

Ursus maritimus. By Douglas P. DeMaster and Ian Stirling

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Ursus maritimus Phipps, 1774

Polar bear

- Ursus maritimus* Phipps, 1774:185. Type locality Spitzbergen.
Ursus marinus Pallas, 1776:691. Type locality Arctic Ocean, Siberia.
Ursus polaris Shaw, 1792:7. Renaming of *marinus* Pallas.
Thalassarctos eogroenlandicus Knotterus-Meyer, 1908:182. Type locality pack ice off coast of eastern Greenland.
Th[alassarctos] labradorensis Knotterus-Meyer, 1908:183. Type locality Okak, Labrador.
?Thalassarctos jenaensis Knotterus-Meyer, 1908:184. Type locality Jena Island, Spitzbergen.
?Th[alassarctos] spitzbergensis Knotterus-Meyer, 1908:184. Type locality Seven Islands, Spitzbergen.

CONTEXT AND CONTENT. Order Carnivora, Family Ursidae. The genus *Ursus* includes three species. The living populations of *Ursus maritimus* are not divided into subspecies (Wilson, 1976), although one fossil subspecies is recognized (Kurten, 1964).

DIAGNOSIS. Typically the body of a polar bear is stocky but lacks a shoulder hump. Polar bears have a longer neck and smaller head than other ursids (Fig. 1). The combined length of the first and second molars is less than the palatal width.

GENERAL CHARACTERS. Fur color varies among white, yellow, grey, or almost brown, depending on season and light conditions. The nose and lips are black, as is the skin. Adult males weigh 300 to 800 kg and measure 200 to 250 cm in length from tip of nose to tip of tail. Adult females weigh 150 to 300 kg and their total body length is about 180 to 200 cm. It is not meaningful to give mean weights because there is a cline in size from Spitzbergen, where the bears are smallest, to the Bering Strait where they are largest (Manning, 1971). Presumably the cline is similar across the Soviet Arctic to the Bering Strait, but this has not been investigated. Cubs weigh roughly 0.6 kg at birth and 10 to 15 kg when they emerge from dens in March or April. In March, yearlings weigh between 45 and 80 kg, while 2-year-olds weigh between 70 and 140 kg. Females reach adult weight by year 5 and males between years 8 and 10.

The length of skull (Fig. 2) ranges from 353 to 412 mm in males and from 311 to 380 mm in females. For adults, the height at the shoulder varies from about 130 to 160 cm. The length of tail ranges between 76 and 127 mm (Uspenskii, 1977).

Polar bears have a plantigrade gait and five toes on each foot. The claws are not retractable and in adults are 5 to 7 cm in length. The forepaws are large and oarlike, as an adaptation for swimming.

DISTRIBUTION. Polar bears are circumpolar in distribution. The southern limits of their range are determined by the distribution of pack ice and annual landfast ice during winter (Fig. 3). The centers of six apparently distinct populations in the main polar basin are: Wrangel Island and western Alaska, northern Alaska, the Canadian Arctic archipelago, Greenland, Svalbard-Franz Josef Land, and Central Siberia (Parovschikov, 1964, 1968; Uspenskii, 1965; and Vibe, 1967; Lentfer, 1974; Stirling et al., 1975; Jonkel et al., 1976). Discrete subpopulations exist within the Canadian Arctic archipelago and James and Hudson bays (Stirling et al., 1975, 1977, 1978, in press). Polar bears have been recorded as far as 88°N (Stefansson, 1913, 1921) and as far south as St. Mathew Island and the Pribilof Islands (Ray, 1971) in the Bering Sea, James Bay (Jonkel et al., 1976) and Newfoundland in Canada (Smith et al., 1975), and Iceland in the North Atlantic. In some areas, such as the Beaufort Sea, polar bears make extensive north-south migrations in relation to the position of the southern edge of the drifting pack ice (Frame, 1969; Stirling et al., 1975). In the polar basin and adjacent areas, polar bears spend the summer along the edge of the pack ice. Near islands

or the mainland, they concentrate in bays that retain shore-fast ice. After breakup, most of the bears that are near islands spend the summer along the coastlines of these islands. Occasionally, adult males have been observed to climb snow-covered glaciers and ice caps. In Hudson Bay, bears go inland and endure the warmer weather by digging caves or pits down into the permafrost (Stirling et al., 1977). In winter, polar bears move to the southern edge of the drift ice, to the coastlines of islands, and to the northern edges of the continents after the annual ice forms in these areas. On the basis of available data, it appears that most pregnant females do not winter along the ice edge, but return to coastlines where suitable habitat exists to make dens for bearing their young. Lentfer (1975) has recorded apparent instances of maternity denning in the pack ice, but it is not yet clear to what extent this occurs. The long-term distribution of polar bears is governed by climatic changes which restrict or increase the amount of available habitat (Vibe, 1967). Climatic factors probably affect the distribution of maternity dens more than does any other aspect of the environment because pregnant females must have access to suitable denning habitat by late October or November.

FOSSIL RECORD. Polar bears are thought to have originated from a segment of the Siberian population of brown bears (*Ursus arctos*) which was isolated during the glacial advances of the mid-Pleistocene (Kurten, 1964). With the exception of the Western Canadian Arctic where brown bears have been seen on the sea ice and polar bears have been seen chasing caribou, the geographic ranges of polar bears and brown bears do not overlap. The dentition of polar bears reflects a rapid evolutionary shift from the heterodont dentition of other ursid types, toward more homodont cheek teeth, as in other aquatic carnivores (Hecht, 1963). Kurten (1964) and Manning (1971) agreed that extant populations of polar bears represent a single species. Kurten (1964) documented the last Pleistocene occurrence of the subspecies, *Ursus maritimus tyrannus*, which was much larger than recent fossils.

FORM. The pelage of the polar bear is made up of a thick layer of underfur (5 cm in length) and an abundance of tufted intermediate guard hairs (15 cm in length) (Uspenskii, 1977). The color of the fur varies mostly with the season of the year. After the molt the fur is often pure white. The yellowish shade often seen during the summer probably results from oxidation by the



FIGURE 1. Adult male polar bear (*Ursus maritimus*). Photograph courtesy of H. P. L. Kiliaan.

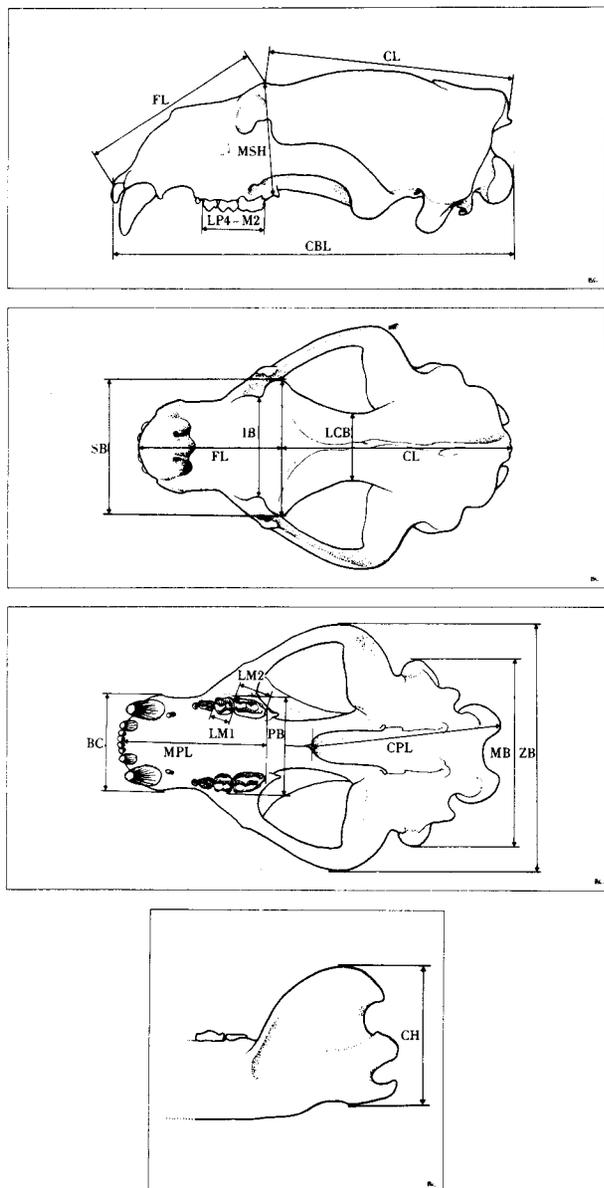


FIGURE 2. Polar bear skull (from Manning, 1971).

sun. Female polar bears have four functional mammae, two of which are 4 cm on either side of the midline of the belly slightly posterior of the axillae, and two of which are approximately 15 cm posterior to the anterior pair.

The dental formula is $i\ 3/3$, $c\ 1/1$, $p\ 2-4/2-4$, and $m\ 2/3$, total 38-42 (Banfield, 1974). Incisors are unspecialized and the canines are elongated, conical, and slightly hooked. The carnassial teeth are weakly developed. The first premolars are usually rudimentary. The fourth upper premolar does not have a third root (Stains, 1967). Sexual differences in the mandibular length were given by Larsen (1971) and molar measurements were reported by Gordon (1977). Polar bears can accumulate considerable amounts of subcutaneous fat. In adults, the thickness of this fat varies from 5 to 10 cm. Adult females are particularly fat just prior to denning.

Uspenskii (1977) described the musculature of a polar bear as powerful, with particularly well developed muscles in the posterior limbs and neck. The digestive tract is typical of carnivores, and apparently does not digest starches well. The stomach of an adult polar bear is large, with a capacity for more than 70 kg of food (Uspenskii, 1977).

The vitamin A content of the liver ranges between 15,000 and 30,000 units per gram (Rodahl and Moore, 1943; Rodahl, 1949; Lewis and Lentfer, 1967; Russell, 1967). This does not seem to vary with age or sex. A very high fatty acid content is char-

acteristic of the polar bear liver, but the phosphate, lipid, and cholesterol contents are relatively low (Uspenskii, 1977). Uspenskii (1977) gave descriptions of the eyes and brain of the polar bear.

FUNCTION. The composition of polar bear milk has been described (Baker et al., 1963a, 1963b, 1967; Cook et al., 1970; Jenness et al., 1972). It contains more fat than whale milk, but less than seal milk (Jenness et al., 1972). The ash content was similar to that of other mammals and the sodium content was high compared to that of other milks (Jenness et al., 1972). An analysis of baseline blood parameters suggests that cubs have higher alkaline phosphatase and calcium levels than adults, and that an overall increase in blood glucose occurs in October and November (Lee et al., 1972). Cardiac physiology at rest and during exercise has been studied (Hock, 1968; Folk et al., 1970, 1973; Øritsland et al., 1976, 1977).

Øritsland (1969) presented data on hypothermia in polar bears and indicated that polar bears use both blubber and pelt for insulation. The oxygen consumption rate during walking increases at twice the rate of most mammals (Øritsland et al., 1976). Heat dissipation is accomplished through the foot pads and shoulders (conduction), and by panting (evaporative cooling) (Øritsland, 1970; Øritsland et al., 1974; Øritsland and Lavigne, 1976). Folk et al. (1972) described the physiology of two males that were held in captivity under conditions that induce denning in brown bears.

ONTOGENY AND REPRODUCTION. Spermatogenesis takes place from February to May, and possibly into June (Erickson, 1962; Lentfer and Miller, 1969; Lønø, 1970). In Alaska, paired bears have been observed in the field between 21 March and 10 May (Lentfer, 1976a). Lønø (1970) noted breeding pairs in Spitzbergen between 8 March and 20 June. Uspenskii (1977) reported that implantation is apparently delayed and gestation (conception to parturition) is therefore relatively long (195 to 265 days). Cubs are born in December and January in dens (Van de Velde, 1957, 1971; Lentfer, 1976a). Two young are commonly born in captivity (Kostyan, 1954), but estimates of average litter sizes from the wild vary between 1.58 and 1.87 (Lønø, 1970; Stirling et al., 1975, 1977; Lentfer, 1976a; Lentfer et al., in press). Geographic differences in litter size and dates of denning and den emergence seem to exist, especially between the Hudson Bay population and all other populations (Stirling et al., 1977). The sex ratio at birth appears to be equal. Newborn cubs have hair at birth (Blix and Lentfer, 1979), but are blind and weigh only about 0.6 kg. By the time they leave the den in late March or early April the cubs weigh approximately 10 to 15 kg. Geographic differences in the age of weaning may exist. Lønø (1970) suggested that cubs were weaned by 17 to 18 months of age, but this was not confirmed for animals of known age. Usually cubs are weaned at about 24 to 28 months of age (Stirling et al., 1975; Lentfer, 1976a), but cubs have been reported to be weaned after 3 years (Stirling et al., 1975). The earliest age of sexual maturity in females (as evidenced by pairing with males) is 3.5 years (Lentfer et al., in press). The average onset of breeding in the Beaufort Sea takes place between 5 and 6 years of age (Stirling et al., 1975; Lentfer et al., in press). Therefore, the average age at which the first cubs are produced is between 6 and 7 years of age, with individual females first reproducing at 4 to 8 years of age. In the eastern Canadian Arctic, however, the age of first breeding appears to occur at 4 years of age, one year earlier than average elsewhere (Stirling et al., 1978, 1980). The reason for this difference is not apparent. The age of reproductive senility for female polar bears has not been clearly determined, but reproductively active females of 21 years of age have been reported (Stirling et al., 1975; Lentfer, 1976a). Females tend to be in peak reproductive condition between the ages of 10 and 19 years, and exhibit a lower natality rate beyond age 20 (Stirling et al., 1978). The mean time span between litters for polar bears in the western Beaufort Sea is 3.6 years (Lentfer et al., in press). The mean of eight known reproductive cycles, calculated from females who were captured and recaptured with different litters of cubs, was 3.1 years and ranged from 2 to 4 years with a median and modal value of 3 (Lentfer, 1976a). An estimate of the annual rate of reproduction for polar bears can be made by assuming that females between 6 and 18 years of age have an average litter size of 1.7 (Stirling et al., 1975, 1978), a sex ratio at birth of 1:1, and an average reproductive interval of 3.1 years, which results in an average annual rate of reproduction of 0.274 females per adult female.

Based on the presence of mature sperm in the testes and

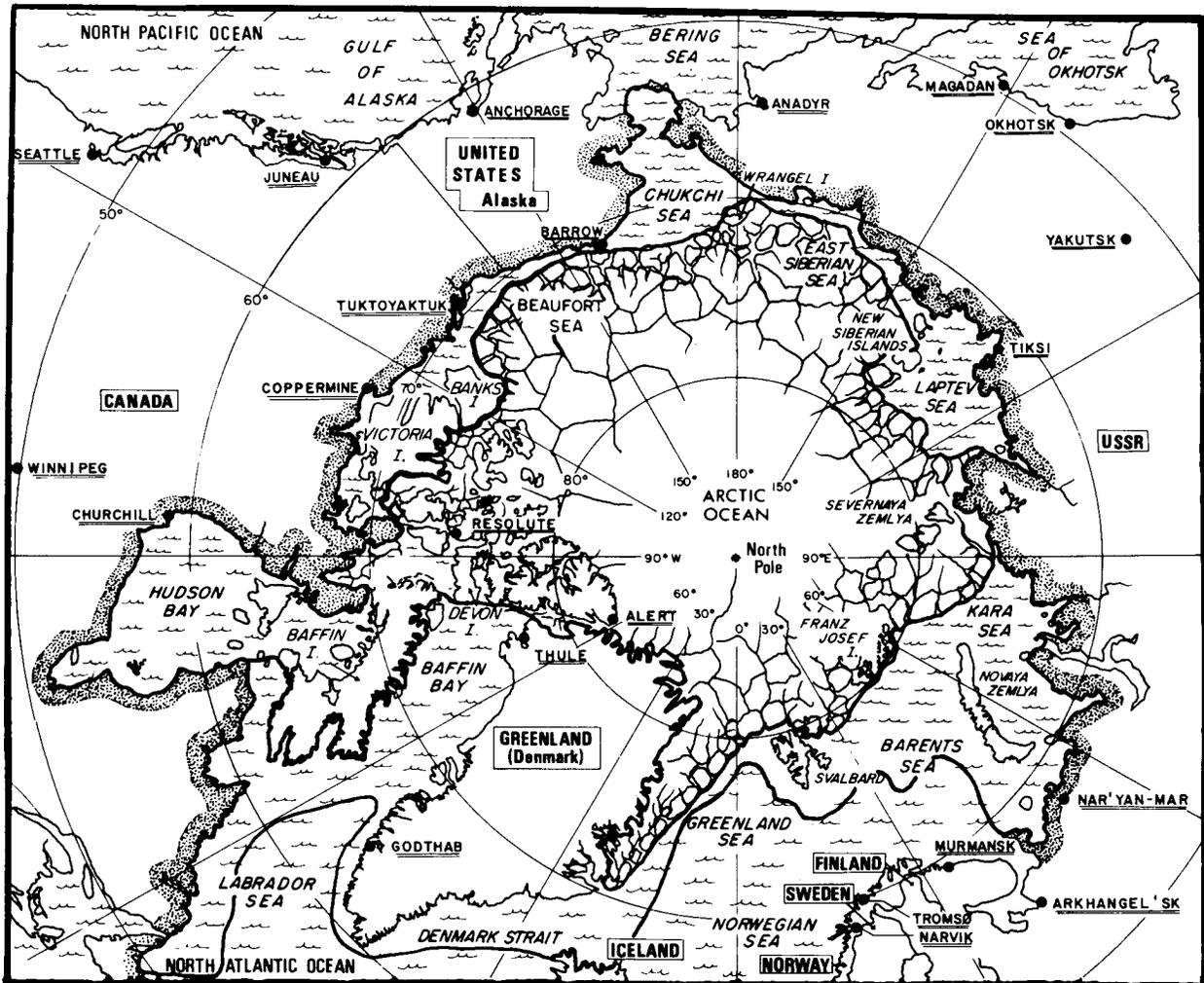


FIGURE 3. Distribution of polar bears. Their range is closely coupled to the distribution of polar sea ice. The inner dark line represents an average summer range of polar bears. The outer dark line represents an average winter range. The stipple pattern outside the winter range represents land areas which may be visited by female polar bears searching for den sites. Land areas enclosed by the winter range are also potential den sites. The ice cap is shown in an average summer position.

epididymis, the minimum and maximum age of breeding in males was estimated to be 3 and 19 years respectively (Lentfer and Miller, 1969). However, the presence of sperm does not necessarily indicate that copulation has occurred. Based on growth data alone (Kingsley, 1979), we suggest that it is unlikely that male polar bears mate before they are 6 years of age.

In Alaska, Lentfer (1976a) suggests that the maximum longevity for polar bears is between 20 and 25 years. Stirling et al. (1975) reported captures of animals 25 years of age, and estimated maximum longevity to be between 25 and 30 years. Age specific rates of survival are not precisely known. Mortality of adult males and females has been estimated to be between 8 and 16% (Stirling et al., 1976; Lentfer et al., in press). Typically, an annual mortality rate of 8 to 12% has been assumed (Stirling et al., 1976; DeMaster et al., 1980). Subadult mortality has been estimated between 3 and 16% (Lentfer et al., in press). The annual mortality of cubs prior to weaning is considered to be between 10 and 30% (Stirling et al., 1975; DeMaster and Stirling, in press).

ECOLOGY. Polar bears feed primarily on ringed seals, *Phoca hispida* (Stirling and Smith, 1975; Stirling and Archibald, 1977). The energetics of predation and caloric value of these seals were discussed by Stirling and McEwan (1975) and Best (1976). During spring at least half of the ringed seals killed by polar bears in the western Canadian Arctic are newborn pups (Stirling and Archibald, 1977). Bearded seals (*Erignathus barbatus*) are taken less often than ringed seals, but are important prey items. Polar bears also eat harp seals (*Pagophilus groenlandicus*) and hooded seals (*Cystophora cristata*); and scavenge on whale, walrus (*Odobenus rosmarus*) and seal carcasses (Russell, 1975; Heyland and

Hay, 1976). Polar bears have been reported to prey on walrus, but polar bear mortalities have been attributed to walrus as well (Kiliaan and Stirling, 1978). Occasional references (Freeman, 1973; Heyland and Hay, 1976) have been made to polar bears attacking beluga whales (*Delphinapterus leucas*). Polar bears occasionally eat small mammals, birds, eggs, and vegetation when other food is not available (Russell, 1975). Scavenging on the remains of seals killed by polar bears is probably of great importance to the survival of arctic fox (*Alopex lagopus*) through the winter (Stirling and Archibald, 1977).

The diseases of polar bears have not been well documented. Roughly 60% of Alaskan bears harbor *Trichinella spiralis*, apparently contracted through eating infected seals (Lentfer, 1976b; Rogers and Rogers, 1976). The pattern of environmental contaminants in bears from western and northern Alaska was reported to be different, suggesting that these populations are relatively isolated from each other (Lentfer, 1974a, 1976b).

The population dynamics of polar bears vary geographically (Larsen, 1968; Stirling et al., 1975, 1977, 1978, 1980; Uspenski, 1977; Lentfer et al., in press). Adult males (age 6 and above) comprise 12% of the Alaskan Arctic population (Lentfer et al., in press), 18% of the western Canadian Arctic (Stirling et al., 1975), and 17% of the Hudson Bay population (Stirling et al., 1977). Adult females comprise 26%, 19%, and 17% of these three populations, respectively. Cubs of the year, yearlings, and 2-year-olds constitute 32% and 26% of the Alaskan Arctic and western Canadian Arctic populations, respectively. Age composition reported from Alaska may include bias (Lentfer et al., in press) because a major portion of the sampling of natural populations was carried out in March and April when adult females with cubs

of the year would be near their dens. Therefore, the number of cubs of the year and 6- or 7-year-old females has probably been undersampled relative to other age classes. However, in southeast Baffin Island, where ecological conditions are quite different, females with cubs of the year were not undersampled, but females with yearlings were (Stirling et al., in press).

Although estimates as low as 10,000 have been proposed by the Soviets (Uspenskii, 1977), the total number of polar bears is roughly estimated at 20,000 by Larsen (1972). The higher estimate was derived by assuming the current harvest of polar bears (roughly 1000 animals) is roughly 5 percent of the total population. Larsen (1972) also obtained a similar total by summing the regional estimates of polar bear populations.

In Alaska, polar bear densities have been estimated between 1 bear per 38 km² (Lentfer et al., in press) and 1 bear per 139 km² (Paul E. Tovey, unpublished report in file of author). The total population of Alaskan bears is estimated to be between 6000 and 9000 (D. G. Chapman, pers. comm.), and available evidence indicates that the population is stable or only slowly increasing (Lentfer et al., in press). In the western Canadian Arctic, where numbers have recently undergone large fluctuations owing to natural causes, the number of polar bears was estimated to be between 1000 and 1700 or 1 bear per 37 to 52 km² (Stirling et al., 1975, 1976). Estimates for the Soviet Union, Greenland, and Norway are not available, but populations are assumed to be stable or slightly increasing in Greenland and Norway, and stable or increasing, after recovery from previously reduced numbers, in the Soviet Union (Uspenskii, 1977).

The preferred habitat of polar bears is ice that is periodically active, where wind and sea currents cause movements and fracturing of the ice followed by refreezing. This process creates intermittent lanes or patches of recently refrozen ice (Stirling et al., 1975). This may occur at the interface between landfast ice and drifting pack ice, across the mouths of bays, or in tidal zones along coastlines. It is in this habitat that hunting success is highest (Stirling and Archibald, 1977).

Pregnant females leave the drifting pack ice in October or November to find suitable areas for denning. The relative discreteness of polar bear populations is therefore greatly influenced by the distribution and movements of the sea ice (Lentfer, 1971, 1972; Stirling et al., 1975, 1978). Pederson (1945) suggested that polar bears were all part of one circumpolar population. However, the results of recent tagging studies indicate that polar bears are divisible into relatively discrete populations (Jonkel, 1967; Lentfer, 1969, 1974a; Larsen, 1972; Stirling and Jonkel, 1972; Stirling et al., 1975, 1977, 1978, in press; Uspenskii, 1977). The sizes of the areas in which these populations exist vary from relatively small areas in the Canadian Arctic to relatively large areas in the Chukchi Sea.

Currently, polar bears are protected under an international agreement (see Lentfer, 1974b) that restricts the taking of polar bears, and directs the signatory nations (U.S., USSR, Canada, Norway, and Denmark) to conduct research to identify the status of populations of polar bears and to protect the areas that are critical to the survival and reproduction of polar bears. In 1972, the U.S. Marine Mammal Protection Act ended responsibility of the State of Alaska for polar bear management. This act eliminated the non-native harvesting of polar bears, but allowed native subsistence hunters an unlimited take (subject to the condition that populations not become depleted). Presently, the state of Alaska has requested the return of management responsibility. In Canada only natives are allowed to hunt polar bears. The total hunting quota (719 for 1979-1980) is made up of individual quotas allocated to specific villages. These quotas are based on polar bear population data from each area. The economic value of this resource was described by Smith and Jonkel (1975a, 1975b), Smith and Stirling (1976), and Smith (1977, 1978, 1979). In Greenland, only residents are allowed to hunt polar bears. The annual take is estimated to be between 125 and 150 bears. In the Soviet Union and Norway, moratoria on taking polar bears were initiated in 1955 and 1973, respectively.

Handling of polar bears (Flyger et al., 1967; Larsen, 1968; Lentfer, 1968) for mark and recapture studies, plus the specimens available from local harvests have produced most of the data that are available on free-ranging polar bears (Lentfer, 1969; Larsen, 1972; Stirling et al., 1975, 1977, 1978, in press; Uspenskii, 1977; Lentfer et al., in press). In addition, radio telemetry studies using radio frequency transmitters and transmitters that are monitored via satellite have produced valuable information on movement patterns (Anderka et al., 1973; Kolz et al., 1978). Aerial surveys have not proven particularly successful (Scott et al., 1959; Lar-

sen, 1972) but recent work with ultraviolet photography may enhance the success of aerial surveys (Lavigne and Øritsland, 1974).

Mark and recapture is the primary technique for estimating the abundance of polar bears (Stirling et al., 1975; DeMaster et al., 1980; Lentfer et al., in press), but information from guides has been shown to be a useful index of population size in Alaska (Lentfer, 1970). Population modeling has proven useful in evaluating the influence of various harvest strategies (Stirling et al., 1976), and indicates that a selective spring hunt of polar bears would be most beneficial to the maintenance of the population. Aging techniques for polar bears have been documented by Manning (1964), Stirling et al. (1975), and Hensel and Sorenson (in press). In general, the annuli found in the cementum produce the most reliable estimates of age, although they are more difficult to count in polar bears than in grizzly or black bears.

Polar bears have been successfully bred and reared in captivity (Jacobi, 1968; Wemmer, 1974; Nunley, 1977), but success depends on such factors as security, solitude, confinement to a small area, and a heated den (Jacobi, 1968). Dermatophilosis (Newman and Appelhof, 1965) and algal growth on the fur (Lewin and Robinson, 1979) have been described in captive bears.

BEHAVIOR. Behavioral studies of free-ranging polar bears have been limited to studies where high cliffs or observation towers were situated in areas used by polar bears (Stirling, 1974; Stirling and Latour, 1978). These studies suggest that during the summer, polar bears hunt seals primarily by still-hunting (77%) and stalking (23%). During the winter and early spring, almost all hunting is done by still-hunting (Stirling and Latour, 1978). Polar bears also stalk seals by crawling on the ice or swimming in the leads. In addition, the popular idea that polar bears cover their nose with a paw or push a chunk of ice with their nose while stalking seals has not been supported by observations of free-ranging polar bears (Stirling, 1974; Stirling et al., 1975). Cubs of all age classes (up to 2.5 years) do almost no hunting during late winter and early spring (Stirling and Latour, 1978). The duration of seal hunts by yearling and 2-year-old cubs were about the same, but the latter were significantly more successful at catching seals. Scavenging and intraspecific competition at seal carcasses were observed. Hunting and feeding behavior may be related to the caloric content of various prey items. During the spring, weaned seal pups and post-parturient females appeared to be preferred (Stirling and McEwan, 1975). Family groups tend to eat more of a seal kill than lone animals and more of the kill may be abandoned if the bear made a kill within the last day. In many instances, considerable portions of the prey items were not completely utilized, thus making scavenging an important consideration in the ecology of polar bears (Stirling, 1974). An important feature of feeding during the summer was grooming, where washing bouts typically occur after 30 minutes of feeding (Stirling, 1974).

The possible use of tools by bears to obtain food was reported by Kiliaan (1974).

Behavioral observations and mark-recapture data indicate that cubs remaining with their mothers until 2.5 years have a higher probability of survival than cubs weaned at an earlier age. Time budgets for the activities of polar bears were summarized in Stirling (1974) and Knudsen (1973, 1978). Polar bears have been reported to swim at least 40 miles across open water (Stirling, 1974), and are capable of diving under the ice and surfacing in the haul out-holes of seals (Stirling, 1974). Sleeping and resting were described by Stirling (1974). Bears are most active in the first 1/3 of the day, and least active in the last 1/3 of the day (Stirling, 1974). Adult females with young are not reported to be subordinate to bears of any other age or sex class, but adult females with cubs of the year are known to avoid interaction with adult males, presumably because of potential predation upon the cubs (Stirling, 1974). Polar bears seem to have a limited vocal repertoire and adult vocalizations are used primarily in aggressive interactions (Wemmer et al., 1976).

The density of maternity dens varies geographically (Uspenskii and Chernyavskii, 1965; Harington, 1968; Jonkel et al., 1972, 1976; Uspenskii and Kistchinskii, 1972; Lentfer, 1975, 1976a; Stirling et al., 1975, 1977, 1978; Lentfer and Hensel, in press). Areas of den concentrations are reported from Wrangel Island, Franz Josef Land (Uspenskii and Chernyavskii, 1965; Uspenskii, 1977), Svalbard (Larsen, 1972, 1976), and southwest of Cape Churchill (Jonkel et al., 1972; Stirling et al., 1977). In Alaska, along the western edge of Banks Island, and throughout most of the Canadian High Arctic, dens are thought to be evenly distributed along the coast (Stirling et al., 1975, 1978; Lentfer, 1976a;

Lentfer and Hensel, in press). Maternity dens are often dug on slopes of 20 to 40° where snow has accumulated to depths of 1 to 3 m (Uspenskii, 1977). These dens are usually located within 8 km of the coast (Harington, 1968; Lentfer, 1976a; Lentfer and Hensel, in press; Uspenskii, 1977), and rarely beyond 48 km. Polar bears have been reported to bear young in maternity dens along the pack ice (Lentfer, 1975). Dens range from single chambers with short tunnels to complex structures with several chambers and tunnels (for detailed descriptions of maternity dens consult Uspenskii and Chernyavskii, 1965; Harington, 1968; Jonkel et al., 1972; Uspenskii and Kistchinskii, 1972; Lentfer, 1976a). Another type of den is a temporary shelter formed in the snow, particularly by females with young, during inclement weather (Jonkel et al., 1972; Lentfer, 1976a). A third type of den is dug into the earth, as a temporary shelter in summer and fall (Kolenosky and Stanfield, 1966; Douth, 1967; Jonkel et al., 1972, 1976).

GENETICS. Crosses between brown bears and polar bears produced fertile hybrids (Gray, 1972). The 2n chromosome number is 74 (Low et al., 1964).

REMARKS. The first description and name of the polar bear, *Ursus maritimus*, means maritime bear. The reduction of stocks in the Soviet Union (Uspenskii, 1977) with subsequent moratoria on the taking of polar bears in the Soviet Union, Norway and the U.S. was interpreted by the news media to mean that polar bear numbers over their entire range were reduced. There is no evidence from studies in Alaska, Canada, or Greenland to support this opinion. No information is currently available on hereditary or genetic differences between the various sub-populations of polar bears.

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