

# Polar Bears in Svalbard



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Photo: T. I. Karlsen

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Photo: T. I. Karlsen

## The Precautionary Principle

Polar bears are impressive creatures. They are the world's largest land carnivores and for many people they have become a symbol of Arctic wilderness. Like the Arctic they have come to represent, polar bears are beautiful, but dangerous. Occasionally, human encounters with polar bears have a fatal outcome – either for the people involved, the bear(s) or both. By following the Precautionary Principle (keep your distance), we can avoid such tragic outcomes.

Norway's polar bear population lives in and around Svalbard; these bears are actually part of a population that inhabits the Northern Barents Region, including Russian territory east to Franz Josef Land. Norwegian authorities take their stewardship of the polar bear in Norway and the preservation of its habitat – the Svalbard Archipelago – seriously. The Norwegian Government has

set the goal of having Svalbard be “one of the best managed wilderness areas in the world”. To achieve this goal, it is vital that visitors and residents follow regulations and help preserve this unique High Arctic wilderness area and its flora and fauna.

This brochure provides practical information regarding how to conduct yourself when in polar bear territory in order to avoid conflict and how to behave should you accidentally come into a situation where you have close contact with a polar bear. The aim is that the information given here should make it clear why baiting, pursuing or actively seeking polar bears is illegal in Svalbard.

## Polar Bears in Svalbard

The polar bear, *Ursus maritimus*, is closely related to the brown bear from which it evolved about 200 000-300 000 years ago. Despite the short time since these two species split, the polar bear has undergone significant morphological changes in becoming adapted to the specific demands the Arctic environment puts on the animals living there. The most obvious of these adaptations is the white fur. The beautiful fur was the primary reason this species was hunted from the time of the early explorers, sealers, and whalers, and later – starting around the turn of the last century – by specialized polar bear trappers (see Hunting, Laws and Regulations). Population sizes decreased rapidly throughout the world in the 1900s until polar bear harvesting became regulated following the signing of an international treaty in 1973.

Twenty different polar bear populations are recognized throughout the Arctic region. Svalbard's polar bears occupy the area from Spitsbergen in the west to the Russian archipelagos of Franz Josef Land and Novaya Zemlya in the east. These bears are referred to as the Barents Sea population.

Female polar bears on the east coast of Svalbard display two different movement patterns. Some individuals roam over large areas, ranging from their denning areas in Svalbard across to Russian territory, spending most of their time along the southern limits of the Arctic ice hunting for seals. Other individuals have a less energy demanding lifestyle, occupying much smaller home ranges that are restricted to Svalbard and its adjacent waters; these bears have a shorter hunting season.

There is some movement of bears between the Barents Sea population, the eastern Greenland population in the west and the Kara Sea population in the east, but exchange between these groups is limited. The Barents Sea population probably contains over three thousand polar bears. Approximately half of these bears are located primarily on or around the islands of Svalbard. The main denning areas in Svalbard are located on Kong Karl's Land, Hopen, Edgeøya and Nordaustlandet. The tiny island of Kongsøya has the highest recorded density of polar bear dens in the world: in 1980 at Bogen on Kongsøya there were 12 dens per km<sup>2</sup> and in August 1984, 168 bears were observed on the island!

## Polar Bears and Humans

Polar bears are potentially dangerous animals, and you should never move around in polar bear territory without being well prepared. In Svalbard, people have been killed on several occasions, including incidents in recent years. On average, three bears have been killed every year during the period from 1993 to 2004 in encounters with humans, i.e. in self-defence. This number can be kept low if people try to avoid critical encounters, and behave in the most sensible way when interacting with bears. Accidents with fatal outcomes are highly unlikely if you follow a few simple procedures.



Photo: F. Jørgensen

Polar bear sign in Longyearbyen: "Valid for all of Svalbard".

## Precautions

### Gain knowledge about polar bears

Learn about the animals and the danger they can represent before entering polar bear country – particularly if you are planning to move around outside the settlements. Study this folder carefully and contact the Governor of Svalbard or the Norwegian Polar Institute (see addresses at the back) if you require further information.

### Avoid confrontations

Pay attention to your surroundings at all times and be prepared to meet polar bears whenever and wherever travelling or camping in Svalbard. Take measures to avoid confrontations and dangerous situations. If you spot a bear at a distance, avoid an encounter by staying out of its path, and never move toward the bear. The call of adventure or the desire to take photographs does not justify putting yourself, your companions or the polar bear in danger.

### Be armed

Always have a sufficiently powerful weapon at hand when travelling in Svalbard outside the settlements. Be prepared to scare away approaching bears using a scaring device (see p. 6). Polar bears are large and formidable, and a wounded bear is a "worst-case scenario". Human fatalities have occurred in Svalbard when people have defended themselves against polar bears with weapons of insufficient calibre. A high powered big game rifle (calibre .308 win, 30-06 or heavier) is the best weapon for



Photo: K. M. Kovacs

Polar bears usually give clear signals prior to an attack, when they become anxious, but many of these cues can be quite subtle. Bears under stress often flatten their ears, turn their heads away from the source of the stress, let their lips hang or yawn. More assertive signals can include front-foot stamping, growling or brief charges. But – attacks can also happen very quickly and without warning!

protection against polar bears, and hunting cartridges with expandable lead core bullets are the only recommended ammunition. The only alternative weapon is a pump action shotgun with rifled slugs (calibre 12); such a weapon must be able to accommodate at least four cartridges in the magazine. Make sure that you are familiar with your weapon to the point where you can aim it and operate it under stress. If you have never shot before, get instructions and training from an experienced person.

## **Camping in polar bear country**

### **Camp location**

Some areas in Svalbard are more prone to have polar bear activity than others. Avoid setting up camps in areas where encounters are most likely. Polar bears often follow the shoreline, both in summer and winter, so camps should always be placed some distance from the shore, preferably with a good view in all directions. Avoid camping near the front of glaciers, close to ravines and narrow valleys or close to possible den sites. Always avoid setting up a camp in areas where there are polar bear tracks.

### **Detection systems**

All camps should be surrounded with trip wires or have other polar bear detection systems. In Svalbard, a system where



Trip wire.

the wire is connected to a flare (that explodes and burns with a bright light) is most frequently used. The wires should be placed several metres away from the tents, preferably at two heights (about 30 cm and 70 cm above the ground). Well-trained dogs can be used to give early warning that there are polar bears around the camp. They can detect bears at a long distance, but if a bear approaches from down wind, there is a risk that the dog may not pick up the scent of the bear. Dogs used to detect bears should always be tied up outside the tents. Another good solution is to have a revolving guard system, such that the camp is always being watched by a designated person – particularly at night when everyone else is indoors sleeping.

### **Cooking and food storage**

Polar bears can smell food over very long distances and dangerous situations can arise when bears are attracted by food at campsites or cabins. It is therefore important to store food securely, in a manner that prevents bears from having access to it – away from sleeping tents. Pack food in plastic or place it inside food boxes to reduce the odour, and be particularly alert when preparing food outdoors. Avoid cooking strong-smelling food inside tents, because the odour remains in the tent canvas for prolonged periods, making them attractive to bears. You must never use food to attract polar bears and never feed them. Bears that have been fed become bolder in approaching people and there is an increased likelihood of encounters where the bear will be shot or people hurt or killed.

### **Waste disposal**

Polar bears are attracted by the smell of garbage and waste. They will come to check if anything edible can be found. Polar bears visiting waste dumps near settlements are a problem throughout the Arctic. In a camp situation, waste should be stored some distance away from the main campground in a spot that can be monitored easily.



### **Firearms**

Always have the gun close by and take it with you whenever you move around in camp or go out on expeditions. Be sure that your gun is in good serviceable condition and that it is clean – oil can jam a gun if it is cold outside. To avoid accidents, keep the chamber empty; keep shells ready in a loaded magazine. Other bear deterrent equipment (flares) and extra shells should be kept so that they are easily found should a bear enter the camp.

## **Encounters with polar bears**

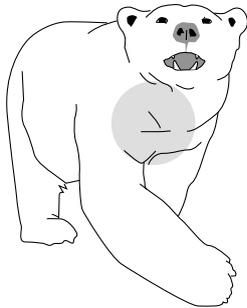
### **Weapon ready**

Have your weapon ready for use, but put a shell into the chamber only when the bear is so close that you feel the situation is threatening.

### Assess the situation

Polar bears do not usually look upon humans as food. But they are naturally curious and will check out everything in their search for food. A really hungry bear will eat almost anything. Young animals are often the most dangerous; they are inexperienced, have limited hunting skills and may have a hard time catching prey. But older weak animals that have trouble catching normal prey can also be dangerous. Bears can be a problem if they get taken by surprise and feel they have to defend themselves. Females with young cubs are usually quite shy, but if you surprise them by suddenly appearing at a short distance, they are also very dangerous because they will defend their cubs.

Also worth noting is that if there is one bear in the area, chances are good there is another one around too. Maybe the female walking away from you is being followed by a male. Maybe the bear you see is an adolescent cub a short distance from its mother.



If forced to shoot a polar bear, aim at the chest or the shoulder.

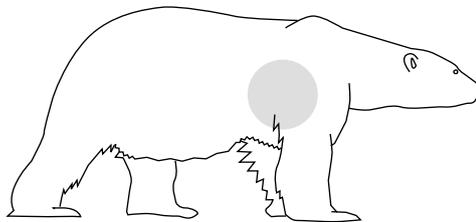
Most bears will run away when confronted by humans, or at least attempt to avoid an encounter, even if they are curious. Many situations can be assessed with some common sense and knowledge of bear behaviour. If there is time, your first step should be to determine what kind of polar bear(s) you are dealing with, and whether it is interested in you or not. Remember to play it safe, though. It is always best not to count on the bear avoiding you.

### Make yourself visible

If the bear moves directly toward you, make yourself visible early and also make noise. Shouting and clapping of hands or starting an engine, i.e. a snowmobile or outboard engine will make the bear aware of you. This may be enough to cause the bear to withdraw.

### Warning shots/flare shots

If the bear's interest in you or the camp continues, you should be prepared to use a signal pistol with crack cartridges, or shoot a warning shot from a rifle to scare it away. Start preparing to take action when the bear



is still at some distance. Flare shots are the best equipment for this (i.e. better than using a rifle). Aim such that the flare lands between you and the bear (i.e. not behind the bear). If you are using a rifle, be careful not to shoot into the ground too close to the bear, because ricochets may hurt the animal. If the bear is already moving toward you, aim to one side or above its head to avoid hitting it accidentally. Continue shooting rifle shots or flares until it retreats. In nearly all cases this will be sufficient to scare curious or even aggressive bears away. If there are trained dogs in the camp they can be let loose at this point. Dogs that show aggression towards polar bears often are efficient at chasing bears away.

### If you have to shoot the bear

If an aggressive bear attacks with no sign of being scared away by warning shots, shoot with the aim to kill. This is a last resort. Aim for the chest, below the head, either from the front or the side. Do not attempt a shot in the head because the skull of polar bears is tough and well protected by heavy muscles, and the vulnerable area is surprisingly small even on a big bear. Keep shooting until the bear lies still, and do not approach it until you are sure it is dead. Even then approach the bear from behind. Do not move the bear or remove anything from the scene. Contact the Governor of Svalbard immediately.

## Polar Bear Biology

The polar bear is a marine mammal, even though most people will see it on land. Polar bears have become specialized at eating seals and hence do most of their hunting out on the sea ice. They roam over huge expanses and adult animals can swim long distances when required to do so.

In Svalbard the polar bear's main prey species are ringed seals and bearded seals, although harp seals might also be important prey in some offshore areas. An adult polar bear needs to kill between 50 and 75 seals annually to meet its energy requirements. It uses different methods to get hold of the seals, such as waiting patiently beside a breathing-hole in the ice or sneaking up on a seal hauled out on the ice.

Polar bears are long-lived mammals that have low reproductive rates. Hence, when left to themselves, their population size changes slowly. In Svalbard, most adult bears die before the age of 30. Most female polar bears reproduce for the first time when they are about five years old. At this age they usually give birth to one or two cubs who will remain with them for the next two and a half years. Then the female mates again and will typically have cubs about every three years for the remainder of her life. Cubs often die when they are quite young, in which case a female can give birth again the following winter. Middle-aged females usually have two cubs, but litters of three do occur.

Most cubs are born around New Year's Day, weighing only a little more than half a kilo. However, they gain weight quickly over the next months in the den, drinking the nutritious, fat-rich milk their mother provides. Cubs weigh up to 10 kg in late March or early April when the family leaves the den. At this time of the year seal hunting is excellent: this is when ringed seals have their pups, which are born in lairs on the sea ice in the fjords around the islands.

In the fjords in Svalbard, particularly on the east coast of Spitsbergen, female polar bears are found in large numbers, actively

hunting to feed their growing young. Male bears also come into these areas, in the hope of mating with the females sometime between April and June. Competition for mating is intense, and often many males can be seen fighting for access to a female.

The fur of a polar bear tends to be yellowish in summer, whereas it is whiter in winter. The skin is black. Polar bears move quickly, but cannot maintain high speed over long distances. If chased by a snowmobile, for instance, bears can overheat and they can even die of heat stroke.



Photo: K. M. Kovacs

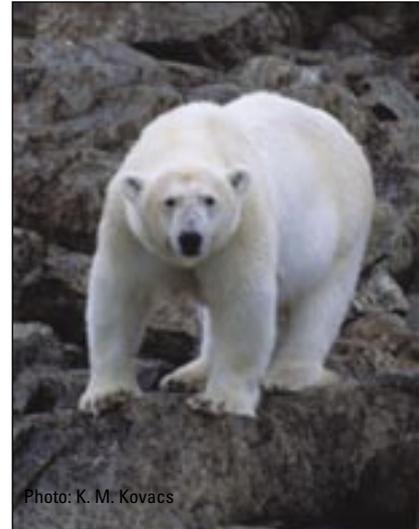


Photo: K. M. Kovacs

Bears that become trapped on land when the sea ice retreats northward in the spring/summer can face months of starvation. These emaciated animals (left) will readily turn to nontraditional prey – such as people – if they are presented with an opportunity to hunt. Well-fed bears (such as the one on the right) are less likely to look at humans as potential food.

## Polar Bear Facts

- An excellent swimmer; considered a marine mammal as it spends most of its life on sea ice and feeds at the top of a marine food chain
- Feeds almost exclusively on ice-living seals
- Can survive up to 8 months without eating
- Can easily walk over 5000 km a year
- Moves quickly, reaching a speed of more than 30 km/h over short distances
- Has a well developed sense of smell
- Typically weighs 400-600 kg. Males are larger than females
- Cubs weigh only about 600 g at birth



Photo: H. Wolkers

Female bear with cubs. These females are usually quite shy. But they can be dangerous – attacking readily in defense of their young.

## Hunting, Laws and Regulations

In Svalbard, polar bears were hunted heavily in the period from the late 1800s until 1973. In the 1920s more than 900 bears a year were killed in Svalbard, and even after WWII the numbers of bears killed annually were as high as 400-500. During the last 25-30 years before the treaty entered into force, harvesting decreased somewhat, but still several hundred polar bears were killed each year in Svalbard. Around 1970 there were probably no more than 1000 polar bears left in Svalbard, and the population was in danger of extinction.

Polar bears have been hunted in many ways through the years – with guns, traps and

even poison. Boats, aircraft and helicopters were used during safari hunts in the 1950s, when wealthy hunters paid for the expeditions. The most efficient hunting was performed using set-guns. Each trapper had a series of these automated baited guns in their hunting territory, and some individual trappers brought back more than 100 hides at the end of a season. Although “efficient” these guns hunted indiscriminately, wounding some bears, and killing mothers of cubs. Other factors also contributed to depleting the population. In addition to adults being killed, a large number of cubs were brought back to Europe from Svalbard and placed in zoos.



Photo: Ing. Klingenberg

Old polar bear trap at Kapp Martin.

In 1973, The International Agreement for the Conservation of Polar Bears and Their Habitat (referred to as the Agreement) which co-ordinates the overall management of polar bears world wide, was signed by all countries that have polar bear populations (USA, Russia, Canada, Greenland/Denmark and Norway). The Agreement was designed to stop the decline in polar bear populations around the globe and to conserve areas with important habitat within their circumpolar range. It was also designed to safeguard traditional hunting of the animals by indigenous peoples in the Arctic. The Agreement directs all signing parties to conduct research to ensure sound management of polar bear populations, and creates an international forum where the different nations can exchange information and share advice.

In Svalbard there were restrictions on polar bear hunting as early as 1927, when the use of poison in the polar bear hunt was prohibited. In 1939 an important denning area, Kong Karl's Land (land areas), was declared closed to hunting. Shooting of cubs and females with cubs was prohibited in 1965. Despite these restrictions, polar bears in Svalbard were heavily over-harvested until the International Polar Bear Agreement came into effect.

Several local laws and regulations in Svalbard are relevant to how humans should act in relation to polar bears. The Svalbard Environmental Protection Act, Regulations relating to tourism and other travel in Svalbard, Regulations related to harvesting and Regulations relating to camping activi-

ties in Svalbard, all protect the environment in Svalbard and thus polar bears and their habitat. In areas with particularly high polar bear density such as the national parks on Spitsbergen and the eastern part of Svalbard, travel restrictions apply, especially travel with snowmobiles. On Kong Karl's Land access is prohibited on a year-round basis because of the high density of polar bears and the fact that so many bears den on these islands.

It is prohibited throughout Svalbard and surrounding waters to bait (lure), pursue or otherwise seek out polar bears in such a way as to disturb them or expose either bears or humans to danger (Svalbard Environmental Protection Act, § 30).

Legal, restricted hunting of polar bears takes place in most other Arctic areas. The Barents Sea population is unique in being under no harvesting pressure. Although the population size in the Barents area is not known precisely, it is clear that polar bears have recovered considerably in Svalbard since 1973.



Photo: M. Andersen

## Polar Bear Research

The Norwegian Polar Institute has conducted a polar bear research programme for many decades. In the 1960s, animals were tagged and samples were taken from many of the animals that had been killed by hunters. Today, the research is done exclusively on live animals. Much of the field work is performed using helicopter transport, enabling the researchers to access large numbers of animals over broad geographic areas. In an average year, approximately 100 bears are captured and measured and the data are used in a variety of studies. More than 1000 bears have been marked since 1990. Approximately 100 females have been fitted with satellite radio telemetry transmitters to register their movements. A rudimentary tooth is taken from all animals older than one year of age the first time they are captured, to estimate their age. Over time, data collected during the capture and recapture of individual animals will provide estimates of survival and reproductive rates. This is important information that can help predict population growth and population viability.

Recent advances in the field of genetic research are also being put to use. Genetic markers can reveal a lot about the biology of a species. Blood and tissue samples are collected from all bears captured, making it possible to determine family relations and population structure. The degree of genetic differentiation between bears from different denning areas, and from Svalbard versus areas to the west and the east, tells how

much polar bears move between the areas. This has implications for how quickly the polar bears will be able to adapt to changing conditions, for instance whether they will be strongly affected if climate change makes some denning areas less suitable. Genetic techniques also make it possible to monitor past and future changes in population distribution due to changing conditions such as hunting pressure and habitat availability.

### Climate change

Climate change is expected to cause serious problems for polar bears; recent research on Arctic climate shows alarming trends. It is possible that the ice cover surrounding the North Pole will disappear in summer within this century, and that the period each winter during which new ice is formed – ice that covers the fjords and areas around the islands and provides polar bears with their prime hunting ground – will get shorter. Reductions in the amount of suitable habitat and increased difficulty hunting seals would have a profound effect on polar bears. Weather conditions during the denning period will also be affected by climate change, and this might be detrimental: polar bears need large volumes of solid snow in which to dig their dens. Less sea ice also creates a danger that different populations will become isolated from one another, which would have a negative impact on the genetic variability within populations, and increase the danger of local extinction. Finally, lack of available food in the summertime could also lead to more confrontations with humans.

## Pollution

The other main threat to polar bears is the fact that alarming levels of several toxic compounds have been observed in the Arctic. Wind and ocean currents transport toxins to the Barents Sea region. Polar bears and other predators are at particular risk as they are at the top of the food chain, consuming prey (fish, seals etc.) that have accumulated pollutants from lower trophic levels. The high levels of the persistent organic pollutant PCB and other fat-soluble pollutants in polar bears are a cause for concern. At high concentrations, pollutants may affect vital functions and the reproductive system, and have been shown to affect immune system responses. Intensive work is being conducted to monitor the levels of toxins in the animals. Although the polar bear population has grown in a period with high levels of pollutants, interactions with other factors, such as climate change, may increase the negative impact of toxins on the average life span. It is therefore important to continue monitoring programmes.

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Protect yourself and polar bears by being smart and playing it safe in polar bear country.

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Scientists from the Norwegian Polar Institute checking an anaesthetized polar bear's teeth (above) and taking blood and fat samples (below).



Photos: A. Derocher

## Contact Information

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## Information on the Internet

Norwegian Polar Institute ..... [www.npolar.no](http://www.npolar.no)  
The Governor of Svalbard ..... [www.syssemmannen.svalbard.no](http://www.syssemmannen.svalbard.no)  
The IUCN Polar Bear Specialist Group ..... [pbsg.npolar.no](http://pbsg.npolar.no)  
The International Association for Bear Research and Management..... [www.bearbiology.com](http://www.bearbiology.com)

