YUKON'S ARCTIC BEARS

-avoiding problems with polar bears and grizzlies north of treeline

·Dept. of Renewable Resources·APRIL 1983·
Hon. H. Tracey - Minister·

C O N T E N T S

POLAR BEARS IN THE NORTHERN YUKON

INTRODUCTION

Polar Bears are the largest terrestrial carnivores in the world. Adult males regularly weigh 800 - 1000 lbs., and exceptionally large individuals tip the scales at over 1700 lbs. Though they are fast and agile on land, the great white Bears should, more appropriately, be considered marine mammals. For they are tied to the sea and the sea ice by the necessity to hunt seals, their major prey. The Bears are completely at home in the water and can swim powerfully both on the surface and underwater. They have been sighted at sea, miles from any land or ice. Therefore, the range of the Polar Bears in the Yukon includes only the extreme northern fringe of land, perhaps as far inland as the first foothills, but extends throughout the waters and sea ice of the Beaufort Sea.

LIFE HISTORY

Female Polar Bears give birth to their small, helpless cubs in the cold and darkness of the arctic winter. To protect herself and her young, the female digs a den in the snow in late autumn. She looks for a location that will drift over as the winter progresses, for example, beneath a steep bank. The mother Bear enlarges the maternity chamber until it measures 10 - 20 ft. long and about 5 feet wide and high. The insulating effect of the snow traps the Bear's body heat, raising the temperature considerably in the den. Dens are usually on land near the coast, but some have been found many miles inland. Some females may also den near pressure ridges out on the sea ice. The mother Bear remains in the den, nursing her cubs throughout the winter. She does not truly hibernate and if disturbed, she may awaken and leave her den.

As soon as the sow and her cubs emerge from the den in late March or April, she leads them onto the sea ice where she begins to hunt seals. Females with young cubs usually remain near the coast during the spring

where the shore ice is stable, and snow cover along the pressure ridges provides denning habitat for ringed seals. Seal pups, born in April and May, lie relatively helpless in their birth lairs beneath the drifts. With a keen nose, the Bear searches out its prey beneath the snow. A quick, powerful pounce through the roof of the birth lair often catches the seals before they can dive through their holes to safety below the ice. The rich seal meat and fat allows the female Bears to recover the reserves of energy they lost through the winter's dormancy and nursing.

Polar Bears depend exclusively on seals throughout much of the year. Without seals, Polar Bears could not live in the Arctic. The abundance and distribution of the Bears seems to depend largely on the numbers of seals in different areas. A decline of seals in a region results in a decrease in the number of Polar Bears and a lowering of their reproduction.

The mother Bear's preference for the shorefast ice may also be to avoid large male Bears that could kill her small cubs. Unlike pregnant females, the males roam the sea ice through the cold winter months, denning briefly

only during severe storms. Seals are most abundant and easily caught in off-shore areas. Here the ice is unstable. Currents and upwellings produce cracks in the ice called leads, and some areas, termed polynyas, are kept open all winter. Bears catch seals by stalking along the open water or lying in wait beside the seal's breathing holes in the newly formed ice when leads freeze over. Thus, by staying away from the off-shore area of unstable ice, females with young cubs avoid many encounters with hunting males.

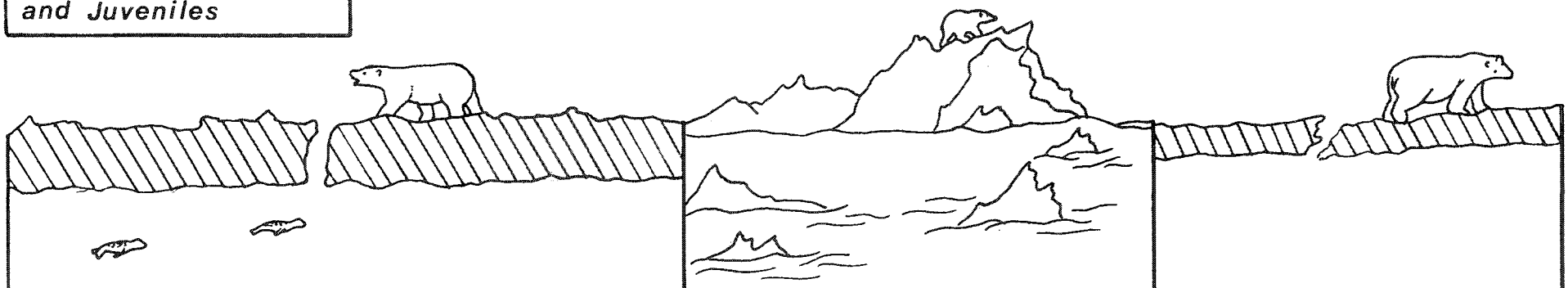
Usually by mid-summer, the shorefast ice breaks up and drifts north, away from the coast. Most Bears move out with the drifting ice and continue to hunt seals among the bergs. But a few individuals stay on land along the coast or on the near-shore barrier islands and spits. These Bears forage on bird eggs, plants and small mammals, as well as scavenging along the beaches. Stranded whale carcasses draw scavenging Bears from miles away where they remain until all the meat is eaten.

If an onshore wind carries the pack ice into the shore at anytime during the summer, the Bears will return with it, thus increasing the density of Bears along the coast

Freeze-up begins in October or early November depending on yearly conditions, signaling the Polar Bears to move south again on the new formed ice. Once again, if offshore winds blow the new ice away, the Bears will retreat with it. As soon as sufficient snow has accumulated, the pregnant females, and those with cubs, den once more The males begin to roam, seeking out the open leads and unstable ice where they will winter, and another year's cycle is completed

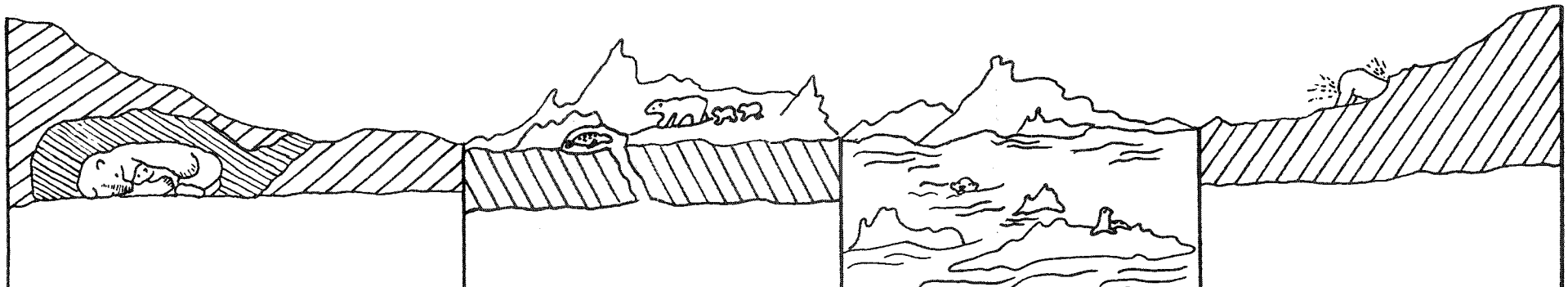
Yearly Cycle of Yukon Polar Bears

Males
Females without Young
and Juveniles



BEARS ROAM THE LEADS AND OPEN WATER AREAS IN THE UNSTABLE ICE OFFSHORE. MATING TAKES PLACE IN APRIL AND MAY.	ICE BREAKS UP AND DRIFTS NORTH. MOST BEARS HUNT FAR OFFSHORE WITH THE PACK ICE, BUT A FEW REMAIN ON LAND ALONG THE COAST.	BEARS MOVE SOUTH TOWARDS COAST AS THE OCEAN FREEZES UP.
DEC----JUNE	**JULY----SEPT**	**OCT----NOV**

Mother Bears

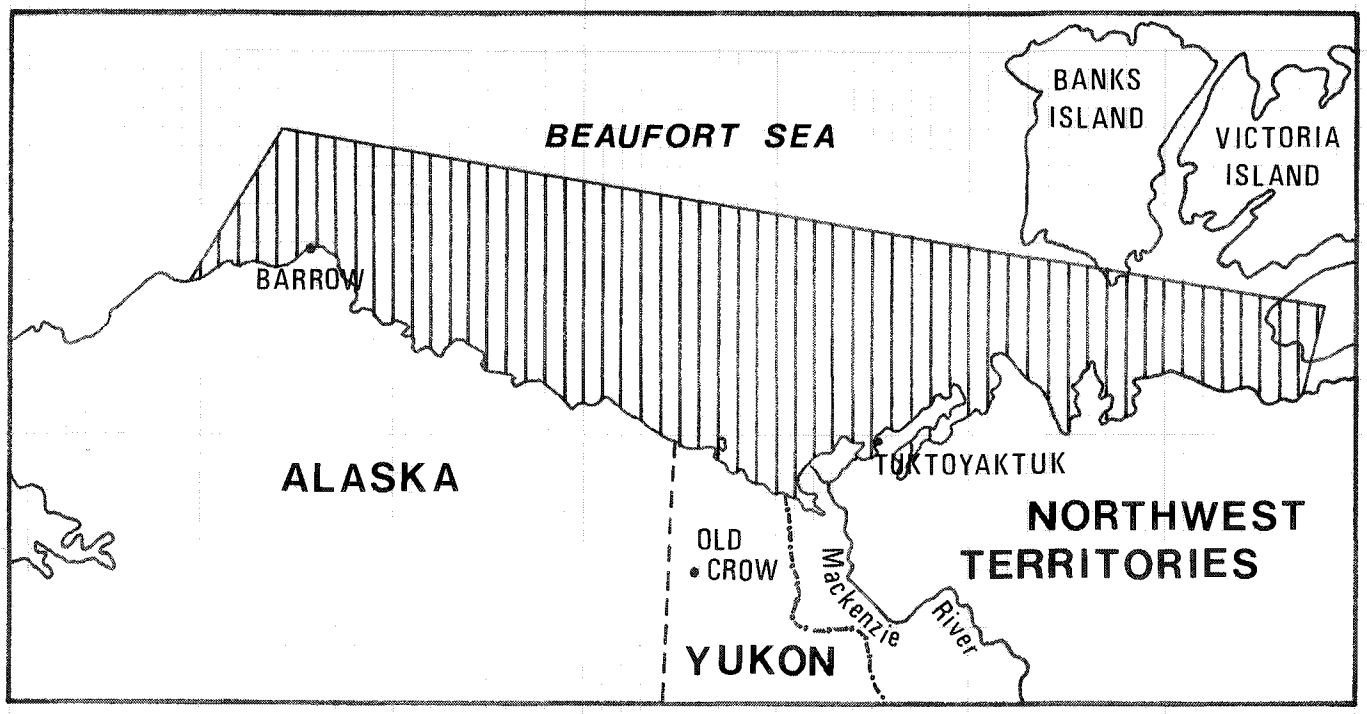


CUBS BORN IN SNOW DENS ALONG THE COAST IN DEC. AND JAN.	MOTHER BEARS HUNT FOR SEALS IN BIRTH LAIRS ON SHOREFAST ICE NEAR THE COAST.	AT BREAK UP, MOST MOTHER BEARS MOVE OFFSHORE TO HUNT SEALS ON PACK ICE.	PREGNANT FEMALES RETURN TO THE COAST AND DEN WHEN ENOUGH SNOW IS PRESENT.
DEC----MAR	**APRIL----MID JULY**	**MID JULY--MID OCT**	**MID OCT----NOV**

NOTE AT ANYTIME DURING MAY THROUGH SEPTEMBER, GRIZZLY BEARS MAY BE ENCOUNTERED ALONG THE ARCTIC COAST.

POPULATION STATUS AND MANAGEMENT OF POLAR BEARS IN THE NORTHERN YUKON

The Polar Bears of the Yukon represent part of a continuous population that extends across the Beaufort Sea from Pt. Barrow, Alaska, as far east as Victoria Island in the Northwest Territories. Studies of marked Bears have shown that individual animals may range over the entire distance, although they usually do not mix with the Bear population on the west coast of Banks Island. The Bears of the Beaufort Sea are an International resource; anything that affects Bears in the Yukon will ultimately influence the population of Bears in Alaska and the Northwest Territories.

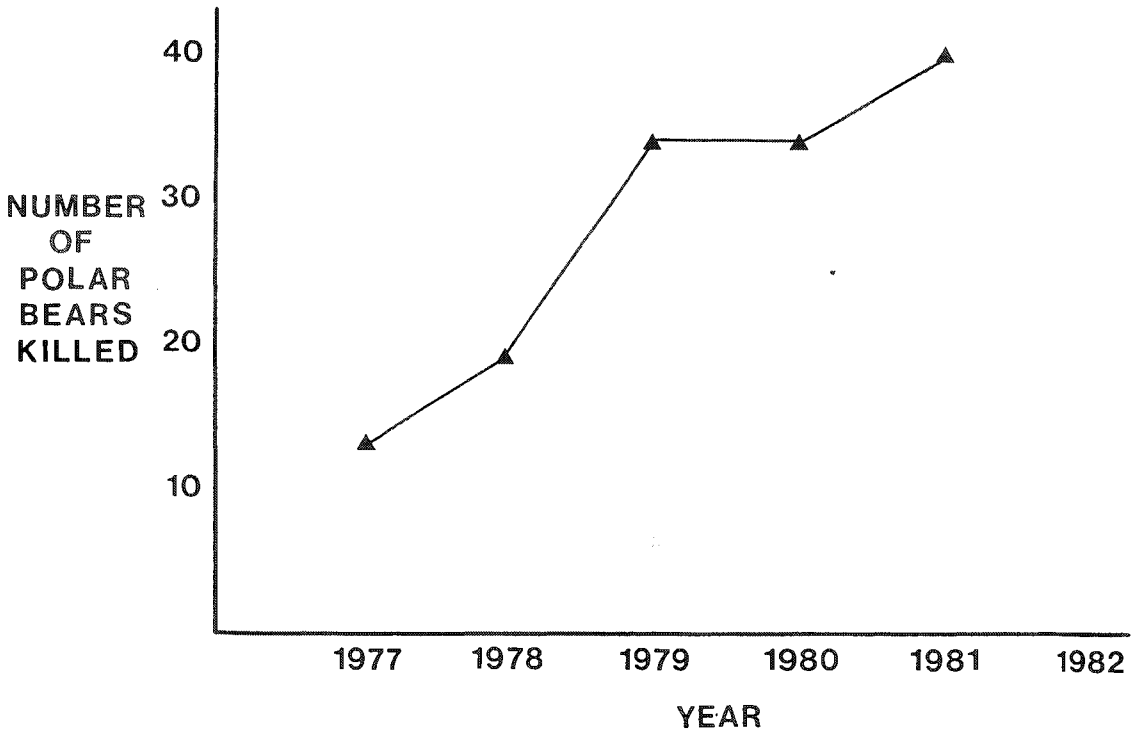


RANGE OF YUKON POLAR BEARS

The number of Polar Bears in the northern Yukon and its offshore waters has never been accurately estimated, but Bears seem to be less common here than in some other parts of the Arctic. Moreover, few maternity dens have been found along the Yukon coast, although it appears to be ideal denning habitat, with abundant snowbanks near to shorefast ice where female Bears can hunt seals in spring. Probably many of the denning Bears were shot during the whaling era and by Inuit hunters and

trappers who regularly plied the coast in the early decades of the 20th century. Journals of early explorers and records of the R.C.M.P. at Herschel Island contain reports of numerous kills of Bears, especially females in dens. Now that travel and hunting have become much less common in the northern Yukon, the Polar Bears are likely increasing. It is important that human activity along the Beaufort coast be conducted so as not to jeopardize the recovery of the population.

Despite the moderate population density, there are still places where Bears are locally abundant. Anyone who camps and works along the Yukon's arctic coast should anticipate and plan for possible encounters with Polar Bears. The way in which we establish and maintain camps and behave in the field, will go far in determining the number of conflicts with Polar Bears.



NUMBER OF POLAR BEARS REPORTED KILLED "IN DEFENCE OF LIFE AND PROPERTY" IN THE NORTHWEST TERRITORIES

The hunting of Polar Bears is restricted to people of Inuit descent through an International agreement. Residents of Aklavik, N.W.T., do most of the hunting along the Yukon coast, and they often travel as far west as Herschel Island in search of game. Because of the moderate size of the Yukon's population of Polar Bears, hunting is closely regulated; only six (6) tags are allocated each year. Any Bears killed at industrial camps must be included in this yearly quota and thus cuts into the number of Bears available to Native people. Throughout the Arctic, the number of "Problem Bears" killed, has increased steadily in recent years. Hopefully, the information contained in this guide will help reverse this destructive trend.

AVOIDING CONFLICTS WITH POLAR BEARS

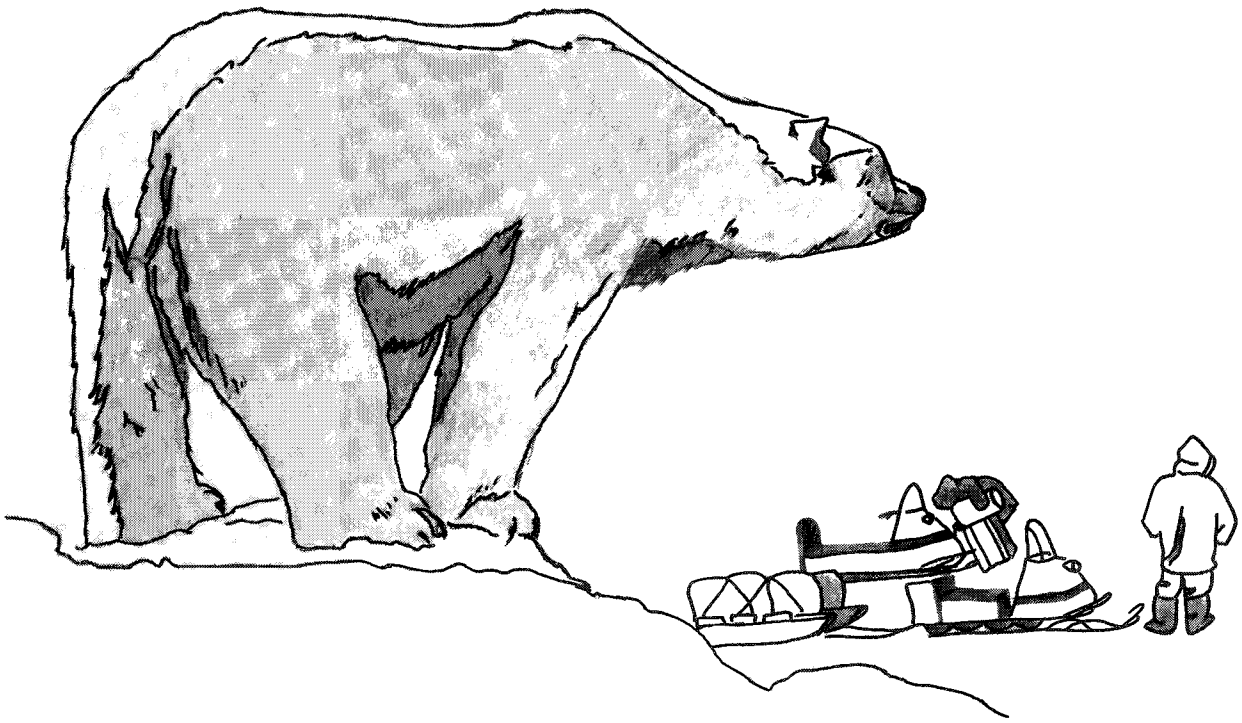
Working in Polar Bear Country

Polar Bears may be out and active at all seasons of the year, even in the darkest, coldest months. Anyone working or camping in the northern Yukon or on the offshore sea ice may encounter a Bear at any time.

Polar Bears are stealthy and powerful predators. Reports of attacks on humans, although not common, come from various places throughout the Arctic. Some of these attacks (including several fatalities) appear unprovoked; the Bears apparently treated the people as prey.

In the darkness and blowing snow of the arctic winter, all the advantages lie with the Polar Bear. The Bear is camouflaged and adept at stalking; his survival depends upon it. His sensitive nose alerts him to camps or people upwind. Anyone going outside at night in Polar Bear country should be particularly vigilant, even close to a large camp. Curious Bears investigate buildings, tents and other structures. They regularly venture into arctic coastal communities. During the winter, travelling and working alone is dangerous. Avoid jumbled ice and

pressure ridges where a Bear could be hard to spot. Land helicopters well away from jumbled ice. When working on the sea ice, never approach fresh killed seals or Bear cubs that appear to be alone.



People working outside in Polar Bear country should carry an adequate firearm and practice using it. The choice and use of weapons for protection from Bears is discussed on Pg. 46 - 48 of this guide. Remember, shooting a Bear is only a last resort. Make every effort to drive it away without hurting it. Most Bears approach merely out of curiosity. Give them a chance.

In the summer months, much the same advice for avoiding trouble with Grizzlies applies for Polar Bears. Stay alert for Bears that you can see, and advertize your presence by sound and smell to those that might be hidden ahead. See field procedures, pages 38 - 45 of this manual.

Remember that carcasses of whales or other marine mammals washed up on the beaches draw Bears from considerable distances. Do not approach

or camp near them. Try to avoid camping on beaches, because Bears use them as travel routes in the summer. When ice drifts inshore, encounters with Polar Bears become more likely. Keep informed about the status of ice along the coast. Watch the wind direction and contact Transport Canada at the Inuvik, N.W.T., airport for ice survey reports.

Also, keep in mind that synthetic materials attract curious and hungry Polar Bears. They may chew inflateable boats, plastic gas cans,

rubber gas lines, insulation on wires, nylon tents, sleeping bags and explosives. Such damage is costly, inconvenient and potentially dangerous if you depend on these items in remote areas. Try to store these materials in metal containers, Bear proof sheds or on elevated platforms. Design platforms with drifting snow in mind.

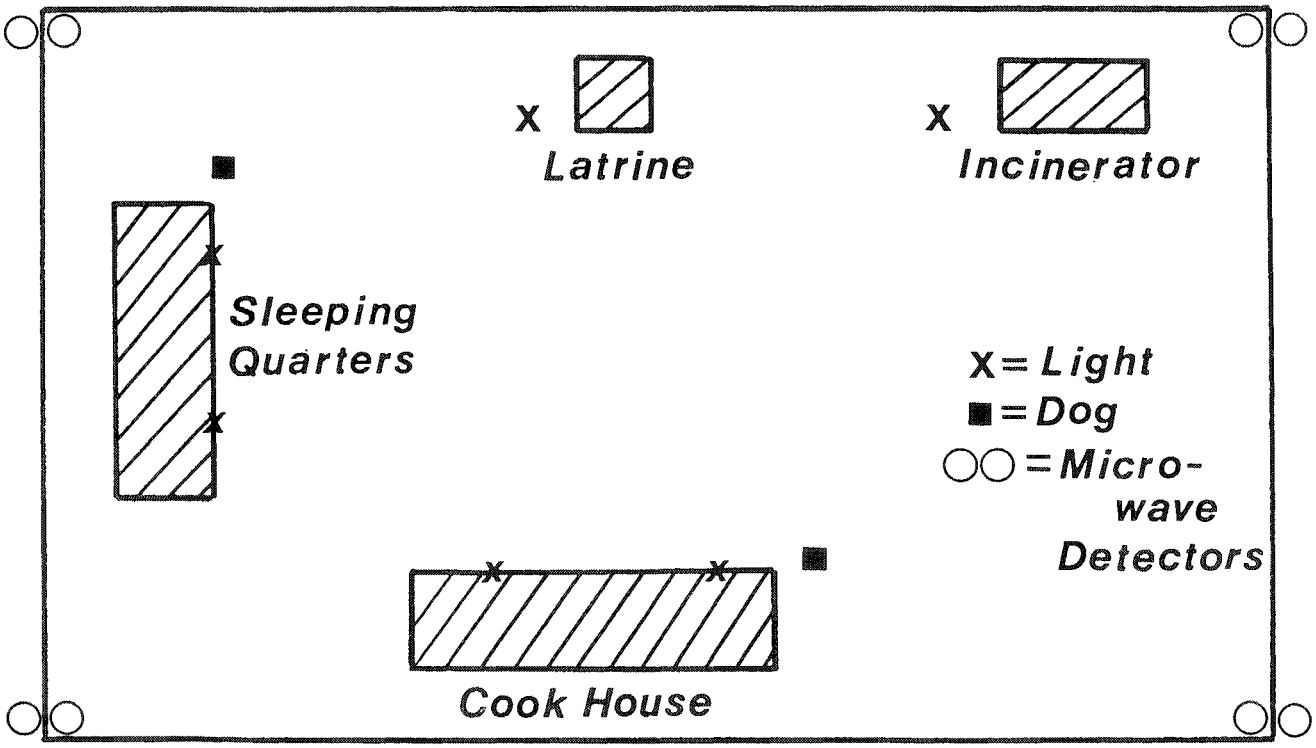
Design of Camps in Polar Bear Country

Curiosity among Bears is to be anticipated in remote regions where Bears have seldom encountered humans and rarely been hunted. No camp located on the sea ice or along the coast where Bears travel back and forth can expect to remain unvisited by Bears. But a properly set up and maintained camp will reduce the number of Bears attracted and increase the security of the people living there.

The smell of food almost always constitutes the primary enticement for Bears. Proper disposal of garbage by burning in a forced air incinerator is an absolute necessity at large permanent camps. The garbage handling area should be a good distance away from the cook tent and sleeping quarters, but visible from the buildings. If an incinerator is not available in small temporary camps, garbage should be placed in airtight containers until camp is abandoned.

Proper disposal of sewage and dishwater (which contains grease - highly attractive to Bears) may present problems. Large camps require proper sewage treatment facilities. In small camps, dishwater whould never be simply thrown outside the cook tent. Carry it away into a pit where it can be treated with disinfectants or lye. Latrines should be located well away from camp and also treated like waste water.

Other important considerations for a semi-permanent arctic camp include lighting during the dark months, proper snow removal and use of Bear detectors and deterrents. Building designs should incorporate a window beside the door and lights over the doorway so the exit area can be observed before going outside. Yard lights, especially near the garbage disposal area are also recommended. Snow ploughing should not create hiding places for Bears near camp or ramps that allow them to reach places they could not get otherwise. For example, an artificial drilling island with sides too steep and high for Polar Bears to climb was made vulnerable when snow ploughed off the island created ramps that the Bears could scramble up. Currently available devices for detecting



Sample Camp Lay-out

and deterring Polar Bears are listed and evaluated below. Also review the suggestions for camp design and maintenance on pages 28 - 31 of this manual.

What to do if a Bear comes into Camp

The visit of a Polar Bear to an arctic camp presents us with a paradox. On one hand, the powerful predator poses a potential threat that cannot be treated lightly. On the other hand, attacks by Polar Bears are extremely rare. Most likely, the Bear is merely curious or scavenging

and will go away if it is frightenend off and not rewarded with food. We cannot afford to kill every Bear that comes around camp on the small possibility that it may be aggressive.

Every effort must be made to discourage the animal using the deterrents now available (see below and Table on Pg.). The most important consideration is not to allow the Bear access to food or garbage. Once a Bear has been rewarded with food, efforts to chase it off are often futile.

Bears may be driven off with a ski-doo or a helicopter. If chasing with a ski-doo, stay at least 30 - 50 m behind the animal and give it the idea that it can outrun you so that it doesn't turn and fight. Carry a rifle or shotgun with you and don't shut off the engine until the Bear is gone. Don't chase a Bear for more than 5 minutes, or it may get over-heated and die.

If you begin to experience problems with Bears, contact a Yukon Wildlife Officer. Because of the remoteness of arctic camps, it may take a long time before the officer can get to your camp, so problems should be reported as soon as possible.

If you must kill an arctic Bear in the Yukon, you must report it immediately to the Yukon Government. Call 667-5715. The hide with claws and the entire skull must be submitted. Falure to report a kill or to turn in the hide and skull is a serious violation of the Yukon Wildlife Act.

DEVICES FOR DETECTING AND DETERRING POLAR BEARS

Most industrial activity in the Polar Bear's range is likely to involve highly technological exploration for petroleum. Thus, most camps will be elaborate, semi-permanent establishments, housing large crews. Camps will be along the coast and out on the sea ice (e.g. artificial islands or offshore drill rigs); the Polar Bear's prime habitat. With such costly and vulnerable set-ups, operators should consider investing in systems to detect and discourage the approach of Polar Bears before they do any damage or harm.

Dogs

The simplest, cheapest and time-honored method of detecting approaching Polar Bears is to keep trained dogs tied up in camp. Northern "husky" type dogs can remain outside in the coldest weather, and their superiour sense of smell and hearing will detect Bears that humans miss. Camps hiring Inuit people should encourage them to bring a few dogs. Animals experienced with Bears, particularly those used in hunting, should be favoured. A barking dog may also discourage a Bear from entering camp, especially if it has been hunted with dogs previously.

Dogs must not roam around loose however, because an excited, aggressive dog can aggravate a Bear and bring the Bear towards you as it retreats to safety. Dogs are not infallible in alerting the camp to Bears, and operators should consider electronic warning devices in addition to dogs.

Perimeter Detection Devices

The idea of having an electronic device continuously monitoring the perimeter of a camp is appealing. Several such devices have been tried experimentally and at camps.

A trip wire fence proved unreliable because winds and frost on the wires caused false alarms. Bears also learned to crawl under or jump over the fence. These fences required a great deal of maintenance under arctic field conditions and had to be reset after each incursion. The experimenters concluded that a trip wire fence was useful to detect the approach of Polar Bears around small, temporary camps.

Another device called a proximity detection unit uses an antenna suspended to detect Bears passing underneath. This system was considered inadequate because constant adjustments were required in the field; otherwise, the device either missed Bears or produced false alarms.

A system using microwaves was the only device that consistently and reliably detected approaching Polar Bears in the field. This device establishes an invisible beam of microwaves between a transmitter and a receiver. A Bear breaking the beam, triggers an alarm within the camp. Four units would provide detection on all four sides of a camp. Powered by a 12 volt battery, this system has an operating range of about 450 m on level ground.

The microwave units proved easy to install and maintain in the field. A few drawbacks were noted: curious Bears regularly knocked the microwave transmitter out of alignment and once destroyed it. They also chewed on cables connecting the receivers to the alarm. Some sort of Bear-proofing

must be designed. Also, the microwave unit requires line of sight between transmitter and receiver. Therefore, the perimeter of a camp might require levelling before installing the detectors.

A microwave detection system should alert the camp at the approach of a Bear. What measures might then deter the animal from coming into camp ?

Bear Deterrents

Experimenters have tried a variety of approaches for discouraging Polar Bears from coming into camps or garbage dumps. These include electric fences, playing recordings of the sounds of aggressive Polar Bears or of dogs barking, scare devices that make loud noises, use of various chemicals and shooting the Bear with painful but harmless hard rubber bullets developed for riot control. Few of these methods have acted consistently in deterring Bears.

Electric fences

No electric fences have been tested that prevent the passage of Polar Bears. The Bears' thick fur and footpads insulated them so well

that most did not even receive a shock when touching or climbing over electric fences, even when barbed wire with extra long barbs was used to help penetrate the fur. Bears which received a shock and were repelled initially, quickly learned which wires carried the charge and how to climb through the fence without getting shocked, often damaging the fence in the process. Possibly a Bear-proof fence could be constructed by using a negatively charged chain link fence with positively charged barbed wires strung on the outside. However, such a fence would cost so much to install and maintain that it could only be used for permanent camps.

Bear scaring devices

Several kinds of noise makers such as thunderflashes or teleshots (essentially large firecrackers) are available as Bear deterrents. When thrown or shot at the Bear from a 12 ga. shotgun, these produce an extremely loud explosion. These devices seem to frighten off most Bears the first time they are used, but may lose their effectiveness with repetition if the Bear returns repeatedly, for example, if attracted by smells of food or garbage at a camp. Scaring off a Bear once he has become habituated to feeding on garbage is very difficult. Crews working in the field and living in small isolated camps should carry these scaring devices.

Recorded sounds as deterrents

Loudly played recording of dogs barking or of the aggressive sounds of Polar Bears sometimes frighten away approaching Polar Bears, or at least make them more hesitant in approaching. However, some Bears behave aggressively toward the sounds or come closer out of curiosity. The difference in behaviour probably depends on whether the Bear is a dominant male or has had previous experience with dogs. At their present stage of development, recorded sound cannot be considered a reliable method of frightening away inquisitive or hungry Bears.

Chemical deterrents

Several kinds of chemical mixtures are sold to keep dogs out of gardens, etc. or for protection against attacks by dogs. These repellents produced no noticeable effects on Polar Bears at bait sites. Some repellents designed for use against attacking dogs appear to cause discomfort when sprayed in the face of captive Bears, but their effectiveness in the case of a real Bear attack is still uncertain.

Shooting with Rubber bullets

Of all the devices tested for deterring Polar Bears, a 38 mm. gun shooting hard rubber bullets showed the most promise. These trials took place with wild Bears feeding at baited sites, as well as those that approached a camp out of curiosity rather than coming to food or garbage. All bears struck with rubber bullets at a range of 40 - 60 m immediately ran away. Of the few animals that returned later, some retreated upon hearing the recorded sound of barking dogs which had previously been played before shooting the Bear with the riot gun. One returning Bear had to be shot again before it ran off. No Bears struck by rubber bullets showed blood or any other sign of injury, but a bullet hitting a Bear in the eye or temple could hurt it. Therefore, all shots should be aimed at the hindquarters or chest.

Rubber bullets suitable for firing in a standard 12 ga. shotgun are currently being developed and tested in Norway. If these bullets prove effective, then commonly available shotguns can function as Bear deterrents.

Accurate shooting with the 38 mm. riot gun requires instruction and practice. Camps intending to use rubber bullets as a Bear deterrent should allow sufficient time for personnel to familiarize themselves with the equipment before going into the field.

Continuing research on Bear Deterrents

Research is continuing to find more effective methods of deterring Polar Bears and protecting camps in the arctic.

For example, devices currently under development and testing include a portable, remote controlled cage to be used by operators to trap and relocate Bears that come into camp and a survival vest that releases a foul smelling and tasting chemical if a Bear attacks the person wearing it.

Those desiring the most up-to-date information and advice on Bear deterrents should contact: Yukon Bear Biologist (403) 667-5177, or N.W.T. Polar Bear Deterrent Biologist (403) 873-7775.

The following table lists sources as well as the advantages and disadvantages of many of the Bear detectors and deterrents that have been tested. Those planning camps in Bear-country may select an array of devices suitable for their needs.

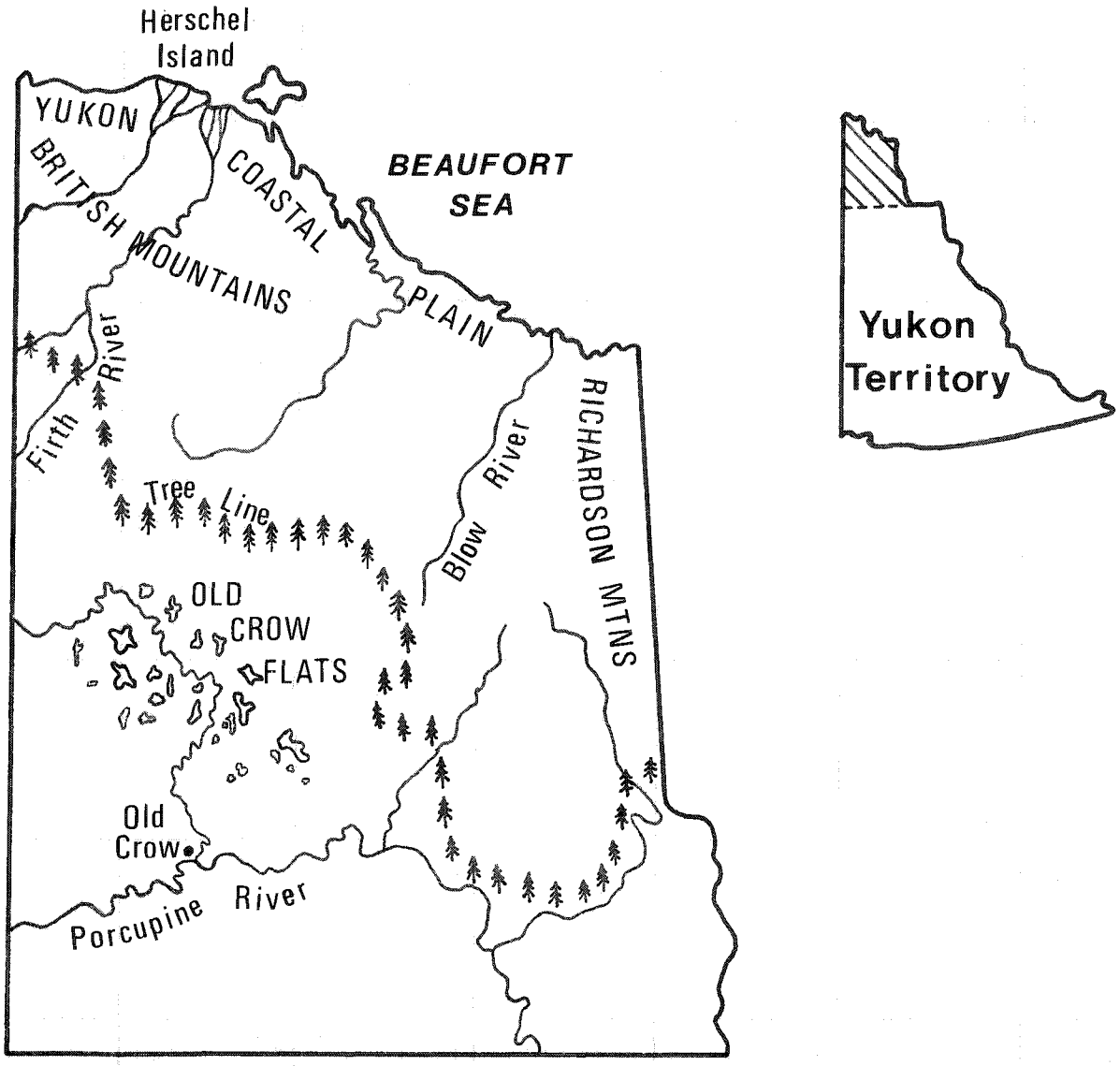
ADVANTAGES AND DISADVANTAGES OF VARIOUS BEAR DETECTORS AND DETERRENTS

DEVICE	ADVANTAGES	DISADVANTAGES	AVAILABLE FROM
Dogs	Cheap, available in the North. Act as both Bear detectors and deterrents.	Dogs inexperienced with Bears may be unreliable. Loose dog may bring Bear back to humans.	Tuktoyaktuk Bear Dog Co., Tuktoyaktuk, N.W.T.
Microwave Detector	Highly reliable, relatively quick and easy to set up. Offers 24 hr. detection.	May be damaged by Bears. Requires level ground to operate.	Racon.Inc. 12628 Interurban Ave So. Seattle, WA 98168, U.S.A.
Tripwire Detector	Relatively cheap and quick to set up. Offers 24 hr. detection.	Subject to false alarm in wind and frost. Must be reset after each alarm.	
Proximity Detector	----------	Unreliable. Without continual adjustment it misses Bears or gives false alarms.	
Electric Fences	In theory, offers 24 hr. protection against Bears entering camp.	Fences expensive and difficult to maintain. Bear fur insulates them so well, they don't receive a shock and penetrate the fence.	Baker Equip. from: Alpec Merchant Corp. 9620 - 27 Ave. Edmonton, Alberta T6N 1B2
Bear Scarers	Cheap, light easy to use in the field. May be thrown or shot at the Bear when he is still distant.	May not frighten all Bears. Lose their effectiveness with repeated use if Bear returns.	Teleshot, Colt Industries, Colt Firearms Div. U.S.A. / Twinshot Maison D'Armes, 181 Rue St-Paul, Quebec, P.Q.
Recorded Sounds	Could be hooked up to sound automatically when microwave detector senses an approaching Bear.	Does not deter all Bears. May make some Bears aggressive or curious.	
Chemical Deterrents	Of potential value for keeping Bears out of dumps, caches, etc. and for driving off an attacking Bear.	Ineffective or of questionable effectiveness at current stage of development. May injure Bear.	
38 mm Riot Gun Shooting Rubber Bullets	Highly effective in driving off Bears. Can be fired at Bear 40-60 m away. Unlikely to injure Bear if properly used.	May be difficult to obtain. Requires training and practice.	Schermuly Ltd., Wiltshire, England.
12 ga Rubber Bullets for Shotguns	Same as for above. Guns more widely available than 38 mm riot gun. Also, 12 ga slugs or buckshot could be put into magazine before rubber bullets. If rubber bullets do not deter, Bear can be killed.	Still under development.	

GRIZZLY BEARS NORTH OF TREE LINE

Tree-line in the Yukon extends further north than anywhere else in Canada. Therefore, relatively little of the Territory lies in the treeless arctic region. But these tundra reaches are home to thriving populations of Grizzly Bears.

Within the treeless region, three distinct habitats occur: the flat, marshy arctic coastal plain, the rolling British Mountains and the rugged northern end of the Richardson Mountains. To the south of these tundra regions lies the lake-strewn Old Crow Flats, with its shrubby muskeg and stunted spruces. Each of these regions supports quite



different Grizzly populations. The coastal plain provides poor habitat for Grizzlies, and Bears are scarce here; perhaps one Bear per 200 - 300 km^2. The mountain habitats sustain good Bear populations with densities averaging about one Bear per 40 km^2, as high or higher a density than many other areas of the Yukon.

The biology of Grizzlies in the northern Yukon is much the same as in the rest of the Territory, but includes some important differences. In the arctic regions, the snow-free growing season spans an even shorter period; plants produce less growth each year. This means that Bears are active for a shorter part of the year and may have even more trouble meeting their energy requirements. No salmon runs occur in the rivers draining into the Arctic Ocean. With less energy available to them each year, the Bears mature later and produce fewer young than those further south. This means that arctic Grizzly populations are even more vulnerable to a reduction in their numbers than populations further south.

Twice each year, in the spring and fall, the migration of the Porcupine caribou herd passes through the northern Yukon. The calves are born in early June on the coastal plain and in the northern foothills of the British Mountains. Then, after moving into Alaska for a sojourn of a month or less, the entire herd (currently numbering more than 125,000 animals) returns to the Yukon, traveling in large groups through the British Mountains, across the northern part of the Old Crow Flats, into the Richardson Mountains.

The northern Grizzlies hunt caribou wherever they pass through the Bears' territories. Newborn and young calves constitute most of the Bears' prey, although they sometimes catch adults as well. The Bears probably do not travel long distances from their home ranges to find caribou; instead they hunt when the caribou come to them. But the high energy caribou meat provides a very important resource to these northern Bears in their unproductive habitats. Grizzlies in regions visited by the caribou grow faster, mature earlier and maintain higher population densities than those without this source of food.

With no trees to climb, knowing how to act when you see or meet a Bear takes on added importance. Review the information on how to react in Bear encounters on pages 40 - 45 on this manual. Remember that northern Bears may approach out of curiosity or try stalking you until they realize that you are not a caribou. Help an approaching Bear identify you by talking and waving your arms.

When caribou arrive in your area, be particularly on the lookout for carcasses of animals killed by Bears. Never investigate a kill that you see or smell. A Bear defending his kill is particularly aggressive and may attack.

Disposal of garbage by burying is always discouraged as ineffective, but in the permafrost regions of the northern Yukon, it is even more untenable. Even in mid-summer, the thawed "active layer" of soil above the permanently frozen ground is only a foot or two deep. Disturbing this active layer will result in a muddy slump hole that quickly exposes the garbage and makes an unsightly mess. Burning refuse on the surface of the ground will likewise cause melting of the permafrost that will enlarge over the years in ice-rich soils. Therefore, garbage should be burned in a forced air incinerator and the residue flown out.

Vulnerability of Arctic Bears

Although we have concentrated on techniques to avoid damage done by Bears to human property, industrial activity can damage Bear habitat as well. The greatest threat to Polar Bears comes from contamination of the sea through oil spills or improper disposal of other chemicals. Exploratory drilling, tapping and transportation of oil in the arctic marine environment will have to be carefully controlled. But even small spills from fuel caches at remote camps could cause local problems.

Proper disposal of garbage and other wastes is also important to protect the Bears. Broken glass, sharp metal, burning material and corrosives or poisons at poorly maintained dumps could injure or kill Bears.

Northern Grizzlies have had few contacts with humans. Virtually no hunting for Bears takes place in the northern Yukon. Consequently, the Bears here may be more curious and less afraid of humans than those from populations that have experienced hunting. The predatory habits of northern Grizzlies means that they are more likely to approach or stalk a person, until they realize that he is not suitable prey.

People camping and working in the northern Yukon should be aware of the differences in habitat and the behaviour of Bears there and act accordingly. Because of the open, treeless terrain, sight plays a more important role both for you and the Bear. Stay alert! Despite the absence of real trees, the broad northern river floodplains are still choked with tall willows where Bears may be hidden while feeding or resting in the shade. Try to stay away from these thickets whenever possible.

Humans are invading the northern wilderness, the Bears last stronghold, in increasing numbers. If human-beings continue to act in irresponsible ways that lure or provoke Bears into situations of conflict, then the great Bears will ultimately be destroyed. But if we understand the behaviour of Bears and learn their strengths and weaknesses, and above all, respect their rights to be there as the first residents, then there is no reason why men and Bears cannot co-exist. Then our time in the northern lands will continue to be enriched by the presence of Bears, the most powerful spirits of the wilderness.