions in most people's minds. For clarification (or additional confusion?), see Appendix 1, Laws and Regulations Concerning Polar Bears. Regulations regarding authorization for incidental "take" have been revised since Appendix 1 was written, and now make provision for a simpler and faster authorization process. *At the time of this writing, the advice to ACRF/NSA/AO site workers is that the existing law concerning the taking of polar bears should not stand in the way of one's personal safety. If the situation warrants, shoot to protect oneself and worry about the administrative details after the shooting.*

## **Bears in Alaska**

Both polar bears and grizzly bears (commonly called brown bears in Alaska) are impressive and dangerous animals. An adult male polar bear may weigh over 1500 pounds. Adult females average closer to 660 pounds. Seals are the primary food of polar bears, but when hungry, polar bears eat what's available. Polar bears are the only carnivores that hunt human beings for food. Grizzlies weigh in at 450 and 250 pounds for adult males and adult females respectively (except for those inhabiting Kodiak Island, AK; Kodiak brown bears are comparable to polar bears in size and weight). Because grizzlies are fairly common in many areas frequented by human beings, far more bear attacks in the US involve grizzlies than polar bears. Such is not the case, however, in the ACRF/NSA/AO area. On the sea ice, polar bears are common, whereas brown bears do not venture out on the ice. Polar bears also frequent the coastal areas, especially for birthing. Polar bears have been seen more than 100 miles inland. In contrast, brown bears are only seldom seen in the coastal areas of the North Slope, and are much more common inland.

It should be noted that another species of bear is found in Alaska and throughout the remainder of the US, but not on the North Slope of Alaska. It is the "black bear." Black bears are smaller and far less aggressive than grizzlies. Confusion arises because the designation "black bear" has little to do with color. Many "black bears" are in fact brown, just as some "brown bears" (grizzlies) are in fact light tan -- "golden." People familiar with bears of brown color in the lower 48 frequently think they know what Alaskans are talking about when they refer to "brown bears." All too often, they don't. Alaskan brown bears pose a much greater threat to human beings than the typical brown-colored bear encountered in the lower 48.

Much more detailed information on polar bears and grizzlies is contained in Appendix 2: Bear Biology and Bear Behavior.

## **Bear Encounters at ACRF/NSA/AO Facilities**

No matter how careful one is the possibility always exists on the North Slope and on the sea ice off the North Slope of a close bear encounter of the wrong kind. Bear hazard depends upon both time and place. Polar bears prefer broken sea ice because seal hunting is better there than in open water or on unbroken ice (Ref. 1, Chapter 2). In Alaska, normally, few bears come ashore during the open water period. In the vicinity of Barrow, the shore-fast sea ice frequently blows away around the 4th of July.

Once the ice is gone, the polar bear hazard on shore typically is not significant. However, the edge of the ice pack is usually only a few tens of miles offshore, and a change in wind direction can bring the ice back in less than a day. In rare years, the ice never leaves. One recent year, however, the coast in the vicinity of Barrow was ice-free until late December. So the polar bear hazard depends more on ice conditions at the coast than on month of the year. A potentially hazardous situation sometimes occurs when the ice is near shore during whaling season, but blows away before the bears have hopped onboard. Then, many bears may be stranded on shore.... hungry bears. That situation occurred during fall, 2002. More than 60 bears were seen in the Barrow area.

Polar bears do not hibernate, and hence, pose a threat throughout the winter. The threat from brown bears in winter is greatly reduced because they do hibernate. However, a hibernating bear is still a hazard if disturbed.

Except when bears are known to be in the immediate vicinity, bear hazard is not considered to be significant in densely populated areas like within villages and towns. However, such is not the case on the fringes of populated areas. Outdoors in fringe areas, bear hazard should be regarded as comparable to that on the tundra. Indoors in populated areas, the hazard normally is considered to be negligible, even though polar bears have been known to break into occupied structures. The farther inland one goes, the less serious the polar bear hazard is, but within several miles of the coast, the hazard is serious as long as there is ice along the coast. In contrast, the brown bear hazard increases the farther inland one goes. The brown bear hazard is considered to be significant during the late spring, summer and fall months at Atqasuk, 60 miles inland, whereas normally the polar bear hazard is not considered to be significant at Atqasuk at any time of the year. (However, polar bears were seen at Atqasuk during fall, 2002.)

The bear hazard can also be event-related. During the fall whaling season, if one or more whales have been taken and butchered on the shore, the blood, bones and any other debris remaining serves as a powerful attractant to polar bears. Bears have an excellent sense of smell and are long distance swimmers. They easily swim the distance from the ice pack to the shore when attracted by the aroma of a dead whale, provided that the ice pack is not more than a few tens of miles offshore. In one instance in which a whale carcass washed up on shore near Barrow, more than 20 bears were counted feasting on the whale. In assessing the bear hazard, project personnel are to note the occurrence and location of areas where whales, walrus or other animals have recently been butchered, or where carcasses have washed ashore.

An important question remains for site workers: How does one determine the bear hazard on any particular workday? The answer is not straightforward but several considerations are given below to assist in assessing the threat.

- **Consult with local site workers.** Walter Brower and Jimmy Ivanoff, our onsite contractors, are Barrow locals, in contact with local bear surveillance personnel, and knowledgeable about the local bear threat on any given day. They should be your first point of contact in assessment of the bear threat.
- **Your work activities may dictate whether you need to be armed.** For example, if you are planning to work indoors at the Great White, you may choose to travel unarmed in a vehicle to the site. A close watch for bears during arrival and departure from the site may suffice in this case.
- **Weather conditions may also dictate the need for being armed or not.** Under good visibility conditions you may be able to spot bears at long range and take evasive action without the need for being armed. On the other hand, under low visibility conditions, (darkness, blowing snow) you might want to be armed (that is, have a properly authorized armed person in your work party) since you could encounter a bear at close range and not have time to take evasive action.
- **Use the various non-firearm protective measures available to you at the site.** To assist in bear protection, a number of items are available to you that may eliminate the need for carrying a firearm. For example, both regular and night vision binoculars are available at Barrow and Atqasuk facilities to aid in sighting bears. Bright fixed lighting has been installed at the Great White and portable high intensity lamps are also available in both vehicles to further aid in assessing the bear threat when entering or leaving the site.

### **ACRF/NSA/AAO Bear Safety Procedures**

At the NSA remote field sites, the procedures to be followed to maintain personnel safety depends upon the degree of hazard involved in any given activity. Walter Brower, the ACRF/NSA/AAO Site Facility Manager, should be consulted on a daily basis concerning the bear hazard. In his absence, Jimmy Ivanoff, ACRF/NSA/AAO Site Chief Operator, is the designated alternate. The following rules and procedures apply whenever workers are exposed to a significant bear hazard:

- **Do not work alone outdoors when the bear hazard is judged to be significant.**
- **ALL members of the work group have a responsibility to watch for bears.**
- **Appoint a Bear Monitor when the bear hazard is judged to be significant.**

When personnel are working at an outdoor location under a significant bear threat, there will be at least one person per group who is designated the "Bear Monitor". This person is responsible for ensuring that the group will not be subjected to a surprise encounter with or attacks from a bear.

The Bear Monitor may perform other duties depending upon the conditions prevailing at the time, but the Bear Monitor's primary duty is bear safety. The level of attention that this duty requires is dependent on the level of the bear hazard, ambient light level, weather conditions, and terrain. For example, when a group is working outdoors on a clear sunny day on flat tundra which affords no cover to approaching

bears, and when bear hazard is not high, it would probably be adequate for the Bear Monitor to do a 360 degree scan of the area every 10 or 15 minutes. On the other hand, a continuous bear watch would clearly be required during periods of low ambient light level and in rugged terrain. The frequency of the area survey is a matter of judgment to be resolved between the lead worker and the Bear Monitor.

However, when the bear watch is not to be continuous, use of a timer with alarm is recommended. Without an alarm, it is too easy to get caught up in one's work and forget to perform the periodic area survey.

- **Rotate Bear Monitor duties**

Because it is difficult for one person to maintain vigilance for long periods of time, the bear monitoring duties will be rotated among firearms-authorized group members on a predetermined basis (one to two hour periods per person). At any given time, everyone should always know who the Bear Monitor is, if the bear hazard has been judged to be significant. The Bear Monitor is to be armed as described in the Firearm Safety Plan. If the bear hazard is considered serious, preferably one or more others in the group should be armed as well. The limitations on who may be armed and what arms they may carry are described in the Firearm Safety Plan.

- **Approach work areas with caution**

When a group is working indoors in a remote area, scanning the area when one first approaches it, and before one leaves any building, instrument shelter or vehicle (even briefly) is normally considered adequate. Note that polar bears are known to lurk around occupied structures, waiting for someone to emerge. This mimics one of their styles of hunting--waiting patiently for a seal to emerge from a breathing hole in the sea ice. One should also give particular attention to areas underneath structures such as the Great White and the instrument platforms.

- **Report all bear sightings to the Bear Monitor**

All bear sightings by any outdoor workers will be immediately reported to the Bear Monitor, who will then go on heightened alert, inform all site workers as well as anyone else in the immediate area. At that point, the bear sighting protocol described in the following paragraphs is to be applied. If workers are indoors when a bear is determined to be in the area (by observation or report from others), the work leader is to be immediately informed. The leader will then designate a Bear Monitor who will remain on alert until either the bear or the workers have left the area. If the bear poses no threat, indoor work may continue. Following a sighting, all site workers and anyone else in the area are to be immediately informed.

Following any polar bear sighting, file a sighting report with the local Barrow office of Alaska Department of Fish and Game (contact information is contained in a following section). If the bear is deemed to be a potential threat to the Barrow community, the NSB Department of Public Safety and the NSB Wildlife Management Department should also be promptly informed.

- **Follow the Bear Sighting Protocol**

If an outdoor worker sights a bear, the bear encounter protocol described in the following section will be followed. If a bear is sighted while workers are indoors, the bear will not be disturbed unless it takes actions that directly threaten the workers.

If such actions become sufficiently threatening that it is deemed to be more hazardous to remain passive indoors than to either withdraw from the area, or take deterrent action, the work leader may organize the others to take such action. In either case, the bear encounter protocol in the following paragraphs would then apply

### **Bear Sighting Protocol**

The ACRF/NSA/AAO bear sighting protocol is adapted from Chapter 9 of Reference 1. The protocol was developed for encounters with polar bears. It is equally applicable for encounters with brown bears, except that there is no requirement to report such encounters to the ADF&G.

- **Assess whether bear encounter is Imminent or Not Imminent**

The protocol distinguishes between situations in which an encounter is imminent, and situations in which an encounter is not imminent. The distinction requires judgment, and cannot be defined simply in terms of distance to the bear. If a bear is a few hundred yards away, but is clearly heading in one's direction, that situation qualifies as "encounter imminent". On the other hand, if a bear is within 30 yards, but is rapidly withdrawing, one may consider that an encounter is already in progress, but by the time one can react to the situation, it no longer qualifies as "encounter imminent". If a bear is sighted at a distance of 100 yards, or so, and is going about its business, showing no particular interest, that clearly qualifies as "encounter not imminent". Other actual situations may not be so clear -- hence, the need for judgment.

- **Encounter Not Imminent**

In the event that the lead worker determines that an encounter is not imminent, the Bear Monitor and others watch the bear until it leaves the area. If the bear does not leave the area over an extended period and appears to present a sustained low-level threat, the leader may choose to proceed as if an encounter were imminent.

- **Encounter Imminent**

In the event that the lead worker determines that an encounter is imminent, the leader calls for all personnel to withdraw to a designated secure location (nearby structures, vehicles, or leave the area). While this is happening, personnel carrying weapons place themselves between the bear and unarmed personnel, and assure that their field of fire to and beyond the bear is safe. Unarmed personnel retreat ahead of the armed personnel.

*Withdrawal is to be accomplished with no deterrent action if the bear threat is not too great. If the bear's approach is such that a serious immediate threat is perceived, a warning shot(s) may be*

fired by armed and authorized personnel to scare off or slow the advance of the bear while withdrawal proceeds.

If the bear either charges, or if it's rate of advance despite the warning shot is such as to pose an immediate threat to any member of the work group (or any other human being), the armed personnel are to fire on the bear, aiming preferably between the shoulders. Avoid headshots as the polar bear's skull can deflect the bullet. Once the bear is hit, keep firing until the bear is still. Try to kill the bear cleanly and quickly. A wounded bear is very dangerous.

Should it prove necessary to destroy a polar bear, contact the NSB Wildlife Management Department, the local ADF&G representative, and the USF&WS Marine Mammal Management Office in Anchorage as soon as possible for instructions on what to do with the carcass, and how to proceed thereafter. A formal inquiry will be conducted. One should start the process by contacting the NSB Wildlife Management Department at the number given in a following section. Personnel at this department can give further guidance on how to proceed.

### **Safety Plan Modifications**

As more is learned about the ACRF/NSA/AAO work environment, associated bear activity, as well as what deterrent actions work and don't work, this plan will be modified as appropriate.

### **Training**

Personnel authorized to carry firearms and deterrent devices will be trained as indicated in the Firearm Safety Plan. All project-affiliated personnel who may be exposed to significant bear hazard are required to read this plan together with its appendices, and offer either written or e-mail notice to the Sandia ACRF/NSA/AAO Program Office that they have done so. This is to be done before exposure to significant bear hazard, and at least once a year thereafter for as long as exposure to significant bear hazard continues.

### **Relevant Contacts and Phone Numbers**

North Slope Borough Wildlife Management Department

Contacts: Craig George

(907) 852-0350 FAX 0351

Alaska Department of Fish and Game, Barrow Office

Contact: Geof Carroll

(907) 852-3464

US Fish and Wildlife Service Marine Mammal Management Office

Contact: Craig Perham

(907) 786-3810, FAX 3816

### References

1. Guidelines for Oil and Gas Operations in Polar Bear Habitats, edited by J.C. Truett, OCS, Study, Mineral Management Service Report MMS 93-0008, August, 1993.
2. Safety in Bear Country, A Reference Manual, Revised Edition, L.H. Graf, P.L. Clarkson and J.A. Nagy, Produced by the Department of Renewable Resources Safety in Bear Country Program, Project No. H43, 1991/92, Government of the Northwest Territories, Canada, 1992.
3. Safety in Polar Bear Country, Marianne Bromley, Department of Renewable Resources, Northwest Territories, Canada, 1986.

The latter two references were provided courtesy of Raymond Bourget, Department of Resources, Wildlife and Economic Development, Rankin Inlet, Northwest Territories, Canada (819) 645-5037.

### Acknowledgements

Numerous individuals associated with the NSB Wildlife Management Department and members of the Barrow community also contributed information, insight and recommendations on how to deal with the polar bear hazard.

[Note: The Appendices referred to in this document are available in hard copy format only and not included in the web version of this document. For access to the printed Appendices, please see the Barrow ACRF/NSA Site Facilities Manager, Walter Brower, or Chief Operator, Jimmy Ivanoff, and in Atkasuk, Doug Whiteman, the ACRF/NSA Part-time Operator or contact the ACRF/NSA Project Office at Sandia National Laboratories.]



**APPENDIX 1**

**LAWS AND REGULATIONS CONCERNING POLAR BEARS**

**Chapter 7 of Reference 1**

**APPENDIX 2**

**BEAR BIOLOGY**

**BEAR BEHAVIOR**

**Chapters 2 and 3 of Reference 2**

**APPENDIX 3**

**FIREARMS**

**AVOIDING PROBLEMS ON THE TRAIL**

**Excerpt from Reference 3**

**APPENDIX 4**

**ENCOUNTERING A BEAR**

**Excerpt from Reference 3**