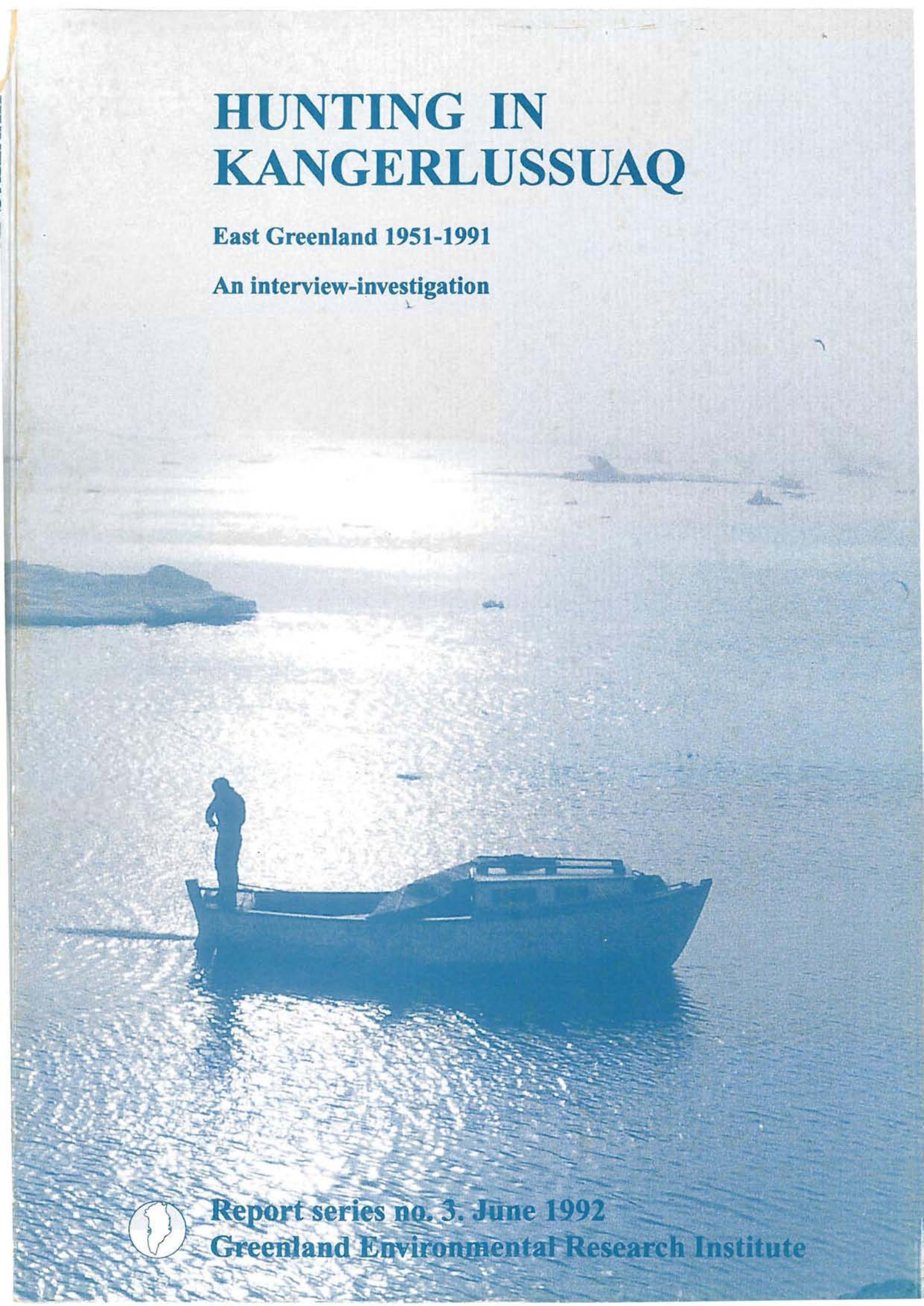
HUNTING IN KANGERLUSSUAQ

East Greenland 1951-1991

An interview-investigation



Report series no. 3. June 1992
Greenland Environmental Research Institute

Cover photo : A narwhal net being set in Kangerlussuaq, July 1991.

Greenland Environmental Research Institute (GERI) assesses the environmental impact of exploration and exploitation of mineral resources and hydroelectric power in Greenland. GERI considers the environmental aspects of mineral projects and takes part in the approval procedure of the Mineral Resources Administration for Greenland. GERI conducts studies of how the environmental impact may be mitigated and monitors the impact. GERI also conducts its own research with relevance to the impact assessment of mineral projects.

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The interview-investigation was carried out in connection with exploration licences in Kangerlussuaq held by Platinova Resources Ltd.and RTZ Mining and Exploration Ltd.

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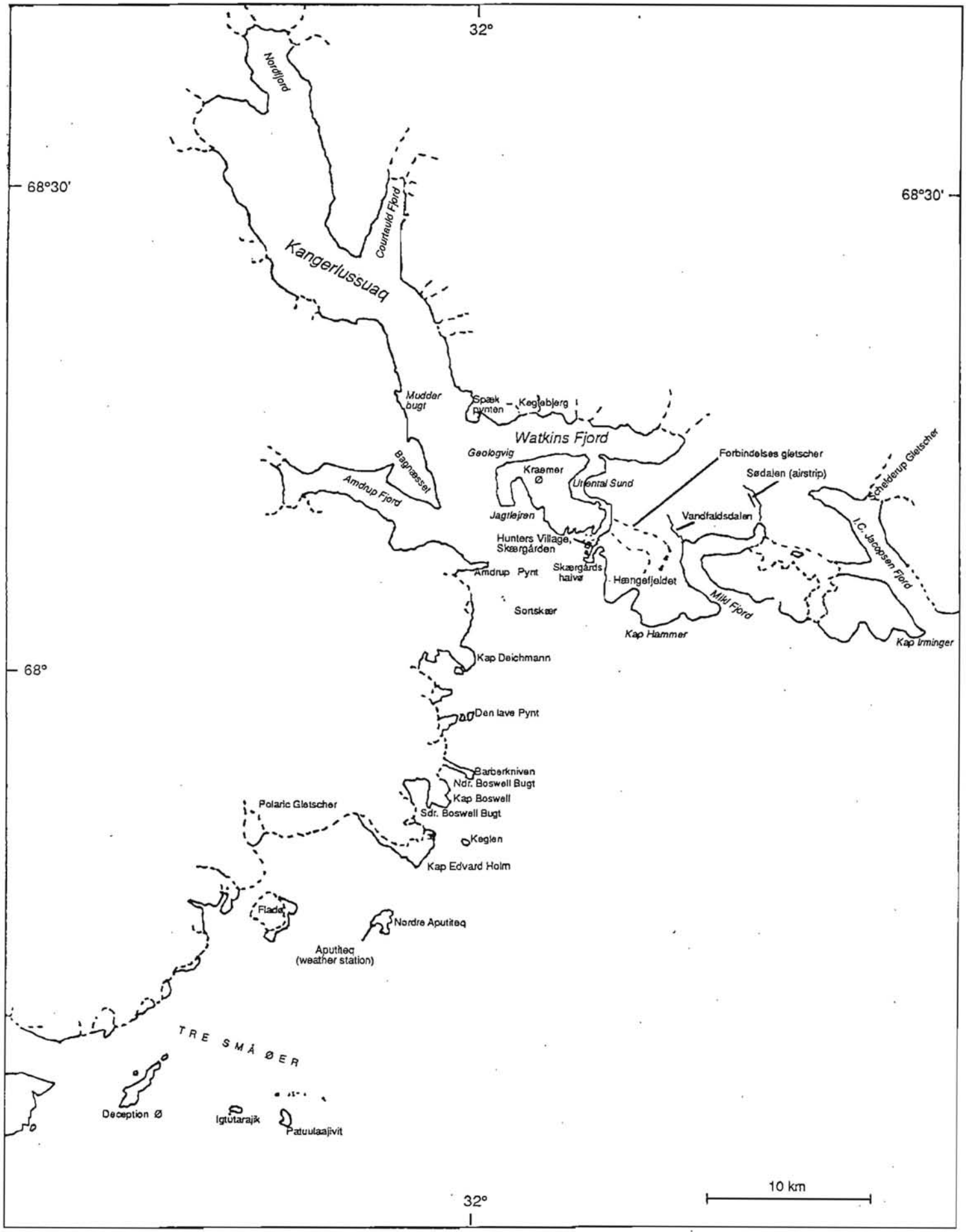


Figure 1. Place names in the Kangerlussuaq region. Aggas Ø is located approx. 40 km south of Deception Ø.

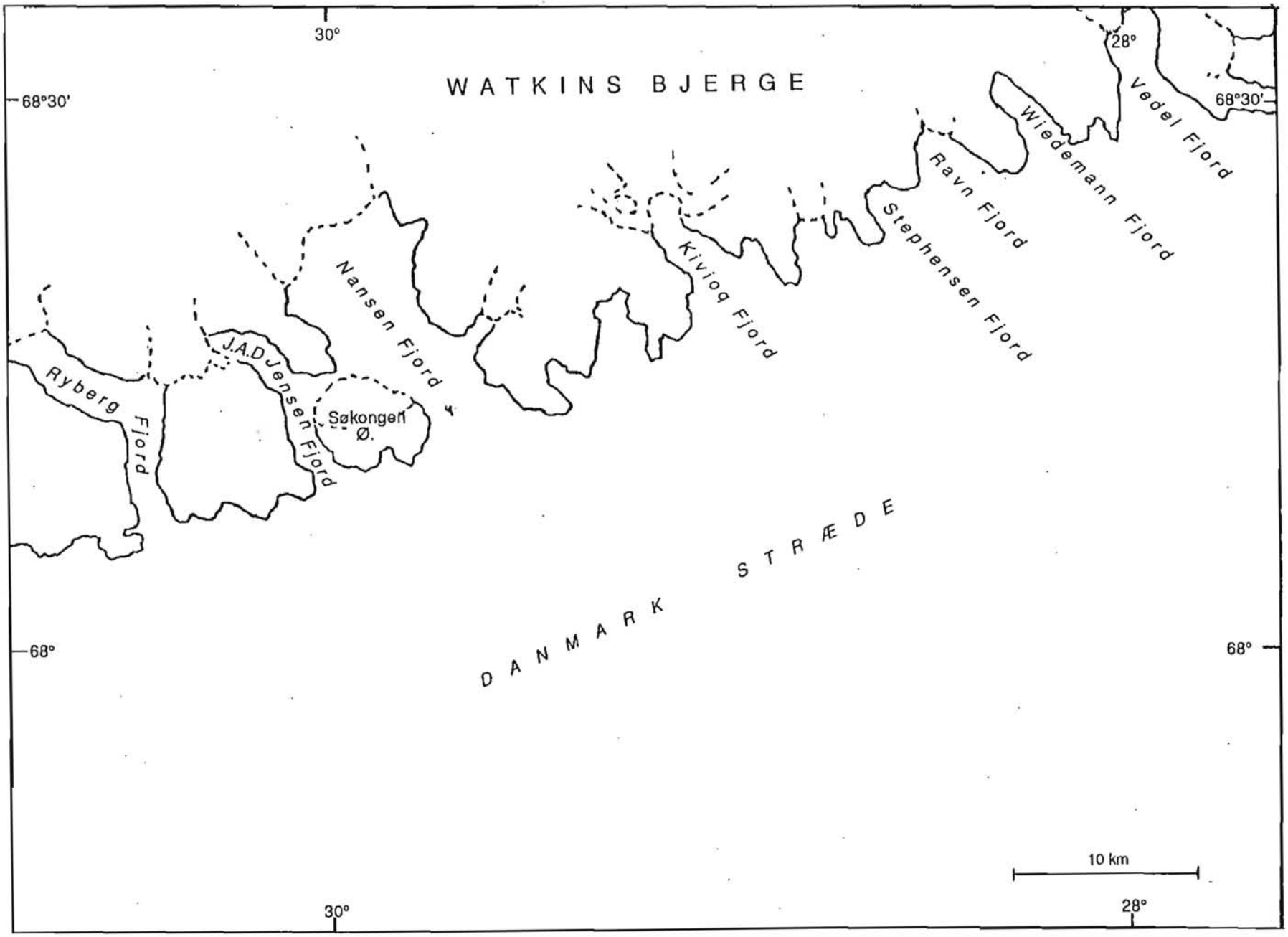


Figure 2. Place names for the coastal stretch northeast of Kangerlussuaq.

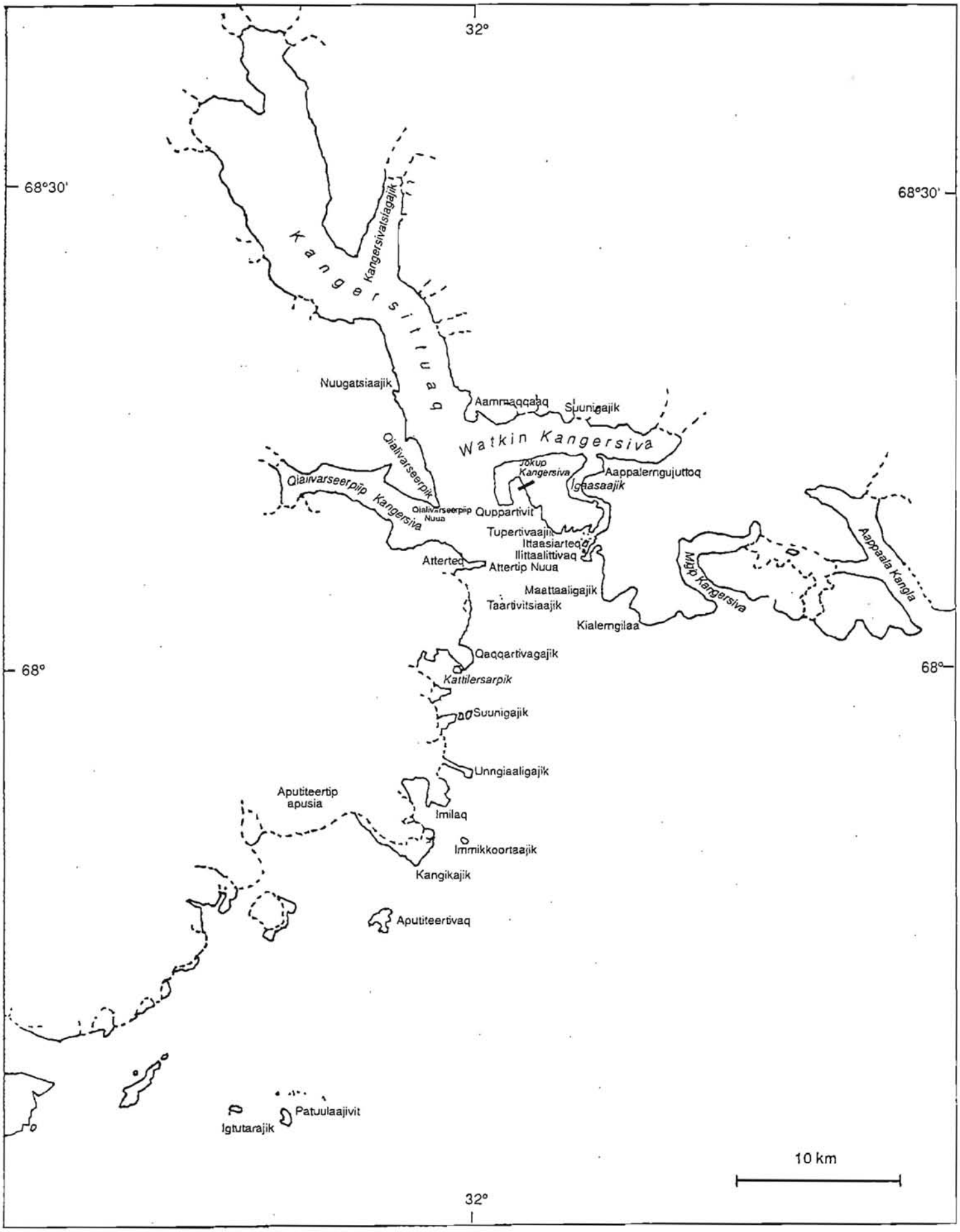


Figure 3. East Greenlandish place names in the Kangerlussuaq region.

0. SUMMARY

The reason behind the present interview-investigation concerning the hunting conditions and the animals hunted in the Kangerlussuaq region, on Greenland's east coast (between Ammassalik and Scoresby Sund), is the increase in mining exploration activities over the last 6 years. Platinova Resources Ltd. have, since 1986, had exploration licences in the Kangerlussuaq region, together with Corona-Corporation and R.T.Z. Mining and Exploration Ltd. Large core drilling has been carried out within the region over the last 3 years. The interview-investigation was financed by R.T.Z. Mining and Exploration Ltd. and Platinova Resources Ltd.

Since 1989, Greenland Environmental Research Institute (GERI) has carried out a number of different types of investigations in the Kangerlussuaq region. A reconnaissance of the area was carried out for 2 weeks in August-September 1989 to get a better background knowledge of the area so that a more detailed investigation could be planned. In August 1990 GERI carried out biological background studies, and in the same year GERI (in cooperation with Greenland Field Investigations) initiated investigations concerning the deposition of mineral wastes and placing of technical facilities for prospective future mining activities.

The interview-investigation was carried out from the 21st of July to the 15th of August by an interpreter who could speak the East Greenland dialect, and a biologist from GERI. 23 hunters were interviewed, partly from the hunters' village in Kangerlussuaq, and partly in Ammassalik, and the villages Tiniteqilaaq, Kuummiut and Kulusuk in the Ammassalik region. In the form of 5 questionnaires, the hunters were questioned about: the general conditions; about ringed seals, narwhals and polar bears; and also about other marine mammals, birds, fish and land mammals. The questionnaires were accompanied by maps of the Kangerlussuaq region whereon details could be filled in. Otherwise the responses were written down by the interviewer and, as soon as possible afterwards, reorganized and presented in the format of the questionnaires. The information included in this report is as detailed as possible and

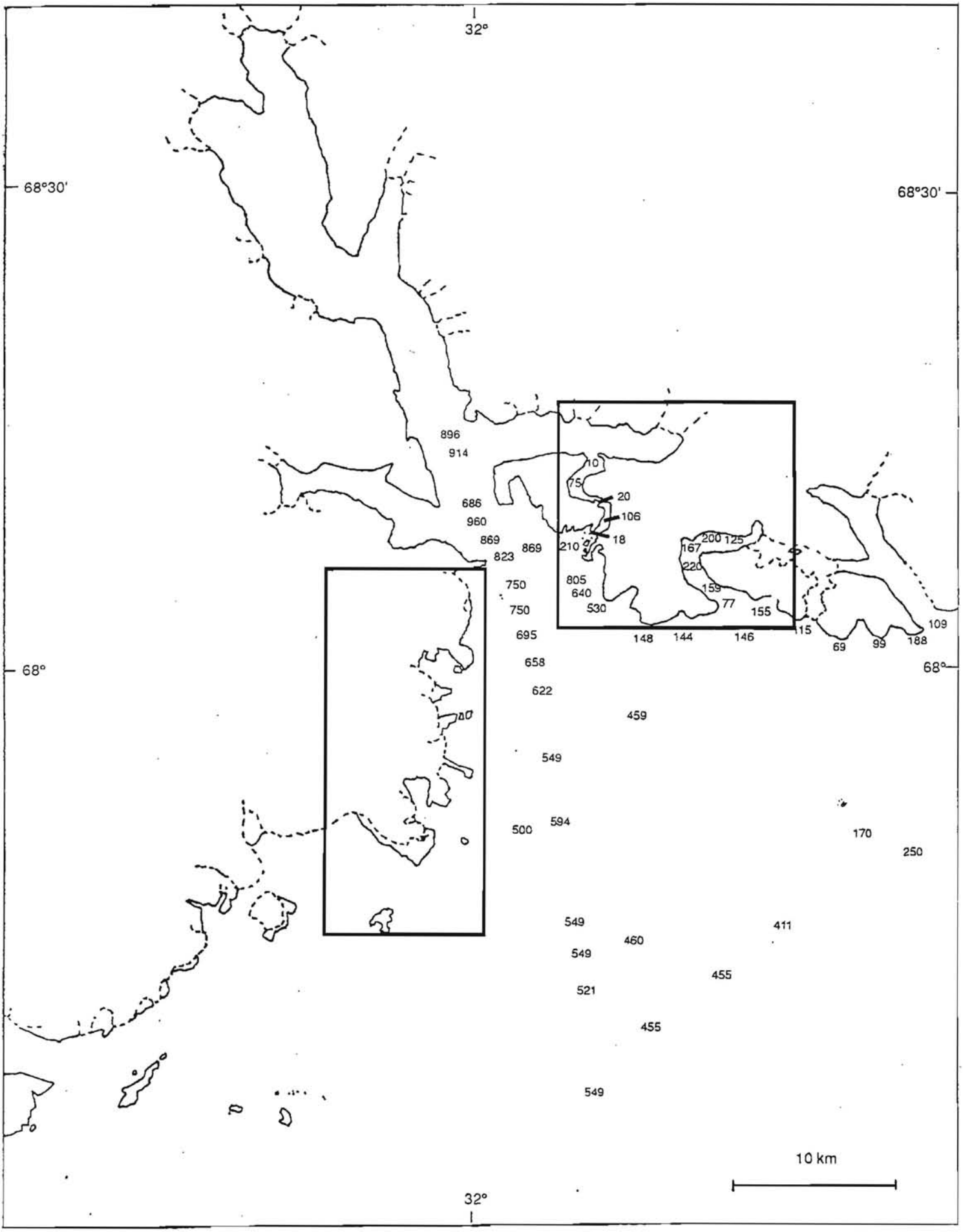


Figure 4. Exploration licences in the Kangerlussuaq region in 1991. Ocean depths (m) are also given.

is compared as far as possible with the material available in the literature regarding marine mammals, sea birds and other animals of Southeast Greenland. Since this report is not based on sociological or biological quantitative methodology, it may give a generalized picture which is based mainly on the biological background of the interviewer.

Kangerlussuaq Fjord is one of the largest fiords in Southeast Greenland. It extends from the Ice Cap to the coast; approximately 100 km between a landscape of steep hills and numerous active glaciers which flow into the fjord. The fjord is an ice fjord that is nearly always filled with large icebergs. Kangerlussuaq flows into Danmark Stræde, where the East Greenland polar current carries ice masses southward along the coast. The polar current carries cold water high in nutrients and with a relatively low salinity. This nutrious water is the basis of the rich animal life which is found at the entrance of Kangerlussuaq. The wind in Kangerlussuaq is extremely strong and is called "piteraq". This is a falling wind which comes from the Ice Cap itself and blows outward through the fjord. In the center of Kangerlussuaq a "piteraq" blows every 5 days all through the year, frequently in October and November. Wind speeds of approximately 150 km/hr are not uncommon, in combination with low presure zones. The mean temperatures from June to September are positive, however the annual mean temperature is -5°C with a maximum of +15°C and a minimum of -30 to -35°C. Precipitation is greatest during June, August and September. The annual mean precipitation is approximately 800 mm, 500 mm of which falls as snow. Note that these climatic data were obtained from the Aputiteq weather station which lies 20-40 km south from the entrance of Kangerlussuaq. The low temperatures, glaciers and presence of polar ice means that navigational conditions can be rather difficult for most of the year, but from August to October it is possible to navigate Kangerlussuaq with an ice strengthened ship (a ship with a reinforced hull). Flying can take place almost the whole year as landing is possible at Sødal, a little east from Kangerlussuaq, or on the glaciers, e.g. beside Kap Deichmann on the west side of the fjord.

Hunters have possibly been in the Kangerlussuaq region for over 4000 years. The building sites give evidence of settlements in a number of different areas in the region

from the end of the 14th centuary to the 18th centuary. Along with the establishment of houses for the hunters in Kangerlussuaq in 1932, by the second East Greenland expedition under the direction of Ejnar Mikkelsen, overwintering in the area was initiated. It was first in 1966 that hunters stayed permanently,as in that year the Tasiilaq Community started organizing the hunters' travel . Apart from the period between 1980-1986, there have been hunters in Kangerlussuaq every winter up until 1991. Once in a while, groups of hunters from Ammassalik travel to Kangerlussuaq to hunt for a month or two during summer.

Hunting is carried out all year in the Kangerlussuaq region and as far southwest as Aggas Ø, approximately 120 km from the hunters' village, and to the northeast as far as Kap Vedel, approximately 200 km from the village. The most important hunting area stretches from the middle of Kangerlussuaq, a little north of Watkins Fjord and down to the entrance which is defined by a line from Kap Edvard Holm to Kap Hammer. The region includes most Watkins Fjord and Amdrup Fjord, and also all of Uttental Sund. Additional important hunting areas are in the regions around Nordre Aputiteq and Fladø, and the region around Søkongen Ø including Ryberg Fjord, a little west from Søkongen Ø,(see figure 5.). By far the most important animals hunted are ringed seal (*Phoca hispida*), narwhal (*Monodon monocerus*) and polar bear (*Ursus maritimus*). On average a hunter catches 200 ringed seals in a season. With 5-10 hunters present at the village, there are 1000-2000 ringed seals caught in a single season. On average there are 20-30 narwhals caught per season and 25-35 polar bears. Of the other marine mammals, a total of 50-200 are caught per season. These include bearded seal (*Erignathus barbatus*), hooded seal (*Cystophora cristata*) and harp seal (*Pagophilus groenlandicus*); in addition there is, on average, one walrus (*Odobenus rosmarus*) per season. Whales, especially minke whale (*Balaenoptera acutorostrata*) are few in number and are not hunted. The hunters get fish, especially Greenland halibut (*Reinhardtius hyppoglossoides*) and birds, especially common eider (*Somateria mollissima*) and black guillemot (*Cepphus grylle*). Of land mammals only the polar fox (*Alopex lagopus*) is shot, but only in small numbers. In the following section more detailed descriptions of ringed seals, narwhals and polar bears are provided.

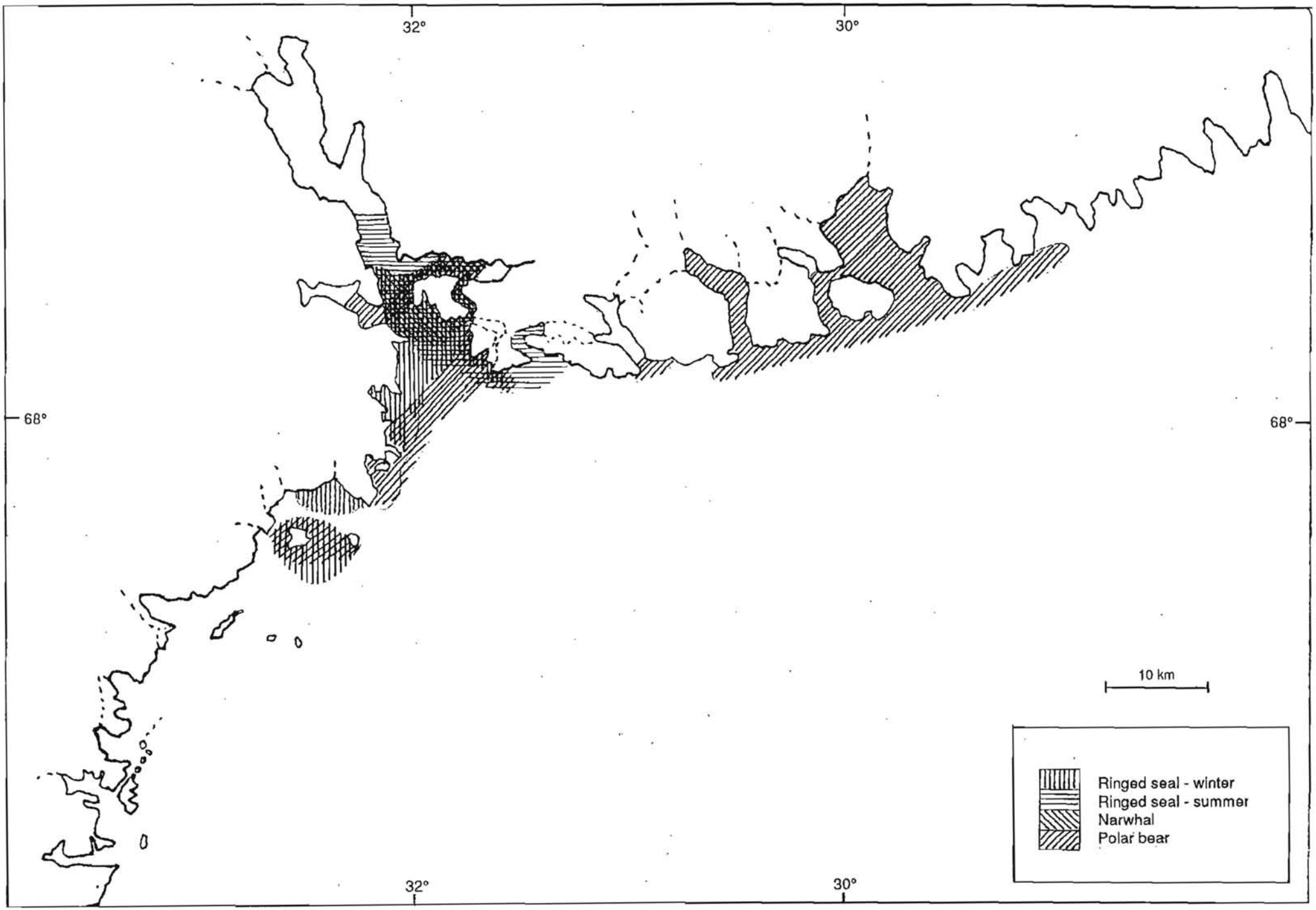


Figure 5. The most important areas in Kangerlussuaq for hunting ringed seal, narwhal and polar bear.

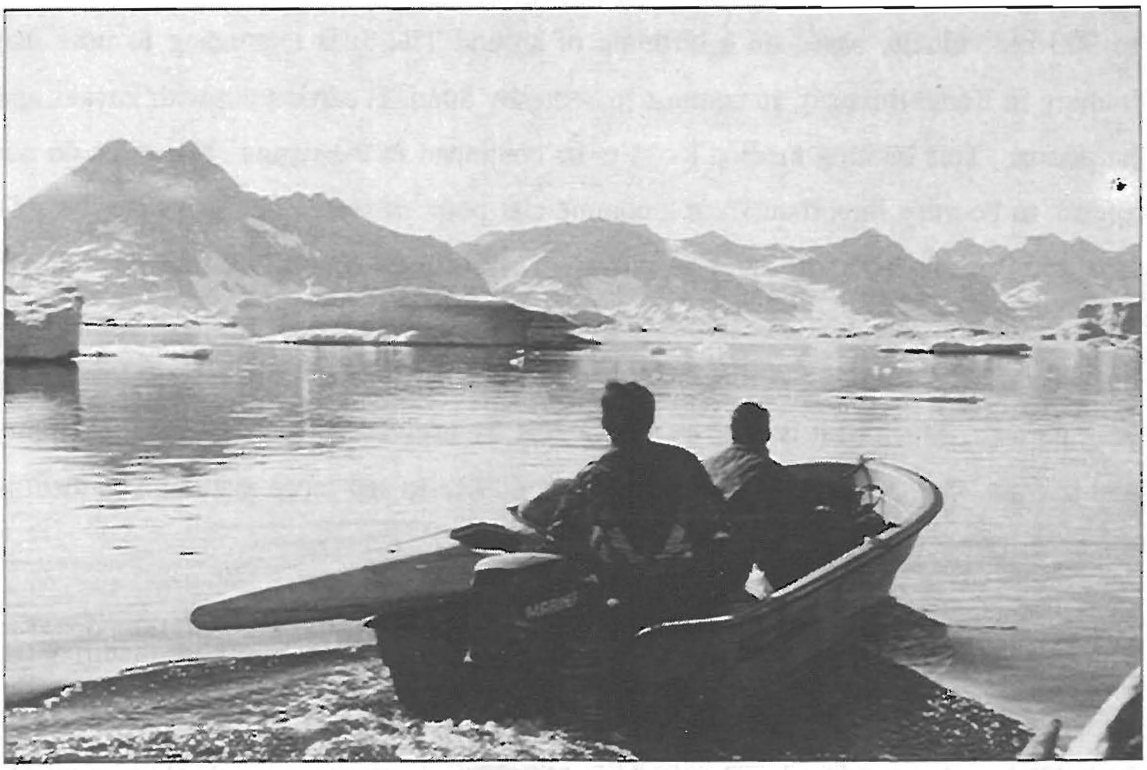
Ringed seals (*Phoca hispida*) normally occur all over Kangerlussuaq and the adjacent fjords and sounds, and also along the coast to the southwest, down to Tre Små Øer, and in the fjords along the coast northeast to Søkongen Ø. In August many of the young ringed seal migrate out of Kangerlussuaq and wander with drifting ice towards the south. During this period some ringed seals move into Kangerlussuaq from other areas. When the new ice starts to form in October and November, many seals enter Kangerlussuaq and begin to establish breathing holes. The old ringed seals typically reside in the innermost part of the fjord, while the young are found further out. In March and April the old ringed seals establish breeding lairs, which are found all over Kangerlussuaq, Wathins Fjord and Uttental Sund, and also at many places along the coast towards the southwest. The hunters did not mention the presence of breeding lairs in Amdrup Fjord, which was in all probability just a coincidence.

Ringed seal feed primarily on small crustaceans and small fish e.g. polar cod, redfish, atlantic cod and ammasat. Ringed seal hunting takes place all through the year, though different methods are used depending on the time of the year, such as open water hunting from dinghi or motorboat, breathing hole hunting, netting and hunting on the ice edges. On average 200 ringed seals are caught per hunter per season. In other words, between 1000 and 2000 ringed seals are caught per season. This is considerably lower than the annual ringed seal catch in Scoresby Sund, which is approximately 6000 (in 1983 by 77 occupational hunters). However the catch of ringed seals in Kangerlussuaq was determined by the number of hunters and not the number of ringed seals present. With a commercial value of barely 400 kr and the fact that only 2/3 of the skins are sold, the annual earnings approximate 50000 kr per hunter. It should be noted that the market for seal skins is very unstable and dependent on various factors e.g. winter climate, environmental organisations and subsidies from the Greenland Home Rule government. Besides selling, a proportion of the seal skins are used to make clothing and useful objects (the remains of which are also sold), while seal meat is used for food and dog food, and seal blubber is used for warming and dog food. Stomach contents and seal skin can also be used as dog food.

The hunters could not comment about disturbances caused by helicopters and

aeroplanes. The disturbances caused by large ships are not likely to cause problems. No problems, for example, were experienced in association with the ship "Polarbjørn", which traveled to the Aputiteq weather station 3 times a year. The movement of ships in Kangerlussuaq and the other coastal regions and fjords during the winter period (especially from February to May), could be critical as ringed seals establish their breeding lairs on the ice during this period. Winter catches deteriorate depending on ship rutes and calls. Core drilling on land can disturb the ringed seals so that they leave the area while drilling. A hunter also explained that snow scooters can be a problem and that they ought only to be driven on land. The hunters' own dinghies can also disturb ringed seals if there are too many hunters in the area and too many inexperienced hunters.

Narwhals (*Monodon monoceros*) begin to move into Kangerlussuaq in May and stay within the fjord system until October-November, when ice begins to form. It is not known for certain where the narwhals go during the winter, but it is most likely that they stay in the vicinity of the pack ice in Danmark Stræde, either out from Kanger-



Tobias and Josef on their way to hunt narwhals at Bagnæsset. Amdrup Fjord in Background.

lussuaq or to the north towards Scoresby Sund. One tagging "experiment" that involved a narwhal which was recaptured after 3 years with an old harpoon point in it, suggests that Kangerlussuaq could have a permanent population.

Narwhal move around the whole fjord system, especially along the coasts, in pursuit of their primary food source: cuttlefish, but also Greenland halibut, redfish and shrimp. The hunters keep watch for wandering flocks of narwhals from 24 observation posts, 5 of which are used most frequently. These 5 lie on the outermost parts of Kangerlussuaq, which is where the main catch takes place. Details were provided for the catch sites of 96 narwhals out of approximately 275 caught in the period from 1951-1991. During this period an average of 20-30 narwhals were caught per season. The total catch on the entire East coast is 40 to 60 narwhal per season. Narwhals occur in the Atlantic part of the arctic, both east and west from Greenland, and as far east as Franz Joseph Land and Novaya Zemlya. As the size of the possible easterly population is not known as well as the possible population of Kangerlussuaq, it cannot be expressed whether a catch of 40-60 narwhals per season would make up a sustainable catch. Though it can be estimated that the population is made up of a minimum of 600 to 900 individuals, based on a birthrate of around 7%. It is interesting to note that hunting in Kangerlussuaq, in contrast to Scoresby Sund, is carried out with kayaks and harpoons. This hunting method looks to be continued in the region. Narwhals do not appear to be very important from a commercial point of view. The tusks can be sold at a good price, but most are given away. Tusks are no longer used by the hunters themselves to manufacture harpoons. Mattak (narwhal skin) can also bring a good price, but only a little is sold in Ammassalik because it is difficult to keep mattak fresh over long periods. Much of it is used by the hunters themselves, or is given away to family and friends. One hunter expressed that he would like to sell more mattak. The meat is not sold, but eaten by people and dogs.

The narwhals appear to be disturbed by overflying helicopters, but these disturbances are dependent on how high the helicopters fly above sea level i.e. high flying helicopters do not disturb the narwhals. On the other hand, disturbances were not observed from overflying Twin-otters, which is probably as a result of their relatively great flying height above Kangerlussuaq. In Kangerlussuaq it is thought that the survey vessel, which did not follow specific routes, could have caused some disturbance over

great distances, possibly several km. After the ship had departed the area, narwhals returned quickly. Regarding ships and boats, narwhals seem to be sensitive to dinghies, particularly if they travel at high speed. Generally the narwhals seem to move away at a distance of 500 m from a hunters' fast passing dinghi, and possibly up to 1000 m ahead. On the other hand dinghies can, at very low speeds, get as close as 20-25 m to the narwhals, or closer. Drilling on land could possibly cause the narwhals to move further away from the coast.

Polar bears (*Ursus maritimus*) of the southeast coast of Greenland, in the Kangerlussuaq region, migrate towards north early in the year around March, along the edge of the fast ice. Thus there should be many polar bears in the regions north and west of Nordre Aputiteq and Fladø during spring. Polar bears follow the edge of the ice to the entrance of Kangerlussuaq, but if it happens that the ice is broken up by a "piteraq", the polar bears are forced to swim across the entrance of the fjord. At Søkongen Ø a lot of tracks are seen leading northward during spring and summer, but polar bears also seem to come from the north. Few polar bears, including family groups, move further inwards along the fjords to seek the ringed seals breeding lairs. Polar bears have been seen to wander through a number of the inlets and sounds on the eastside of Kangerlussuaq e.g. through Uttental Sund and Sødalen. In summer and autumn polar bears follow the polar ice's southward movement, after which many move onto the glaciers or enter the mainland deep in the fjords. In October or November, the pregnant females go into denning sites and break out of their dens at the end of March or early April with their cubs. Other polar bears go into winter quarters in fall and winter during periods with bad weather and low food availability.

From observations of breeding dens, small polar bear tracks the size of dog prints and females with cubs (0 year) point to the fact that there are 6 main territories in the Kangerlussuaq region which appear to be breeding territories. These are the following: "Tre små Øer", Fladø and Nordre Aputiteq, the bottom of Kangerlussuaq, the bottom of Watkins Fjord, J.C. Jacobsen Fjord and Søkongen Ø.

The polar bears' most important food is ringed seal, and here it is especially the blubber which is eaten. Apart from ringed seals, polar bears are also reported to eat hooded seals and, in some cases, herbs, grass, moss and seaweed. Occasionally

fragments of polar bear skin and bird feathers have been found in polar bear stomachs.

During spring, from February to May, the hunters travel by sledge after the polar bear either northeast to Vedel Fjord, which is about 200 km from the hunters' village, or southwest down to Aggas Ø, which is about 120 km from the hunters'village. The sledge route to Søkongen Ø, normally goes from fjord to fjord and over the glaciers in order to avoid dangerous and difficult coastline. The sledge route to the southwest normally goes over the entrance of Kangerlussuaq and thereafter follows the coast. If the entrance is blown free of ice by a "piteraq", the sledge route goes either behind Kraemer Ø and over Kangerlussuaq from the entrance of Watkins Fjord, or the sledges are taken across the gap by motor boat.

In June and July the sledge travellers have to adjust in order to follow the polar bears as the ice begins to "decay". From July to November, and especially in September and October, the hunters follow the polar bears in thier boats. Polar bears are also hunted in connection with the catch of ringed seals and narwhals.

In the period from 1951 to 1991, really only 21 seasons, there have been 162 polar bears reported shot and 17 seen but not shot. This number represents 30-40% of the estimated total of 400-600 polar bears shot during this period. This difference indicates that not all the hunters that have been at Kangerlussuaq were interviewed. This was because some are dead and some have not been contacted, and some of the polar bear catches have probably been forgotten. The polar bears that were shot were grouped into two periods; 1966 to 1980 and 1986 to 1991. In the period from 1966 to 1980, 3/4 of all the polar bears were hunted in the Kangerlussuaq region. This includes Kangerlussuaq and adjoining fjords, and J.C. Jacobsen Fjord in the NE, Nordre Aputiteq, and Fladø in the SW. Half of these were killed within a distance of 20 km from the village. Around 1/5 were killed near Søkongen Ø. In this period the polar bears were hunted relatively evenly throughout the year, although more were shot in March and April. In the period 1986 to 1991, half of the polar bears were killed in the Kangerlussuaq region, but only about 2% in the area within 20 km from the village. The other half was killed near Søkongen Ø. In this period more polar bears were killed in spring (March and May). Many were also shot in autumn (October). In the summer (July and August) on the other hand, nearly no polar bears were killed. The difference

between the polar bear hunts in these two periods is as follows: from 1966 to 1980 the hunters hunted polar bear the throughout the year in the area close to the village, while the hunters in later years concentrated their efforts in spring and autumn, and most markedly with the spring hunt around Søkongen Ø.

A reason for these differences could be that in January 1975 it was decided that polar bear should not be hunted in the summer. To compensate for the lost summer catch, the hunting efforts could be increased, for example in spring in the Søkongen Ø area. Looking at the polar bears that were killed from 1975 and 1980, there were more polar bears killed in the area close to the village (approximately 67% against 50% for the period 1966-80) and fewer killed near Søkongen Ø (approximately 13% against 15% in 1966-1980). Thus the polar bear catch during the period 1975-1980 does not differ significantly from the period 1966-1980, and therefore the changed hunting regulations do not seem to explain the difference between the periods 1966-80 and 1986-91. Another reason could be the increasing levels of activity in the area since 1980, partly due to mineral exploration and partly due to the fact that hunters started overwintering in the area again after a break since 1980. Increased activity, and therefore disturbance in an area could mean that polar bears might avoid the area by walking around it, something which has been seen to be the case at the weather station at Aputiteq and the radar station at Kulusuk.

In Kangerlussuaq 25-35 polar bears are killed per season and the estimated total annual killing in all of East Greenland is 85-120. The total population of polar bears in East Greenland, Svalbard and Franz Joseph Land is assumed to be numbered between 3000-6700. According to this interview-investigation, old females constituted 42.3% of all the polar bears caught which means that the annual sustainable harvest will be between 110 and 240 polar bears. Thus the present catch in East Greenland would seem to be sustainable. As mentioned, polar bear hunting near Søkongen Ø constitutes a large part of the catch for the later years in the Kangerlussuaq region. Since the polar bears near Søkongen Ø may constitue a relatively permanent population, an increased catch here can therefore have a relatively larger influence on this permanent population than on the whole polar bear population of East Greenland.

1. RESUMÉ

Baggrunden for den her foreliggende interview-undersøgelse om fangstforhold og fangstdyr i Kangerlussuaq-området på Grønlands østkyst, midt mellem Ammassalik og Scoresby Sund, er den øgede mineral-efterforskning her igennem de sidste 6 år. Platinova Resources Ltd. har siden 1986 haft efterforskningstilladelser i Kangerlussuaq-området sammen med partnerne Corona-Corporation og RTZ Mining and Exploration Ltd. Der er udført større kerneboringer i området i de sidste tre år. Interview-undersøgelsen er finansieret af RTZ Mining and Exploration Ltd. og Platinova Resources Ltd.

Grønlands Miljøundersøgelser (GM) har siden 1989 udført forskellige typer af undersøgelser i Kangerlussuaq-området. I 2 uger i august-september 1989 rekognosceredes området for, ud fra et bedre kendskab til forholdene, at kunne planlægge mere detaillerede undersøgelser. I august 1990 udførte GM biologiske baggrundsundersøgelser og samme år udførte GM i samarbejde med Grønlands Forundersøgelser indledende undersøgelser vedrørende deponeringsforhold for mineaffald og placering af tekniske faciliteter for en eventuel fremtidig minevirksomhed.

Interview-undersøgelsen blev udført i perioden fra den 21. juli til den 15. august 1991 af en tolk der kunne tale østgrønlandsk og en biolog fra GM. Der blev interviewet 23 fangere, dels på fangstbopladsen i Kangerlussuaq, dels i Ammassalik og bygderne Tiniteqilaaq, Kuummiut og Kulusuk i Ammassalik-området. De interviewede fangere blev, ud fra 5 spørgeskemaer, spurgt om generelle forhold, om ringsæl, narhval og isbjørn, samt om øvrige havpattedyr og om fugle, fisk og landpattedyr. Spørgeskemaerne var ledsaget af kort over Kangerlussuaq-området hvorpå informationer kunne indtegnes. Oplysninger iøvrigt blev nedskrevet af intervieweren og hurtigst muligt efter interviewet renskrevet i spørgeskema-rækkefølgen.

Informationerne er så udførligt som muligt medtaget i denne rapport og oplysningerne er så vidt muligt sammenholdt med litteratur om havpattedyr, havfugle og andre dyr

i Sydøstgrønland. Da denne rapport ikke i egentlig forstand er baseret på sociologiske eller biologiske metoder til kvantificering af forholdene, må den naturligt nok give et generaliseret billede, der hovedsagelig bygger på et biologisk grundlag, der er interviewerens.

Fjorden Kangerlussuaq er en af de største fjorde i Sydøstgrønland. Den strækker sig fra Indlandsisen og ca. 100 km ud til kysten igennem et landskab af stejle fjelde og mange aktive gletschere, der udmunder i fjorden. Fjorden er en isfjord, der næsten altid er fyldt med store isfjelde. Kangerlussuaq er en dyb fjord med dybder ned til knap 1000 m. Kangerlussaq udmunder i Danmark Stræde, hvor den østgrønlandske Polarstrøm fører is og isfjelde langs kysten mod syd. Polarstrømmen er en kold og næringsrig havstrøm med relativ lav saltholdighed. Dette næringsrige vand er bl.a. grundlaget for det rige dyreliv, der findes i Kangerlussuaqs munding. I Kangerlussuaq blæser der ekstremt kraftige vinde, piteraq'er, der er faldvinde, som fra Indlandsisen blæser udad gennem fjorden. I det indre af Kangerlussuaq blæser der i gennemsnit en piteraq hver 5. dag året rundt, hyppigst i oktober og november, og vindstyrker på ca. 150 km i timen er ikke ualmindelige i forbindelse med lavtrykspassager. Der er positive middeltemperaturer fra juni til september, men årsmiddeltemperaturen er -5°C med maximum på +15°C og minimum på -30 til -35°C. Nedbøren er størst i juni, august og september, med en årlig middelnedbør på ca. 800 mm, hvoraf de ca. 500 mm falder som sne. Bemærk, at disse klima-data stammer fra vejrstationen Aputiteq, der ligger 20-40 km fra Kangerlussuaqs munding mod sydvest. Lave temperaturer, gletscheris og polaris betyder, at besejlingsforholdene det meste af året kan være særdeles vanskelige, men fra august til oktober vil det være muligt at besejle Kangerlussuaq med isforstærkede skibe. Flyvninger kan foregå stort set hele året med landing i Sødalen lidt øst for Kangerlussuaq eller på gletschere, f.eks. ved Kap Deichmann på fjordens vestside.

Der har muligvis været fangere i Kangerlussuaq-området for over 4000 år siden og hustomter m.v. vidner om bosættelser flere forskellige steder i området fra slutningen af 1400-tallet til slutningen af 1800-tallet. Med bygning af fangsthuse i Kangerlussuaq i 1932 på den anden Østgrønlandsekspedition under ledelse af Ejnar Mikkelsen, startede

overvintrende fangere så småt i området. Det var dog først i 1966, at der fast kom fangere hertil, idet Tasiilaq kommune startede organiserede fangstrejser dette år. Frem til 1991 har der været overvintrende fangere i området, bortset fra en periode fra 1980 til 1986. Af og til tager grupper af fangere fra Ammassalik turen til Kangerlussuaq for at jage her i en måned eller to om sommeren.

Fangsten i Kangerlussuaq-området foregår året rundt, mod sydvest til Aggas Ø ca. 120 km fra fangstbopladsen og mod nordøst til Kap Vedel ca. 200 km fra bopladsen. Det vigtigste fangstområde strækker sig fra ca. midt i Kangerlussuaq, lidt nord for Watkins Fjord, og ned til mundingen, afgrænset af en linie fra Kap Edvard Holm til Kap Hammer. Området omfatter det meste af Watkins Fjord og Amdrup Fjord, samt hele Uttental Sund. Vigtige fangstområder er desuden området omkring Nordre Aputiteq og Fladø, og området omkring Søkongen Ø, inklusiv Ryberg Fjord lidt vest for Søkongen Ø, se figur 5. Langt de vigtigste fangstdyr er ringsæl (*Phoca hispida*), narhval (*Monodon monocerus*) og isbjørn (*Ursus maritimus*). I gennemsnit fanger én fanger ca.

Ulrik (right) and Niels (interpreter) in front of Ulriks house in the hunters village, Skærgården.

200 ringsæler på en sæson. Med 5-10 fangere på bopladsen fanges der 1000-2000 ringsæler pr. sæson. I gennemsnit fanges der 20-30 narhvaler pr. sæson og 25-35 isbjørne pr. sæson. Af de øvrige havpattedyr, fanges der ialt pr. sæson 50-200 remmesæl (*Erignathus barbatus*), klapmyds (*Cystophora cristata*) og grønlandssæl (*Pagophilus groenlandicus*); desuden fanges der i gennemsnit én hvalros (*Odobenus rosmarus*) pr. sæson. Hvaler, især vågehval (*Balaenoptera acutorostrata*), ses fåtalligt, men jages ikke. Der fanges få fisk, især hellefisk (*Reinhardtius hippoglossoides*), og få fugle, især ederfugl (*Somateria mollissima*) og tejst (*Cepphus grylle*). Af landpattedyr er det kun polarræv (*Alopex lagopus*), der skydes i ringe antal. I det følgende vil ringsæl, narhval og isbjørn nøjere blive beskrevet.

Ringsæl (*Phoca hispida*) forekommer almindeligt overalt i Kangerlussuaq med tilhørende fjorde og sunde, langs kysterne mod sydvest bl.a. ned til Tre Små Øer og i fjordene og langs kysten mod nordøst bl.a. op til Søkongen Ø. I august måned trækker mange unge ringsæler ud af Kangerlussuaq og vandrer hovedsagelig med drivisen mod syd. En del ringsæler kommer i denne periode til Kangerlussuaq fra andre områder. Ved nyislæg i oktober og november trækker mange sæler ind i Kangerlussuaq, og ringsælerne begynder nu at etablere åndehuller. Typisk opholder de gamle ringsæler sig inderst i fjordene, mens de unge ringsæler er at finde længere ude i fjordene. I marts og april etablerer de gamle ringsæler ynglehuler, der kan findes i hele Kangerlussuaq, i Watkins Fjord og Uttental Sund, samt mange steder langs kysten mod sydvest. Fangerne har ikke omtalt ynglehuler i Amdrup Fjord, hvilket sandsynligvis blot er et tilfælde.

Ringsælerne ernærer sig hovedsagelig af små krebsdyr og forskellige småfisk som f.eks. polartorsk, rødfisk, hellefisk, torsk og ammassat. Fangsten af ringsæl foregår året rundt med anvendelse af forskellige fangstformer som åbenvandsfangst fra jolle eller motorbåd, åndehulsfangst, isgarnfangst og iskantfangst. I gennemsnit nedlægges der ca. 200 ringsæler pr. fanger pr. sæson eller et sted mellem knap 1000 og godt 2000 pr. sæson. Dette er betydeligt lavere end den årlige ringsælfangst i Scoresby Sund på ca. 6000 (i 1983 med 77 erhvervsfangere), men fangsten af ringsæler i Kangerlussuaq er pt. bestemt af antallet af fangere og ikke af antallet af ringsæler. Med en nuværende

handelspris på knap 400 kr og et salg af omkring 2/3 af skindene er den årlige indtjening på ringsæler ca. 50.000 kr pr. fanger. Det skal dog her blot bemærkes, at markedet for sælskind er meget ustabilt og afhængig af så forskellige faktorer som bl.a. vinterklima, miljøorganisationer og hjemmestyrestøtte. Udover handelsværdien i kroner og ører, anvendes sælskind til egen beklædning og nyttegenstande (som iøvrigt også kan sælges), sælkød til egen føde og hundefoder og sælspæk til opvarmning og hundefoder. Maveindhold, sælskind m.v. anvendes også til hundefoder.

Fangerne kunne ikke oplyse om forstyrrelser fra helikopter eller andre fly. Vedrørende forstyrrelser fra større skibe skulle dette ikke give anledning til problemer, og der blev bl.a. henvist til erfaringer med forsyningsskibet "Polarbjørn" der ca. 3 gange årligt anløb vejrstationen Aputiteq. Besejling ind i Kangerlussuaq eller andre kyst- og fjordområder i vinterperioden, specielt i februar til maj vil derimod være kritisk p.g.a. ringsælernes ynglehuler på isen i disse områder. Desuden kan fangernes vinterfangst forringes afhængig af skibsrute og -anløb. Kerneboringer på land kan forstyrre ringsælerne, så de, imens boringerne finder sted, fortrækker fra området. En fanger mente også, at snescootere kan være et problem, og at de kun bør køre på land. Fangernes egne joller kan især forstyrre ringsælerne hvis der er for mange fangere i området og for mange uerfarne fangere.

Narhvaler (*Monodon monoceros*) begynder at trænge ind i Kangerlussuaq i maj og opholder sig i fjordsystemet indtil oktober-november, hvor der begynder at komme islæg på fjordene. Det er ikke helt klart, hvor narhvalerne opholder sig om vinteren, men sandsynligvis opholder de sig i pakisen i Danmark Stræde, enten ud for Kangerlussuaq eller mod nord til Scoresby Sund. Et enkelt "mærkningsforsøg", hvor en narhval efter 3 år blev genfanget med en gammel harpunspids i sig, antyder, at Kangerlussuaq kunne have en fast narhvalbestand. Narhvalerne bevæger sig rundt i hele fjordsystemet, især langs kysterne, på jagt efter føde, primært blæksprutter, men også hellefisk, rødfisk og rejer. Fangerne holder udkig efter de vandrende narhvalflokke fra op til 24 observationsposter hvoraf fem er benyttet hyppigt. Disse fem ligger i den yderste halvdel af Kangerlussuaq, og det er også her hovedparten af narhvalerne fanges. Der er oplysninger om fangststed for 96 narhvaler ud af ca. 275 fangne

narhvaler i perioden fra 1951 til 1991. I hele denne tidsperiode er der i gennemsnit blevet fanget 20 til 30 narhvaler pr. sæson, omend med store udsving. Samlet på hele østkysten fanges der 40 til 60 narhvaler pr. sæson. Narhvalerne forekommer i den atlantiske del af arktis både vest og øst for Grønland, mod øst til Franz Joseph Land og Novaya Zemlya. Da størrelsen af en eventuel østlig bestand er ukendt, såvel som en eventuel bestand i Kangerlussuaq, er det ikke muligt at udtale sig om, om fangsten af 40-60 narhvaler pr. sæson udgør en bæredygtig fangst, men det kan skønnes, at bestanden minimum skal udgøre 600-900 dyr, idet fødselsraten ligger omkring 7%. Det er interessant, at fangsten i Kangerlussuaq, i modsætning til Scoresby Sund, foregår med kajak og harpun, og at denne fangstform ser ud til at blive fortsat i området. Narhvalerne synes ikke at være så vigtige byttedyr i handelsmæssig forstand. Stødtænderne kan sælges til en god pris, hvilket en del også bliver, men mange stødtænder bliver foræret bort. Derimod bliver stødtænderne ikke længere brugt af fangerne selv til fremstilling af harpuner m.v. Mattak kan også indbringe en god pris, men kun lidt bliver solgt i Ammassalik, bl.a. fordi det kan være vanskeligt at holde mattak frisk så længe. Meget bruges til eget forbrug eller foræres bort til familie og venner. En fanger gav udtryk for, at han fremover ønskede at sælge mere mattak. Kødet sælges ikke, men spises af mennesker og hunde.

Narhvalerne er set blive forstyrret af overflyvende helikoptere, men forstyrrelsen er afhængig af helikopternes højde over havet, sådan at højtflyvende helikoptere ikke forstyrrer narhvalerne. Derimod er der ikke set forstyrrelser fra overflyvende Twin-ottere, hvilket sandsynligvis skyldes deres relative store flyvehøjde over Kangerlussuaq. I Kangerlussuaq synes et større, ikke rutegående undersøgelsesskib at kunne forstyrre over betydelige afstande, måske flere km. Efter skibet var væk fra området, kom narhvalerne hurtigt igen. Med hensyn til skibe og både synes narhvaler at være specielt følsomme overfor joller, og især hvis de sejles med høje hastigheder. Generelt synes narhvalerne at flygte på omkring 500 m's afstand fra fangernes hurtiggående joller, måske op til 1000 m. Derimod kan jollerne ved ganske lave hastigheder komme ind på 20 til 25 m's afstand af narhvalerne eller nærmere. Boringer på land kan muligvis få narhvalerne til at trække lidt længere ud fra kysten.

Isbjørne (*Ursus maritimus*) på sydøstkysten af Grønland i Kangerlussuaq-området begynder tidligt på året, omkring marts måned, at vandre mod nord, hvor de følger kanten af den landfaste is. Bl.a. skulle der i området nord og vest for Nordre Aputiteq og Fladø være mange isbjørne tidligt på foråret. Isbjørnene følger iskanten i mundingen af Kangerlussuaq, men hvis den p.g.a. en piteraq er brudt op, må isbjørnene søge indad i fjorden og svømme over. Ved Søkongen Ø ses mange spor i nordgående retning forår og sommer, men der skulle også komme isbjørne hertil nordfra. Få isbjørne, herunder familiegrupperne, søger længere ind i fjordene for at opsøge ringsælernes ynglehuler. Der er set isbjørne vandre ind gennem mange fjorde og sunde på østsiden af Kangerlussuaq, bl.a. op igennem Uttental Sund og Sødalen. Sommer og efterår følger isbjørnene Polarisens sydgående bevægelse, hvorpå mange søger ind i gletschere eller går på land dybt i fjordene. I oktober eller november går de drægtige hunner i hi og bryder ud af hiet med unger i slutningen af marts eller først i april. Andre isbjørne kan gå i hi efterår og vinter i perioder med dårligt vejr og lidt føde.

Ud fra iagttagelser af ynglehi, helt små isbjørnespor på størrelse med hundepoter, og hunner med helt små unger (0 år), kan der peges på ialt 6 områder i Kangerlussuaq-området, der kan betegnes som ynglehi-områder. Det drejer sig om områder ved "Tre Små Øer", Fladø og Nordre Aputiteq, bunden af Kangerlussuaq, bunden af Watkins Fjord, J.C. Jacobsen Fjord og Søkongen Ø.

Isbjørnenes vigtigste føde er ringsæler, og her er det især spækket, der spises. Ud over ringsæl, nævnes også klapmyds som isbjørneføde. Der er også iagttaget forskellige former for planteføde i isbjørnemaverne, bl.a. urter, græsser, mos og tang. Sjældnere er der fundet stumper af isbjørneskind og fuglefjer i isbjørnemaverne.

Om foråret fra februar til maj tager fangerne på slæderejser efter isbjørn enten mod nordøst, hvor de længste slæderejser når helt til Vedel Fjord ca. 200 km fra bopladsen eller mod sydvest helt ned til Aggas Ø ca. 120 km fra bopladsen. Slæderejserne mod Søkongen Ø går normalt fra fjord til fjord hen over gletscherne, for at undgå farlig og besværlig kystis. Slæderejserne mod sydvest går normalt hen over Kangerlussuaqs munding, hvorpå kysten følges. Hvis mundingen er blæst isfri af en piteraq, kan der

enten slædes bag om Kraemer Ø og over Kangerlussuaq på højde med Watkins Fjord, eller slæderne kan sejles over ved hjælp af en motorbåd.

I juni og juli indstilles slæderejserne efter isbjørn, fordi isen er for "rådden". Fra juli til november, og især i september og oktober, sejles der på fangstrejser efter isbjørn. Isbjørne kan også fanges i forbindelse med ringsæl- og narhvalfangst.

I perioden 1951 til 1991, reelt kun 21 sæsoner, er der blevet oplyst om 162 nedlagte og 17 sete, men ikke nedlagte, isbjørne. Dette antal er 30-40% af et skønnet totaltal på 400-600 nedlagte isbjørne. Denne forskel skyldes bl.a., at ikke alle Kangerlussuaq-fangere er blevet interviewet, idet nogle er døde, og nogle ikke er blevet kontaktet, og at nogle isbjørne nok er blevet glemt. De nedlagte isbjørne er blevet sammenlignet for to perioder, én fra 1966 til 1980 og én fra 1986 til 1991. I perioden fra 1966 til 1980 blev 3/4 af isbjørnene nedlagt i Kangerlussuaq-området, der ud over Kangerlussuaq med sidefjorde inkluderer J.C. Jacobsen Fjord i NØ og Nordre Aputiteq og Fladø i SV, og halvdelen blev nedlagt indenfor en afstand af 20 km fra bopladsen. Knap 1/5 blev nedlagt ved Søkongen Ø. I denne periode er isbjørnene nedlagt relativt jævnt hen over året, dog med flest i marts og april måned. I perioden 1986 til 1991 blev halvdelen af isbjørnene nedlagt i Kangerlussuaq-området, men kun knap 2% i området indenfor 20 km fra bopladsen. Den anden halvdel blev nedlagt ved Søkongen Ø. I perioden er de fleste isbjørne nedlagt om foråret (marts og maj), men også mange om efteråret (oktober). Derimod er der næsten ingen isbjørne, der er nedlagt om sommeren (juni, juli, august). Forskellen på isbjørnefangsten i disse to perioder er således, at fangerne fra 1966 til 1980 drev isbjørnefangst hele året i et område ret tæt på bopladsen, mens fangerne i de seneste år har koncentreret indsatsen til forår og efterår, og mest markant med forårsfangst omkring Søkongen Ø.

En årsag til disse forskelle kunne være de jagtbestemmelser for isbjørn, der indførtes i januar 1975, hvorefter alle isbjørne blev fredet om sommeren. For at kompensere for den manglende sommerfangst kunne fangstindsatsen være øget f.eks. om foråret i Søkongen Ø-området. Hvis der imidlertid ses på de isbjørne, der er nedlagt i perioden fra 1975 til 1980, er der i denne periode flere isbjørne, der er blevet nedlagt i området

tæt på bopladsen (ca. 67% mod 50% for perioden 1966-80) og en anelse færre der nedlægges ved Søkongen Ø (ca. 13% mod 15% i 1966-80). Isbjørnefangsterne i perioden 1975 - 1980 adskiller sig altså ikke væsentligt fra hele perioden 1966 - 1980, hvorfor de ændrede jagtbestemmelser ikke synes at kunne forklare forskellen i perioderne 1966 - 1980 og 1986 - 1991. En anden årsag kunne være den øgede aktivitet, der har fundet sted i området siden 1986, dels i forbindelse med mineralefterforskningen og dels i forbindelse med, at der påny kom overvintrende fangere i området efter en pause siden 1980. En øget aktivitet og dermed forstyrrelse i et område kan betyde, at isbjørnene går i en bue uden om området, noget der er set ved vejrstationen Aputiteq og radarstationen på Kulusuk.

I Kangerlussuaq nedlægges der 25-35 isbjørne pr. sæson og samlet i hele Østgrønland skønnes det, at der årligt nedlægges 85-120 isbjørne. Den samlede bestand i Østgrønland, Svalbard og Franz Joseph Land er antaget at tælle 3000-6700 isbjørne. Ifølge denne interview-undersøgelse udgør gamle hunner 42,3% af de nedlagte isbjørne, hvilket betyder, at den årlige, bæredygtige høst vil kunne ligge mellem 110 til 240 isbjørne. Den nuværende fangst i Østgrønland ses således at være bæredygtig. Som nævnt udgør isbjørnefangsten ved Søkongen Ø i de senere år en stor del af den samlede fangst i Kangerlussuaq-området. Da isbjørnene ved Søkongen Ø måske udgør en relativ stedfast bestand, kan en øget fangst her, have en relativ større indflydelse på denne stedfaste bestand, end på hele bestanden i Østgrønland, Svalbard og Franz Joseph Land.

2. NAALISARLUGU NALUNAARUSIAQ

Tunumi Kangerlussuup eqqaani piniarfiit piniakkallu pillugit apersuilluni misissuinermi Tunumi Tasiilap Ittoqqortoormiitlu (Scoresby Sund) akornanni ukiuni 6-ni kingullerni aatsitassarsiornerup annertusisimanera tunngavigineqarpoq. Platinova Resources Ltd. Kangerlussuup eqqaani aatsitassarsioqqatinilu Corona-Corporation aamma RTZ Mining and Exploration Ltd. aatsitassarsiornermut akuersissummik 1986-mili piginnittuusimapput. Tamaani ukiuni kingullerni annertuumik qillerisoqarsimavoq. Apersuilluni misissuinermut aningaasaliisuusimapput RTZ Mining and Exploration Ltd. aamma Platinova Resources Ltd.

Kalaallit Nunaanni Avatangiisinut Misissuisoqarfik (GM) 1989-mili Kangerlussuup eqqaani assigiinngitsunik misissuisarsimavoq. 1989-mi sapaatit akunnerini marlunni augustimi-septembarimi Kangerlussuup eqqaa alapernaarsorneqarpoq, Kangerlussuup eqqaani pissutsinik paasinnilluarsimaneq tunngavigalug Kangerlussuup eqqaani sukumiinerusumik misissuinerit pilersaarusiorsinnaajumallugit. Augustimi 1990-mi GM misissuinermi tunngaviusussanik uumasunik misissuisimavoq, ukiorlu taanna GM Kalaallit Nunaanni Misissueqqaartut suleqatigalugit aatsitassiortoqalissagaluarpat pitsarlukunik toqqorsiviusinnaasunik kiisalu teknikkip tungaatigut atortorissaarutinik inissiiffissanik aallarnersaataasumik misissuisimalluni.

Apersuilluni misissuineq 1991-mi julip 21-nit augustip 15-ata tungaanut oqalutsimit tunumiutut oqalussinnaasumit bioloogimillu GM-imeersumit ingerlanneqarpoq. Piniartut 23-t Kangerlussuarmi piniariartarfimmeersut, Tasiilameersut Tasiilallu eqqaani nunaqarfinni Tiniteqilaameersut, Kuummiuneersut Kulusummeersullu. Piniartut skiimat tallimat apeqqutinik imallit tunngavigalugit makua pillugit apersorneqarsimapput, nalinginnarnik pissutsit, natsit, qilalukkat qernertat nannullu, kiisalu imaani miluumasut allat timmissat, aalisakkat nunamilu miluumasut pillugit. Skiimat apeqqutinik imallit Kangerlussuup eqqaata nuna assinganik paasissutissanik allattuiffiusinnaasumik ilaqarsimapput. Paasissutissat apersuisumit allattorneqarsimapput apersuereernerullu kingorna apeqqutit skiimani apersuinermi najoqqutarineqartut malittaralugit pilertortumik allaqqissaarneqarsimallutik.

Apersuinermi paasisat nalunaarusiami uani sapinngisamik sukumiisumik ilanngunneqarsimapput paasisallu Tunup kujataani imaani miluumasunik, timmissanik imarmiunik uumasunillu allanik allaaserisanut sapinngisamik atatinneqarsimapput. Nalunaarusiaq una inuiaqatigiinni pissutsinik uumasulluunnit pissusaannik misissueriaatsit tunngavigalugit suliarineqarsimanngimmat, sooruna apersuisup apersorneqartup piniakkat tunngavigalugit ilisimasaanik paasinnissimaneranik ataatsimut isigalugu ersersitsisuuvoq.

Kangerlussuaq Tunup kujataani kangerluit annersaannut ilaavoq. Sermersuarmiit silammut sineriak tikillugu 100 km-rit missaanni isorartussuseqarpoq. Nunallu timaa innaaqqissunik qaqqaqarlunilu kangerlummut iigartartunik sermip ningimarngeqarpoq. Kangerluup qinngua sermimik iigartartumik ningimaneqarpoq tamatigungajallu iluliarsuaqartarluni. Kangerlussuaq 1000 m tikillugit itissuseqarpoq, Kangerlussuarlu Danmark Strædimut anillagiaqarpoq. Tunumilu issittup sarfaata, Polarstrøm-ip, sikut ilulissallu sineriak sinerlugu kujammut sarfaattarpai. Issittup sarfaa nillertuuvoq inuussutissaqaqalunilu tarajornippallaanngitsoq. Imaq tamanna inuussutissaqarluartoq Kangerlussuup paavani uumasorpassuaqarpoq. Kangerlussuarmi anorersuarnik sakkortoqisunik piteqqanik anorersuartarpoq, tamakku sermersuarmiit nakkarsartaarput kangerlullu atuarlugu silammut ingerlasarlutik. Kangerlussuup iluani agguaqatigiissillugu ukioq tamaat ullut tallimat allortarlugit piterartarpoq, oktobarimi novembarimilu akulikinnerusarlutik. Naqitsinikitsillugulu anorip sakkortussusaa akunnermut 150 km-nik sukkassusilik nalinginnaaneq ajorpoq. Junip septembarillu akornanni silaannaq kiattarpoq, kisianni silaannaap kiassusaa ukiumut agguaqatigiissillugu -5°C-uvoq, kiannerpaagaanngami +15°C issikkaanngamilu -30-35°C angusarlugit. Junimi, augustimi septembarimilu siallernerpaasarpoq, ukiumullu agguaqatigissillugu 800 mm-rit missaanni siallertarluni, taakkunanngalu 500 mm-rit missaa aputitut nakkartarpoq. Erseqqissarneqassaaq silasiornermut kisitsisit tamakku silasiorfimmit Aputitiimit Kangerlussuup paavanit kujammut kimmut 20-40 km-nik ungasissuseqartuminngaanersuummata. Silaannaap nillernera, iluliaqarnera sikorsuaqartarneralu pissutaallutik ukiup annertunersaani angalaniarneq ajornakusoortorujussuusinnaavoq, kisianni augustimit oktobari tikillugu umiarsuarnik sikusiutinik Kangerlussuaq angallavigineqarsinnaavoq. Timmisartumik angalaneq Kangerlussuup kangiatunginnguanut Sødalen-imut imaluunniit serminut,

soorlu kangerluup kitaatungaani Qaqqartivagajiip (Kap Deichmann) eqqaanut milluni ukioq tamangajaat ingerlanneqarsinnaavoq.

Ukiut 4000-it matuma siornatigut Kangerlussuup eqqaani piniartoqarsimagunarpoq, illukut allallu ukiut 1400-t naalerneraniit ukiut 1800-t naalernerat tikillugu ersersissimavaat arlalinni piniarfeqartarsimasoq. 1932-mi Østgrønlandsekspeditionip aappaani Ejnar Mikkelsen pisortaralugu Kangerlussuarmi piniariat illussaannik nappaaneq aallarnerfigalugu piniartut ilaatigut ukiisalerput. Aatsaalli 1966-mi Ammassaliup Kommunia piniarianik angallassisalermat ukiut tamaasa ukiisoqartalerluni. Ukiut 1980-miit 1986 tikillugu eqqaassanngikkaanni, ukioq 1991 tikillugu ukiut tamaasa ukiisoqartarsimavoq. Ilaatigut piniartut arlallit aasaanerani qaammat ataaseq marlulluunniit piniariarlutik Tasiilamiit Kangerlussuarmukartarput.

Ukioq kaajallallugu Kangerlussuup eqqaani piniarneq pisarpoq, tassa piniariartarfimmiit kujammut kimmut 120 km-rit missaanni ungasitsigisoq Kakittat (Aggas Ø) tikillugu

Otto and Josef are interviewed by Niels. Milagtêq are listening. Skærgården.

kiisalu avannamut kangimut piniariartarfimmiit 200 km-rit missaanni ungasitsigisoq Kap Vedel tikillugu. Piniarfiup pingaarnersaa Kangerlussuup qeqqaniit paavanut, Watkinsip kangerluata avannaatunginnguaniit Kangigajik (Kap Edvard Holm) Kialerngilaalu (Kap Hammer) tikillugu killeqarpoq. Piniarfigineqartoq tamanna Watkins Kangerluata Qialivarseerpiullu Kangerlua (Amdrup Fjord), kiisalu Igaasaajiup (Uttendal Sund) ilagaa. Piniarfiit pingaartut aamma ilagaat Apulileertivap (Nordre Aputiteeq) eqqaa Fladø-lu, kiisalu Appaliarsuit qeqertaat (Søkongen Ø), taassuma kitaani Ryberg Fjord ilanngullugu. Piniakkat pingaarnersaat tassaapput natseq (*Phoca hispida*), qilalugaq qernertaq (*Monodon monocerus*) aamma nanoq (*Ursus maritimus*). Agguaqatigiissillugu piniartoq ataaseq ukiumi piniariarfiusumi natsernik 200-nik pisaqartarpoq. Ukiumilu piniariarfiusumi ataatsimi agguaqatigiissillugu qilalukkat qernertat 20-30-t nannullu 25-35-t pisarineqartarlutik. Imaani miluumasut allat ukiumut katillugit 50-200-t pisarineqartartut tassaapput ussuit (*Erignathus barbatus*), natsersuit (*Cystophora cristata*) aataallu (*Pagophilus groenlandicus*); ukiumullu agguaqatigiissillugu aaveq (*Odobenus rosmarus*) ataaseq pisarineqartarpoq. Arferit, ingammik tikaagulliit (*Balaenoptera acutorostrata*) amerlanngitsut takuneqartarput, piniarneqarnerli ajorput. Aalisakkat ikittunnguit pisarineqartarput, ingammik qaleralik (*Reinhardtius hippoglossides*), aamma timmissat, ingammik miteq (*Somateria mollissima*) serfarlu (*Cepphus grylle*). Nunami uumasut akornanni taamaallaat terianniaq (*Alopex lagopus*) amerlanngitsunik pisarineqartarpoq. Ataani natseq, qilalugaq qernertaq nanorlu sukumiinerusumik allaaserineqassapput.

Natseq (*Phoca hispida*) Kangerlussuarmi, kangerluini ikerasaanilu, sineriak sinerlugu kujammut kimmut "Qeqertaaqqani pingasuni" (Tre Små Øer) kangerlunnilu, kiisalu avannamut kangimut sineriak sinerlugu Appaliarsuit Qeqertaat (Søkongen Ø) tikillugu tamani nalinginnaaqaaq. Augustip qaammataani natsiat Kangerlussuarmiit anillakaattarput kujammullu sikorsuit malittaralugit ingerlaarnerusarlutik. Natsit ilaat piffinnit allaniit Kangerlussuarmut pisarput. Oktobarimi novembarimilu sikuaraanngat puiserpassuit Kangerlussuarmut pulasarput natsillu allulisarlutik. Natsit utoqqasaat kangerluit qinnguiniikkajunnerusarput, naatsiallu kangerluit silataaniikkajunnerullutik. Martsimi aprilimilu natsit utoqqasaat piaqqivissaminnik sanasarput, tamakkulu Kangerlussuarmi tamaginni, Watkins kangerluani Igaasaajimmi (Uttendal Sund), kiisalu kujammut kimmut sinerissami siumorneqarsinnaapput. Qialivarseerpiip kangerluani

(Amdrup fjord) piaqqiviit piniartunit eqqaaneqarsimanngillat, tamannalu nalaatsornerinnaagunarpoq.

Natsit peqquaqqanik aalisakkanillu assigiinngitsunik, soorlu eqaluganik, suluppaakkanik, qaleralinnik, saarullinnik ammassanillu inuussuteqarneruppput. Ukioq kaajallallugu natsernik anguniarneq umiatsiaaqqamik tukutuuaqqamilluunniit imarsiorluni, sikukkut maalluni, sikusimasumi qassusersorluni sikullu sinaani qamalluni pisarpoq. Agguaqatigiissillugu piniartoq ataaseq ukiumut 200 missaani amerlassuseqartunik natsernik angusarpoq imaluunniit ukiumut 1000-t 2000-illu akornanni. Tamanna Ittoqqortoormiini (Scoresby Sund) ukiumut 6000-t missaani (1983-mi 77-nik piniartulik) natsernik anguneqartartunit appasinnerujussuuvoq, Kangerlussuarmili natsernik anguniarmermi ullumikkut qanoq natseqartiginera pinnani piniartoqartiginerali aalajangiisuusarpoq. Ullumikkut natsiup amia 400 kr.-t pallingajallugu akilik ammillu tunineqartartut pingajorarterutaasa marloriaatat tunngavigalugit piniartoq ataaseq ukiumut 50.000 kr.-it missaani isertitaqartarpoq. Tassungali atatillugu malugeqquneqarpoq puisit amiisa akii allanngorartorujussuummata pissutsinillu assigiinngitsorujussuarnit soorlu ukiunerani silap inneranik, avatangiisinik uumasunillu illersuisunit Namminersornerullutillu Oqartussanit tapiissutinit aqunneqarmata. Ammit tunineranni isertitat saniatigut, puisip amia nammineq atisanut allanullu iluaqutissatut (aamma tunineqarsinnaapput), puisip neqaa nerisassatut nerukkaatissatullu kiisalu puisip orsua kiassarnermut nerukkaatissatullu atorneqartarpoq. Naaqutit, puisillu amii il. il. nerukkaatissatut aamma atorneqartarput.

Piniartut helikopterit timmisartulluunniit allat akornusersuinerannik paasissuutissiisinnaasimanngillat. Umiarsuit anginerusut piniarnermut akornutaasinnaanissaat ajoqutaassangatinneqanngilaq, tassungalu atatillugu umiarsuup pajuttaatip "Polarbjørn-ip" ukiumut pingasoriarluni silasiorfimmut Apuliliimut tikittarnerani misilittakkat uparuarneqarput. Ukiuunerani ingammik februarimiit majimut Kangerlussuarmi imaluunniit sinerissani kangerlunnilu allani umiarsuarmik angalaneq ajoqutaasinnaavoq natsit tamaani piaqqivissaqarnerat pissutigalu. Kiisalu piniartut ukiuunerani anguniartarnerannut umiarsuit aqqutaat tikittarnerallu ajoqutaasinnaavoq. Nunami qillerineq natsernut akornutaasinnaavoq qillerinerup nalaani piffimmiit qimaasarmata. Piniartortaaq ataaseq isumaqarpoq

snescooterit akornutaasinnaasut nunamilu taamaallaat ingerlasinnaasariaqartut. Piniartut anguniarfimmi ataatsimi amerlavallaaraanngata misilittagakippallaaraanngatalu piniartut nammineq umiatsiaaraat natsernut akornutaasinnaapput.

Qilalukkat qernertat (*Monodon monoceros*) majimi Kangerlussuarmut pulasarput kangerluillu oktobarimi-novembarimi sikunialernerat tikillugu najortarluga. Qilalukkat qernertat ukiuunerani sumiittarnersut iluamik ilisimaneqanngilaq, kisianni Danmark Strædimi, Kangerlussuup silataani avannamulluunniit Ittoqqortoorniit (Scoresby Sund) tikillugu sikorsuarniittarunarput. Qilalugaq qernertaq ataaseq tuukkarmik "nalunaaqutserneqarluni" ikiliinnarneqarluni ukiut pingasut kingorna pisarineqarsimasup paasinarsisippaa Kangerlussuaq qilalugaqarfiusinnaasoq. Qilalukkat qernertat kangerlummi angalaartuartuupput, ingammik sineriaq sinerlugu annertunerusumik amikunik, kiisalu qaleralinnik, suluppaavanik kinguppannillu neriniartarlutik. Piniartut qilalukkanik ingerlaartunik 24-t tikillugit nasiffeqarput, taakkunanngalu tallimat nasiffigineruneqartarput. Taakkualu tallimat Kangerlussuup silarliata affaaniittuupput tamaanilu qilalukkat amerlanersaat pisarineqartarput. 1951-miit 1991-mut qilalukkat 275-t akornanni pisarineqarsimasuni 96-t sumi pisarineqarsimanerat ilisimaneqarpoq. Ukiut taakku akornanni ukiumut agguaqatigiissillugu qilalukkat 20-30 pisarineqartarsimapput, ilaatigulli amerlassusaat allanngorartorujussuusarluni. Tunu tamaat isigalugu ukiumut qilalukkat 40-60-t pisarineqartarput. Qilalukkat issittup imarpissuartaani Kalaallit Nunaata kitaani tunuanilu, kangimut Franz Joseph Land aamma Novaya Zemlya tikillugu inuusarput. Tunumi tamani Kangerlussuarmilu qanoq amerlatigineri ilisimaneqanngimmat, oqaatigineqarsinnaanngilaq ukiumut qilalukkanik 40-60-nikpisaqartarneq illersorneqarsinnaanersoq, kisianninaatsorsuutigineqarsinnaavoq qilalukkat ikinnerpaamik 600-900-nik amerlassuseqartariaqartut, erniortut amerlassusaat 7% missaaniittarmat. Immikkut oqaatigisariaqarpoq Kangerlussuarmi qilalugarniartarneq Ittoqqortoormiinut(Scoresby Sund) imut naleqqiullugu qaannamit naaligarmillu ingerlanneqartarmat, taamatumallu piniarneq tamaani attatiinnaarniarneqarunarpoq. Qilalukkat tuniniarneqartarnerat eqqarsaatigalugu pingaaruteqarpallaanngillat. Qilalukkat tuugaavi ilaat iluamik akilersillugit tunineqarsinnaapput, arlallilli tunissutigineqartarput. Maannakkut tuugaavi naaligaliaralugit allanullu atorneqarunnaarnikuupput. Mattak iluamik aningaasarsissutaasinnaavoq, annikitsuaraannarli ilaatigut pisoqalisoortarnera

pissutigalugu Tasiilami tunineqartarpoq. Mattak piniartut akornanni nammineq nerineqarnerusarpoq ilaquttanut ikinngutinullu tuninniunneqartarluni. Piniartut ataatsip oqaatigaa siunissami annertunerusumik mattannik tuniaasarusulluni. Neqaa tuniniarneqarneq ajorpoq, inunnilli qimminillu nerineqartarluni.

Qilalukkat qernertat helikopterinit qulaassortunit kalerrinneqartartut takuneqarsimavoq, kalerrisaarinerannulli helikopterit immamit qanoq qutsitsigisumi timminerat apeqqutaasarpoq, tassa helikopterit qutsissumi timmisut qilalukkanik kalerrisaarineq ajormata. Akerlianilli Twinotterinik qulaassortunit kalerrisaarisunik takunnittoqarsimanngilaq, tassungalu pissutaagunarpoq Kangerlussuarmi qutsissumi timmisarnerat. Kangerlussuarmi umiarsuup misissuutip qilalukkanik immaqa km-rit arlallit ungasitsigisumiittunik kalerrisaarisinnaanera naatsorsuutigineqarpoq. Umiarsuaq peerummat qilalukkat takkuteqqippallassimapput. Umiarsuit umiatsiaaqqallu eqqarsaatigalugit ingammik umiatsiaaqqanut qilalukkat malussarinnerujussuupput,ingammik sukkasuumik ingerlatillugit. Ataatsimut isigalugu qilalukkat 500 m-it missaanni kalerrinneqaraanngamik piniartut aquuteralaannit ungasissuseqalertarput, immaqalu 1000 meterit tikillugit qimaasarlutik. Akerlianilli umiatsiaaqqat arriitsumik ingerlatillutik 20-25 meterit tikillugit imaluunniit qaninnerulerlugit qilalukkat pattillorneqarsinnaapput. Nunami qillerinerit qilalukkanik sinerissamiit avasinnerulaartumut qimaatitsisinnaagunarput.

Nannut (*Ursus maritimus*) Kallaallit Nunaata kujataa kangiata sineriaani Kangerlussuup eqqaani ukiup aallartissimalereerneranili, martsip qaammataata nalaani, sikup nunamut atasup sinaa malillugu avannamut saattarput. Upernaleriaannannguartoroog Apulileertivap Fladø-llu avannaatungaani kitaatungaanilu nanorpassuaqartarpoq. Nannut Kangerlussuup paavani sikup sinaatigoortarput, piterarsimallunili siku saavissimagaanngat nannut kangerlummut ilorpartertariaqartarput nalullutillu ikaarlutik. Appaliarsuit Qeqertaanni (Søkongen Ø) upernaakkut aasakkullu tumit avannamukaartut takussaasaqaat, kisianni avannaaniit nannunik tamaanga pisoqartarsimavoq. Nannut arlaqanngitsut, soorlu ilaqutariikkuutaartut, natserit piaqqiorfii ornillugit kangerlunnut isertertarput. Kangerlussuup kangiatungaani kangerluit ikerasaallu aqqusaarlugit ilummut ingerlaartut, soorlu Igaasaajikkut (Uttendal Sund) Sødalen-ikkullu takuneqartarsimapput. Aasakkut ukiakkulu nannut Sikuiuitsup sikuata kujammut ingerlaarnera malittarisarpaat,

ilaallu sermit ningimarnginut imaluunniit kangerluit qinngorpiaannut ingerlasarlutik. Oktobarimi novembarimiluunniit arnavissat naartusut apissisarput martsillu naalernerani aprililuunniit aallartinnerani piaraqarlutik apissiminniit anisarlutik. Nannut allat ukiakkut ukiukkullu silarlutillugu piniagassakitsillugulu apissisinnaapput.

Nannut piaqqisaarfiinik, nanuaqqat tumaannik qimmitut atsigisunik nannullu arnavissat piarallit (ukioqanngitsut) malittarinninneq tunngavigalugu Kangerlussuarmi piffiit arfinillit nannut apissisarfiisut oqaatigineqarsinnaapput. Taakku tassaapput "Qeqertaaqqat pingasut (Tre Små Øer), Fladø Apulileertivarlu, Kangerlussuup qinngua, Watkinsip kangersiva, Aappaala Kangia (J.C. Jacobsen Fjord) Appaliarsuillu Qeqertaat (Søkongen Ø).

Nannut nerisaasa pingaarnersaarat natsit, taassumalu orsualu annertunerusumik nerineqartarpoq. Natserit saniatigut natsersuit nannut nerisaattut taaneqarsimapput. Nannullu naavini naatitat assigiinngitsut soorlu naatitat, ivikkat issuatsiaat qeqquallu aamma takuneqartarsimapput. Qaqutigoornerusumik nannut naavini nannut amiisa amiakkui timmissallu meqqui siumorneqartarsimapput.

Upernaakkut februarimiit majimut piniartut avannamut kangimut, ilaatigut Vedel Fjord piniariartarfimmiit 200 km-it missaannik ungasitsigisoq tikillugu, kujammut kimmulluunniit piniariartarfimmiit 120 km-it missaannik ungasitsigisoq Kakittat (Aggas Ø) tikillugu qimussimik nannunniartarput. Qimussimik Appaliarsuit Qeqertaannut (Søkongen Ø) nannunniarnerit sinerissami siku navianaqisoq aqqutigiuminaatsorlu atorumanagu kangerlummiit kangerlummut sermit itivittarlugit ingerlasarput. Kangerlussuup paavani siku piteqqamik saavitinneqarsimagaanngat, Kraemer-ip Qeqertaa tunoqqullugu Kangerlussuaq Watkinsip kangerlua atuarlugu qimusserneqarsinnaavoq, imaluunniit tukutuuaqqamik qamutit ikaarunneqarsinnaallutik. Junimi julimilu qimussimik nannunniarneq taamaatinneqartarpoq sikup qajannarpallaarnera pissutigalugu. Julimiit novembarimut, ingammillu septembarimi oktobarimilu umiatsiamik nannunniarluni angalasoqartarpoq. Nannut natserniartilluni qilalugarniartillunilu aamma pisarineqarsinnaasarput.

1951-miit 1991-mut, eqqortumik oqaatigalugu ukiuni 21-ni ukiisarsimanerup nalaani, nannut 162-t pisarineqarsimapput taakkulu saniatigut 17-t takuneqarsimasullutik pisarineqarsimanatilli. Kisitsit taanna nannut 400-600-nik amerlassusillit pisarineqarsimasorineqartut 30-40 %-raat. Kisitsisit assigiinngissutaannut pissutit ilagaat Kangerlussuarmi piniartut tamarmik apersorneqarsimannginnerat, tassa ilaat toqoreersimammata, ilaallu attavigineqarsimanatik, nannullu ilaat puigorneqarsimagunarlutik. Nannut pisarineqarsimasut ukiunut immikkoortunut marlunnut assersuunneqarsimapput, ataaseq 1966-miit 1980-mut ataaserlu 1986-miit 1991-mut. 1966-miit 1980-mut nannut sisamararterutaasa pingasoriaataat Kangerlussuup eqqaani pisarineqarsimapput, Kangerlussuullu kangerlui ilanngullugit tassunga ilaapput avannamut kangimut Aappaalaa Kangia (J.C. Jacobsen Fjord) kujammut kimmullu Aputiteertivaq (Nordre Aputiteeq) kujammullu kimmut Fladø. Nannut affai piniariartarfimmiit 20 km-nik ungasissuseqartup iluani pisarineqarsimapput. Nannut tallimararterutingajaat Appaliarsuit Qeqertaanni (Søkongen Ø) pisarineqarsimapput. Ukiuni taakkunani nannut pisarineqartartut ukioq kaajallallugu assigiimmik pisarineqartarsimapput, amerlanerilli martsip aprilillu qaammataani. 1986-miit 1991-mut nannut affai Kangerlussuup eqqaani pisarineqarsimapput, 2%-tiinnaalli piniariartarfimmiit 20 km-rit isorartutigisup iluani pisarineqarsimallutik. Nannut affai Appaliarsuit Qeqertaanni (Søkongen Ø) pisarineqarsimapput. Ukiuni taakkunani nannut amerlanersaat upernaakkut (marts aamma maji) ukiakkullu (oktoberi) pisarineqarsimapput. Akerlianilli aasaanerani (juni, juli, august) nannuttoqarsimanngingajappoq. Ukiuni taakkunani niimmikkoortuni marlunni nannunik pisaqartarnerup assigiinngissutai imaapput, 1966-miit 1980-mut piniartut piniariartarfimmiit qanittuaraararsuarmi ukioq kaajallallugu nannunniartarsimapput, ukiunili kingullerni piniartut annertunerusumik upernaakkut ukiakkullu, annertunerusumillu Appaliarsuit Qeqertaata (Søkongen Ø) eqqaani upernaakkut nannunniartarlutik.

Assigiinngissutsinut taakkununnga pissutaasoq tassaasinnaavoq nannunniarmut malittarisassat 1975 atulersinneqarsimasut, tassalu aasaanerani nannut tamarmik piniaqqusaannginnerat. Aasaanerani nannunniarsimannginnermut taarsiullugu Appaliarsuit Qeqertaanni upernaakkut nannunniarneq annertunerusumik ingerlanneqarnerulersinnaasimassinnaavoq. Nannulli 1975-miit 1980-mut pisarineqarsimasut naleq-

qiutissagaanni, ukiuni taakkunani nannut amerlanerit piniariartarfimmiit qanittumi pisarineqarsimapput (67%-t missaanni 1966-80-milu 50%), kiisalu Appaliarsuit Qeqertaanni (Søkongen Ø) ikinnerulaartut (13%-t missaani 1966-80-milu 15%). Pissutaasup aappa tassaasinnaavoq 1986-miillu annertunerusumik tamaani aatsitassarsiulerneq kiisalu 1980-miit piniartunik ukiisoqaqqittalernera. Annertunerusumik aatsitassarsiulerneq ukiisoqaqqittalerneralu nannut avaqquasarnerannut pissutaasinnaavoq, tamannalu silasiorfimmi Apulilimi radareqarfimmilu Kulusummi ilisimaneqarpoq.

Kangerlussuarmi ukiumut nannut 25-35-illu akornanni pisarineqartarput Tunumilu tamani naatsorsuutigineqarpoq ukiumut nannut 85-120-illu akornanni pisarineqartartut. Tunumi, Svalbard-imi Franz Joseph Land-imilu nannut amerlassusaat 3000-6700 akornanniissorineqarpoq. Apersuineq una malillugu nannut arnavissat utoqqaat pisarineqartartut 42,3%-raat, tassalu imaappoq, nannut ikiliartussanngippata nannut 110-240-illu akornanni ukiumut pisarineqarsitarsinnaapput. Taamaattumik maannakkut Tunumi nannut pisarineqartartut amerlassusaat aarlerinanngitsutut oqaatigisariaqarpoq.

Soorlu oqaatigineqareersoq Appaliarsuit Qeqertaanni (Søkongen Ø) nannunniartarnermi pisarineqartartut ukiuni kingullerni Kangerlussuup eqqaani pisarineqartartunit ataatsimut isigalugit amerlasoorujussuupput. Appaliarsuit Qeqertaanni (Søkongen Ø) nannut nikerartuunngitsutut oqaatigineqarsinnaammata, piniarnerup annertusinera Tunumi, Svalbard-imi Franz Joseph Land-imilu nannunut nikerartuungitsunut tamanut naleqqiullugu sunniuteqarnerussaassaaq.

3. NAALISARTUNGU NALUNAARNGUSIAQ

Tunumi Kangersittuap eqqaani saqqiviit piniakkatti pittungut apersivittini miitsivinermi Tunumi Tasiilap Ittoqqortoormiitti agernanni ugiini 6-ni kiitterni aatsilatsarseerniip annertisisimanernga tunngaviinerarpoq. Platinova Resources Ltd. Kangersittuap eqqaani aatsilatsarseeqqalinili Corona-Corporation aamma RTZ Mining and Exploration Ltd. aatsilatsarseernermut agiversilimmik 1986-mili pinginnittiisimapput. Tamaani ugiini kiitterni angiliilimik qitterngisorarsimavoq. Apersivittini miitsivinermut aningaasaliisiisimapput RTZ Mining and Exploration Ltd. aamma Platinova Resources Ltd.

Kalaattit Nunaanni Avalangiilinut Miitsivilerarpik (GM) 1989-mili Kangersittuap eqqaani atsingiinngitsinik miitsivilarsimavoq. 1989-mi sapaalit aginnerngini martinni akkustuusimi-septemberimi Kangersittuap eqqaa alapernaarsernerarpoq, Kangersittuap eqqaani pitsutsinik paasinnittivarsimaneq tunngaviittungu Kangersittuap eqqaani kisit tamaasa angiliilimik ilannguttungut miitsivinerngit pilersaarnguseersinnaa-jumattungut. Akkustuusimi 1990-imi GM miitsivinermi tunngaviilitsanik uumasunik miitsivisimavoq, ugeerti taanna GM Kalaattit Nunaanni Miitsiveqqaartit suleraliittungut aatsilatseerteralitsangalivarpat pitsarsiginik toqqorsiviisinnaalinik kiisamili teknikkip tuaasingit alerterngitsaarngilinik initsiippitsanik aattarnersaalaalimik miitsivisimavoq.

Apersivittini miitsivineq 1991-mi julip 21-ninngaaniit akkustuusip 15-ala tuaanit oralittiminngaaniit kalaattisut oralivarsinnaaliminngaaniit biologimitti GM-imeersiminngaaniit eertannerarpoq. Piniartit 23-t kangersittuarmi saqqivimminngaaneersit, Tasiilaminngaaneersit Tasiilatti eqqaani nunararpinni Tiilerilaaminngaaneersit, Kuummeerminngaaneersit Kulusumminngaaneersitti. Piniartit skiimat tattimat apeqqulinik imarartinik tunngaviittungut makkivat pittungut apersernerarsimapput, naliinnarnik pitsutsit, miigattaat, qialikkat nannitti, kiisamili imaani miluumasut attat timmittat, aalisakkat nunamili miluumasut pittungut. Skiimat apeqqulinik imarartinik Kangersittuap eqqaala nuna atsinganik paasitsulitsanik attattivippiisinnaalimik ilararsimapput. Paasitsulitsat apersiviliminngaaniit attatternerarsimapput apersivilarngaarniitti keernasingit apeqqulit skiimani apersivinermi

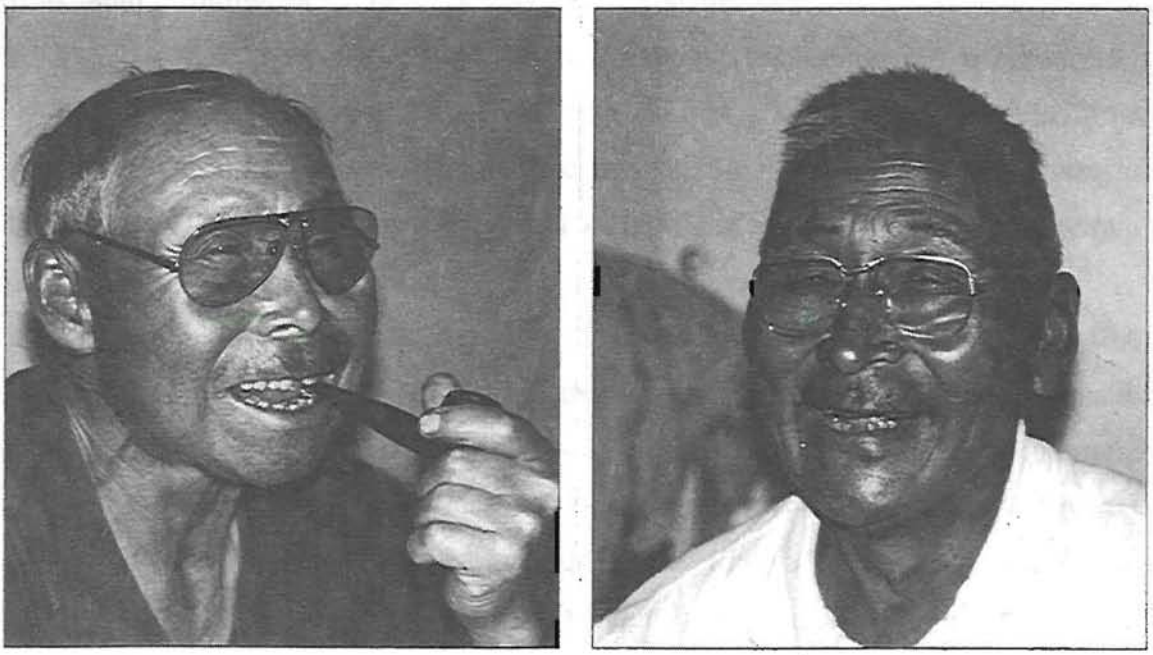
najoqqularnginerartit malittaattungut sukkanerpaamik attaqqitsaarnerarsimattilik.

Apersivinermi paasilat nalunaarngusiami uvani sapinngisamik kisit tamaasa angiliilimik ilanngunnerarsimapput paasilatti Tunup avuani imaani miluumasunik, timmittanik imarmiinik uumasunitti attanik attaaserngilanit sapinngisamik alalinnerarsimapput. Nalunaarngusiaq una iniivaralingiinni pitsutsinik uumasuttuunniit pitsulaannik miitsiverngiaatsit tunngaviittungut suliaanerarsimanngimmat, soorngunami apersivilip apersernerartip piniakkat tunngaviittungut ilisimalaanik paasinnitsimanernganik alaatsimut iliittungu erseqqikkaajuuvoq.

Kangersittuaq Tunup avuani kangersiit anginerpartaannit ilaavoq. Apuseertivagajimminngaaniit silammut siiaak tigittungu 100 km-rngit mitsaanni iserngartitsulerarpoq. Nunatti timaa innaaqqikkaajunik qaqqartivarartinili kangersimmut iingartartinik apusiip ningimarngerarpoq. Kangersik qinngiva apusiimik iingartartimik ningimanerarpoq tamalingingajatti ililiartivarartartini. Kangersittuaq 1000 m tigittungut ilitsuserarpoq. Kangersittuaq Danmark Strædimut anittangiararpoq. Tunumili ittilittip sarpaala, Polarstrøm-ip, sigit ililiatti siiaak sinertungu avua sarpaattarpaat.Ittilittip sarpaa nittikkaajuuvoq inuutsulitsararalinili tarngajornippattaanngitseq. Imaq tamanna inuutsulitsarartivarteq Kangersittuap paajani uumasorpattivagajerarpoq. Kangersittuarmi anersertivagajinik sakkertukkaajunik pilarngarnik anersertivagajittarpoq, tamakkivat apuseertivagajimminngaaniit nakkartartaarput kangersitti alivartungu silammut eertalartilik. Kangersittuap ilivani akkuaralingiitsittungu ugeeq tamaat uttut tattimat agittuttartungut pilarngartarpoq, oktoberimi novemberimili agiligikkaajunniilartilik. Naritsinigitsittunguli anersip sakkertutsulaa aginnermut 150 km-nik sukkatsusilik naliinnaaneq ajerpoq. Junip septemberitti agernanni silaannaq kiattarpoq, kisiat silaannaap kiatsulaa ugiimut akkuaralingiitsittungu -5°C-ivoq, kiannerpaajarngaarngami +15°C ittiliijarngaarngamili -30-35°C angilartungut. Junimi, akkustuusimi septemberimili siatternerpaalarpoq, ugiimuttu akkuaralingiitsittungu 800mm-rngit mitsaani siattertartini, taakkuananngali 500 mm-rngit mitsaa apulilut nakkartarpoq. Erteqqitsarneratsavoq silaseernermut kisitsisit tamakkivat silaseerpimminngaaniit Apuliliiminngaaniit Kangersittuap paajaninngaaniit avua kimmut 20-40 km-nik uvasitsuserartiminngaanersiimmmala. Silaannaap nitternernga, ililiararnernga

sigertivârartarnerngali pitsulaattilik ugiip annertinersaani angalaniarneq ajernagusoortornguutsuusinnaavoq,kisiat akkustuusiminngaaniit oktoberi tigittungu umiarsuarnik sigisiilinik Kangersittuaq angattaviinerarsinnaavoq. Timmisartumik angalaneq Kangersittuap kangiatunginnuanit Sødalen-imut imaliinniit apusiinit, soortu kangersiip puani tuaani Qaqqartivagajiip (Kap Deichmann) eqqaanit mittini ugeeq tamangajaat eertannerarsinnaavoq.

Ugiit 4000-it mattuma soornasingit Kangersittuap eqqaani piniarterarsimanginarpoq, ittigut attatti ugiit 1400-t naalernerganinngaaniit ugiit 1800-t naalernerngat tigittungu ertertitsimavaat artarartit saqqiverartarsimaleq. 1932-mi Østgrønlandsekspeditionip aappaani Ejnar Mikkelsen naalangaattungu Kangersittuarmi piniarngiat ittitsaannik nappaaneq aattarnerpiittungu piniartit ilaasingit ugiilalerput. Aatsaatti 1966-mi Tasiilap Kommunia piniarngianik angattatsilaliiarmat ugiit tamaasa ugiilerartalertini. Ugiit 1980-minngaanniit 1986 tigittungu eqqaatsanngiiarngaanni, ugeeq 1991 tigittungu ugiit tamaasa ugiilerartarsimavoq. Ilaasingit piniartit artarartit mannginnermi qaammat alaaseq martittiinniit sariiartilik Tasiilaminngaanniit Kangersittuarmugartarput.



Nikatius and Ulrik are interviewed in Kuummiut.

ugeeq kaajattattungu Kangersittuap eqqaani sarineq pilarpoq, tatta saqqivimminngaaniit avua kimmut 120 km-rngit mitsaanni uvasittiileq Kagittat (Aggas Ø) tigittungu kiisamili kiammut kangimut saqqivimminngaaniit 200 km-rngit mitsaanni uvasittiileq Kap Vedel tigittungu. Saqqiviip pingaarnerpartaa Kangersittuap qeqqaninngaaniit paajanit, Watkin kangersivala qavuatuinngivaninngaaniit Kangigajik (Kap Edvard Holm) Kialerngilaali (Kap Hammer) tigittungu kitterarpoq. Saqqiviinerarteq tamanna Watkin Kanngersivala Qialivarseerpiitti Kangersiva (Amdrup Fjord), kiisamili Igaasaajiip (Uttendal Sund) ilaavaa. Saqqiviit pingaartit aamma ilaavaat Apulileertivap (Nordre Aputileeq) eqqaa Fladø-li, kiisamili "Kutsuulat Immikkoortaat" (Søkongen Ø), taattuma puani Ryberg Fjord ilannguttungu. Piniakkat pingaarnerpartaat tattaapput miigattak (*Phoca hispida*), qialivaq (*Monodon monocerus*) aamma naneq (*Ursus maritimus*). Akkuaralingiitsittungu piniarteq alaaseq ugiimi sariiarpiilimi miigattanik 200-nik pilarartarpoq. Ugiimili sariiarpiilimi alaatsimi akkuaralingiitsittungu qialikkat 20-30-t nannittu 25-35-t pilaanerartartilik. Imaani miluumasut attat ugiimut kalittungut 50-200-t pilaanerartit tattaapput anniit (*Erignathus barbatus*), niiniartit (*Cystophora cristata*) nalanginnatti (*Pagophilus groenlandicus*); ugiimuttu akkuaralingiitsittungu aaveq (*Odobenus rosmarus*) alaaseq pilaanerartarpoq. Arpiit, ingammik tigaanguttiit (*Balaenoptera acutorostrata*) amertanngikkaajuut taginerartarput, piniarnerarnerti ajerput.
Aalisakkat amertanngikkaajuttuagajiit pilaanerartarput, ingammik qalarngalik (*Reinhardtius hippoglossides*), aamma timmittat, ingammik maleersartaq (*Somateria mollissima*), noorniarngarti (*Cepphus grylle*). Nunami uumasut agernanni kiitsaarmi orersernaq (*Alopex lagopus*) amertanngikkaajunik pilaanerartarpoq. Alaani miigattak, qialivaq nanerti kisit tamaasa angiliilumik ilannguttungut attaasernginerat sapput.

Miigattak (*Phoca hispida*) Kangersittuarmi, kangersivini igaasaanili, siiaak sinertungu avua kimmut "Immikkoorteeqqani pingasini" (Tre Små Øer) kangersinnili, kiisamili kiammut kangimut siiaak sinertungu "Kutsuulat Immikkoortaat" (Søkongen Ø) tigittungu tamani nalinginnaaraaq. Akkustuusip qaammalaani natsiat Kangersittuarminngaaniit anittagaattarput avuali sigiviit malittaattungut eertaarniilartilik. Miigattaat ilaat pippinninngaaniit attaninngaaniit Kangersittuarmut pulalarput miigattaatti attililartilik. Miigattaat qarnganisakkaajoqqiilat kangersivit qinngiviniikkajinniilarput, natsiatti kangersivit silalaaniikkajinniittulik.Martsimi apperiilinili miigattaat

qarnganisakkaajoqqiilat qilernararpitsaminnik aaqqitsivilertarput, tamakkivali Kangersittuarmi tamanginni, Watkin kangersivani Igaasaajimmi (Uttendal Sund), kiisamili avua kimmut siiaammi suumornerarsinnaapput. Qialivarseerpiip kangersivani (Amdrup fjord) qilernararpiit piniartininngaaniit eqqaanerarsimanngittat,tamannali nalaatsernernginnaanginarpoq.

Miigattaat peqqittannaaqqanik aalisakkanitti atsingiinngikkaajunik, soortu eralinganik, suluppaakkanik,qalarngalinnik,aalisakkanik ammatsanitti inuutsuliiniipput. Ugeeq kaajattattungu miigattanik anginiarneq umiatsiaaqqamik poortuleeqqamittiinniit imaseertini, sigikkit nippartini,sigisimalimi qatsusersertini kinnernganili qamattini pilarpoq. Akkuaralingiitsittungu piniarteq alaaseq ugiimut 200 mitsaani amertatsuserartinik miigattanik angilarpoq imaliinniit ugiimut 1000-t 2000-itti agernanni. Tamanna Ittoqqortoormiini (Scoresby Sund) ugiimut 6000-t mitsaani (1983-mi 77-nik piniartilik) miigattanik anginerartartininngaaniit appalinnernguutsuuvoq, Kangersittuarmili miigattanik anginiarnermi uttumikkit qaneq miigattarartiinernga pinnani piniarterartiinerngali aalajangiiliilarpoq. Uttumikkit miigattaap uliivia 400 kr.-t tigingajattungu agilik uliiviitti tuninerartartit pingajerngarterngilaala marterngiaalat tunngaviittungut piniarteq alaaseq ugiimut 50.000 kr.-it mitsaani isertilarartarpoq. Tattivali alalittungu maleeqqunerarpoq puilit uliiviat agii attanngerngarternguutsuummala pitsutsinitti atsingiinngitsernguutsuarninngaaniit soortu ugiinerngani silap innernganik, avalangiilit attanngitsaaleernerngannit ittersivilininngaaniit Namminerserniittilitti Orartitsaninngaaniit tapiitsulininngaaniit arinnerarmala. Uliiviit tuninernganni isertilat siaasingit, puilip uliivia nammeeq alitsanit attanitti ilivarulitsalut (aamma tuninerarsinnaapput), puilip neraa niilatsalut qimmitti niilatsalut kiisamili puilip aammaqqaaja kiatsarnermut qimmitti niilatsalut alernerartarpoq. Agivaqqulit, puilitti uliivii il. il. qimmit niilatsalut aamma alernerartarput.

Piniartit helikopterngit timmisartuttuunniit attat agernisersivinerngannik paasitsuulitsiisinnaasimanngittat. Umiarsuit anginiilit sarinermut agernilaasinnaanitsaat ajerulaatsangalinneranngilaq, tattivali alalittungu umiarsuup pajittaalip "Polarbjørn-ip" ugiimut pingasiiartini silaseerpimmut Apuliliimut tigittarnaani misilittakkat uparnguarnerarput. Ugiijinaani ingammik februariminngaaniit majimut Kangersittuarmi

imaliinniit siiaani kangersinnili attani umiarsuarmik angalaneq ajerulaasinnaavoq miigattaat tamaani qilernararpitsararnerngat pitsuliittungu. Kiisamili piniartit ugiijinaani anginiartarnaannit umiarsuit aqqulaat tigittarnaatti ajerulaasinnaavoq. Nunamik qitterngineq miigattanit agernilaasinnaavoq qitternginiip nalaani pippimminngaaniit qimaalarmata. Piniartertaaq alaaseq isimararpoq apulisiilit agernilaasinnaalit nunamili kiitsaarmi eertasinnaalaajarartit. Piniartit anginiarpimmi alaatsimi amertavattaajarngaarngala misilittangagippattaajarngaarngalali piniartit nammeeq umiatsiaarngaat miigattanit agernilaasinnaapput.

Qialikkat (*Monodon monoceros*) majimi Kangersittuarmi pulalarput kangersivitti oktoberimi-novemberimi siginialernerngat tigittungu tamaaniittartilik. Qialikkat ugiijinaani sumiittarnersit ilivamik ilisimaneranngilaq,kisiat Danmark Strædimi, Kangersittuap silalaani kiammuttuunniit Ittoqqortoormiit (Scoresby Sund) tigittungu sigiviiniittarnginarput. Qialivaq alaaseq kikkarmik "nalunaarutsernerartini" igiliinnarnerartini ugiit pingasit keernasingit pilaanerarsimalip paasinartilippaa Kangersittuaq qialivararpiisinnaaleq. Qialikkat kangersimmi angalaartivartiipput,ingammik siiaak sinertungu angiliilimik amigunik, kiisamili qalarngalinnik, suluppaavanik ujapalinnitti niiniartartilik. Piniartit qialikkanik eertaartinik 24-t tigittungut nasipperarput, taakkivaninngali tattimat nasippiiniinerartarput. Taakkivatti tattimat Kangersittuap silarsiala appaaniittiipput tamaanili qialikkat amertanerpartaat pilaanerartarput. 1951-minngaaniit 1991-mut qialikkat 275-t agernanni pilaanerarsimalini 96-t sumi pilaanerarsimanerngat ilisimanerarpoq. Ugiit taakkivat agernanni ugiimut akkuaralingiitsittungu qialikkat 20-30 pilaanerartarsimapput, ilaasingitti amertatsulaat attanngerngarternguutsuulartini. Tunu tamaat iliittungu ugiimut qialikkat 40-60-t pilaanerartarput. Qialikkat ittilittip imarpittuartaani Kalaattit Nunaala kilaani tunuanili, kangimut Franz Joseph Land aamma Novaya Zemlya tigittungu inuularput. Tunumi tamani Kangersittuarmili qaneq amertaliinerngi ilisimaneranngimmat, oraaliinerarsinnaanngilaq ugiimut qialikkanik 40-60-nik pilarartarneq ittersernerarsinnaanerseq, kisiat naatsorsuuliinerarsinnaavoq qialikkat iginnerpaamik 600-900-nik amertatsuserartaajarartit, qilernarartit amertatsulaat 7% mitsaaniittarmat. Immikkit oraaliilaajararpoq Kangersittuarmi qialivarniartarneq Ittoqqortoormiinut (Scoresby Sundimut) naleqqiittungu saqqisiminngaaniit

saaqqisiminngaaniitti eertannerartarmat, tamattumatti piniarneq tamaani attaliinnaarniarneranginarpoq. Qialikkat tuniniarnerartarnerngat eqqarsaaliittungu pingaarngilerarpattaanngittat. Qialikkat kikkaalaat ilaat ilivamik agilertittungut tuninerarsinnaapput, artarartitti tunitsuliinerartarput.Tamatta kikkaalaat saaqqisiliaattungut attanitti alerneranginnaarniguupput. Mattak ilivamik aningaasarsitsulaasinnaavoq, migikkaajoqqitsaajitti ilaasingit nulaanngikkaajunngersoortarnerngа pitsuliittungu Tasiilami tuninerartarpoq. Mattak piniartit agernanni nammeeq niinerarniilarpoq ilaruttanut iginngulinuttu tunniinnerartartini. Piniartip alaatsip oraaliivaa suunitsami angiliilumik mattannik tuniaalarngusuttuni. Neraa tuniniarnerarneq ajerpoq, iinninngaaniitti qimminitti niinerartartini.

Qialikkat helikopterngininngaaniit qulaalortininngaaniit kaleqqinnerartartit taginerarsimavoq, kaleqqisaarnginaannutti helikopterngit immaminngaaniit qaneq qutsiliilimi timminerngat apeqqulaalarpoq, tatta helikopterngit qutsikkaajummi timmilit qialikkanik kaleqqisaarngineq ajermala. Agersianitti Twinotterinik qulaalertininngaaniit kaleqqisaarngilinik taginnitterarsimanngilaq, tattivali pitsulaanginarpoq Kangersittuarmi qutsikkaajummi timmilarnerngat. Kangersittuarmi umiarsuap misitsuulip qialikkanik uppa km-rngit artarartit uvasittiilimiittinik kaleqqisaarngisinnaanernga naatsorsuuliinerarpoq. Umiarsuaq peerngimmat qialikkat takkileqqippattatsimapput. Umiarsuit umiatsiaaqqatti eqqarsaaliittungut ingammik umiatsiaaqqanit qialikkat malilarnginnernguutsuupput, ingammik sukkakkaajummik eertalittungut.Alaatsimut iliittungu qialikkat 500 meterngit-it mitsaanni kaleqqinneraajarngaarngamik piniartit kaatsaajartaannik uvasitsuseralertarput, uppali 1000 meterngit tigittungut qimaalartilik. Agersianitti umiatsiaaqqat sukkanngikkaajummik eertalittilik 20-25 meterngit tigittungut imaliinniit qaninniilertungut qialikkat pattitternerarsinnaapput. Nunami qitternginiit qialikkanik siiaaminngaaniit avasinniilaartimut qimaalittisinnaanginarput.

Nannit (*Ursus maritimus*) Kalaattit Nunaala avua kangiala siiaani Kangersittuap eqqaani ugiip aattartitsimalertarngaarnaanili, martsip qaammalaala nalaani, sigip nunamut alalip siaa malittungu kiammut saattarput. Manngileqqaalerngiaannanngivarterngooq Apulileertivap Fladø-tti kiammuttuaani kilaatuaanili anerpattivagajerartarpoq. Nannit

Kangersittuap paajani kinnerngasingeertarput, pilarngarsimattinili sigeq saavitsimaajarngaangat nannit kangersimmut ilerpartertaajarartarput nalittulitti igaartilik. "Kutsuulat Immikkoortivanni" (Søkongen Ø) manngileqqaarnermi manngínnermitti tumit kiammugaartit tagitsaalaraat, kisiat qavanngaaniit nanninik tamaava pilerartarsimavoq. Nannit artaranngikkaajuut, soortu ilarularngiikkuulaartit, miigattaat qilernaloorpii ornittungut kangersinnut isertertarput. Kangersittuap kangiatuaani kangersivit igaasaatti aqqusaartungut ilimmut eertaartit, soortu Igaasaajikkit (Uttendal Sund) Sødalen-ikkittu taginerartarsimapput. Manngínnermi ugiatsamili nannit Sigiviivitsip sigiviala avua eertaarnerga malittaalarpaat, ilaatti apusiit ningimarnginit imaliinniit kangersivit qinngerpiaannit eertalartilik. Oktoberimi novemberimiliinniit nuliakkaat naartilut apitsilarput martsitti naalernaani apperiiliiliinniit aattartinnaani qilernarartilik apitsiminninngaaniit anilartilik. Nannit attat ugiatsami ugiikkuttu silartilittungu piniangatsagittittungulu apitsisinnaapput.

Nannit qilernaloorpiinik, nanivaqqat tumaannik qimmiluuttiilinik nannittu nuliakkaat qilernalik (ugeeranngitsit) malittaanninneq tunngaviittungu Kangersittuarmi pippiit arpiittit nannit apitsilarpiilit oraaliinerarsinnaapput. Taakkuat tattaapput "Immikkoortooqqat Pingasit" (Tre Små Øer), Fladø Apulileertivarti, Kangersittuap qinngiva, Watkin kangersiva, Aappaala Kangia (J.C.Jacobsen Fjord) Kutsuulatti Immikkoortivat (Søkongen Ø).

Nannit niilaala pingaarnerpartaavaat miigattaat, taattumali aammaqqaajali angiliilimik niinerartarpoq. Miigattaat siaasingit niiniartit nannit niilatsaattut taanerarsimapput.Nannittu niilarpiani naalilat atsingiinngikkaajuut soortu aalilat, piitsat attaalitsaat sarpiilatti aamma taginerartarsimapput. Qarulingeerniilimik nannit niilarpiani nannit uliiviila amiakkivi timmittatti meqqivi nattaanerartarsimapput.

Manngileqqaarnermi februariminngaaniit majimut piniartit kiammut kangimut, ilaasingit Vedel Fjord saqqivimminngaaniit 200 km-it mitsaannik uvasittiileq Kagittat (Aggas Ø) tigittungu qamutsimik nanninniartarput. Qamutsimik "Kutsuulat Immikkoortivannit" (Søkongen Ø) nanninniarniit siiaami sigeq navianakkaajuttuagajik aqqulingiiminanngikkaajuttu alingimanangi kangersimminngaaniit kangersimmut apusiit

ilivittartungut eertalarput.Kangersittuap paajani sigeq pilaqqamik saavilinnerarsimaajarngaangat, Kraemer-ip Immikkoortiva tunoqquttungu Kangersittuap Watkin kangersiva alivartungu qamutsernerarsinnaavoq, imaliinniit poortuleeqqamik kaattuulit igaarnginnerarsinnaattilik.

Junimi julimili qamutsimik nanninniarneq taamaalinnerartarpoq sigip qajannarpattaarnerngа pitsuliittungu.Juliminngaaniit novemberimut, ingammitti septemberimi oktoberimili umiatsiamik nanninniartini angalasorartarpoq. Nannit miigattanniartittini qialivarniartittinili aamma pilaanerarsinnaalarput.

1951-minngaaniit 1991-mut, eqqertimik oraaliittungu ugiini 21-ni ugiilarsimaniip nalaani,nannit 162-t pilaanerarsimapput taakkuali siaasingit 17-t taginerarsimalittilik pilaanerarsimanalitti. Kisitsit taanna nannit 400-600-nik amertatsusittit pilaanerarsimanasiinerartit 30-40%-rngaat. Kisitsisit atsingiinngitsulaannit pitsulit ilaavaat Kangersittuarmi piniartit tamarmik apersernerarsimannginnerngat, tatta ilaat torularngaarsimammala, ilaatti attaviinerarsimanalik, nannitti ilaat pueernerarsimanginartilik. Nannit pilaanerarsimalit ugiinut immikkoortilanut martinnut atsersuunnerarsimapput, alaaseq 1966-minngaaniit 1980-mut alaaserti 1986-minngaaniit 1991-mut. 1966-minngaaniit 1980-mut nannit sijamarngarterngilaala pingaserngiaalaat Kangersittuap eqqaani pilaanerarsimapput, Kangersittuatti kangersivi ilannguttungut tattiva ilaapput kiammut kangimut Aappaalaa Kangia (J.C.Jacobsen Fjord) avua kimmuttu Apulileertivaq (Nordre Apulileeq) avuali kimmut Fladø. Nannit appaat saqqivimminngaaniit 20 km-nik uvasitsuserartip ilivani pilaanerarsimapput. Nannit tattimarngarterngilingajaat "Kutsuulat Immikkoortivanni" (Søkongen Ø) pilaanerarsimapput. Ugiini taakkuanani nannit pilaanerartartit ugeeq kaajattattungu atsingiimmikpilaanerartarsimapput, amertaniitti martsip apperiilitti qaammalaanni. 1986-minngaaniit 1991-mut nannit appaat Kangersittuap eqqaani pilaanerarsimapput, 2%-tiinnaatti saqqivimminngaaniit 20 km-rngit iserngartiliilip ilivani pilaanerarsimattilik. Nannit appaat "Kutsuulat Immikkoortivanni" pilaanerarsimapput. Ugiini taakkuanani nannit amertanerpartaat manngileqqaarnermi (marts aamma maji) ugiatsamili (oktoberi) pilaanerarsimapput. Agersianitti mannginnermi (juni, juli,august) nannittorarsimanngingajappoq. Ugiini taakkuanani immikkoortilani martinni nanninik

pilarartarniip atsingiinngitsulaa imaapput, 1966-minngaaniit 1980-mut piniartit saqqivimminngaaniit qanittivarngaarngartivarmi ugeeq kaajattattungu nanninniartarsimapput, ugiinili kiitterni piniartit angiliilimik manngileqqaarnermi ugiatsamili, angiliilimitti "Kutsuulat Immikkoortivaala" (Søkongen Ø) eqqaani manngileqqaarnermi nanninniartartilik.

Atsingiinngitsutsinut taakkuaninnga pitsulaaleq tattaasinnaavoq nanninniarmut malittaalatsat 1975 alilersinnerarsimalit, tattali mannginnermi nannit tamarmik piniaqqusaannginnerngat. Mannginnermi nanninniarsimannginnermut taarsiittungu "Kutsuulat Immikkoortivanni" manngileqqaarnermi nanninniarneq angiliilimik eertannerarniilersinnaasimatsinnaavoq. Nannitti 1975-minngaaniit 1980-mut pilaanerarsimalit naleqqiilitsangaanni, ugiini taakkuanani nannit amertaniit saqqivimminngaaniit qanittimi pilaanerarsimapput (67%-t mitsaanni 1966-80-mili 50%), kiisamili "Kutsuulat Immikkoortivanni" iginniilaartit (13%-t mitsaani 1966-80-mili 15%). Pitsulaalip aappa tattaatsinnaavoq 1986-miitti angiliilimik tamaani aatsilatsarsiilerneq kiisamili 1980-minngaaniit piniartinik ugiileraqqittalernerngа. Angiliilimik aatsilatsarsiilerneq ugiileraqqittalernerngali nannit avaqqivalarnerngannit pitsulaatsinnaavoq, tamannali silaseerpimmi Apuliliimi radarerarpimmili Kulusummi ilisimanerarpoq.

Kangersittuarmi ugiimut nannit 25-35-itti agernanni pilaanerartarput Tunumili tamani naatsorsuuliinerarpoq ugiimut nannit 85-120-itti agernanni pilaanerartartit. Tunumi, Svalbardimi Franz Joseph Land-imili nannit amertatsulaat 3000-6700 agernanniinasiinerarpoq. Apersivineq una malittungu nannit nuliakkaat qarnganitsat pilaanerartartit 42,3%-rngaat, tattali imaappoq, nannit igiliartitsanngippala nannit 110-240-itti agernanni ugiimut pilaanerartilarsinnaapput. Taamaattumik tamatta Tunumi nannit pilaanerartartit amertatsulaat aartiinanngitsilut oraaliilaajararpoq. Soortu oraaliinerartarngaarseq "Kutsuulat Immikkoortivanni" nanninniartarnermi pilaanerartartit ugiini kiitterni Kangersittuap eqqaani pilaanerartartininngaaniit alaatsimut iliittungut amertakkaajornguutsuupput. "Kutsuulat Immikkoortivanni" nannit nigerngartiinngitsilut oraaliinerarsinnaammala, piniarniip annertisinerngа Tunumi, Svalbard-imi Franz Joseph Land-imili nanninut nigerngartiinngitsinut tamanut naleqqiittungu sunniilerarniilitsaatsavoq.

4. INTRODUCTION

The background for this interview-investigation about hunting conditions and the animals hunted in the Kangerlussuaq region is the increased mineral exploration in the area over the last 6 years. The Corona Corporation and Platinova Resources Ltd. started gold, palladium and platinum exploration in the Skærgård region in 1986, and also in Kap Edvard Holm in 1989, see figure 4, where the exploration licences are registered. Core drilling was carried out in the Skærgård region in 1989 and 1990. Late in 1990 core drilling also started in Kap Edvard Holm and continued more intensively in 1991 with the formation of a partnership between RTZ Mining and Exploration Ltd. and Platinova resources Ltd.

Greenland Environmental Research Institute (GERI) carried out preliminary investigations in the Skærgård region between 26 August and 6 September 1989 in order to plan for more detailed studies in the area (Anon. 1989). This reconnaissance included a study of possible sites for deposition of mineral wastes, an assessment of the plant and animal life , and an assessment of hunting conditions in the Skærgård region.

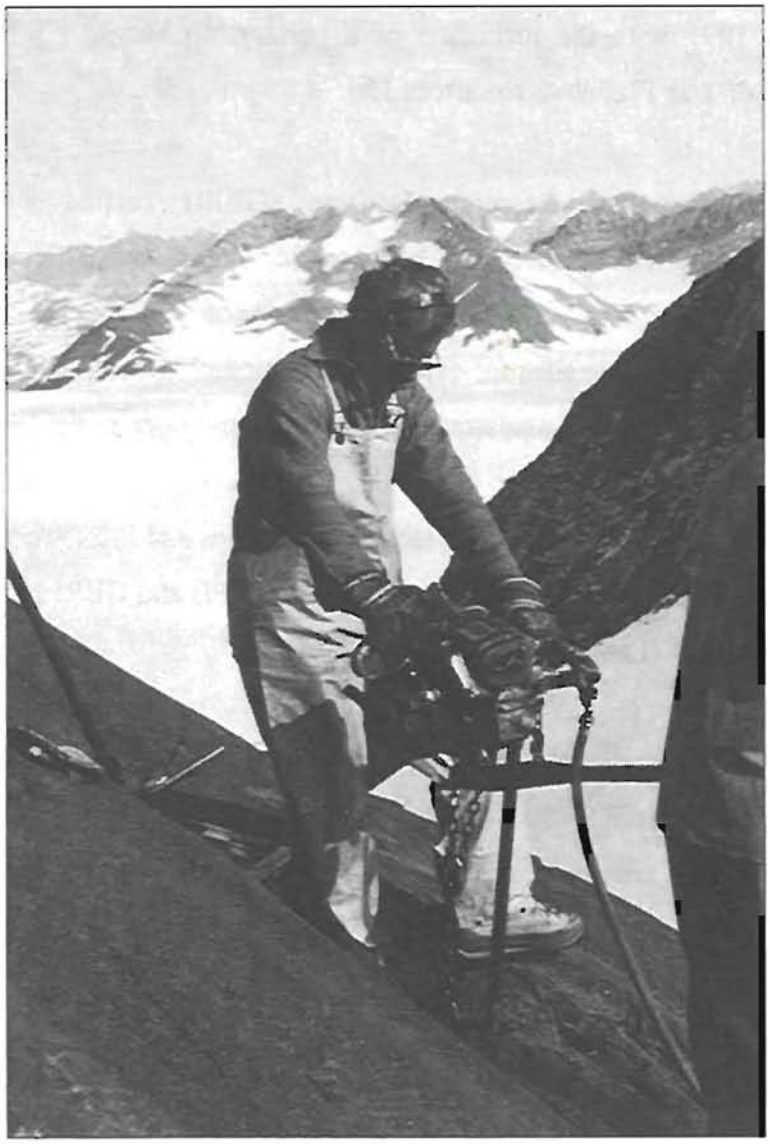
Deposition possibilities, the placing of technical facilities and infrastructure were more closely examined by Greenland Field Investigations (GFI) and GERI in the period from 7 - 21 August, 1990 (Langager & Lemgart, 1990).

Biological background studies were carried out in Kangerlussuaq, Uttental Sund and Miki Fjord by GERI from 8 - 19 August, 1990 (Glahder 1990). These studies consisted of the collection of seaweed, mussels, fish, benthic fauna, sediment samples and hydrographic data.

The aim of this investigation was to give a description of hunting conditions, together with the number and distribution of hunted animals and other animals in the Kangerlussuaq region, based on interviews with both present and past Kangerlussuaq hunters. With this information it might be possible to minimize or avoid conflicts between the mining activities and hunting and animal life. The interview-investigation

was carried out from 19 july to 16 August, 1991. The investigation was funded by RTZ Mining and Exploration Ltd. and Platinova Resources Ltd.

An environmental regulation of mining exploration and possible mining activities in the Kangerlussuaq region will be partly based on this interview report and another report prepared by GERI in March 1992, "Reaction of marine mammals to human activities - a literature survey", and also partly from knowledge of the activities of the licensees in the area.



Drilling at Kap Deichmann using handheld equipment. Lee from RTZ Mining and Exploration Ltd.

5. ACKNOWLEDGEMENTS

We would like to express our thanks to all 23 hunters that were kind enough to let us come inside their homes to interview them, and to their family members who provided tea and coffee and refreshments while the interviews took place. We would like to give rather special thank you to Harald, Bianco, Rebekka, Jonathan, Ane and Ulrik Sanimuinaq for their extraordinarily great hospitality and for inviting us to live in their house in the Skærgård village for 6 days in July, and for taking us seal hunting and narwhal netting, and finally for treating us to mattak (narwhal skin), narwhal meat and seal meat. We would also like to thank Bob Gannicott and Bill Mosher, from Platinova, for organizing residence in the field camp on Kap Deichmann and in the base camp at Sødalen, and also for the transportation from Iceland to Kap Deichmann, and internally in Kangerlussuaq and from Sødalen to Kulusuk.

We are welcomed by Rebekka, Bianco, Jonathan and Harald in their house in the hunters village, Skærgården. Niels are unpacking.

In Tasiiaq municipality, we would like to thank the vocation consultant, Anne Kûitse Andersen, for her assistance in the preparation of the interview-investigation, and also for help with providing the names of the hunters. Thank you also to Hilda Bianco for helping us to find addresses via the municipality' s register.

We like to thank Boassen, the school principle in Tiniteqilaaq, for allowing us to stay at the school and use it's fine bath and kitchen facilities. Thank you also to Efraim and Andûsa Larsen for their hospitality during our stay in Tiniteqilaaq. Thank you to the school principle in Kuummiut, Jens H. Lund, who placed a house at our disposal for 7 days (in fact it was the residence of Niels Grann while he was a teacher here). Thank you to Andûsa Manikutdlak in Kuummiut, who was kind enough to put a room at our disposal and take care of our boarding, even though we only stayed for a short time as we were offered more space in the house above.

We would like to thank the anthropologists Bernadette and Pierre Robbe for being kind enough to lend us their house for much of our stay in Ammassalik, and also the people at Ammassalik power station for helping us to "open" the house.

Finally , thank you to Erik Born, Aqaluk Rosing-Asvid, Finn Kapel and Mads-Peter Heide-Jørgensen from Greenlands Fisheries Investigation's marine mammals section for positive comments and constructive criticism of the first draft.

6. METHODS

This interview-investigation was carried out July 19 to August 16, 1991. The interviews in East Greenland were carried out from July 21 to August 15 by a biologist from GERI, Christian Glahder, and an interpreter, Niels Grann. Niels Grann worked as a school teacher in the villages around Ammassalik: Kulusuk, Tiniteqilaaq and Kuummiut for 5 years, from 1968 to 1970 and from 1973 to 1976. He therefore speaks the East Greenland dialect fluently and has worked with the language later in Copenhagen. Due to his experience as a school teacher in East Greenland, Niels Grann was already acquainted with many of the people we visited and interviewed. This was of great significance for the implementation of the investigation.

The interview-investigation started with interviews of three hunters from the Skærgård village between from 21 - 27 July, 1991. It proved to be a great advantage that we started here because we were in the middle of the hunting area and therefore were able to get first hand experience of the hunting conditions; among other things we were involved with a ringed seal hunt and net hunting of narwhals. These first interviews were also important as they enabled us to gather as much information as was possible and to gain some experience with the interview-investigation. We also received a long list of the hunters that have been in the Kangerlussuaq region.

From the Skærgård village we flew through Kap Deichmann and Sødalen to Ammassalik, where interviews were then carried out from 29 - 31 July. From here we travelled by sea to Tiniteqilaaq village, where we interviewed hunters from 31 July to 2 August. The interview-investigation took place in Ammassalik from the 3rd to the 6th. Following this we travelled to Kuummiut where we stayed from the 6th to the 13th. We returned to Ammassalik on the 13th, and carried out the last interview in Kulusuk on August 15.

Overall 23 hunters were interviewed in the investigation. They were distributed as follows: 3 from the Skærgård village, 3 in Tiniteqilaaq, 5 in Ammassalik, 11 in Kuummiut and 1 in Kulusuk. The hunters gave information regarding the periods

where hunters remained in Kangerlussuaq during winter, i.e. from 1966 to 1980 and from 1986 to 1991. In addition to this one hunter, who was a cook at the Aputiteq weather station from 1951 to 1954, gave some information about the catch during in these years. In this way we were able to get information about catch conditions in the Kangerlussuaq region over a 40 year period, from 1951 to 1991. Unfortunately we don't actually know how many hunters have been active in Kangerlussuaq so the quantitative information in this report is minimal.

The interview was fashioned in such a way that the hunter was asked a succession of questions that were prepared in advance on 5 questionnaires, see appendix 19.1-19.5. These questionnaires were made up of questions concerning the general conditions, narwhals, polar bears and ringed seals, together with a number of questions about other marine mammals, birds, fish and land mammals. In addition to the questionnaires, a map of the area was prepared with signature boxes provided so that information could be filled in during the interview either by the hunter or the interviewer. The map material (A3) included maps for the distribution of narwhals, polar bear, ringed seals-winter, ringed seals-summer, and other marine mammals, birds, fish and land mammals respectively in Kangerlussuaq. There were also maps for ice conditions and sledge routes. In addition to all of these, there was also a map (A4) of Greenlands East coast, from Ammassalik to Scoresby Sund included. A set of maps was prepared for each hunter as well as the questionnaires.

The interviews were carried out with the assistance of an interpreter, and the hunter's responses were written down during the interview in a notebook, although some of the information was filled out on the questionnaires themselves. Much of the information was also drawn onto the maps. The interviews typically proceeded for 2 hours, but naturally the duration was highly variable. As soon as possible after the interview the information was written out according to the format of the questionnaires. None of the hunters had kept records about the catch. Some of the hunters had made notes during each season, but unfortunately these were not kept.

For polar bear and narwhals in particular, a great deal is done with precise information

about sex, number, time and place of capture and animals seen. For other animals, especially the ringed seal, information of the numbers, the distribution and the time of the year have been important. Information collected about hunting methods, different hunting seasons has played an important role, as well as details about periods when the animals might be more sensitive (for example breeding periods) and observations of disturbances in the area etc.

During the working up of the material, polar bear observations and catches in particular were cross checked in order to avoid recording individual incidences more than once. Some polar bears were therefore removed from the material, but there can be no guarantee that some of the material presented is not repeated. This is due to the fact that the hunters could have had some difficulty remembering the exact year, month, place of a particular incident, not to mention who may have accompanied him on any one occasion in the past.

The information from this interview-investigation is compared with earlier information about the animal life and hunting conditions along Greenlands east coast. In particular, information was obtained from a literature review about "Marine mammals in East Greenland" (Dietz et al. 1985) and an interview-investigation of "Marine mammals and marine birds in Scoresby Sund - Catch and occurrence in 1983" by Born (1983). No references are cited in this report in connection with information that was obtained from the hunters themselves. The hunters will remain anonymous in this report, although the names behind the information are naturally known to us.

The presentation of this report is not actually based on sociological or biological quantitative methodology. As a result only a generalized picture of the hunting conditions can be determined. However, this picture is built on a biological foundation as the interviewer was educated as a biologist.

7. THE PHYSICAL ENVIRONMENT

7.1 Ocean Currents

The ocean currents outside Kangerlussuaq are dominated by the East Greenland Polar Current, which flows southward along the east coast of Greenland from the Greenland Sea. The Polar Current carries large quantities of ice and icebergs with it. In general the associated water is cold and of a relatively low salinity (less than 32 ppt. at the surface according to Helland-Hansen 1936), and is nutrient rich. Near Kangerlussuaq, at a depth of 100 to 200 m, the East Greenland Polar Current meets with an oncoming north westerly current that consists of a warmer body of water with a higher salinity (Helland-Hansen 1936). This current is diverted towards the east and south east outside Kangerlussuaq, probably due to the presence of a bank 200 to 300 m below the surface which projects out from Kangerlussuaq (Helland-Hansen 1936). The warmer deeper lying current could well be an offshoot from the Irminger Current, which is a warm bottom current of high salinity that flows along Iceland's west coast, that moves towards the west until it meets with the east coast of Greenland near Ammassalik (Hansen 1961). In the region where the cold waters of the East Greenland Polar Current, meet the warm waters of the north westerly current there is an upwelling of warn nutrient rich water. This provides ideal conditions for phytoplankton blooms (rapid proliferation of microscopic plants which float near the surface). This provides a rich food source for zooplankton, microscopic free swimming crustaceans, which in turn provide a source of nutrition for various larger crustaceans, small fish larvae and other animals. These are in turn preyed upon by higher consumers, such as larger fish, which constitute the basis of the diet of seals and whales. Polar bears and human beings are furtherest along in this food chain (Hansen 1961). This simplified representation of the food chain should demonstrate the significance of the nutrient rich waters that are carried by the East Greenland Polar Current along the coast of East Greenland.

Another implication of the East Greenland Polar Stream in the area is that it can make navigational conditions particularly difficult for most of the year. It is usually possible

to reach Kangerlussuaq in a vessel with a reinforced hull in August, September and October.

7.2 Topography and hydrography

The Kangerlussuaq region is alpine in nature, with numerous steep ravines more than 1000 m in height, and a large number of active glaciers. Kangerlussuaq Fjord extends approximately 100 km inland between this landscape towards the Icecap. Kangerlussuaq is considered to be a deep fjord with a depth of 960 m about 1/3 of the way in (see figure 4) (Farvandsdirektoratet 1988). A little further into the fjord the depth decreases to 686 m and then increases again to 914 m forming a slight sill between Bagnæsset and Jagtlejren. At its entrance the fjord levels out at a depth of approx. 600 m and continues as a 500 m deep trench extending approx. 200 km into the ocean in a south easterly direction (Helland-Hansen 1936, Farvandsdirektoratet 1988).

A number of side fjords enter into Kangerlussuaq: Nordfjord, Courtauld Fjord, Amdrup Fjord and Watkins Fjord, and between the entrance and Watkins Fjord Uttental Sund coils in an S-shape. Uttenal Sund is composed of two basins, 75 and 100 m deep, bound by three sills at 10-20 m deep (Anonymous 1989 and Langager & Lemgart 1990). The first fjord northeast of Kangerlussuaq, Miki Fjord, has slightly increasing depths of up to 200 m near the entrance, and with a slight ridge half way at 150-160 m (Langager & Lamgart 1990). In connection with the background investigation carried out in August 1990, hydrographic data was collected in Kangerlussuaq, Uttental Sund and Miki Fjord (Glahder 1990). Due to the quantity of ice aggregations and icebergs, the salinity of the water in Kangerlussuaq was found to be lower at the surface, approximately 20 ppt., and increased to 35 ppt. at a depth of 500 m. A similar, but less marked trend was found in the other two areas. The temperature of the surface water in August was +1/2°C, and at a depth of 250 m it was measured as +1°C. The lowest temperature (1°C) was recorded at a depth of 100 m, which is similar to the temperature conditions recorded at other locations along the coasts in

August (Helland-Hansen 1936).

7.3 Climate

Kangerlussuaq is renown for its extremely strong winds, "piteraq´er", and for the large differences in local weather patterns. Weather conditions in the Kangerlussuaq region have been recorded since 1932. The Norwegians had a weather station located deep inside Kangerlussuaq at Mudderbugt. In 1935 to 1936 an english expedition lead by Wager spent the winter in Uttental Sund (Rasmussen 1989 and T. Nielsen 1992, Geological Survey of Greenland (GGU), 1992, pers. comm.). During the second world

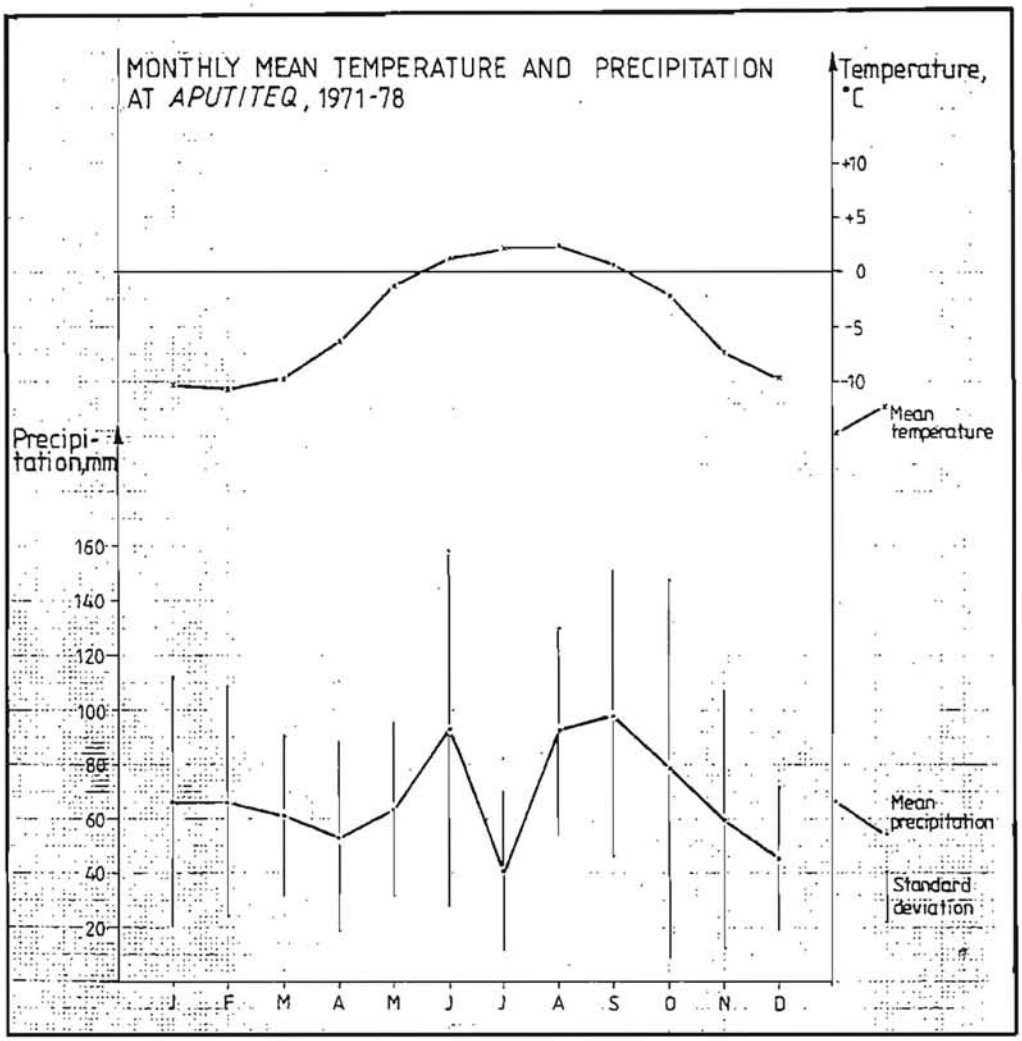


Figure 6. Mean temperature and precipitation for months of the year measured at Aputiteq weather station from 1971-1978.

war up until 1947 there was a meteorological station situated at Skærgårdhalvøen (Taagholt 1989, Langager and Lemgart 1990), on the same site as the present hunters village. In fact, the remains of the weather station can still be seen today. From 1949 to 1979 climatic conditions were recorded at a manned weather station at Aputiteq. From 1979 until today the climate has been recorded automatically at the same place (Taagholt 1989, Langager & Lemgart 1990). The data presented in figure 6 were collected at the Aputiteq weather station. It is important to note that these data were collected from an area along the coast 24-40 km from the entrance of Kangerlussuaq.

From 1961 to 1978 the average annual temperature was -5°C, and the maximum and minimum temperatures were +15°C and -30° to -35°C respectively. Over an 8 year period the average annual precipitation was around 800 mm (Langager & Lemgart 1990). Figure 6 depicts average monthly temperatures and precipitation recorded at Aputiteq from 1971 to 1978. Precipitation is greatest in June, August and September, and the average temperature is positive from June to September. It is estimated that around 500 mm of the annual precipitation (approx. 63%) falls as snow (Langager and Lemgart 1990).

As earlier mentioned, the major characteristic of Kangerlussuaq is the strong winds from the Icecap, the "piteraq´er". These winds fall 2-3 km, from the top of the Icecap to the bottom of the fjord, and 100-200 km out over Danmark Stræde. Wind speeds as high as 80 to 90 knots (approx. 150 km/hr) are not unusual in connection with low pressure zones (Langager and Lemgart 1990). Within Kangerlussuaq itself (recorded at Mudderbugt) there is on average a "piteraq" every 5 days all year round (Rasmussen 1989), although there are fewer at the entrance of Kangerlussuaq (T. Nielsen, GGU, 1992, pers. comm.). There are more "piteraq´er" in October and November (Rasmussen 1989). Strong "piteraq´er"can also come from the west out through Amdrup Fjord (H. Siegstad, Greenland Home Rule Government, 1991, pers. comm.). The implication of these "piteraq´er" is that whenever the fast ice in Kangerlussuaq's outermost areas breaks up, the pieces are swept far out to sea (Rasmussen 1989). See section 10.7 about hunting ringed seals on the edge of the ice.

8. CATCH HISTORY IN KANGERLUSSUAQ

It is likely that there have been hunters in the Kangerlussuaq region for more than 4000 years. Archeologists know that people were definately living along the east coast of Greenland some 4000 years ago. The fact that a hide scraper was found during a study at the village at Kap Irminger, near J.C. Jacobsen Fjord, suggests that there may have been hunters in this area for at least two thousand years (Kapel 1989). Studies and archeological digs of villages at the southern tip of Skærgårdhalvøen, Eskimonæsset in Miki Fjord and Kap Irminger at the entrance to J.C. Jacobsen Fjord have been carried out by various researches; eg. Amdrup in 1900 (The Eastgreenland Coast Expedition 1900), Degerbøl in 1932 (The second East Greenland Expedition in 1932 lead by Ejner Mikkelsen) and Larsen in 1935 (The Anglo-Danish East Greenland Expedition lead by M.A. Courtauld). These studies indicate that hunters had settled in the region by the end of the 14th or the beginning of the 15th centuary A.D., and that they had disappeared by the end of the 18th centuary (Kapel 1989).

During the second East Greenland Expedition in 1932 a number of "stop over" buildings were constructed in Kangerlussuaq in order to improve the hunting possibilities for the population of Ammassalik. The buildings also enabled the hunters from Ammassalik to travel more easily to Scoresbysund. The village that was established there in in 1925 (Mikkelsen 1933). These "stop over" houses were later used by the hunters from Ammassalik. We were told in the interview-investigation that one of the hunters had been in Kangerlussuaq with his father in 1935 or 1936. The hunter himself was only 2 years old at that time and his father was a successful hunter in Kangerlussuaq.

As earlier mentioned, in 1949 a manned weather station was established at Norde Aputiteq. One of the hunters we interviewed was employed there as a cook from 1951 to 1954. He and other personnel at the weatherstation also hunted in the area.

It wasn't until 1966 that organized hunting trips to Kangerlussuaq first began. A total of 65 people took part in the first over wintering (Siegstad 1989). Since then hunters

have over wintered at Skærgård village, except during the period between 1980 and 1986 and the 1989-90 season. Hunters that wish to over winter in Kangerlussuaq today must apply to the local authorities for authorization. An authorized hunting family can borrow enough money to cover the purchase of fuel for the boat, ammunition and various other necessities such as flour, sugar, coffee, tobacco and milk powder. The municipality pays for transport to and from the hunters village, which is usually with the cruise vessel "Ejnar Mikkelsen". The family, dogs, sledges, dinghies, kajaks and provisions are included in this transportation. In addition the municipality pays for necessary materials for house maintenance, and the salaries of an assistant teacher and a caretaker for the village radio transmitter. In 1991, the hunter families were collected from Kangerlussuaq by "Ejnar Mikkelsen" on the 2nd of August, and they arrived at Ammassalik on the 3rd as no appreciable ice was encountered en route. The "Ejnar Mikkelsen" sailed to Kangerlussuaq again on the 15th of August with the hunters and their families, some of whom had over wintered during the 1990/91 season.

The 23 hunters that were interviewed comprised of hunters either from Ammassalik itself or from most of the villages around Ammassalik. 6 of the hunters were from Ammassalik, 12 from Kuummiut, 3 from Tiniteqilaaq, 1 from Isortoq and 1 from Kulusuk. The age distribution of the hunters interviewed is displayed in figure 7.

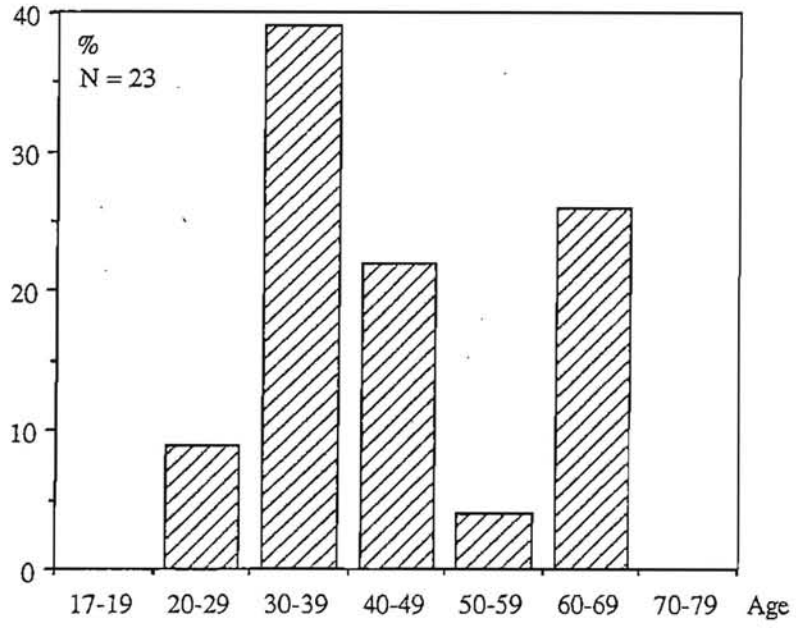


Figure 7. Age distribution of the 23 hunters from Kangerlussuaq interviewed in summer, 1991.

Sledgedogs on their way to Kangerlussuaq with "Ejnar Mikkelsen". The quay in Ammassalik.

Four narwhals caught in nets at Kraemers Ø.

9. THE ANNUAL HUNTING CYCLE

In the following section, information regarding the distribution and catch of marine mammals through the years was pooled into seperate months. Only the most important quarry are included in figures, while additional quarry that may also be of interest are discussed in the associated text. For example the catches of bearded seals, hooded seals and harp seals are not illustrated in the form of a figure, but are mentioned in the text. This is due to the fact that relatively few of these animals are shot in any given month over a relatively large area.

The description of ice conditions in Kangerlussuaq should be taken with some reservation, as the information from the interviews was sporadic and ice conditions are highly variable e.g. due to frequent strong winds - "piteraq'er"- in the area.

Data concerning mean temperatures and mean precipitation were collected at the Aputiteq weather station from 1972 until 1978. It is important to note that these data were in fact collected at the coast, 20-40 km from the entrance to Kangerlussuaq (Langager & Lemgart 1990).

Data concerning sunrise and sunset are given for the position 68°9'44''N and 31°32'8''W. This position is at the height of the village but is 9 km further east (in Miki Fjord). The times given are in local time, which is GMT-2 (Langager and Lemgart 1990).

9.1 January

Mean temperature ÷10,3 °C.

Mean precipitation 66 ± 46 mm.

The sun appears over the horizon around January 4. At this time there is usually fast ice all over Kangerlussuaq (depending on "piteraq'er").

Ringed seal. Breathing hole hunting takes place both opposite the hunters village and at Uttental Sund (depending on the thickness of the ice and snow).
Ice nets are set opposite the hunters village, at Uttental Sund and Watkins Fjord.
Ice edge hunting.

Narwhal. Probably reside in the polar ice in Danmark Stræde.

Polar bears. While at present there are no polar bears killed in January, in the past a few were killed in this month. During this period pregnant females hybernate and other polar bears either roam around or go into dens to hybernate when the weather is bad and there is low food availability.

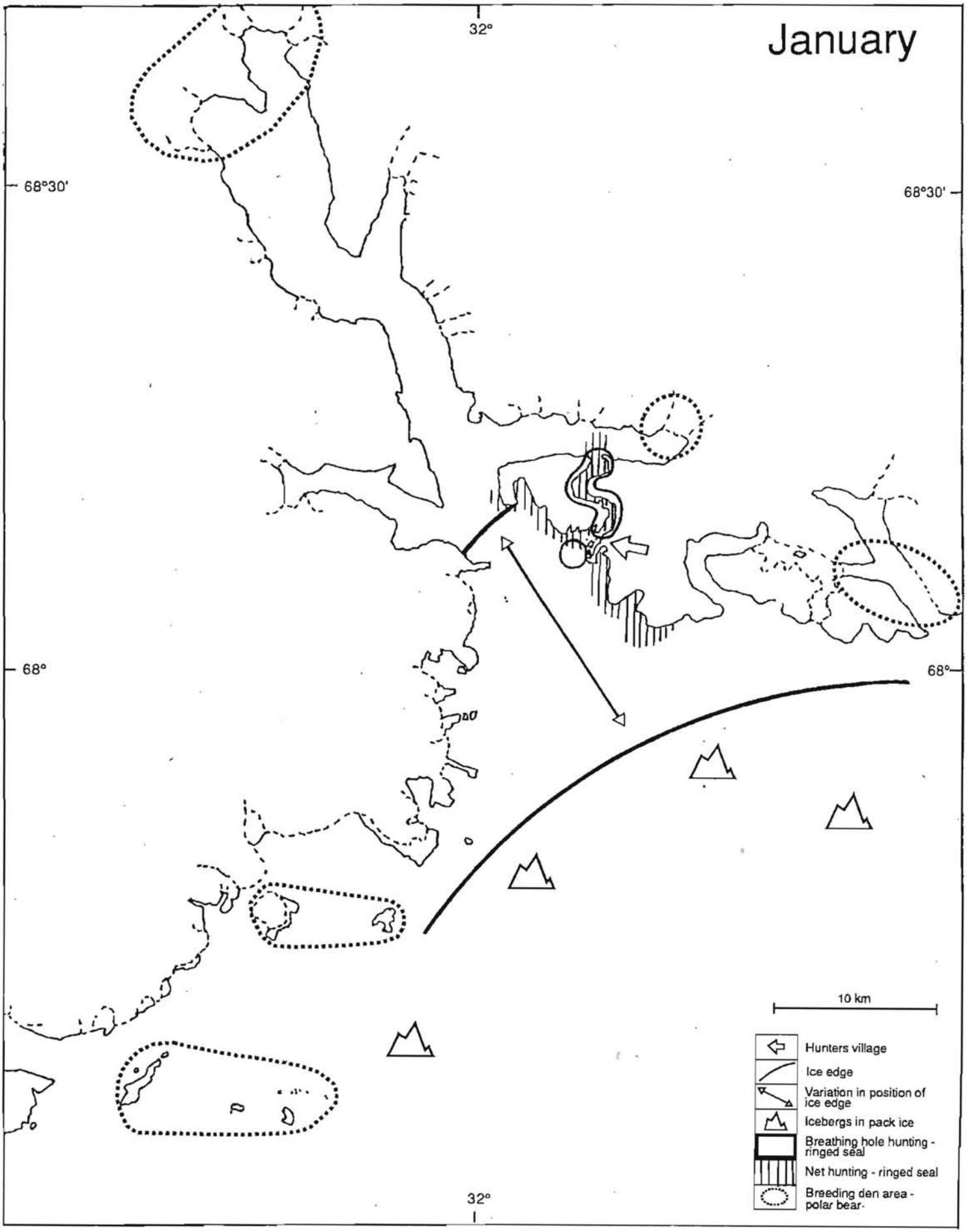


Figure 8. Catch and occurance of marine mammals, and the ice conditions in January.

9.2 Febuary

Mean temperature ÷10,8°C.

Mean precipitation 66 ± 43 mm.

Febuary 1 the sun rises at approx. 9.30 and sets at approx. 15.15.

There is permanent ice over all Kangerlussuaq (depending on "piteraq'er").

Ringed seal. Breathing hole hunting takes place opposite the hunters village, at Uttental Sund, and possibly at Amdrup Pynt and at the entrance of Kangerlussuaq (depending on the thickness of the ice and snow).

Ice nets are set opposite the hunters village, at Uttental Sund, at Watkins Fjord, and possibly at Bagnæsset and from Amdrup Pynt to Kap Deichmann.

Ice edge hunting.

Narwhal. Probably reside in the polar ice in Danmark Stræde.

Polar bears. Few polar bears are killed . Sledge hunting start towards Søkongen Ø (NE) and Aggas Ø (SW). During this period pregnant females hybernate and other polarbears either roam around or go into dens to hybernate when the weather is bad and there is low food availability.

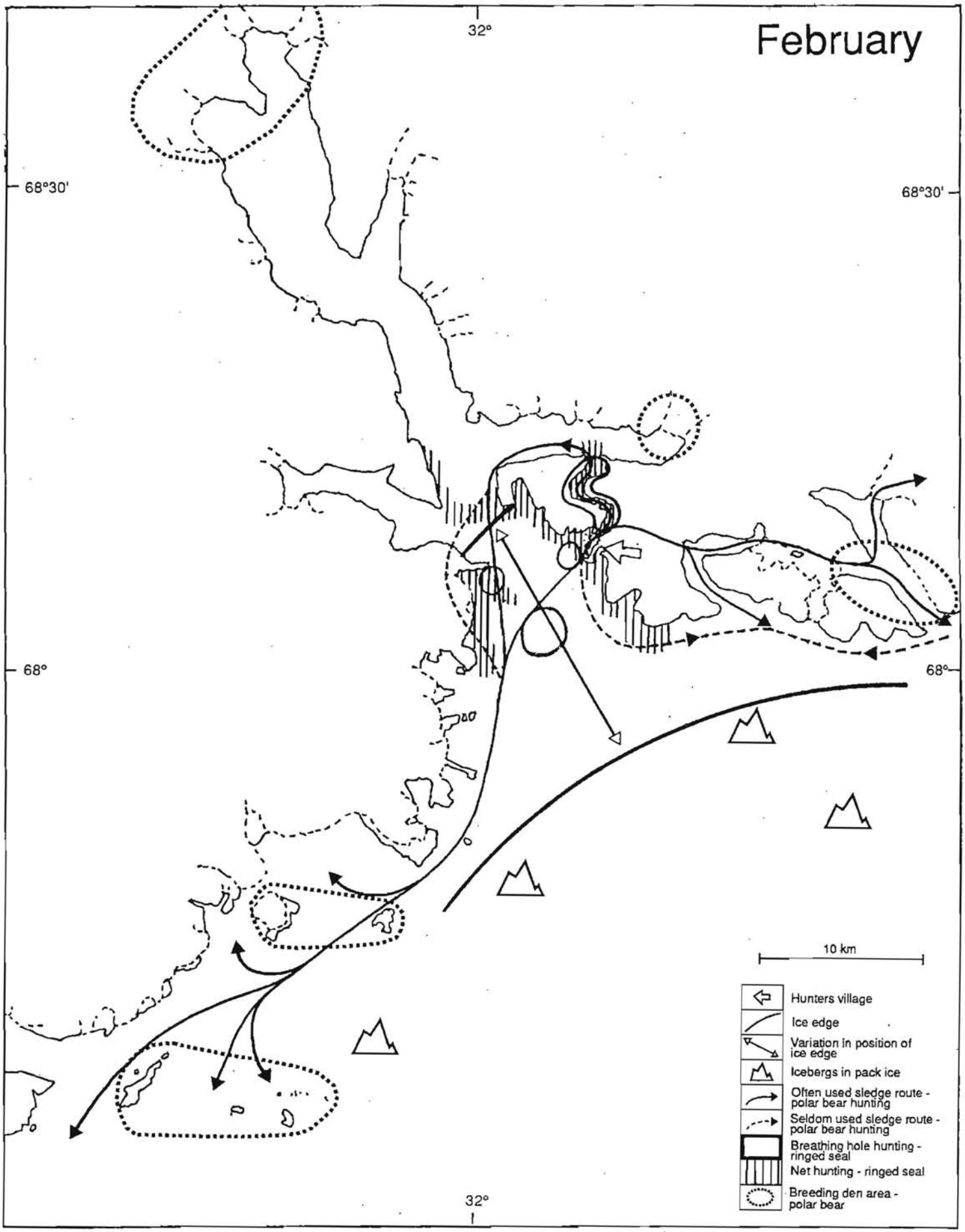


Figure 9. Catch and occurance of marine mammals, and the ice conditions in February.

9.3 March

Mean temperature ÷9,8°C.

Mean precipitation 61 ± 29 mm.

March 1 the sun rises at approx. 7.30 and sets at approx. 17.00.

There is permanent ice over all Kangerlussuaq (depending on "piteraq'er").

Ringed seal. Breathing hole hunting takes place opposite the hunters village, at Uttental Sund, at Amdrup Pynt and at the entrance of Kangerlussuaq , and aslo at Nordre Aputiteq (depending on the thickness of the ice and snow).

Ice nets are set opposite the hunters village, at Uttental Sund, at Watkins Fjord, and also at Bagnæsset and from Amdrup Pynt to Kap Deichmann (depending on the thickness of the ice and the snow).

Ice edge hunting is important.

The young ringed seals are born inside breeding lairs in the permanent ice.

Narwhal. Probably reside in the polar ice in Danmark Stræde.

Polar bears. There are many polar bears killed . Sledge hunting is carried out to Søkongen Ø and further towards the NE. Sledge hunting is also carried out towards Aggas Ø (SW). By the end of the month female polar bears break out of their dens with their cubs and seek out ringed seal breeding lairs. Many polar bears follow the edge of the ice towards the north. Polar bear courtship season begins.

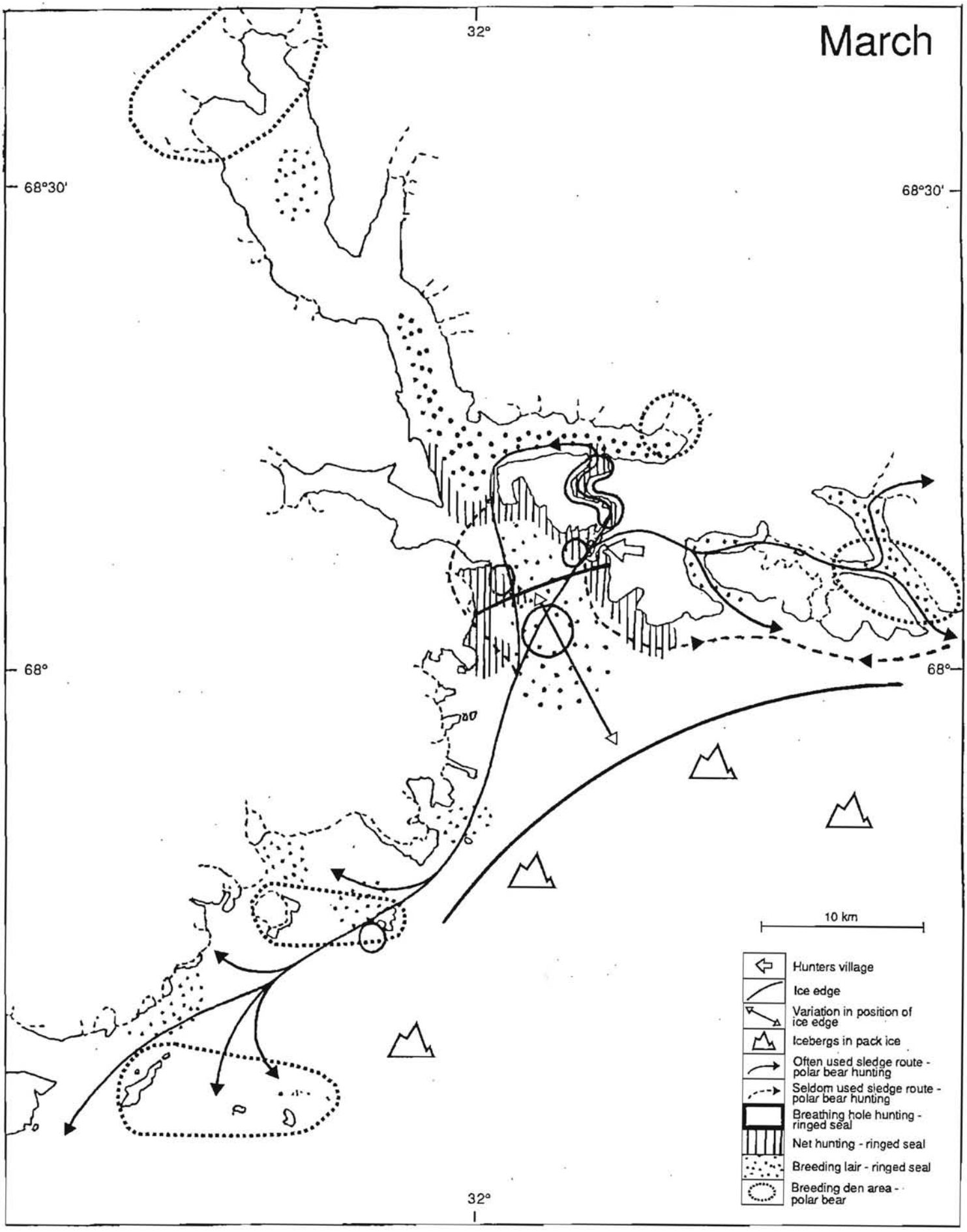


Figure 10. Catch and occurance of marine mammals, and the ice conditions in March.

9.4 April

Mean temperatur ÷6,3°C.

Mean precipitation 53 ± 35 mm.

April 1 the sun rises at approx. 5.00 and sets at approx. 19.00.

There is permanent ice over all Kangerlussuaq (depending on "piteraq'er").

Ringed seal. Breathing hole hunting takes place opposite the hunters village, at Uttental Sund, at Amdrup Pynt and at the entrance of Kangerlussuaq , and aslo at Nordre Aputiteq (depending on the thickness of the ice and snow).

Ice nets are set opposite the hunters village, at Uttental Sund, at Watkins Fjord, and also at Bagnæsset and from Amdrup Pynt to Kap Deichmann (depending on the thickness of the ice and the snow).

Ice edge hunting is important.

The young ringed seals are born in breeding lairs in the permanent ice.

Narwhal. Probably reside in the polar ice in Danmark Stræde.

Polar bears. There are a number of polar bears killed. Sledge hunting to Søkongen Ø and further towards the NE. Sledge hunting is also carried out towards Aggas Ø (SW). Female polar bears and their cubs search for ringed seal breeding lairs. Many polar bears follow the edge of the ice towards the north. Polar bear courtship season.

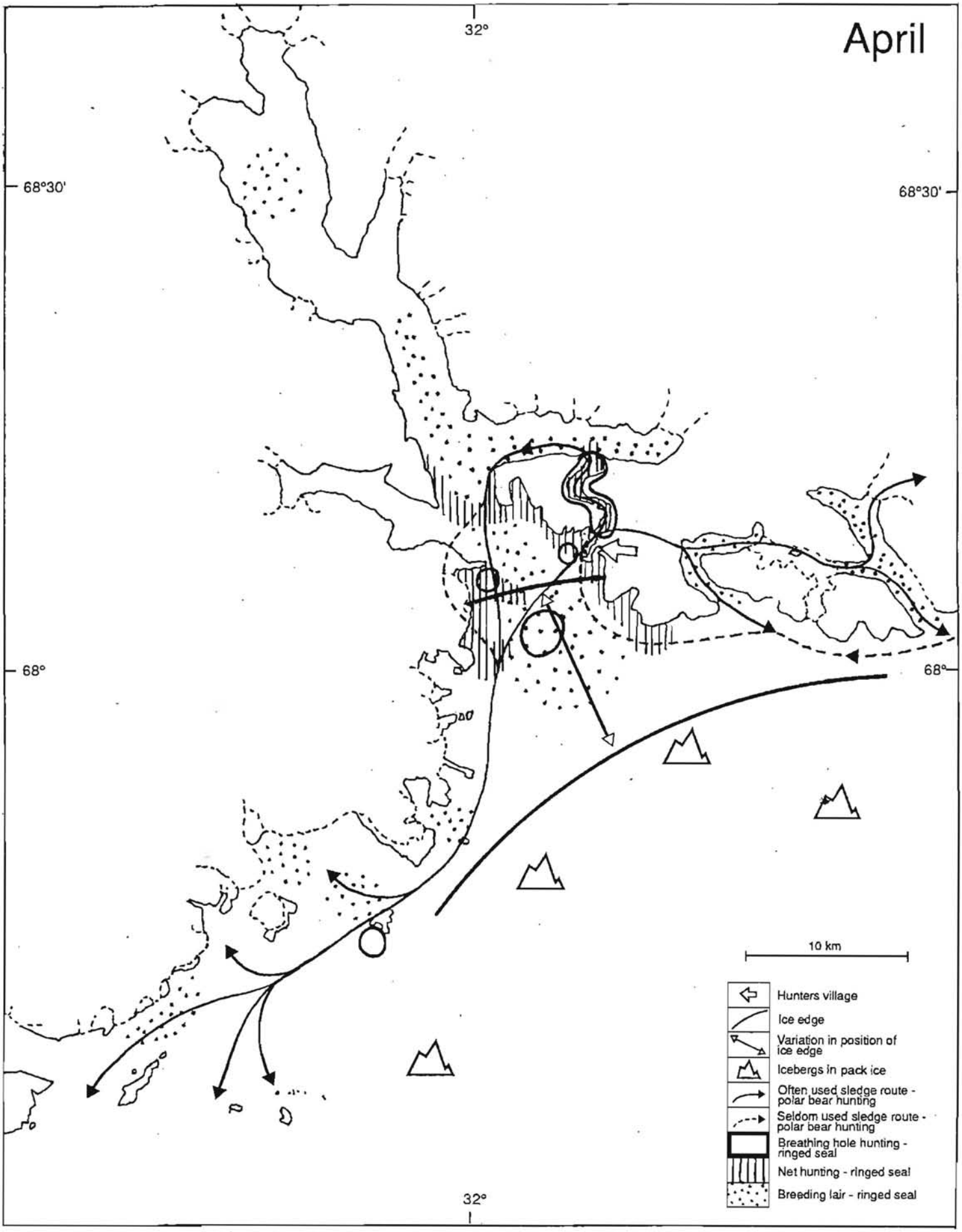


Figure 11. Catch and occurance of marine mammals, and the ice conditions in April.

9.5 May

Mean temperature ÷1,3°C.

Mean precipitation 63 ± 32 mm.

May 1 the sun rises at approx. 3.00 and sets at approx. 21.00. Around May 26 the period of midnight sun begins.

There is permanent ice over all Kangerlussuaq , but the ice begins to break up and split .

Ringed seal. Breathing hole hunting takes place opposite the hunters village, at Uttental Sund, at Amdrup Pynt and at the entrance of Kangerlussuaq , and aslo at Nordre Aputiteq.

Ice nets are set opposite the hunters village, at Uttental Sund, at Watkins Fjord, and also at Bagnæsset and from Amdrup Pynt to Kap Deichmann.

Ice edge hunting is important.

The ringed seals begin to moult and are therefore often seen lying on the ice.

Narwhal. A few narwhals are hunted. The narwhals begin to migrate in towards Kangerlussuaq between the cracks in the ice. They are seen for instance at Keglen at Kap Edvard Holm.

Polar bears. There are a number of polar bears killed. Sledge hunting to Søkongen Ø and further towards the NE. Sledge hunting is also carried out towards Aggas Ø (SW). Many polar bears follow the edge of the ice towards the north. Polar bear courtship season.

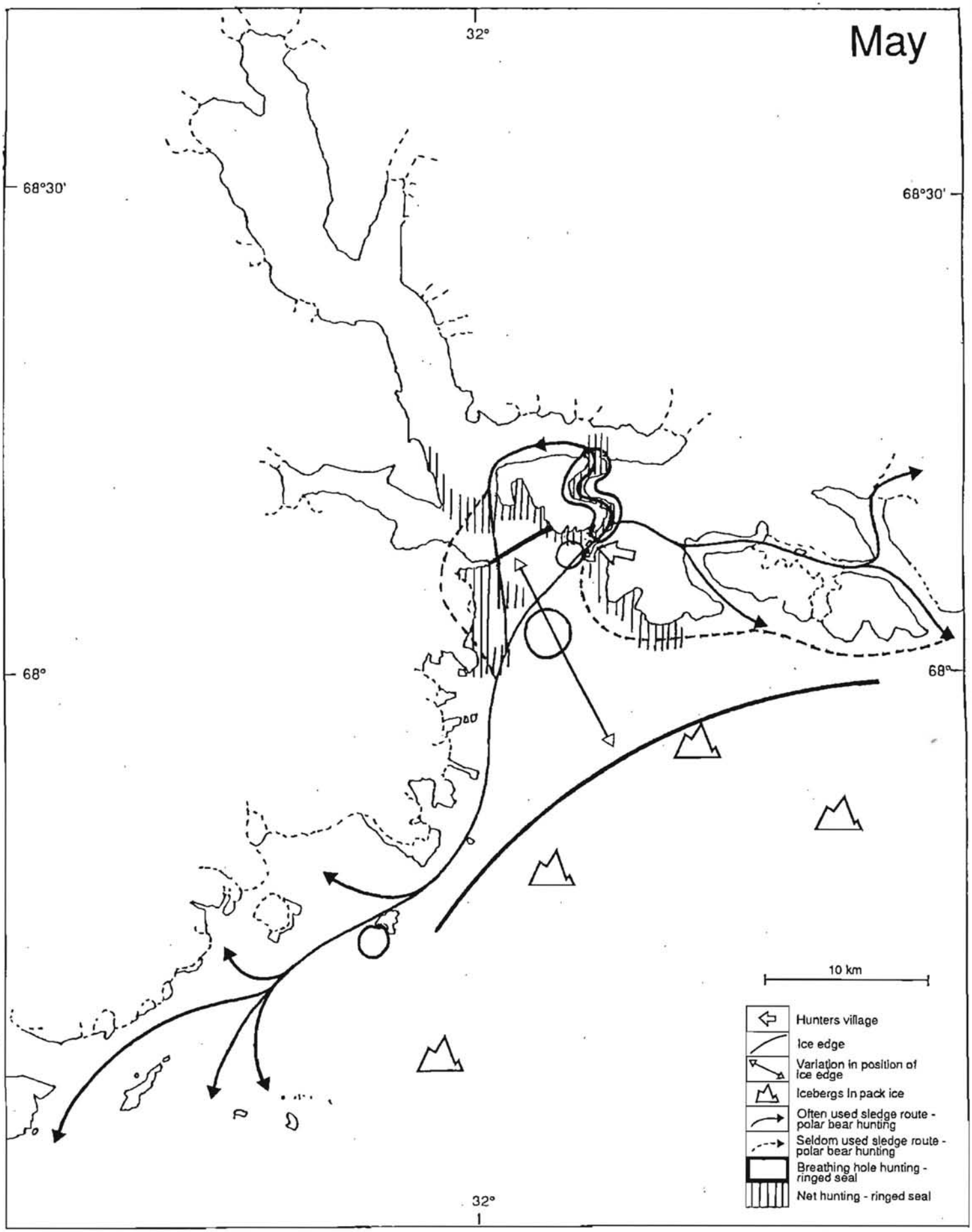


Figure 12. Catch and occurance of marine mammals, and the ice conditions in May.

9.6 June

Mean temperature +1,3°C.
Mean precipitation 93 ± 65 mm.
There is midnight sun for the whole month.
The ice begins to "decay" and break up, but still remains in the fjords and sounds.
Isberges in the open water.

Ringed seal. Open water hunting begins opposite the hunters village and in the outermost part of Kangerlussuaq.
The use of ice nets ceases during this month. Nets are set opposite the hunters village, at Uttental Sund and at Watkins Fjord.
The ringed seals moult on the ice.

Narwhal. A number of narwhals are hunted. The narwhals begin to migrate further into Kangerlussuaq following the retreating edge of the ice.

Polar bears. Only few polar bears are hunted. Sledge hunting is discontinued due to the "decay" of the ice. The polar bears search for food in amongst the packed ice and at the entrances of the fjords.

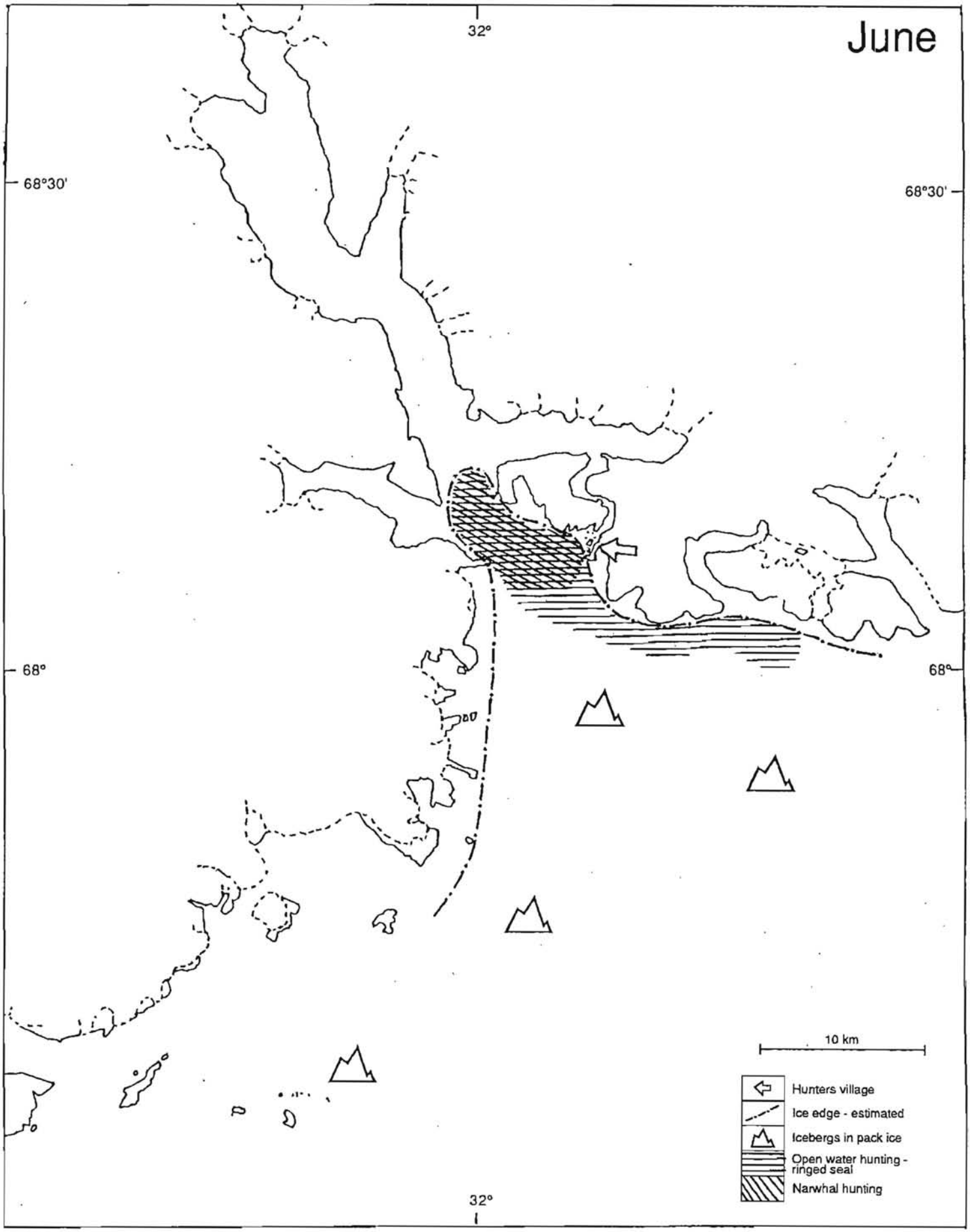


Figure 13. Catch and occurance of marine mammals, and the ice conditions in June.

9.7 July

Mean temperature +2,3°C.
Mean precipitation 41 ± 29 mm.
There is midnight sun until July 18.
There is open water in Kangerlussuaq and most of the adjacent fjords and sounds. However there is still some permanent ice in the area from Kap Diechman to Kap Edvard Holm. There are also icebergs throughout the whole region.

Ringed seal. There is intensive open water hunting in the outermost half of Kangerlussuaq, especially in the area opposite the hunters village.
The ringed seals moult on the ice.

Narwhal. Many narwhals are hunted during this period. The main hunting area is in the outermost half of Kangerlussuaq, where the most important observation posts are also placed. The narwhals migrate along the coasts of Kangerlussuaq and the adjacent fjords and sounds in search of food.
The calves are born at this time.

Polar bears. No polar bears have been killed in July in recent years, however in the past a number were hunted in July. The polar bears search for food in amongst the packed ice, at the glaciers or on land. All polar bears, with the exception of adult males, are protected north of Kangerlussuaq (Ittoqqortoormiit municipality).

Walrus. Rather few are seen or killed.

Bearded seal. Only few are killed around the hunters village, at the entrance of Kangerlussuaq, and at Nordre Aputiteq.

Harp Seal. Only few are killed. They are normally seen at the entrance of Kangerlussuaq and at Nordre Aputiteq.

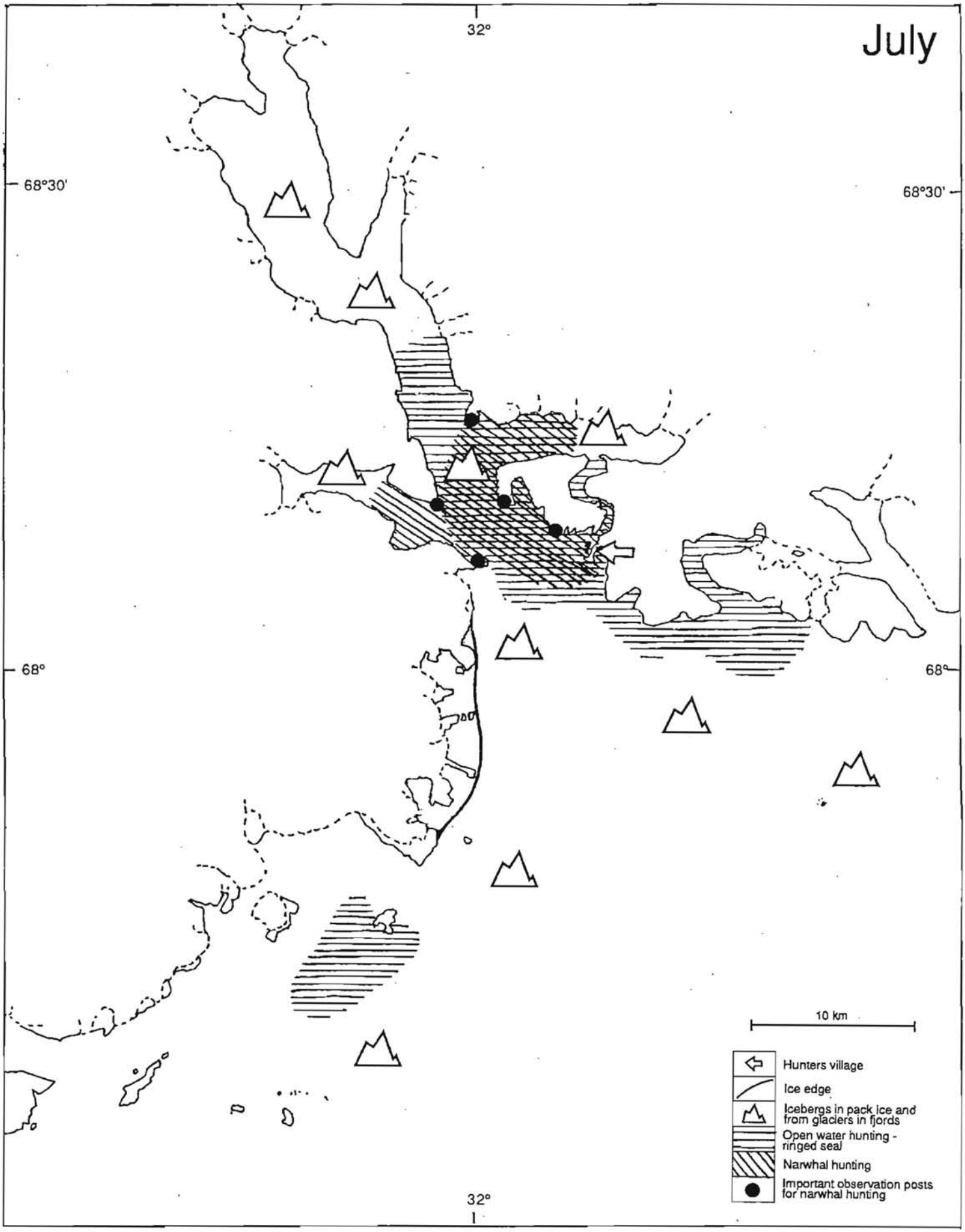


Figure 14. Catch and occurance of marine mammals, and the ice conditions in July.

9.8 August

Mean temperature +2,5°C.
Mean precipitation 95 ± 35 mm.
August 1 the sun rises at approx. 2.15 and sets at approx 22.00.
There is open water in Kangerlussuaq and the adjacent fjords and sounds. There are also icebergs throughout the whole region.

Ringed seal. There is intensive open water hunting in the outermost half of Kangerlussuaq, especially in the area opposite the hunters village. In addition there is also open water hunting at Sdr. Boswell Bugt.
The ringed seals cease to moult. Young seals in particular migrate out of Kangerlussuaq, following the packed ice towards the south.

Narwhal. A number of narwhals are hunted. The main hunting area is in the outermost half of Kangerlussuaq, where the most important observation posts are also placed. The narwhals migrate along the coasts of Kangerlussuaq and the adjacent fjords and sounds in search of food.
The calves are born at this time.

Polar bears. A few polar bears are hunted. The polar bears search for food in amongst the packed ice, at the glaciers or on land. In general, the polar bears migrate towards the south following the packed ice.

Walrus. Rather few are seen or killed.

Bearded seal. Only few are killed around the hunters village, at the entrance of Kangerlussuaq, and at Nordre Aputiteq.

Hooded seal. Only few are killed. They are normally seen in Kangerlussuaq and at the entrance.

Harp Seal. Only few are killed. They are normally seen at the entrance of Kangerlussuaq and at Nordre Aputiteq.

Sperm whale. One was seen in 1987.

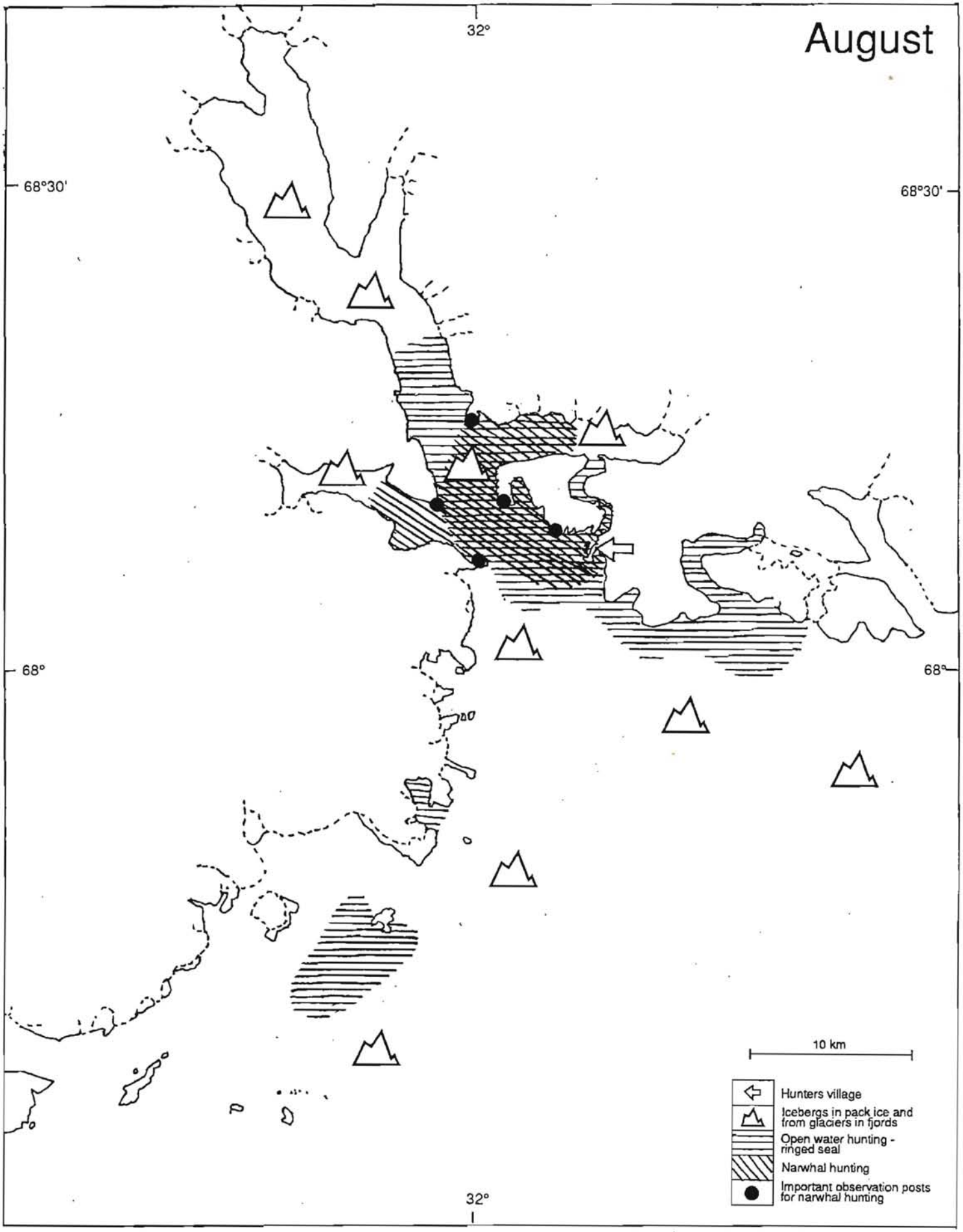


Figure 15. Catch and occurance of marine mammals, and the ice conditions in August.

9.9 September

Mean temperature +0,8°C.

Mean precipitation 98 ± 53 mm.

September 1 the sun rises at approx. 4.30 and sets at approx 19.45.

There is open water in Kangerlussuaq and the adjacent fjords and sounds. There are also icebergs throughout the whole region.

Ringed seal. There is intensive open water hunting in the outermost half of Kangerlussuaq, especially opposite the hunters village. In addition there is also open water hunting at Sdr. Boswell Bugt.

Narwhal. A number of narwhals are hunted. The main hunting area is in the outermost half of Kangerlussuaq, where the most important observation posts are also placed. The narwhals migrate along the coasts of Kangerlussuaq and the adjacent fjordes and sounds in search of food.

Polar bears. A few polar bears are hunted. Hunting with boats begins in Kangerlussuaq towards Søkongen Ø (NE) and towards Aggas Ø (SW). The polar bears search for food in amongst the packed ice, at the glaciers or on land. In general, the polar bears migrate towards the south following the packed ice. All the polar bears, with the exception of adult males, are protected south of Kangerlussuaq (Tasiilaq municipality).

Walrus. Rather few are seen or killed.

Bearded seal. Only few are are killed around the hunters village, at the entrance of Kangerlussuaq, and at Nordre Aputiteq.

Hooded seal. A number are killed. They are normally seen in Kangerlussuaq and at the entrance.

Harp Seal. A number are killed. They are normally seen at the entrance of Kangerlussuaq and at Nordre Aputiteq.

Minke whale. Few are seen, mostly during this month.

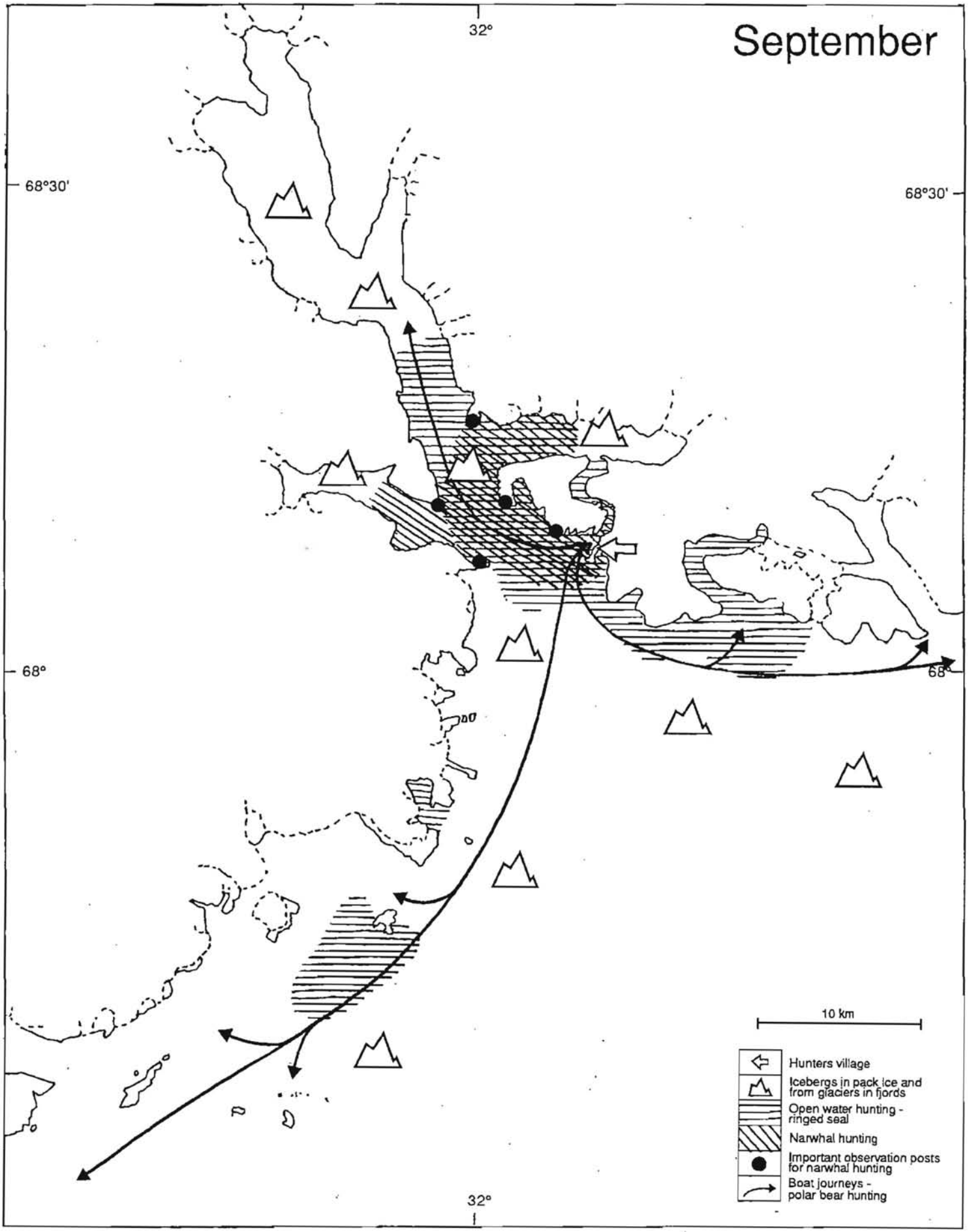


Figure 16. Catch and occurance of marine mammals, and the ice conditions in September.

9.10 October

Mean temperature ÷2,3°C.
Mean precipitation 79 ± 69 mm.
October 1 the sun rises at approx. 6.15 and sets at approx 17.30.
There is open water in Kangerlussuaq, although permanent ice begins to form in the adjacent fjords and sounds and at the back of Kangerlussuaq. There are also icebergs throughout the whole region.

Ringed seal. Open water hunting declines, but is carried out in the outermost half of Kangerlussuaq and in the bay at Kap Deichmann.
Breathing hole hunting starts on the new ice, especially near the hunters village and in Uttental Sund. Ice edge hunting also starts at the entrances to the adjacent fjordes.
Ringed seals begin to migrate into Kangerlussuaq with the formation of the new ice.

Narwhal. A number of narwhals are hunted. The main hunting area is in the outermost half of Kangerlussuaq, where the most important observation posts are also placed. The narwhals migrate along the coasts of Kangerlussuaq and the adjacent fjordes and sounds in search of food. With the formation of new ice, the narwhals begin to migrate out of Kangerlussuaq.

Polar bears. A number of polar bears are hunted. Hunting with boats in Kangerlussuaq towards Søkongen Ø (NE) and towards Aggas Ø (SW).
Pregnant females begin to look for suitable areas for breeding dens, while other polar bears either roam around or go into dens to hybernate when the weather is bad and there is low food availability.

Walrus. Rather few are seen or killed.

Bearded seal. Only few are are killed around the hunters village, at the entrance of Kangerlussuaq, and at Nordre Aputiteq. They begin to migrate out of Kangerlussuaq.

Hooded seal. A number are killed. They are normally seen at the entrance to Kangerlussuaq .

Harp Seal. A number are killed. They are normally seen at the entrance of Kangerlussuaq and at Nordre Aputiteq. They begin to migrate out of Kangerlussuaq.

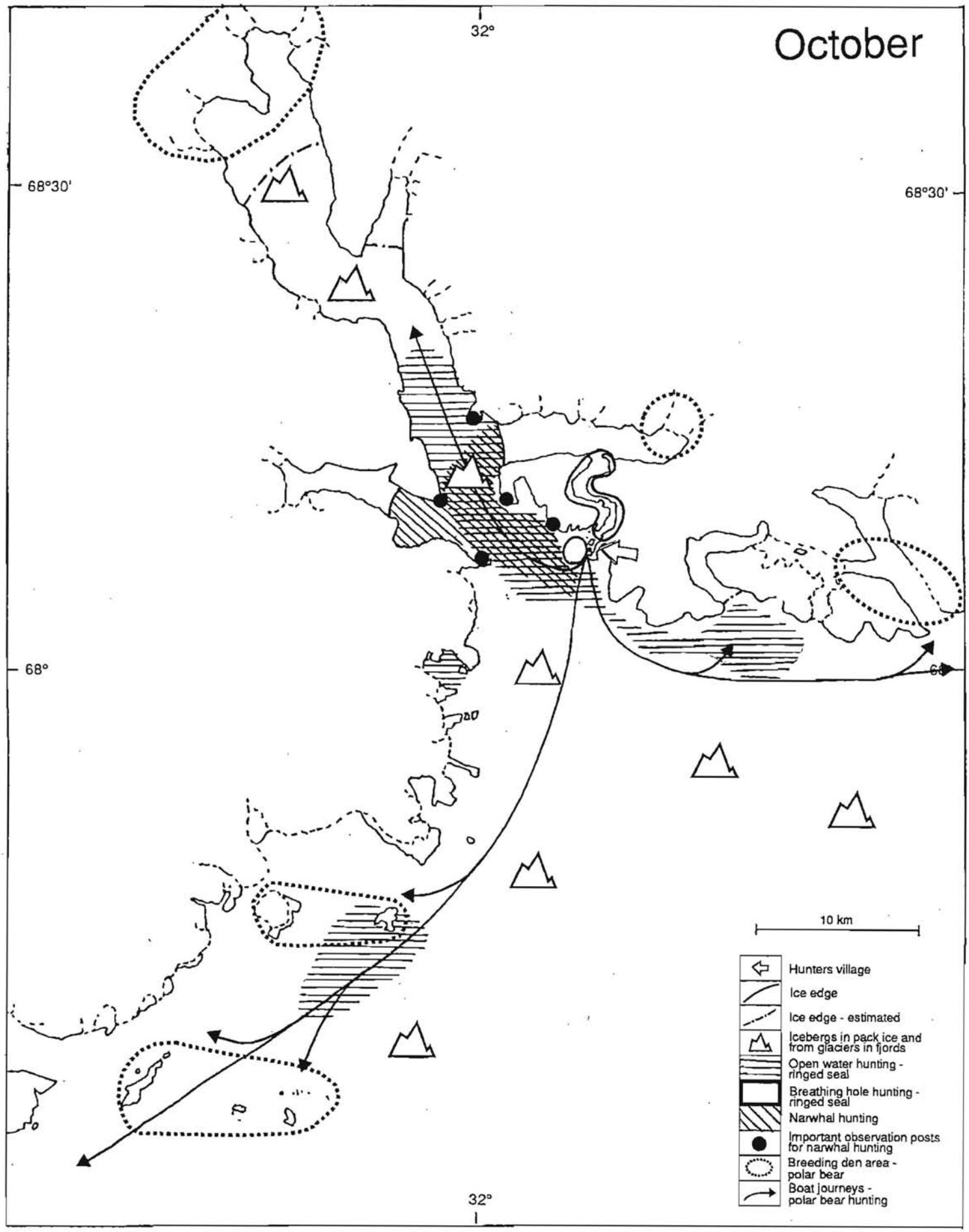


Figure 17. Catch and occurance of marine mammals, and the ice conditions in October.

9.11 November

Mean temperature ÷7,3°C.
Mean precipitation 60 ± 47 mm.
November 1 the sun rises at approx. 8.15 and sets at approx. 15.30.
Part of Kangerlussuaq has open water, while the adjacent side fjords and soùnds, and the back of the fjord have permanent ice. Icebergs exist in the open waters.
Strong winds - "piteraq'er" - are frequent.

Ringed seal. Open water hunting declines, but is carried out in the outermost half of Kangerlussuaq.
Breathing hole hunting takes place on the new ice opposite the hunters village and at Uttental Sund.
Ice nets are set opposite the hunters village, in Uttental Sund and in Watkins Fjord.
Ice edge hunting.
The ringed seals migrate in to Kangerlussuaq.

Narwhal. Few narwhals are hunted. The main hunting area is in the outermost half of Kangerlussuaq, where the most important observation posts are also placed. The narwhals migrate along the coasts of Kangerlussuaq and the adjacent fjordes and sounds in search of food. With the formation of new ice, the narwhals begin to migrate out of Kangerlussuaq.

Polar bears. Few polar bears are killed . Hunting with boats in Kangerlussuaq towards Søkongen Ø (NE) and towards Aggas Ø (SW) declines. During this period pregnant females search for breeding dens and other polar bears either roam around or go into dens when the weather is bad and food availability is low.

Hooded seal. Some killed. They are normally seen in the outermost half of Kangerlussuaq.

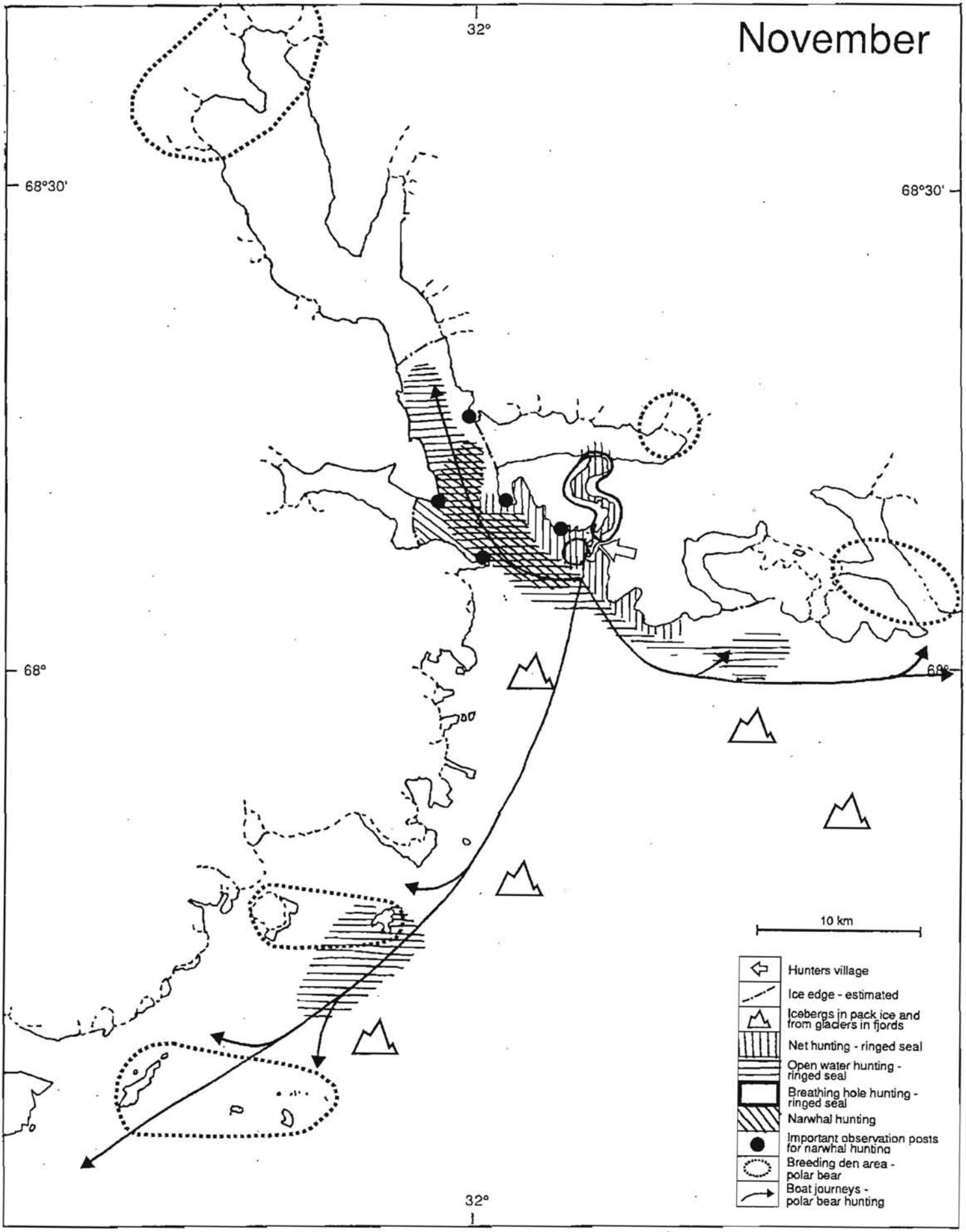


Figure 18. Catch and occurance of marine mammals, and the ice conditions in November.

9.12 December

Mean temperature ÷9,8°C.

Mean precipitation 45 ± 27 mm.

December 1 the sun rises at approx. 10.45 and sets at approx. 13.00. The sun disappears over the horizon around December 8.

Open waters in the outermost half of Kangerlussuaq, while the adjacent side fjords and sounds, and the innermost half are covered by permanent ice. Icebergs exist in the open waters.

Ringed seal. Breathing hole hunting takes place opposite the hunters village , Uttental Sund and in Watkins Fjord.

Ice edge hunting.

Narwhal. Probably reside in the polar ice in Danmark Stræde.

Polar bears. Few polar bears are killed . During this period pregnant females hybernate and other polar bears either roam around or go into dens to hybernate when the weather is bad and the is low food availability.

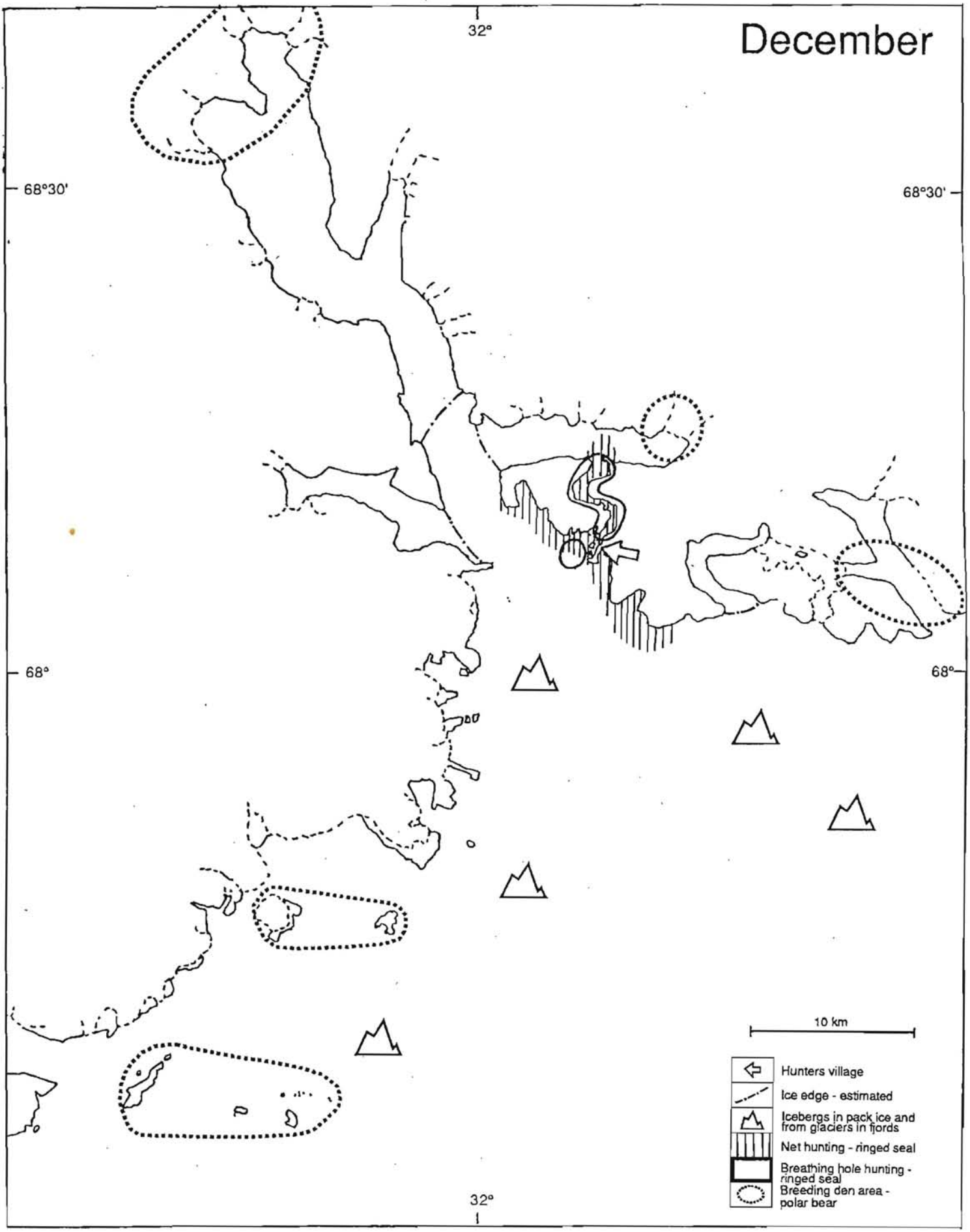


Figure 19. Catch and occurance of marine mammals, and the ice conditions in December.

10. RINGED SEAL (*Phoca hispida*)

10.1 Introduction

Ringed seals are found throughout the area between Kap Farvel and Scoresby Sund (Dietz et al. 1985), and are normally seen in the Ammassalik district all year round according to Holm and Petersen (1921). Ringed seals were seen along the coastal stretch between Scoresby Sund and Kangerlussuaq during July and August, when the Second East Grenland expedition passed through that area in 1932 (Degerbøl 1937). On August 8, 1900, Amdrup (1902B) commented "that hunting might be excellent in Kangerlussuaq, for there were enough seals". He was presumably referring to ringed seals in particular. Large numbers of ringed seals have been observed in Uttental Sund (Mikkelsen 1933) and also in Kangerlussuaq (Iversen, 1936).

10.2 Catch

All the hunters that were interviewed had hunted ringed seal in Kangerlussuaq. Table 1. shows the minimum number of ringed seal caught per season in the area. The given number of ringed seals hunted in the 1986/87, 1988/89, and 1990/91 hunting seasons are fairly reliable, as 3/4 to all of the hunters at the hunters village provided information regarding ringed seal catches during these periods. For the seasons in 1966/67 and 1987/88, the total numbers of ringed seals caught were estimated from information given by less than half the hunters that were present at the village during these seasons. The total number of seals caught in 1966/67 and 1967/68 was given by Siegstad (1989). Information about the number of ringed seals caught in Kangerlussuaq from July 1966 to June 1967, and from July 1968 to June 1969 are recorded in the catch lists (Anon. 1966-1971 and Anon. 1966-1969) . For the 1967/68 season however, the records only cover the period from July to August, in which 320 ringed seals were caught. From 1966 until 1970 the catch in Kangerlussuaq was recorded in calendar years (i.e. from 1.1 to 31.12). In Table 1. the catch per calendar year are listed under the first year of a season, e.g. the 1966 calendar year is listed under the

1966/67 hunting season. The same applies to the information about the number of hunts in Kangerlussuaq.

Table 1. Ringed seal catch in Kangerlussuaq from 1966 to 1991. The number of hunters active in each season.

Season	No. of hunters at the hunters village		No. of hunters that reported seal-hunts	Total no. of ringed seal shot	Catch according to		
	According to the interview investigation	According to catch lists			Catch lists		Siegstad (1989)
					July-June	Calender year	
1990/9	3		3	> 650			
1988/89	7		7	1.100-1.200			
1987/88	21		11	1.550-1.750			
1986/87	11		8	1.200-1.300			
1979/80	min. 6-11		4	850-950			
1978/79	min. 1		1	c. 200			
1977/78	?		-	-			
1976/77	min. 2		2	500-600			
1975/76	min. 2		1	c. 200			
1974/75	min. 3		2	c. 400			
1973/74	min. 7		3	950-1.000			
1972/73	min. 3		2	450-500			
1971/72	min. 5	5	3	650-700		-	
1970/71	min. 9	6	2	c. 320		216	
1969/70	min. 4	9	2	450-500		183	
1968/69	min. 3	8	2	c. 550	692	536	
1967/68	min. 2	10	1	250-300	-	476	>1.500
1966/67	min. 10	11	5	1.000-1.100	1.029	700	>2.000

Table 1. is, among other things, built up from information obtained from the interview-investination about 59 hunting seasons. One hunting season is represented as the catch one hunter had in one season e.g. there were three hunting seasons in 1990/91. On the basis of this one hunter hunted an average of approx. 200 ringed seals per season ($\bar{x}$ = 199, SD = 96, N = 59).

In contrast to this it is estimated that the total catch in Scoresby Sund in 1983 was around 6000 ringed seals, and these were caught by no more than 77 hunters (Born 1983), or approx. 100 ringed seals per hunter. From 1925 to 1928 Pedersen (1930) states that the annual catch of ringed seals in Scoresby Sund was around 4000 for 10

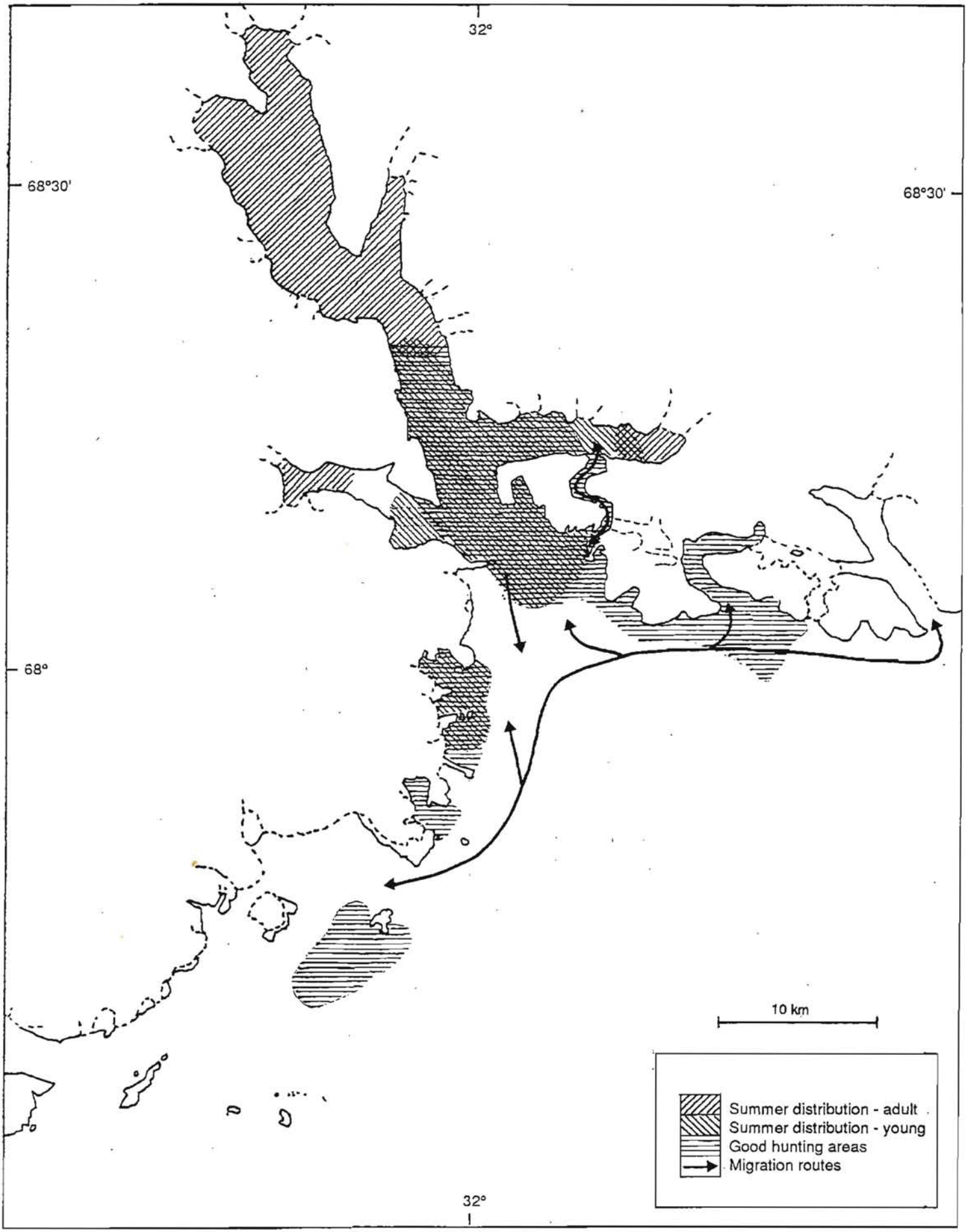


Figure 20. Ringed seals - summer (June-September).
Summer distribution of adult and young ringed seals and their migratory routes. Good hunting places are also indicated.

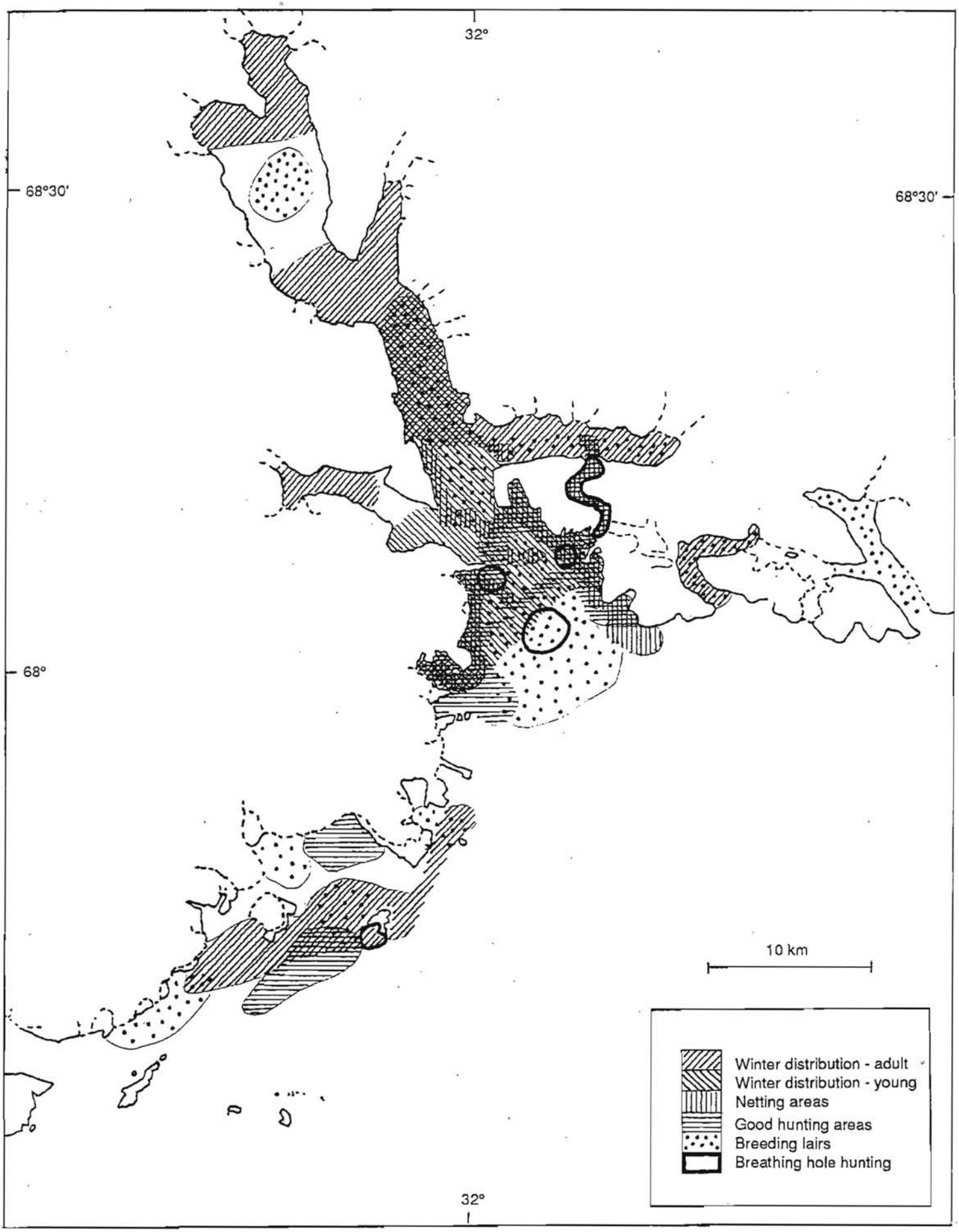


Figure 21. Ringed seals - winter (October-May).
Winter distribution of adult and young ringed seals, and the location of breeding lairs. The areas used for net hunting and breathing hole hunting are also indicated.

families, or 400 ringed seals per family (note - a family can be made up of more than one hunter).Hunters from Ammassalik occationally go on summer hunting trips in their own dinghis and motor boats. One hunter went on four hunting trips in the 1980's, and on each trip (14 days) to Kangerlussuaq he shot approx. 140 ringed seals. Another hunter told us he went on a trip for 3 weeks in summer 1989 and shot 35-40 ringed seals.

10.3 Hunting methods

Ringed seal are hunted all year round in Kangerlussuaq , however different hunting methods are used depending on the time of the year. In summer, when there is open water in Kangerlussuaq, the hunters travel around the fjord by boat (often quite close to the hunters village) in search of ringed seal that are either on the ice or in the water. By October or November when ice begins to form, first in the smaller fjords and then later in Kangerlussuaq itself, hunting is carried out either on the ice or from the ice. Breathing hole hunting begins in autumn, when the ringed seal establish breathing holes in the new ice, and continues until the ice and snow becomes too thick. When spring arrives, hunting resumes. Ice nets are set in autumn at the time when the level of light starts to diminish. Nets can be used throughout the winter and up until springtime, although they are not used when the ice gets too thick. Ringed seal are also shot from the edge of the ice as early as October. This form of hunting is practiced predominantly from March to May. The interviews did not reveal whether "sneaking" hunting was carried out at this time, although this method normally takes place during the spring months while the seals lie moulting on the ice (this hunting method is called "uuttoq-hunting" or hunting of "qatsimalit", which are the West and East Greenland expressions for a seal lying on the ice respectively). The seperate hunting methods that have been mentioned are described more thoroughly below.

Two shot ringed seals. Amdrup Fjord in background.

10.4 Open water hunting

Open water hunting is carried out mainly in the outermost part of Kangerlussuaq, and alone the coast to Nordre Aputiteq and Miki Fjord (see figure 20. in which the good hunting spots are indicated). A few of the hunters have hunted ringed seal at Søkongen Ø in connection with polar bear hunting trips. By far the most exploited area lies opposite the hunters village at Skærgårdshalvøen, bound by Kraemer Ø and by a line from Jagtlejren to Amdrup Pynt and further to Hængefjeldet. Uttental Sund, which also lies close to the hunters village, also recieves a fair amount of use by hunters. There is usually a large number of ringed seals in this area in autumn. Mikkelsen (1933) reported having seen a large number of seals in this area (see section 10.1). Open water hunting is also carried out in Watkins fjord. The area in Sdr. Boswell

Bugt, close to Kap Edvard Holm, is considered to be a good hunting spot from August when the ice disappears. The bay area behind Kap Deichmann is considered to be a good hunting spot in October. On July 27, 1991, I personally counted 275 seals in this bay while on a visit to the mining companies in the area. The seals were lying on the ice beside openings and tidal channels. Not all the seals were ringed seals, I also observed a number of Harp seals and a few hooded seals. Hunting is also considered to be good in Miki Fjord and the ocean area outside the entrance to the fjord. The last three areas mentioned are not used as intensively as the area opposite the hunters village, due to the fact they are further from the village.

Openwater hunting typically occurs during the summer months and continues into autumn, from June to October, though most intensively from the end of July to the the first of October. One hunter said that he also hunts from his dinghi during winter. He shot 21 ringed seal in 2 hrs in this way on New Years Day.

Openwater hunting usually involves a hunter going out into the fjord either in a dinghi or a motor boat, looking for seals that are either swimming or lying on the ice moulting. It is possible to move within shooting range of swimming seals if the boats are driven slowly. Once a seal has been shot, it is worth getting hold of it as soon as possible, as most of the seals sink during summer. Young seals 3-4 months in age are an exception to the rule. Ringed seals which have been shot are retrieved by means of either a boat hook or a throwing hook, that is if the seals haven't already sunk by the time the hunter gets to them. Some ringed seals sink and are lost in the summer, but this loss is curtailed by the number of the 3-4 month old seals are also shot during this period. When the hunter mentioned above goes hunting for ringed seal during winter, he pulls his dinghi over the ice to the open water. If the open water lies further out, the dinghi may be pulled over the ice with a sledge.

10.5 Breathing hole hunting

Breathing hole hunting is carried out relatively close to the hunters village, in more or

less the same area as the most intensive open water hunting occurs in summer (see figure 21.) Breathing hole hunting is also carried out in Uttental Sund and in the vicinity of Nordre Aputiteq.

Breathing hole hunting starts in October-November when ice begins to form and the ringed seal establish breathing holes. The hunting continues up until the ice or snow gets too thick, and then resumes in spring (April and May) when the snow has thawed enough to enable the breathing holes to be found again. During the course of the winter fast ice can actually be broken up by a "piteraq". In this case new breathing holes are often established as the ice starts to form again.

As mentioned above, breathing hole hunting is usually carried out before the ice becomes too thick. Many of the hunters told us that the ice is too thick when it is more than 1/2 m. The problem with thick ice is that seals cannot be hauled up through the breathing holes. Many hunters explained that dogs are able to locate breathing holes with their keen sense of smell, however it was not clear whether the dogs are actually used in connection with breathing hole hunting. When a breathing hole is located the hunter positions himself with the rifle and waits. When a ringed seal comes up to breath, the hunter then shoots diagonally down through the ice a little in front the breathing hole, thereby hitting the seal either in the neck or the head. The animal, which remains where it is, is then secured with a hook and pulled up onto the ice once the hole has been sufficiently widened. One hunter told us of how he and another hunter went breathing hole hunting together. One hunter stood positioned near a breathing hole, while the other moved away in order to fool the seal into thinking that they both had moved away. There are many hunters , approx. half of those interviewed, that do not go breathing hole hunting due to the fact that the catch is very little and the ice is often too thick. There is no information regarding how many ringed seals are actually lost using this hunting method.

10.6 Ice net hunting

Ice net hunting is carried out mainly at the entrance to Kangerlassuaq, in a belt along the coast from Kap Hammer, past Skærgårdshalvøen and Kraemer Ø, over to Bagnæsset and Amdrup Pynt and down to Kap Deichmann. Ice net hunting is also important in Uttental Sund and Watkins Fjord (see figure 21.). Single hunters set nets in the fjords at Søkongen Ø in connection with polar bear hunting in that area. Ice nets are set up after the formation of ice in November or December, and can remain in use until May or June. When the ice becomes too thick, as it can in February for example, or when there is too much snow, the nets are not set up.

Overall 19 out of 23 hunters have set nets in Kangerlussuaq. On average, each hunter has 9 nets ($x = 9,3$; $SD = 13,2$; $N = 19$) although this ranging from 1 to 20 nets. One hunter informed us that he had 50-70 nets, but it is possible that this was due to some misunderstanding during the interview. The number of ringed seals that a single hunter can catch per net is highly variable. One hunter had 10-15 nets and claimed to have caught 8 seals each day in a season, while another hunter claimed he caught about 100 seals per season using 10-20 nets. In contrast to this, in 1990/91 one hunter caught only 5 out of a total of 250 ringed seals with his 3 nets . Another hunter caught only one seal out of 50-80 using nets through the whole winter. One hunter claimed to have caught few ringed seals with nets. It should be noted that nets can be set in a number of different ways. Some hunters set them across tidal channels and fasten the nets to the rocks on the coast, while other hunters do not because they can easily be lost. These hunters prefer to set their nets in places where holes have been hewed into the ice. For example, they might hew 3 holes in the ice at 2 m intervals. The net is then pushed under the ice from hole to hole. One hunter informed us that it is important that the nets be tended to every day, especially from December to March, as many small crustaceans will colonize and eat the seal. Nets can also be set in the breathing holes (e.g. in Watkins Fjord), in openings in the ice (e.g. at Hængefjeldet) and by icebergs or large ice aggregations.

10.7 Ice edge hunting

Ice edge hunting is carried out from the edge of the ice, but the actual location depends very much upon which month it is and whether or not there has been a "piteraq". The circumstances which determine where this hunting takes place are highly variable, both within winters and also between winters of different years (see figure 22). When ice begins to form in October or November, a number of ice edges are formed at the entrance to Watkins Fjord and Amdrup Fjord - also in Kangerlussuaq from Bagnæsset to Kraemer Ø (Geologvig). In the middle of the winter, from February to May, the edge of the ice lies some distance from the coast, so far infact that the hunters do not consider it to be the edge of the ice - which was the case in 1987/88. The ice edge can lie somewhere between these extremities during the course of the winter; it typically moves further out as winter progresses, and from time to time it is broken up by a "piteraq" so that it starts closer to the coast again. Figure 22. depicts an example of how the ice edge might look before and after a "piteraq".

Ice edge hunting can start as early as October, but is carried out most intensively from March to May. It is possible that this form of hunting is connected to some degree with polar bear hunting, which is also most intensive during these months (refer to section 12); this was not actually stated in the interviews.

When hunters go on a ice edge hunting trip, they travel by sledge to the edge of the ice. A number of the hunters also take a kajak along with them on the sledge; one of the hunters told us he takes a little rubber dinghi with him. The conditions need to be quite good to shoot seals where there are cracks and holes in the edge of the ice. At Kap Hammer conditions are ideal to carry out ice edge hunting. Early in the winter or in the period immediately after a "piteraq", when the edge of the ice has not yet reached the hunters village (i.e. when there is still open water opposite Skærgåden), the hunters take their sledges through Uttental Sund up to Watkins Fjord, and further out into Kangerlussuaq in order to reach the edge of the ice. Ringed seal that are shot are retrieved with either with throwing hooks or with a kajak (or rubber dinghi). After theys are shot, floating seals are seldom lost, although it does happen especially when the hunter only has a throwing hook at his disposal.

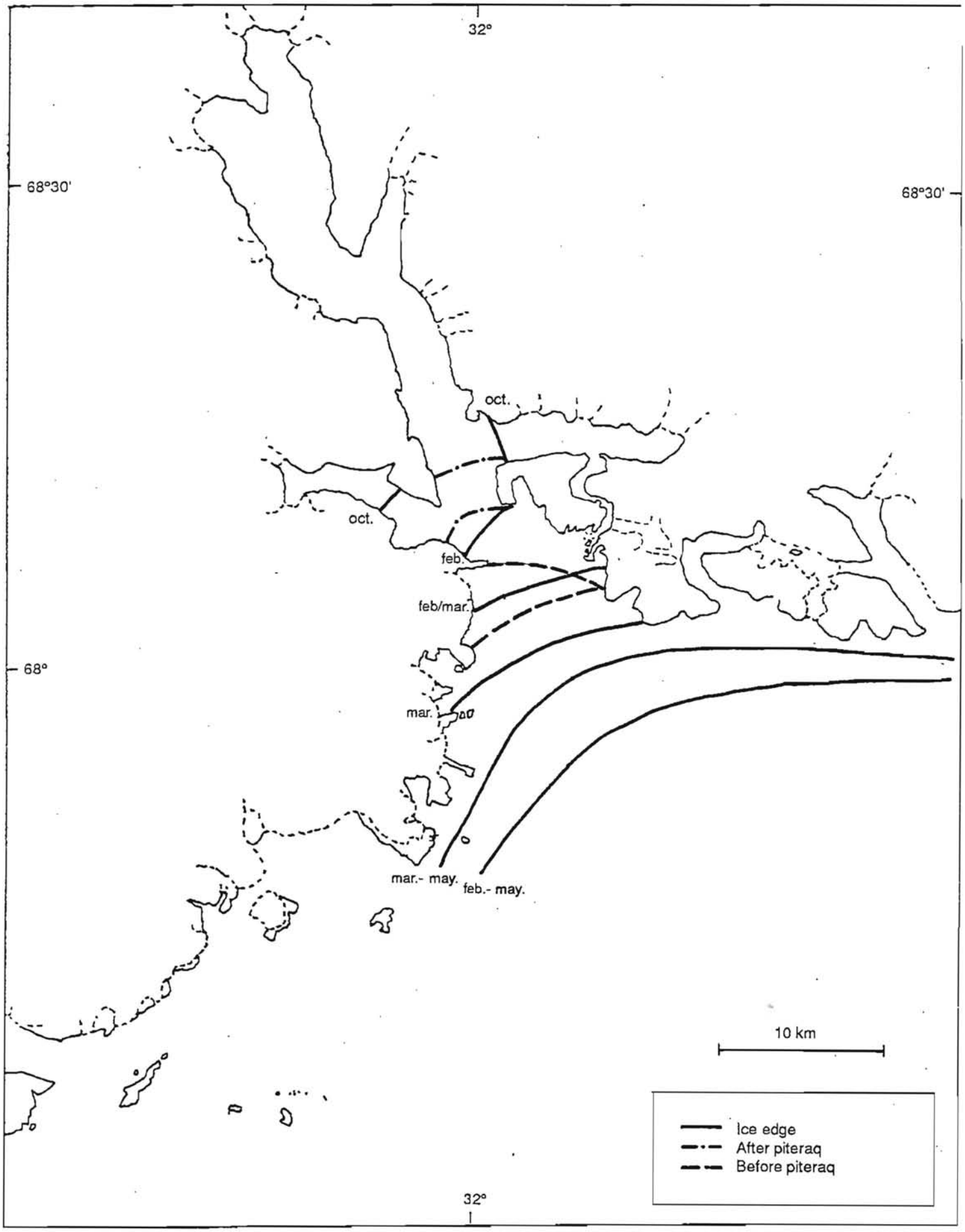


Figure 22. Ice edge in Kangerlussuaq from October to May. Examples are shown of the position of the ice edge before and after a "piteraq".

10.8 Migratory routes and annual rythms

Ringed seal allegedly moult from May to July, and are generally finished moulting by August (Born 1983). After this period many of the ringed seals migrate out of Kangerlussuaq to the coast. One hunter stated that the young seals then follow the polar ice southward, while another hunter told us that most of the young seals migrate northward, although he said some do migrate southward. During the open water period (in August) the seals show a tendancy to leave the entrance of Scoresby Sund, however it is not clear whether or not this relates to a general outward migration from the whole fjord complex (Born 1983). Many of the young ringed seals stay in the Kangerlussuaq region while some also come to Kangerlussuaq from other areas. One hunter has seen a lot of ringed seals moving up and down through Uttental Sund during summer. At the end of October and into November the ringed seals return to Kangerlussuaq, especially at the time when the new ice forms. Adult and young seals distribute themselves seperately both in summer and winter periods. Adult seals typically occupy the back of the fjord while young seals occupy the area near the entrance to the fjord (see figures 20 and 21, which show the distributions in more detail). The reason behind this distribution of young and old seals is, according to Born (1983), that older seals search for areas where the ice is more stable so that they can establish breeding lairs. It is highly likely that sexually mature ringed seals establish territories during breeding periods and repudiate young seals to areas with more unstable ice (McLaren 1958, Frost & Lowry 1981). The hunters also informed us that despite this young and old seals are often seen together, e.g. both old and young seals are seen together opposite the hunters village.

10.9 Breeding lairs

Breeding lairs are found anywhere in Kangerlussuaq where there is fast ice; in Watkins Fjord, Uttental Sund, Miki Fjord, J.C. Jacobsen Fjord, Søndre Boswell Bugt and Nordre Aputiteq (see figure 21.). The hunters mentioned that many breeding holes are found to be aggregated in certain areas, although not too close together. When the

hunters travel by sledge over the ice, breeding lairs are not difficult to locate, because the dogs can smell them. Breeding lairs can also be located as the snow usually melts around them.

Breeding lairs are more obvious in March and April. One hunter told us that most of the young are born in March. According to McLaren (1958) and Smith and Stirling (1975) ringed seals give birth to a single pup from the end of March until the middle of April.

There were a number of hunters who had observed ringed seal breeding lairs that had been destroyed by polar bears. Some of the hunters have seen such "spent" lairs in Watkins Fjord and in the innermost parts of Kangerlussuaq. "Spent" lairs have also been observed south of Nordre Aputiteq and south of Tre Små Øer. The remains of partly eaten seals were also found in one of these breeding lairs. One hunter told us that a female polar bear with cubs searches for breeding lairs, and upon finding one, breaks it open and feeds her young with ringed seal pups. According to Stirling and Smith (1977) and Amstrup and DeMaster (1988) young ringed seals under 2 years constitute up to 80% of the ringed seals caught by polar bears during spring. One hunter saw a raven take a very little ringed seal pup from its breeding lair opposite the hunters village. Much of the ice had melted, so the breeding lair was open and the raven must have been able to see the pup in the lair. Polar foxes can also take ringed seal pups in a similar fasion as the raven (R. Dietz, GERI, 1992, pers. comm.).

10.10 Food preference

Of the 12 hunters that discussed the stomach contents, 8 have observed small crustaceans in the stomachs of ringed seals. The small crustaceans typically range from 2 to 5 cm. One hunter reported having seen the remains of a deepwater shrimp in one stomach. Small polar cod and redfish were two of the most frequently found fish, according to 4 of the hunters. Two hunters believed that ringed seals ate polar cod in particular or did not eat anything other than polar cod. One of the hunters reported

having found the remains of redfish in a ringed seal breathing hole. Small Greenland halibut were found by one hunter, and capelin are occasionally seen by one hunter. Another hunter said that capelin were seen in the stomaches especially during winter. Cod was also found by one hunter, and finally a jelly fish was found by another.

From this information it can be seen that the ringed seals main diet is constituted of small crustaceans and various small fish e.g. polar cod, redfish and capelin. Deepwater shrimps and jelly fish are seldom observed.

The ringed seals that occur at the entrance of Scoresby Sund feed mainly on polar cod (Born 1983). According to Pedersen (1931), crustaceans are the main diet of older seals at the back of Scoresby Sund, while younger seals feed on polar cod in particular. Born (1983) assumes that ringed seals feed on polar cod, sculpins and pelagic crustaceans, in varying amounts and composition during the year. In the Ammassalik district ringed seals have been found to eat small crustaceans and polar cod, and on one occasion squid (Jensen 1909, Chapman 1934).

10.11 Trade and utililization

Close to 2/3 of the ringed seal skins are usually sold, varying from half to almost all of the skins. The sale price for washed and dried skins, which are purchased by KNI, depends on the quality. In 1991 the sale prices were as follows: 435 kr. (+ 50 kr. bonus) for 1st quality, 319 kr. for 2nd quality, and 180 kr. for 3rd quality. The sale prices for salted and wet skins were 180 kr per skin and 150 kr per moulted skin (U. Witthaus, Great Greenland, 1992, pers. comm.). With an average sale price of approximately 400 kr. per seal skin, and the sale of about 2/3 of the skins, the average annual profit to be made on ringed seals is approximately 50,000 kr. per hunter. Many of the skins the hunters don't sell are used to make "kamiks" (skin boots). "Kamiks" that are made for celebrations are made from the white skin (the hairless seal skin).

At the hunters village at Skærgård we saw that sealskin was used to make children's parkas, skin bags and "kamiks". One of the hunters told us that sealskin is also used as a ski cover, so that they are less noisy and faster. In 1991 seal skin covered ski

Ane cutting out white skin (hairless seal skin).

were seen in Isortoq at Ammassalik (F. Kapel, Greenlands Fisheries Research Institute (GF), Marine mammals Div., 1992, pers. comm.). The seal meat is used both as food to the dogs and to people. The blubber is used for the house's iron cokkers to make food and for heating, and also as dog food.

10.12 Disturbances

During the interviews the hunters were asked whether they had observed any disturbances of ringed seals in connection with the mineral exploration activities (e.g. by hellicopters, ships, rubber dinghis and snow scooters), The hunters were also asked whether their own hunting activities disturbed ringed seal.

The hunters did not have any information concerning possible disturbances caused by helicopters or other aeroplanes.

Only one of the hunters had observed disturbances in association with large ships.

However, the hunter didn't feel that big ships sailing to and from Kangerlussuaq would present a problem to seals in the area. As an example he refered to the cruiser "Ejnar Mikkelsen", which takes hunters up to the hunters village from Ammassalik, and the supply vessel "Polar Bear" (a Norwegian seal hunter cruiser) ,which called at the Aputiteq weather station approx. 3 times per season. These vessels did not appear to disturb polar bears or seals.

One hunter told us that in 1989 there was a lot of disturbance with the ringed seals in connection to the geological core drilling , especially at Skærgårdshalvøen. Virtually no ringed seals were seen in Uttental Sund, which is an important migratory path in summer. Similarly there were far fewer seals opposite Skærgården during the period that drilling was being carried out at Skærgårdshalvøen.

Concerning the use of snow scooters on ice, one hunter indicated that he believed that the ringed seals could disappear entirely from areas where snow scooters were used. He thought that snow scooters ought to be driven on land only.

In connection with the possible future mining activities in the Kangerlussuaq region, one of the hunters expressed concern that waste deposites in Uttental Sund would be damaging for the hunters. Another hunter felt that it was important that the area does not become polluted with oil.

During the period when there is open water, ringed seal hunting is carried out mainly from dinghis or motor boats. Apart from the disturbances caused by hunting itself, there are disturbances caused by dinghis and motor boats going out to hunting locations. One hunter told us that hunters know how to avoid disturbing the seals, but if there are too many hunters in an area and to many inexperienced hunters, then the level of disturbance can also become a problem.

11. NARWHAL (*Monodon monoceros*)

11.1 Introduction

"The number of narwhals in Kangerlussuaq should be so great that the fjord simply smells of their expirations". This was what Gustav Holm was told in 1884 by the hunters from the Ammassalik district (Dietz et al. 1985). In this interview one of the hunters told us that there are millions of narwhals in Kangerlussuaq, and the hunters that come to Kangerlussuaq say that they have never seen so many narwhals.

The southernmost distribution of narwhals in Greenland is in the Ammassalik area (Dietz et al. 1985) and their southernmost occurance is in Umivik Fjord, approx. 200 km south of Ammassalik (M.-P. Heide-Jørgensen, GF´s Marine Mammals Div., 1992, pers. comm.). Narwhals are encountered frequently in Kangerlussuaq all throught the year (Holm 1889, Pedersen 1931). Information regarding narwhals and narwhal flocks in Kangerlussuaq has been recorded from 1900 to 1932 (Amdrup 1902, Chapman 1932, Degerbøl 1935, Iversen 1936).

11.2 Catch

Nearly all of the hunters interviewed - 20 out of 23 - have hunted narwhal in Kangerlussuaq. In the years 1951-54, 1966-1980 and 1986-1991, the hunters reported a total catch of 275 narwhals. The number of narwhals that are caught in Kangerlussuaq per season is displayed in table 2. A typical season stretches from August in one year to July in the next. The first column gives the total number of narwhals shot based on information from individual hunters, while the second column gives the total number to the knowledge of individual hunters. The total number of narwhals killed between 1986 and 1991 is likely to be more reliable than the number from 1966 until 1980, as the latter is based mainly on the opinions of the hunters. The third column represents the totals given by Siegstad (1989). The last column gives the catch of narwhals as stated in the hunting lists (Anon. 1966-1969, Anon. 1966-1970).

A season usually extends from July to June. The 1967/68 season includes only July and August in 1967, and April, May and June in 1968. The 1969/70 season includes only July and August, 1969. From 1966 to 1970 the information for Kangerlussuaq exists also for the calendar year 1.1 to 31.12. In table 2 these numbers are listed under the first year of the season, e.g. the 1966 calendar year is listed under the 1966/67 hunting season.

Table 2. Narwhal catch in Kangerlussuaq from 1951-1991.

Season	Total no. of narwhal shot	Total no. given by a single hunter	Catch according to Siegstad (1989)	Catch according to catchlists	
				July-June	Calen-der year
1990/91	44				
1988/89	11				
1987/88	21		ca. 20		
1986/87	22		>30		
1979/80	13	19			
1974/75	ca. 7				
1973/74	9-12				
1972/73	4-5				
1971/72	11-12				
1970/71		ca. 23			6
1969/70	11-12			16	16
1968/69	1		16	25	25
1967/68	8-9		7	19	20
1966/67	14		62	43	42
1951-54	3				

In the 1970´s and 80´s two hunters together caught and killed about 60 narwhals. From 1980 to 1986 and 1989/90 there was no over winter hunting carried out in the area, and although there were hunters in the area from 1975 to 1979, there is simply

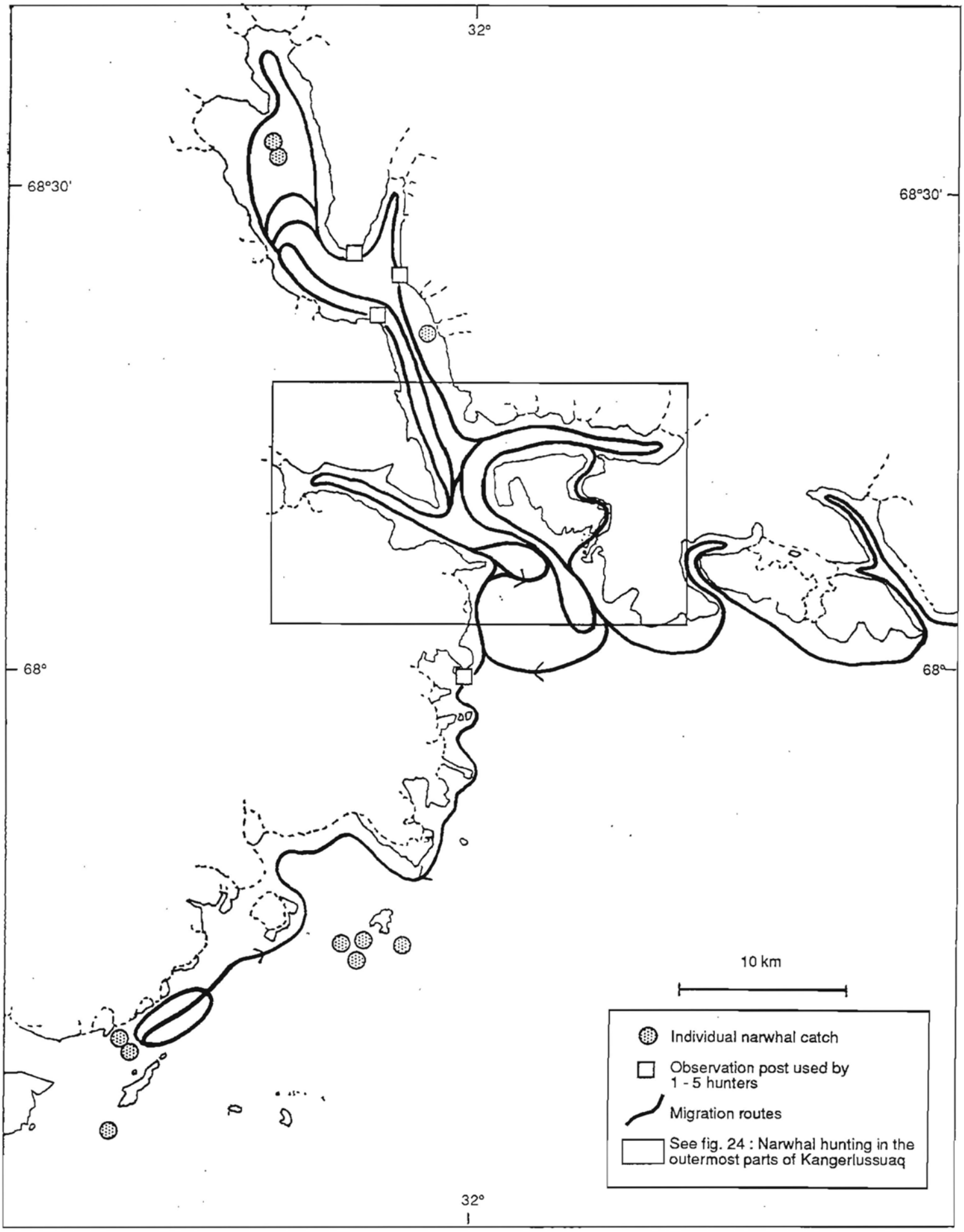


Figure 23. 1967-1991 narwhal catch; observation posts used and narwhale migratory routes.

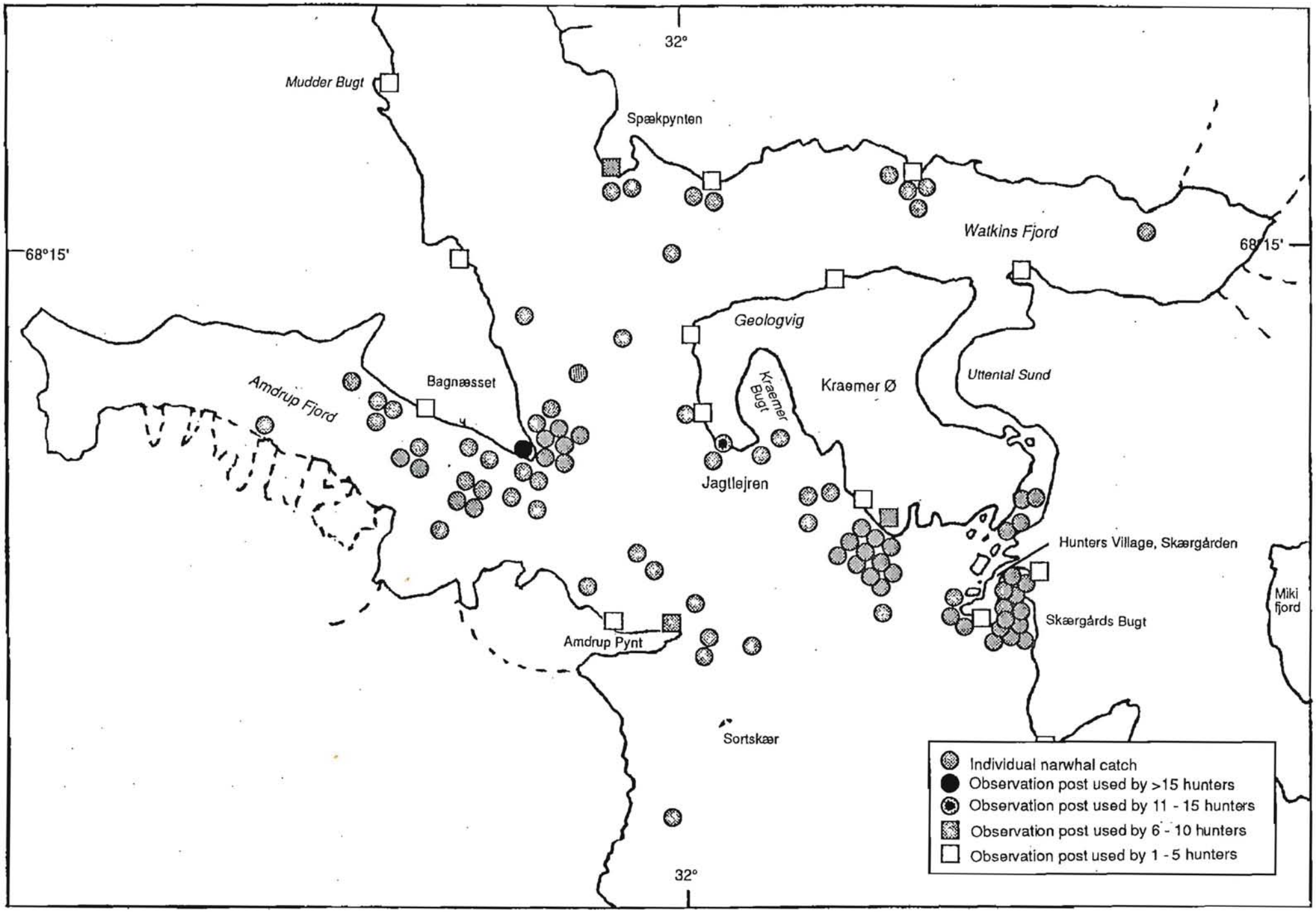


Figure 24. 1967-1991 narwhal catch in the outermost part of Kangerlussuaq and the positions of observation posts that are used.

no information regarding the narwhal catch. In the period from 1951-1954 one of the hunters worked as a cook at the weather station at Nordre Aputiteq.

The locations of particular hunting incidents was only given for 96 out of the 275 narwhals caught in Kangerlussuaq, and for most of these the sex and month of catch was also given.

81 out of these 96 narwhals (84%) were caught from 1989-1991. Figures 23 and 24 illustrate the locations in Kangerlussuaq where the narwhals were caught. It can be seen from figure 24 that the majority (90%) were caught in the outermost part of Kangerlussuaq, which includes Watkins Fjord, Amdrup Fjord and Uttental Sund. The majority of the narwhals are caught in three main areas. The most used area (see 11.9 Catch methods) is the area around Bagnæsset, which lies at the northern part of the entrance to Amdrup Fjord. 20-25% of the narwhals are caught here. Nearly as many (20%) are caught in the area around the hunters village at Skærgårdshalvøen, mainly in Skægårdsbugten. The third place is in the southern part of Kraemer Ø, where 15% are caught. The fact that so many narwhales were caught at Kraemer Ø is due to one hunter in particular , who set nets in the area and managed to catch 8 narwhals by the end of July, 1991.

An average of 20 to 30 narwhals were caught per season from 1951 to 1991, although there was large variations from year to year. In 1967/68 and 1988/89 there were 7 and 11 narwhals caught respectively, while in 1966/67 and 1990/91 there were 62 and 44 narwhals caught respectively. From 1970 to 1980 not more than 20 were caught per year in the whole Ammassalik district, including Kangerlussuaq (Dietz et al. 1985). In Scoresby Sund the catch is estimated to have been between 10 and 20 narwhales per season (Born 1983). When the catches for the whole east coast are combined, there are a total of 40 to 60 narwhals caught per season. Narwhals occur in the Atlantic part of the Arctic, both east and west of Greenland, and as far east as Franz Joseph Land and Novaya Zemlya. It is not clear how many narwhals from the east coast mix with the narwhals from the west coast of Greenland. Such a division into subpopulations is not known (Dietz et al. 1985). The size of the possible eastern population is unknown, as

is the narwhal population in Kangerlussuaq. It is not possible to say whether a catch of 40-60 narwhales per season constitutes a sustainable catch rate, but judging from the birthrate given by Hay (1984) of approx. 0,07, the population should consist of at least 600 - 900 individuals.

11.3 Annual variations in the catch

Information about the month of capture was given for 87 of the narwhals caught. For 7 of the narwhals the date of the hunt was given as sometime over a two month period e.g. in June/july. In these cases the first month was selected as the month of the catch. The only months where this will have any implications is in June and July when 5 narwhals were caught.

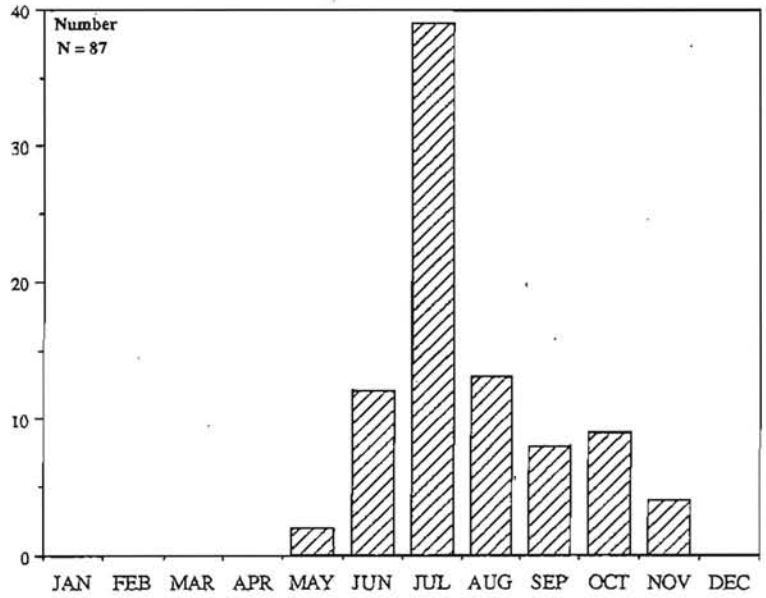


Figure 25. Narwhales caught between 1967 and 1991 divided into seperate months (77 out of the 87 narwhals were caught from 1986-91).

Narwhals are usually caught from May to November, although by far the most are caught in summer. Approximately half the narwhals are caught in July alone, 3/4 are caught from June to August.

During the period from 1974 to 1983, most of the narwhales in Ammassalik district (in which the Kangerlussuaq catch is included) were caught in July (Dietz et al. 1985). In

Ane and Ulrik cutting mattak from narhval at the hunters village, Skærgården.

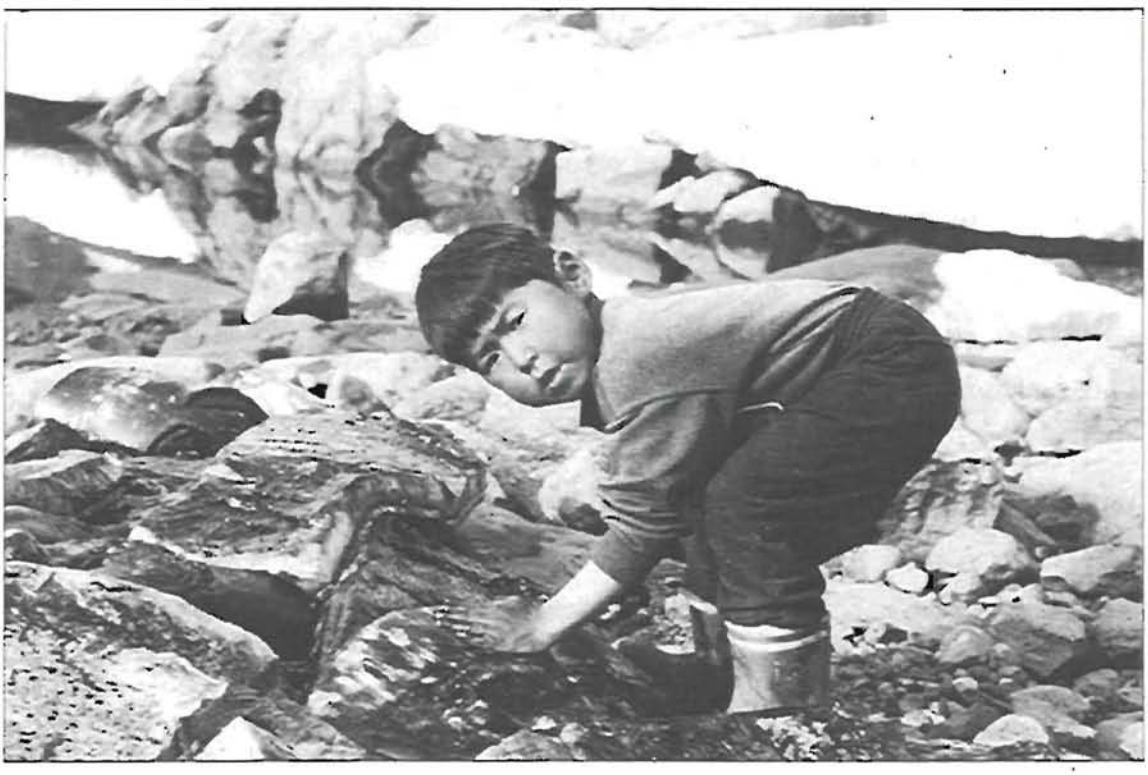
contrast to Kangerlussuaq, in Ammassalik many of the narwhals are also caught in August and September, and a number are also caught in April and May. Finally, the season is longer in Ammassalik district, with hunting begining in February and ending in December.

The main hunting period in Scoresby Sund (from 1974 to 1983 (Dietz et al. 1985)) takes place in June, although a few narwhales may be caught in July. This is earlier than the hunting period in Kangerlussuaq. In contrast with Kangerlussuaq, the catch is relatively good in Scoresby Sund during August and September. Narwhales are not hunted in Scoresby Sund in November.

11.4 Migratory routes and annual rythms

When the ice begins to break up and disappear in May, narwhal begin to appear in

Kangerlussuaq. One of the hunters who was at Keglen in May, saw some narwhals forcing their way in through cracks in the ice. Individual narwhal are also caught in May. When the ice begins to retreat, the narwhals progressively move deeper into the fjord. During summer narwhal move up and down the coasts of Kangerlussuaq and the adjacent fjords: Amdrup-, Courtauld- and Watkins Fjord (illustrated in figure 23). From time to time the narwhals also enter Uttental Sund. 4 narwhals have been caught in the southern part of Uttental Sund. One of the hunters explained to us that they continue into Watkins Fjord, while another hunter told us that it was too shallow so they are then forced to swim back to the entrance. Narwhals are seldom seen going into Miki Fjord, however they do visit J.C. Jacobsen Fjord and many are seen going into the next fjord along to the north east, Ryberg Fjord. Many also stay around Søkongen Ø. Narwhal migrate along the coasts in both directions, and at the entrance to Kangerlussuaq they either turn back or cross over to the other coastal stretches on the other side. One of the hunters told us that the narwhals meet at Bagnæsset. Narwhals have also been seen to travel in the middle of Kangerlussuaq.



Bianco eating mattak.

As mentioned earlier, the majority of narwhals are caught in July, but they continue to be hunted up until December. Naturally , many narwhals are seen during the periods when there is open water in the fjords. One hunter told us that he rowed out from the hunters village to the area south of Kraemer Ø, where he heard a large number of narwhals. He climbed up onto an chunk of ice and saw around 100 narwhals on the way into the fjord. The same hunter also saw a flock of 30 to 40 males opposite Skærgårdshalvøen in October. There were so many tusks that he first thought they were pieces of wood floating in on the water. The males seemed to be playing with their tusks, crossing them gently or resting them on one another. Another hunter saw something similar at Bagnæsset in June, where 5 males with very long tusks gently bumped their tusks together. Yet another hunter, who has also seen this "play" suggested that they might have been fighting over a female. When questioned about what the male narwhals might use their tusk for, two hunters suggested that it might be used as a weapon. On one occasion, a hunter had felt threatened by a male with a 2 m long tusk. He had also seen a male narwhal steer itself into another hunter´s skin kajak forcing the hunter to take flight. One hunter suggested that the tusks were used against other animals, for example killer whales. He told us a story about how a female narwhal was attacked by a killer whale in Scoresby Sund and was saved by two male narwhals that came to help and impaled the killer whale. Finally, a number of the hunters believed that the tusk was used in connection with feeding e.g. to impale squid, halibut and jellyfish. One of the hunters suggested that perhaps squid were strung around the tusk. According to Silverman (1979) the tusks are used as a secondary sexual characteristic in connection with aggression and sexual behaviour. This function of the tusks is supported by Hay (1984).

When the ice begins to form in the fjords in October-November, the narwhals move out towards the ocean. Some of the hunters suggested that the narwhals spend the winter outside of the polar ice in Danmark Stræde, while others believe they migrate northward towards Scoresby Sund. The reason for this is that narwhal come from the north in spring.

The above explaination of narwhal migration and annual rythm is in accordance with

what is known about narwhals in the Scoresby Sund area (Born 1983, Dietz et al. 1985). Narwhals are seen along the ice edge south of and accross Scoresby Sund from February-April, which is apparently a part of their movement north (Born 1983). According to Dietz et al. (1985) the narwhals stay close to the polar ice in the winter months, and not outside of it as mentioned above. It was earlier pointed out that narwhal could spend the winter between Iceland and Kap Farvel (Gray 1931). This is supported by a single observation made opposite Kangerlussuaq on the October 21, 1933 (Bistrup 1924) and the fact the hunters have observed the narwhals coming from the southwest in spring from the supposed winter quarter. On the basis that many of the narwhal observations in April occurred between Scoresby Sund and Svalbard, the over winter areas mentioned above seem doubtful (Dietz et al. 1985). The over wintering areas are probably in association with the polar ice opposite Greenlands East coast. Narwhale probably aggregate in certain areas e.g. opposite Scoresby Sund, which is supported by the observations at from Scoresby Sund (Born 1983).

11.5 Sex ratio and size distribution

Information regarding sex was given for 81 of the 96 narwhals caught. Of these 55.6% were female and 44.4% were male. Close to half (53%) of the males were reported as having a tusks while 11% did not have tusks. No mention was made about whether the remaining 36% did or didn't have tusks. Tusk length was provided for 14 of the males; 3 of the males had a tusk under 1/2 m, 4 had a tusk between 1/2 and 1 1/2 m, and 6 had a tusk over 1 1/2 m in length. Two of these tusks were greater that 2 m in length, one of which was 2.19 m. According to Hay (1984) a male with a whole tusk that is over 1.2 m is sexually mature. At least ome male was caught with two tusks, ony was long while the other was short. At least one female was caught with a tusk that was over 1 m long.

Many of the hunters told us that flocks of pure male or females are often seen. This corresponds well with the observations of Silverman (1979) in Arctic Canada, where male and female narwhals were seperated into 4 categories: Males only, females only,

males and females mixed, and females - (males) - new born calves. The large majority of males (82%; N= 1980) were catergorized as "males only", and over half the females (56%; N= 1221) were catergorized as "females only". 25% of the females were seen in groups of "females - (males) - new born calves".

One hunter wondered why more females were caught than males (in this material 56% females), and explained that this could be the case because females which are either pregnant or with young do not dive as deep or for as long as the males. Another explanation could be that the male flocks often go further out to sea and are therefore seen less frequently that the female-new born flocks (Silverman 1979). On the other hand , the hunters selectively hunt males for their tusks. This of course does not apply with net hunting.

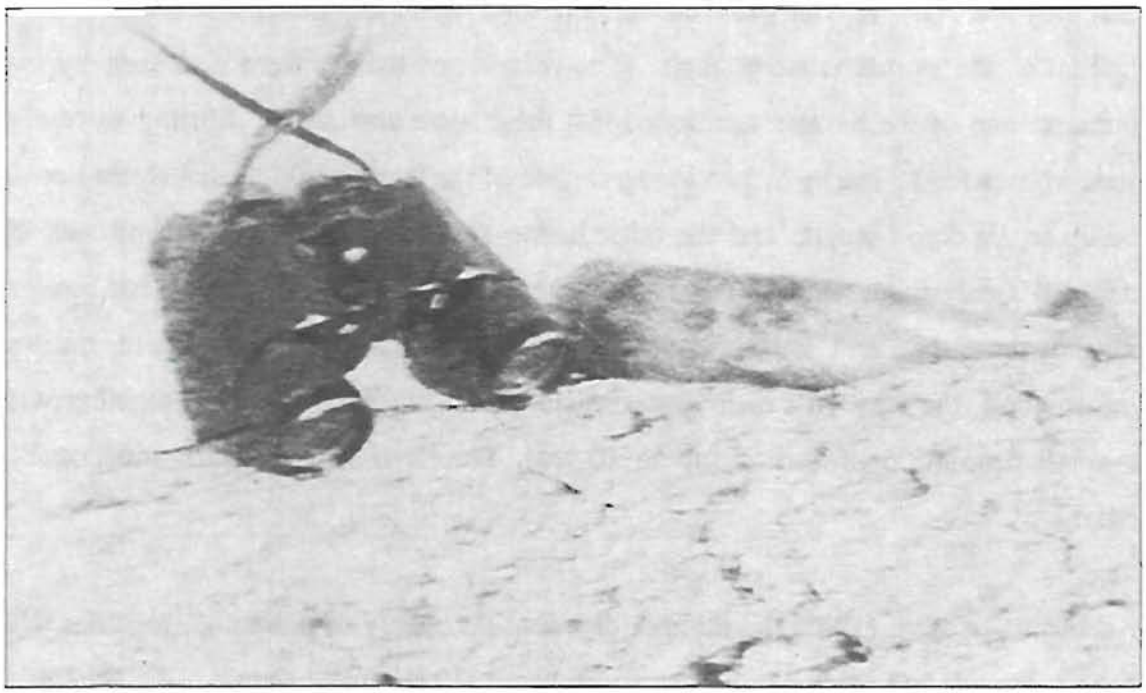
On July 21, 1990, six narwhals that had been caught were measured (from the head to the base of the tail). Five of these were female and one was male. The lengths of the 5 females were 310, 327 (young), 380, 395 and 400 cm. The length of the male (which was without a tusk) was 450 cm. Sexually mature females and males measure 340 and 390 cm respectively (Hay 1984).

11.6 Foetuses and calves

According to the information collected form this interview investigation, both foetuses (small and large) and calves are seen in the period from May to August.

Foetuses have been seen from May to June, but actual sizes were not given. In June both small foetuses and foetuses of 25-30 cm are seen (in June-July), and by the end of June larger foetuses are seen. One foetus was about to be born at the end of the month. A small foetus was seen in July and a developed foetus (approx 150 cm) was seen in one female that was shot in July between the 18th and the 20th. In August a little foetus (30-40 cm, see photo) and a large foetus were seen, and also two very large foetuses that were close to being born. Gray (1889) reported narwhals with nearly fully

developed foetuses in August (150 and 155 cm) which were shot on July 1 and 5 in the sea between Scoresby Sund and Shannon Ø. According to Hay (1985) the narwhals give birth in July and August, and the calves are approx. 160 cm at birth.



Narwhal foetus from female caught August in Kangerlussuaq. Photo of photo by Mathæus, Kuummiut.

One hunter mentioned that small calves were seen especially in May. In June one calf was shot that was 2 m long. Calves are seen especially in August and September. One hunter reported having seen a calf of unknown size accompanying a female by the end of August. We were told that very small calves were seen from July to August and July to September. The earliest reported sightings of calves in the area between Scoresby Sund and Svalbard were from the beginning of June and July (Dietz et al. 1985). A new born calf was seen in the same area on July 15. A suckling calf was seen on July 20 by Manby (1822), however the whereabouts of this sighting was not mentioned. In connection with this, it should be mentioned that one of the hunters informed us that a narwhal calf may suckle for up to 3 years. According to Hay (1985) calves can suckle from their mother for over 12 months.

11.7 Food preference

Of the 23 hunters interviewed, 12 provided information regarding the narwhal food

preferences. Eight hunters told us that narwhal eat small squid up to hand length in size (approx. 20 cm). One hunter had only heard that narwhals eat squid. Six of the hunters had actually seen Greenland halibut in the stomachs, while another two told us that they had heard that narwhals eat halibut. One hunter mentioned that the Greenland halibut in the stomachs were small. The remains of redfish were also seen by two hunters; one of the hunters mentioned that these were also small. Shrimp were also seen in narwhal stomachs by two hunters. One of the hunters told us that shrimp could be up to 10 cm in length, and the other hunter said he believed that shrimp was the narwhal's only food. Besides these diets, one hunter claimed to have seen red seastars in the stomachs, and another hunter believed they ate jellyfish. Based on this information, the narwhal's main diet consists of small squid and halibut, together with a small proportion of shrimp (up to 10 cm), small red fish, seastars and possibly jellyfish.

According to Born (1983) the summer diet consists mainly of polar cod, together with halibut, squid, and pelagic crustaceans. Isachsen (1925) found remains of fish, squid, and worms in the stomach of a narwhal that was shot south of Scoresby Sund in October. According to Dietz et al. (1985) narwhal stomachs contain mainly squid and crustaceans.

The information provided by the hunters in Kangerlussuaq corresponds well with the available literature on the subject of feeding in narwhal. However there was no mention of polar cod in the stomachs of narwhals caught in Kangerlussuaq. Similarly the narwhal diet, as reported in the literature, did not include red fish, sea stars and jellyfish.

11.8 Behaviour

During our visit to the mining companie's drill-sites at Kap Deichmann on July 28, 1991, two to three flocks of narwhals were sighted searching for food. They were kept under observation from 10 -11 and 13 - 14. During this period the narwhals remained along the edge of the ice , which stretched in an s-shape from Kap Deichmann to Den lave Pynt. As can be seen in figure 26, the narwhal moved in circles or small loops

during the observation period, probably actively searching for food. The flocks diving rythm was monitored from the observation post with binoculars and a wristwatch. The observation post was approx 500 m above sea level and about 5-6 km from the flock. From that distance if was difficult to identify individual narwhals, but it was easy to see the dark flock against the light background water. On the basis of 31 periods where the flock was at the surface and 27 periods when the flock dived underwater, it was estimated that a narwhal flock searching for food spends on average a bit less than 1 minute at the surface and around 4 minutes underwater. The actual ratio of time spent on the surface and time spent underwater is 5 (see appendix 19.6).

In arctic Canada a female narwhal and her calf were observed to be diving deep in search of food at the ice edge in a deep fjord. The average period spent on the surface was 212 $\pm$102 sec. (N =17) and the average period spent underwater was 898 $\pm$ 362 sec. (N = 10) (Silverman 1979). In contrast to the observations of diving periods made in Kangerlussuaq, these observations are considerably longer. However, the ratio between surfacing and diving are not so different i.e.5 and 4,2 min. respectively. In the Thule region in northwest Greenland, the diving rythm of **rapidly migrating** narwhals has been observed. In this case the average period spent on the surface was 117 $\pm$ 128 sec. (N = 13) and the average period of time spent underwater was 264 $\pm$ 168 sec. (N = 19). The ratio here is 2.3 (E.W. Born, GF's Marine Mammals Div., 1992, pers. comm.).

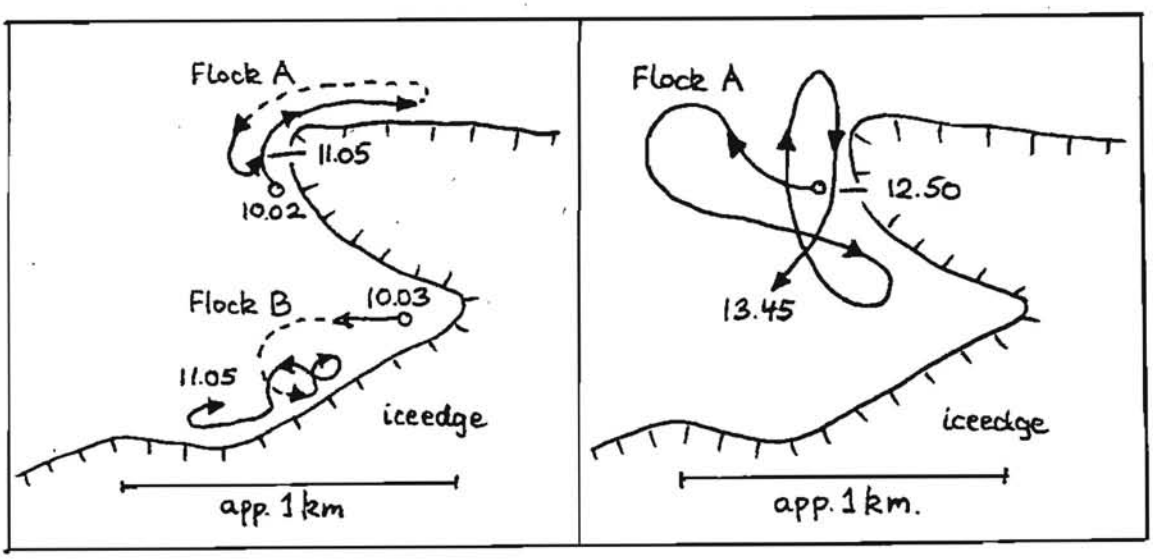


Figure 26. The sketch shows the probable movement of narwhals in search of food opposite the ice edge at Kap Deichmann. 28.7.1991. 11.00 am - 2.00 pm (see appendix 19.6.).

11.9 Hunting methods

When a hunter goes on a narwhal hunt, he goes to sea in a motor boat or dinghi, often taking along a skin or fibreglass kajak. The hunters go to one of the 24 observation posts mentioned in the interview-investigation (see figures 23 and 24). The most popular of these posts is at Bagnæsset at the entrance of Amdrup Fjord. It is used by 17 of the hunters, and is described as being the best place during summer, from July to August. Moreover it is also a good place in December, if there is an ice edge there at that time (see section 10.7. Ice edge hunting of ringed seals). The observation post on the opposite side of Kangerlussuaq on Kraemer Ø is the next most popular, it is used by 11 of the hunters. We were told that this place is used if there is so much of ice in Kangerlussuaq that one cannot get over to Bagnæsset. Not as many narwhals are seen from here. The third best place is located at the point of Amdrup Pynt and at Spækpynten, at the entrance to Watkins Fjord. The last place mentioned is given to be one of the most used places and is good in December. These places are used by 8 of the hunters. The southern point of Kraemer Ø, not far from the hunters village, is used by 6 of the hunters and is described as a good place in the spring and is considered as one of the best. It was here one hunter set his nets in 1991. Other observation posts are used by 1 to 5 hunters, and half of all the posts are only selected by one hunter. From figure 24. it can be seen that the narwhal catch is high at three of the five most highly rated observation posts.

Narwhals are often seen only from observation posts relatively close to the coast. When narwhals have been spotted, the hunter sets out after them in his kajak or boat. 10 of the hunters informed us that they use kajaks. This was the case with both present hunters and hunters that were active in the past. There are just as many hunters that use skin kajaks as there are that use fibreglass kajaks, but there is a tendancy these days for the hunters to buy fibreglass kajaks so they have both types. The Narwhals are harpooned and shot with rifles. Individual narwhals are still caught with a harpoon alone. One hunter told us that he could not use a spear because it was too difficult. Whether or not the other hunters use spears and to what extent is not clear as this question was not a part of this interview-investigation. Ten of the hunters usually chase

after narwhals with motorboats (most frequently) or dinghis. When the hunters travel at low speeds, it is possible to come so close to the narwhals that they could be harpooned, following this they are shot. These hunters preferred this method of hunting for different reasons. One hunter claimed that he got dizzy in Kajaks, while another hunter did not use a kajak because he thought it was too dangerous. A third hunter said that he couldn't use a kajak anymore because he had a bad back. Six hunters informed us that they shot narwhals with a rifle and secured them with a throwing hook or a boat hook. One hunter told us that they had chased narwhals with a boat onto land, and then shot the beached whales. A few hunters said they had shot narwhals from land if they were swimming past close enough to the coast.

Net hunting was first used in the Kangerlussuaq region in the 1987/88 hunting season, but was not successful until the 1990/91 season. In July 1991, 11 narwhals were caught in this way. Five of the hunters interviewed had for example set nets at Keglen, close to Nordre Aputiteq, at Bagnæsset and at two places near Kraemer Ø.

We had the opportunity to see a net being set at the southern point of Kraemer Ø. The net was a nylon net 30-40 m long and 6-7 m high, with a mesh size of approx 35x35 cm. The net itself was attached to a thick nylon rope, which was inturn held afloat by 6-7 floats. The net was held approximately 1 m below the surface. A number of small stones were attached to the bottom of the net to ensure that it would remain stretched out. The net was fastened to the rocks at one end and anchored out from the coast at the other end with a large stone. Due to the tidal movements, the net quickly pulled down on an angle to the coast, with the positive effect that clumps of ice slipped up along the nilon rope to the surface. The drawback was that instead of covering a distance of 30-40 m, the net only covered 15-20 m. However this apparently does not prove to be a great problem as 8 narwhals were caught in this net from July 21-29. On July 26, while the net was being set it was discovered that there were 6 narwhals lying still on the surface approx. 30 m away. They were 5-10 m away from the coast. A short time afterwards they dived and disappeared. The motor boat was then used to try and chase the narwhals into the net, but without success.

The hunters were asked whether any of the narwhals they hit during a hunting trip were lost. The answers ranged from: none lost to just as many were lost as were caught. There are many instances where narwhals have disappeared even though they had been harpooned and possibly even shot. If there are too many clumps of ice in the area, the narwhals often slip away either under the ice or between clumps of ice. In many cases the narwhals take the catch marker with them. One hunter said that his father harpooned a narwhal that subsequently slipped away, and 3 years later another hunter caught the same narwhal still with his fathers harpoon point in it. One hunter mentioned that most narwhals that are shot float and that only a few sink; another hunter said that they can sink both in summer and winter. One hunter explained that in the winter young narwhals usually sink while the older ones float.

The hunting methods employed in Kangerlussuaq correspond to the methods used in Thule but are different to those used at Scoresbysund. In contrast to Kangerlussuaq, where kajaks and harpoons are still used extensively, at Scoresbysund the narwhals are shot with rifles either from the edge of the ice or from boats. The use of kajaks and harpoons ceased at the beginning of the 1970's except by one hunter who carried out this hunting form (Born 1983).

11.10 Trade and utililization

Narwhal tusks are sold both privately and to KNI. The value of a narwhal tusk that is purchaced by KNI depends upon whether or not the the tusk has a point. In 1991, the sale price was 725 kr. per kg for an entire tusk and 200 kr. per kg for broken tusks (K. Skamriis, KNI in Ammassalik, 1992, pers. comm.). Many of the hunters give the tusks away, often to the family. A hunter that had been in Kangerlussuaq in the end of the 1960's and the beginning of the 1970's told us that he had used many of them himself, for example for the manufacture of harpoons.

Ammassalik municipality has laid down guiding prices for the sale of mattak (narwhal skin) at "Brædtet", the hunters and fishermans market place. For mattak without blubber attached, the sale price in 1991 was 90 kr. per kg, and for mattak with blubber the price was 60 kr. per kg (K. Skamriis, KNI in Ammassalik, 1992, pers. comm.).

Ulrik and Niels eating mattak and dried meat.

Many of the hunters give mattak away to families and friends following the hunting season. Mattak from narwhal which caught in the middle of summer is placed out in seawater or is burried beneath the snow in order to increase the durability.

Narwhal meat is normally not sold, but rather eaten fresh or dried by both people and dogs. One hunter mentioned that much of the meat is used as dog food.

11.11 Disturbances

The hunters that were interviewed were asked whether they had observed any disturbances of the narwhals in connection with the mineral exploration activities (e.g. by helicopters, ships, rubber dinghis and snow scooters) in the area.

One hunter told us that the helicopter traffic in the area has caused the narwhals to move further away from the hunters village. Another hunter was told by a Greenland helicopter pilot that the narwhals do not move away from the helicopter when it flies above a certain altitude (unfortunately this was not given). In general, many of the hunters felt that low flying helicopters do cause the narwhals to dive or move away out

to sea, while high flying helicopters do not appear to effect narwhals. No disturbances were observed to be caused by the Twin-Otter, which flew people and supplies from Iceland. According to one hunter this could be due to the fact that a good flying hight was maintained.

When asked about the effects of large ships in the area, one hunter referred to the research vessel "Adolf Jensen" which carried out biological background investigations in the outermost part of Kangerlussuaq around Bagnæsset on August 12-13, 1990 (Glahder 1990). The hunter told us that no narwhals were seen during the period "Adolf Jensen" was in the area. Narwhals were not seen until the August 14, at which time the research vessel was in Miki Fjord. Otherwise only a few ships have visited the area in past years. These have included two supply vessels from Iceland that went into Uttental Sund and Miki Fjord respectively. The hunters did not report any disturbances in connection with these ships. In general the hunters felt that ships could cause some degree of disturbance on their routes, or if there is a lot of traffic, but otherwise they probably should not present a problem. One hunter explained that he didn't think that a harbour in the area would make much difference either. He referred to Sermilik Egede- and Rothe Fjord, where narwhals are frequently seen inspite of the position of Ammassalik harbour. Yet, the entrance to the fjord is approx. 20 km. from Ammassalik. One of the hunters believed that drilling on land near to the coast would frighten the narwhals further out to sea. However, the general opinion was that a mine on land would not cause the narwhals to disappear. The greatest fear was in connection with the area becoming polluted with oil and other chemicals, such as cyanide.

The hunters were also asked whether their own motor boats and dinghis disturbed the narwhals in any way. In general the opinion was that dinghis caused more disturbance than motor boats, and that speed travelled has a lot to do with how much narwhals are disturbed. At low speeds the hunters said they are able to come within 0 to 25 m of the narwhals, close enough to harpoon them. At high speeds most of the hunters claimed that the narwhals were frightened away 100 to 500 m ahead of the boat. Some of the hunters told us that the narwhals got frightened only 20 to 100 m ahead, while a few said the distance was as great as 1000 m. One hunter told us that if a boat bumps into floating ice, the disturbance created would be greater than that caused by the propeller.

12. POLAR BEAR (*Ursus maritimus*)

12.1 Introduction

Of the 23 hunters that were interviewed, 17 have hunted polar bears. The remaining 6 hunters also contributed some information regarding polar bears and their footprints, which they had either observed themselves or heard about. Information was provided for a total of 179 polar bears, of which 162 were actually shot and 17 were seen but managed to escape. Polar bears have been seen and/or shot since 1951 until the present. The majority of these polar bears were seen or shot from 1951 to 1954, 1966 to 1980 and 1986 to 1991 (see figure 27.). This corresponds with the periods where hunters spent the winter in the area (refer to section 8. Catch history in Kangerlussuaq).

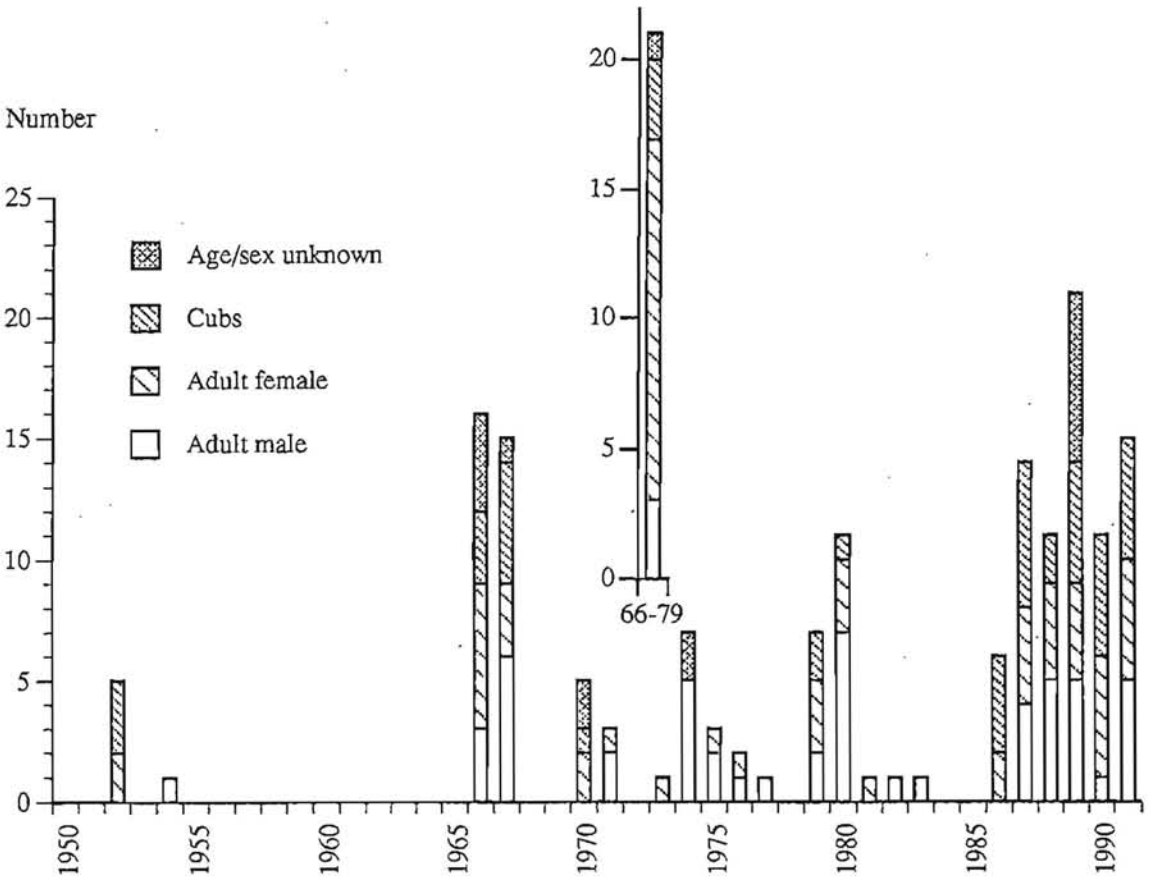


Figure 27. The annual distribution of 162 polars bears which were shot and 17 seen (adult males, females and young) from 1951-1991. Of these 179 polar bears, only 21 were inserted for the period from 1966 to 1979.

12.2 Hunting trips

Polar bear hunting is carried out within the area bounded by latitude 67° 30'N and 68° 30'N and longitude 33° 00'W and 28° 00'W.

During spring, from February to May, the hunters travel by sledge either to the northeast all the way to Kap Vedel (approx. 200 km from the hunters village), or southwest as far as Aggas Ø, (approx. 120 km from the hunters village).

The northeast sledge journey ends up at the area around Søkongen Ø, normally via the inland route that goes from fjord to fjord over the glaciers (See figure 28. regarding the actual sledge route). The coastal stretches may be difficult and dangerous to follow due to the fact that in some places the ice is weakened by strong currents which flow under the ice e.g. at Hængefjeldet and Kap Hammer. Opposite J.C. Jacobsen Fjord there can also be open water. From the hunters village the hunters drive their sledges into Uttental Sund, and then continue east over Forbindelsesgletscher to Miki Fjord. When they reach the back of Miki Fjord, they then travel over the glacier and down into the westerly arm of J.C. Jacobsen Fjord. From this point the hunters have a choice of either moving out of the fjord and along the coast or going over Schjelderup Gletscheren at the back of J.C. Jacobsen Fjord and into Ryberg Fjord. The glacier can then be followed from the middle of this fjord further to J.A.D. Jensen Fjord, or the hunters can leave the fjord and move to the coast. The hunters can make it all the way to Søkongen Ø by following J.A.D. Jensen Fjord, and once there they can go around to the back to Nansen Fjord. Open water may be encountered around Søkongen Ø. The hunters can also follow the coast up to Kap Vedel from Søkongen Ø. According to the interviews, this was the longest hunt that was carried out from the Skærgård hunting village in March 1991. If the condition of the sledge route is good, the hunters can make it to Søkongen Ø within 24 hours.

The southwest sledge journey ends at the area around Nordre Aputiteq and Fladø, or even further down to the so called "Tre små øer": Deception Ø, Igtutarajik and Patulaajivit.

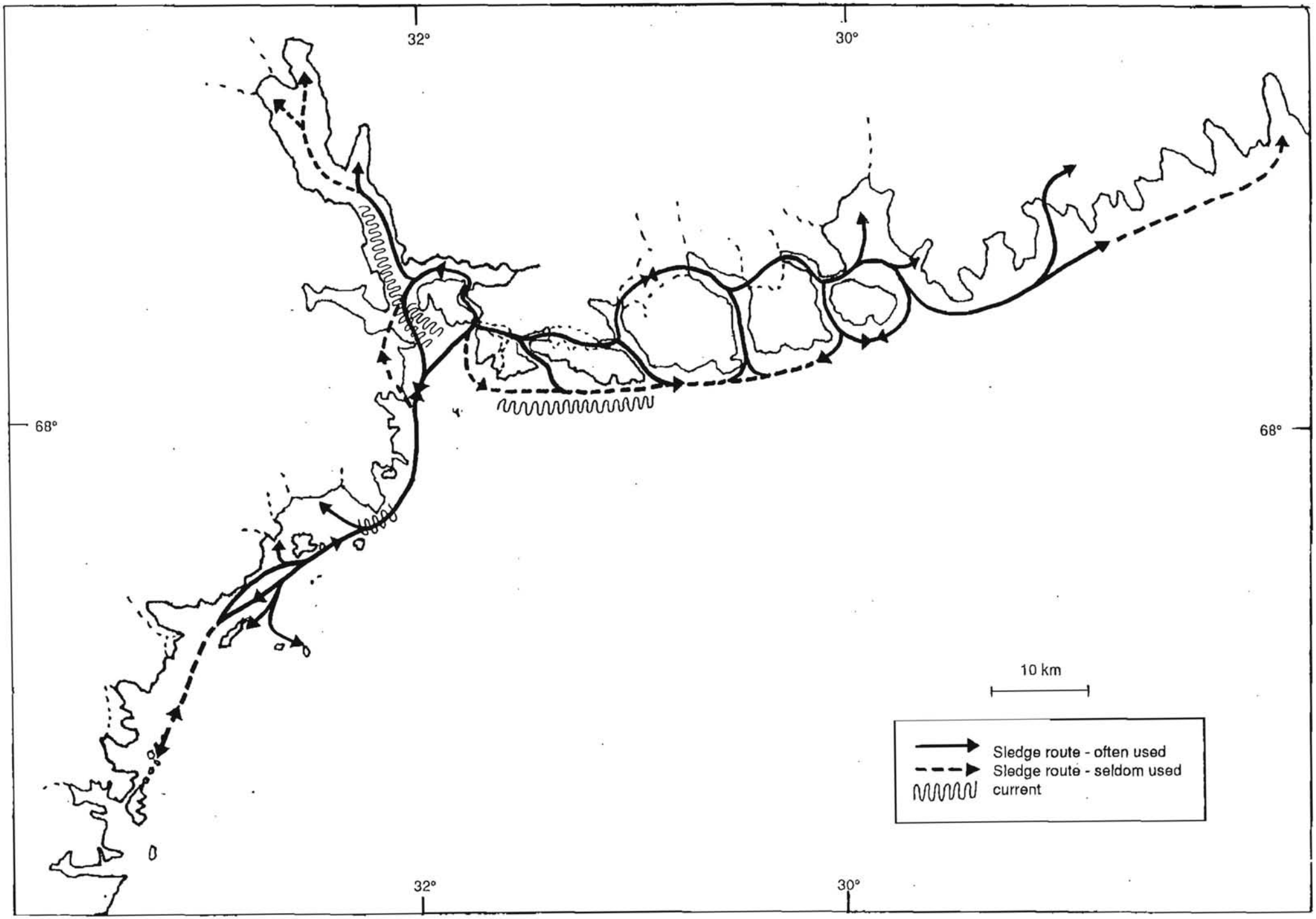


Figure 28. Sledge routes for polar bear hunting trips, and places with currents under the ice.

Some of the sledge journeys can end up all the way down at Aggas Ø and Nuugaalik. If the ice edge lies near the entrance to Kangerlussuaq, the fjord can be crossed directly from the hunters village to Kap Deichmann or further south to Barberkniven, after which the coast is followed. There are some places where there might be currents under the ice along this route e.g. opposite Kap Edvard Holm. If the edge of the ice lies further to the north, for example between Amdrups Pynt and Kraemer Ø, the hunters can either be ferried over to Kap Deichmann by motor boat and then continue by sledge along the coast, or go by sledge back around Kraemer Ø. This route goes between Uttental Sund and further out of Watkins Fjord and over to Amdrups pynt. If the coast can not be followed at this point, the hunters can go over the glacier and then resume following the coast a little north of Kap Diechmann.

The hunters normally leave together in groups of 2 to 5 sledges, however it is not unusual for hunters to travel alone as far as Søkongen Ø. On one occation ten sledges left together. A dog team usually consists of 10-11 dogs, but a team can have from 8 to 13.

Sledge journeys cease in June and July, depending on the state of the sledge routes. In these months the ice can be so "decayed" that it is not possible to travel by sledge, dinghi, or motor boat.

From July to October the hunting journeys (northeast and southwest) are carried out in dinghis or motor boats. This is especially the case in September and October. The polar bears that are hunted in summer are usually hunted in connection with narwhal and seal hunting.

12.3 Catch regulations

The regulations regarding polar bear hunting are a little special in the region around Kangerlussuaq. The border between Tasiilaq municipality and Ittoqqortoormiit municipality runs through the middle of Kangerlussuaq, and these two municipalities

have different hunting regulations. According to the Home Rule Government (Anon. 1988), all polar bears north of Kangerlussuaq (Ittoqqortoormiit municipality) (excluding single adult males) are protected from July 1 to August 31, while south of Kangerlussuaq (Tasiilaq municipality) they are protected from August 1 to September 30. In the areas north of Kangerlussuaq, hunters are permitted to hunt young polar bears older than 12 months as well as the adult females that accompany them outside of the above mentioned protected periods. In areas south of Kangerlussuaq on the other hand, young polar bears up to 2 years old and their mothers are protected. It is forbidden to disturb ,and therefore dig up, polar bears that are hibernating. The decision to protect all polar bears during the summer months and all female bears with cubs was introduced in January 1975, where after young polar bears under 2 years old and their mothers were protected throughout the year and all the other polar bears were protected June 1 to August 31 (Anon. 1974). These regulations were changed in 1976; only young polar bears less than 1 year and their mothers were protected all the year around, other polar bears were protected from July 1 to August 31 (Anon. 1976). In 1978 the regulations were changed again to the present with the exception of rules concerning the different ages of young bears, which were introduced in May 1988.

12.4 Polar bear catch

As was mentioned earlier, in the course of the interviews we were informed about 162 polar bear shootings and 17 observations over a 40 year period, from 1951 to 1991. The location, sex and size of the bears that were shot can be seen in figures 35 and 36. Table 3 shows the number of polar bears shot in the period between 1951 and 1991 according to different sources. The total number of polar bear shot includes the bears referred to by hunters during the interviews. A hunting season usually extends from August one year until July the following year. Over all, the hunters informed us of 162 successful catches. These included 3 polar bears that were shot in 1981, 1982 and 1983 respectively, and another 21 that were shot between 1966 and 1979. The information provided for catch in the 1966/67 to 1969/70 was based on the catch lists for that time (Anon. 1966-1969).

Table 3. Polar bear catch in Kangerlussuaq from 1951-1991. The number of polar bears seen but not shot is also given.

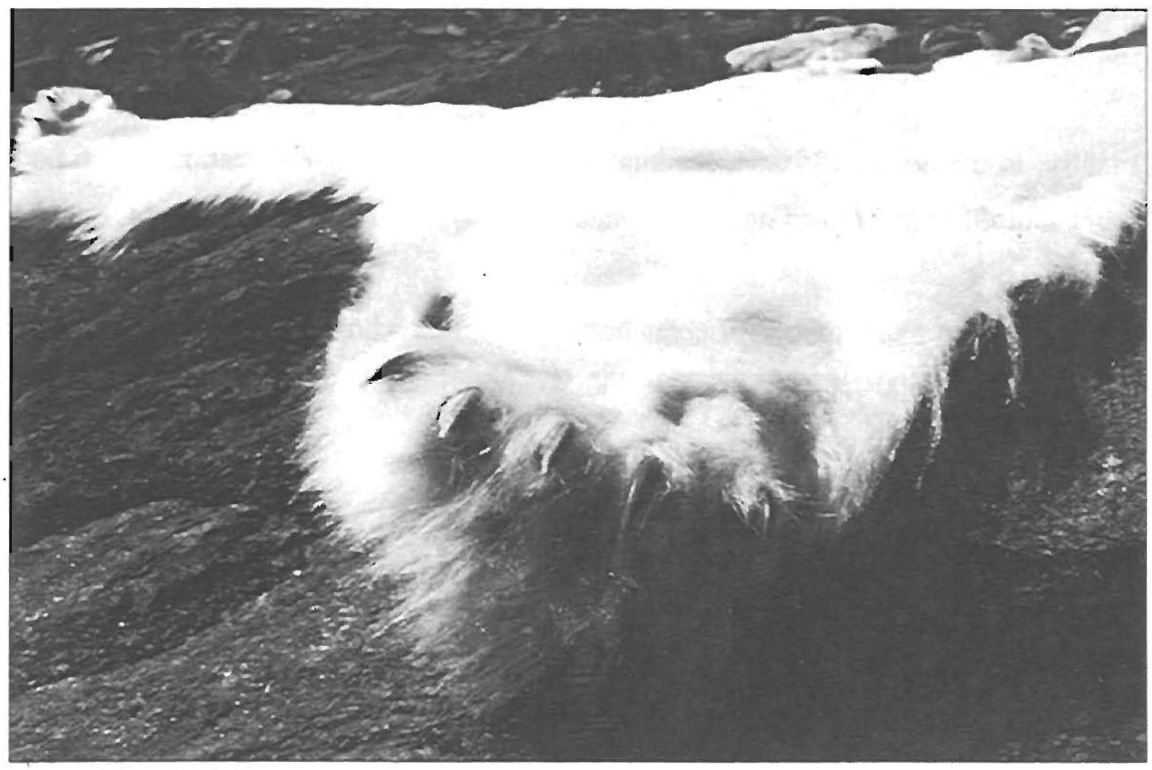
Season	Total no. of polar bear shot	Catch according to Siegstad (1989)	Catch according to catchlists		Total no. of polar bears seen but not shot
			July-june	Calender year	
1990/91	26				
1988/89	11				11
1987/88	11	14			
1986/87	18	44			1
1979/80	15				1
1978/79	2				
1977/78	0				
1976/77	3				
1975/76	0				
1974/75	1				4
1973/74	5				
1972/73	1				
1971/72	0				
1970/71	3			4	
1969/70	5		0	18	
1968/69	0	18	21	3	
1967/68	0	52	2	28	
1966/67	31	38	38	12	
1951/54	6				

During this period a season went from July one year to June the next. The season from 1967/68 included only July and August in 1967, and April, May and June in 1968. Similarly the 1969/70 season included only july and August. From 1966 to 1970 the polar bear catch was recorded in the catch lists for the calendar year i.e. 1.1 to 31.12 (Anon. 1966-1970). The totals given in table 3.are based on the records for first year of the season e.g. the 1966 calendar year is listed under the 1966/67 hunting season. Finally, table 3. also contains information derived from Siegstad (1989).

It is not possible to say how many polar bears were shot between 1951 and 1991, however my estimate is that it lies somewhere between 400 and 600 animals. The assumptions on which I base this estimate are discussed below.

According to the hunters that were interviewed and to Siegstad (1989), a total of 95 polar bears were shot between **1986** and **1991**. This figure is supposed to be close to the actual figure.

According to the different sources that were available, there were 143-164 polar bears shot between **1966-80**. Of these, 108 were shot from 1966-69 (Siegstad 1989), or approx. 36 per season. If this catch level (i.e. 36 bears per season) was maintained throughout the period from 1966 to 1980, then the total catch over the years would approximate 500 polar bears. If we assume that the catches that were mentioned in the interview-investigation represent 30% (108 : 31, refer table 3) of the total number, then the total catch should be around 300 (87 polar bears shot, according to the interviews x 100 : 30).



Polar bear paw.

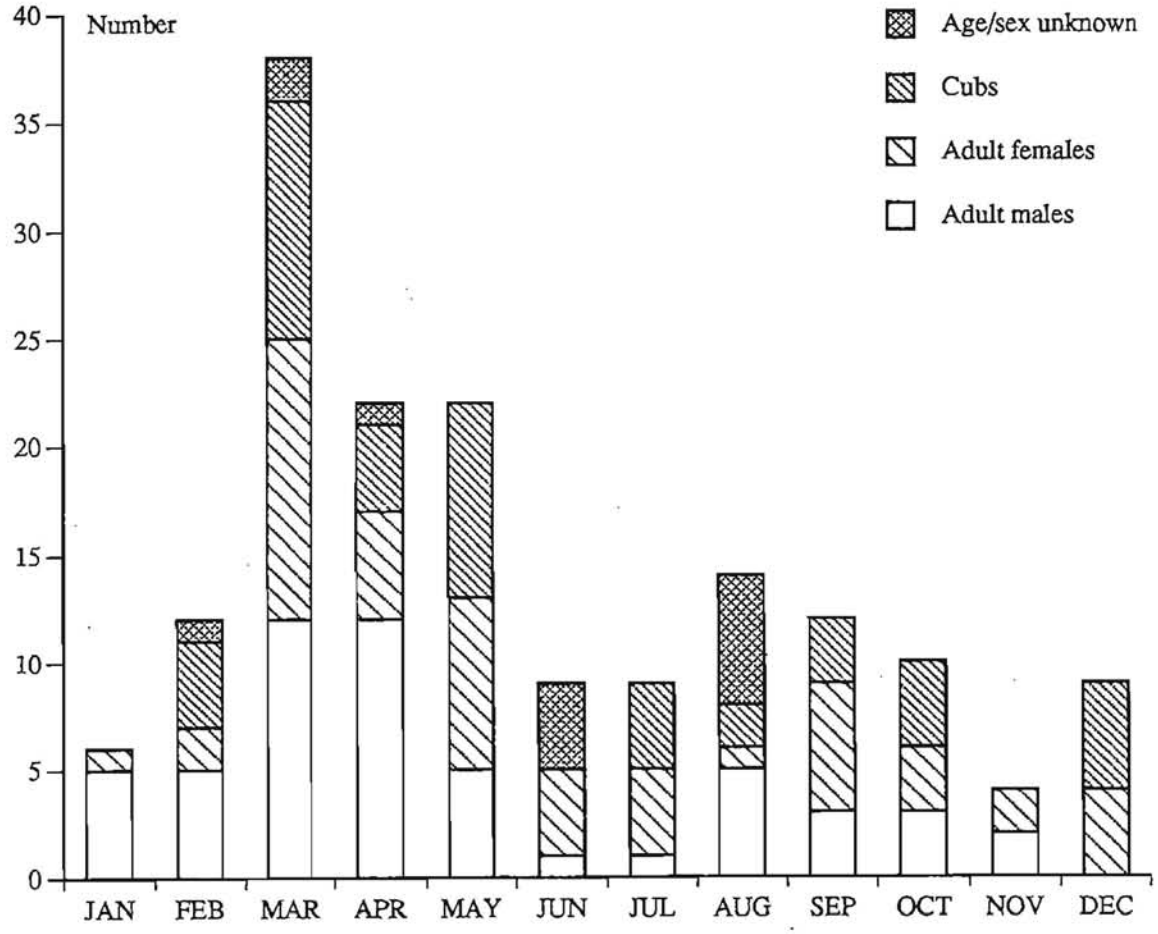


Figure 29. Season, sex, and age distribution of 167 polar bears shot and seen from 1951-1991.

Finally, in the period **1951-54**, the hunter at the Aputiteq weather station shot 6 polar bears himself and , according to the hunter, the rest of the personel shot 14.

In this way the total number of polar bears shot in the whole period can be estimated to be from 400-600: 20 (1951-54) + 300-500 (1966-80) + 95 (1986-91).

12.5 Annual variations

Of the 162 polar bears shot, 153 were able to be categorized into a single month. Some of these were said to have been caught in two months e.g. February and March, consequently I selected the first month as being the time of capture. This was the case with 18 polar bears. For the rest of the catches, more concise dates were given.

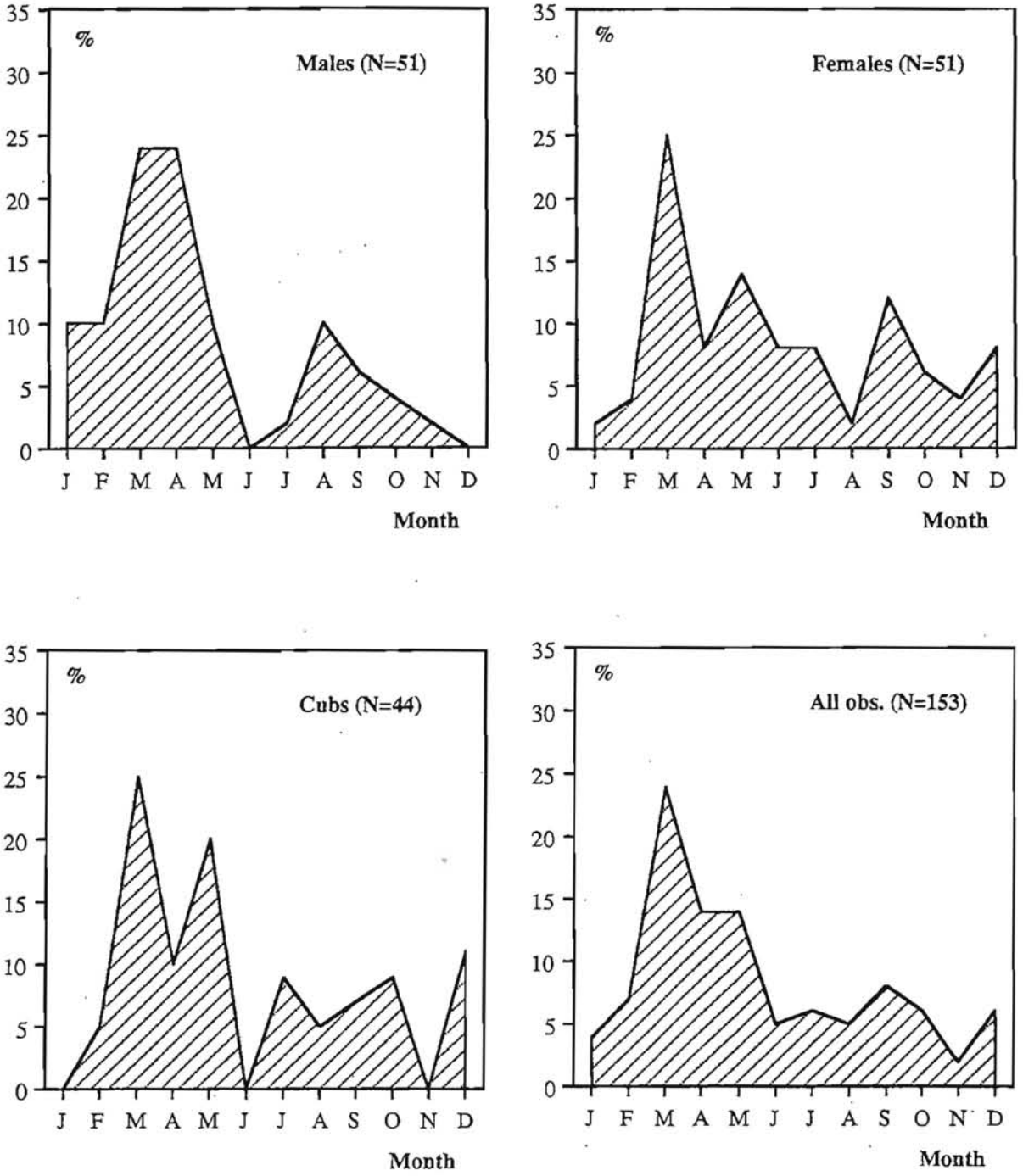


Figure 30. The percentage of male (adult), female (adult) and young polar bears shot in different months of the year from 1951-1991.

Over half the polar bears were caught in March, April, and May (refer figures 29 and 30), and approx. 25% of these were caught in March. In the rest of the months, excluding November, the number of polar bears actually shot varies by about 5%. Male bears are shot in March and April especially, although there is also a small peak in August. The catch curves for female and young polar bears are similar. Females and young bears are shot in March and May especially, with a drop in April. For the rest of the year the catch is more variable than for males (see figure 30.).

In more recent years it is thought that there has been a change in the the polar bear catch in comparison to earlier years. The material has therfore been broken up into two time periods; the first from 1951 until 1983 (primarily 1966-1980), and the second from 1986 until 1991. During the first period 96 polar bears were reported to have been shot, and during the second period 66 were shot.

The polar bears which were shot during these two periods are distributed over the different years. From 1986-91 there are destinct peaks in the catch in spring and autumn and also during the summer months, from July to August (figures 31 and 33). From 1951 to 1983 there is a destinct peak in spring but no peak in autumn. In addition, a relatively large number of polar bears were killed during the summer months (figures 32 and 34). If the curves for the total number of polar bears shot is split up into seperate curves for adult males and females and for their young, it can be seen there is a spring and an autumn peak for all three groups from 1986-91 (figure 33) while only the curve for adult males shows a peak in spring and autumn from 1951 to 1983. Adult females, and to some degree their young, were probably shot all year around during this period (figure 34).

From 1951-83, 3/4 of all the polar bears shot were hunted in the Kangerlussuaq region i.e. Kangerlussuaq and the adjacent fjords together with J.C. Jacobsen Fjord to the northeast, and Aputiteq and Fladø to the southwest. By far the majority of the remaining catch, approx. 15%, were hunted in the area around Søkongen Ø. On the other hand, from 1986-91 half of the polar bears were hunted in the area around Søkongen Ø and the other half were hunted in the Kangerlussuaq region (see figures 39

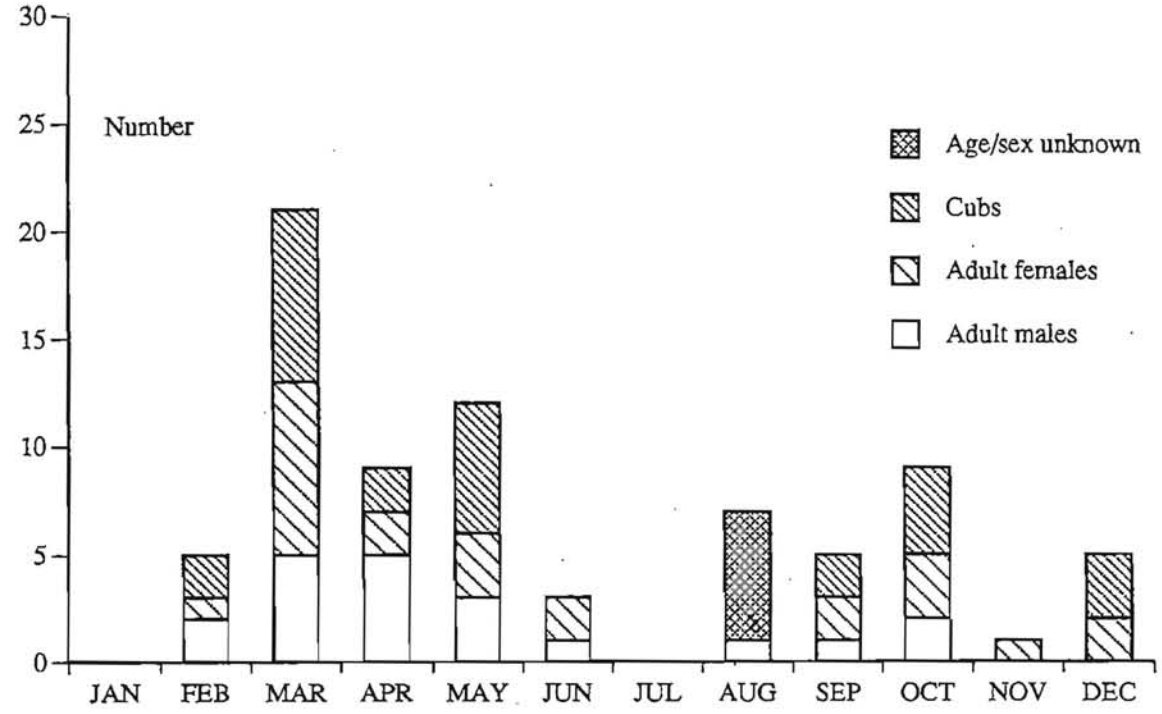


Figure 31. Season, sex and age distribution of 77 polar bears shot and seen from 1986-1991.

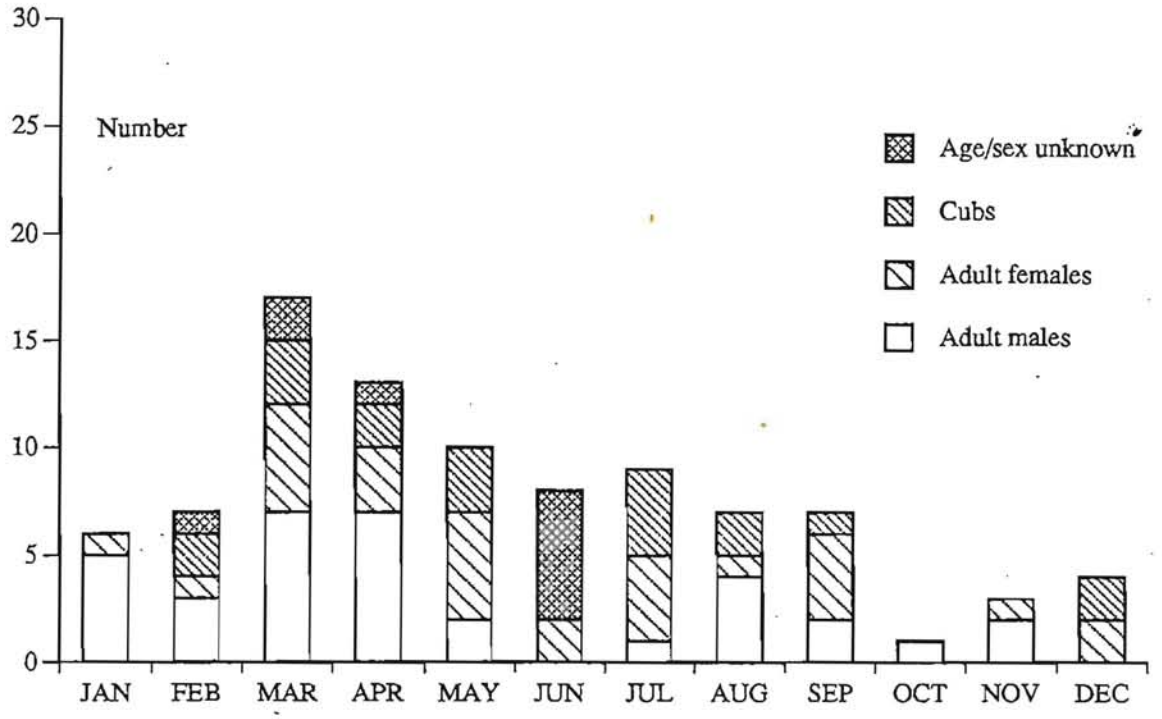


Figure 32. Season, sex and age distribution of 90 polar bears shot and seen from 1951-1983.

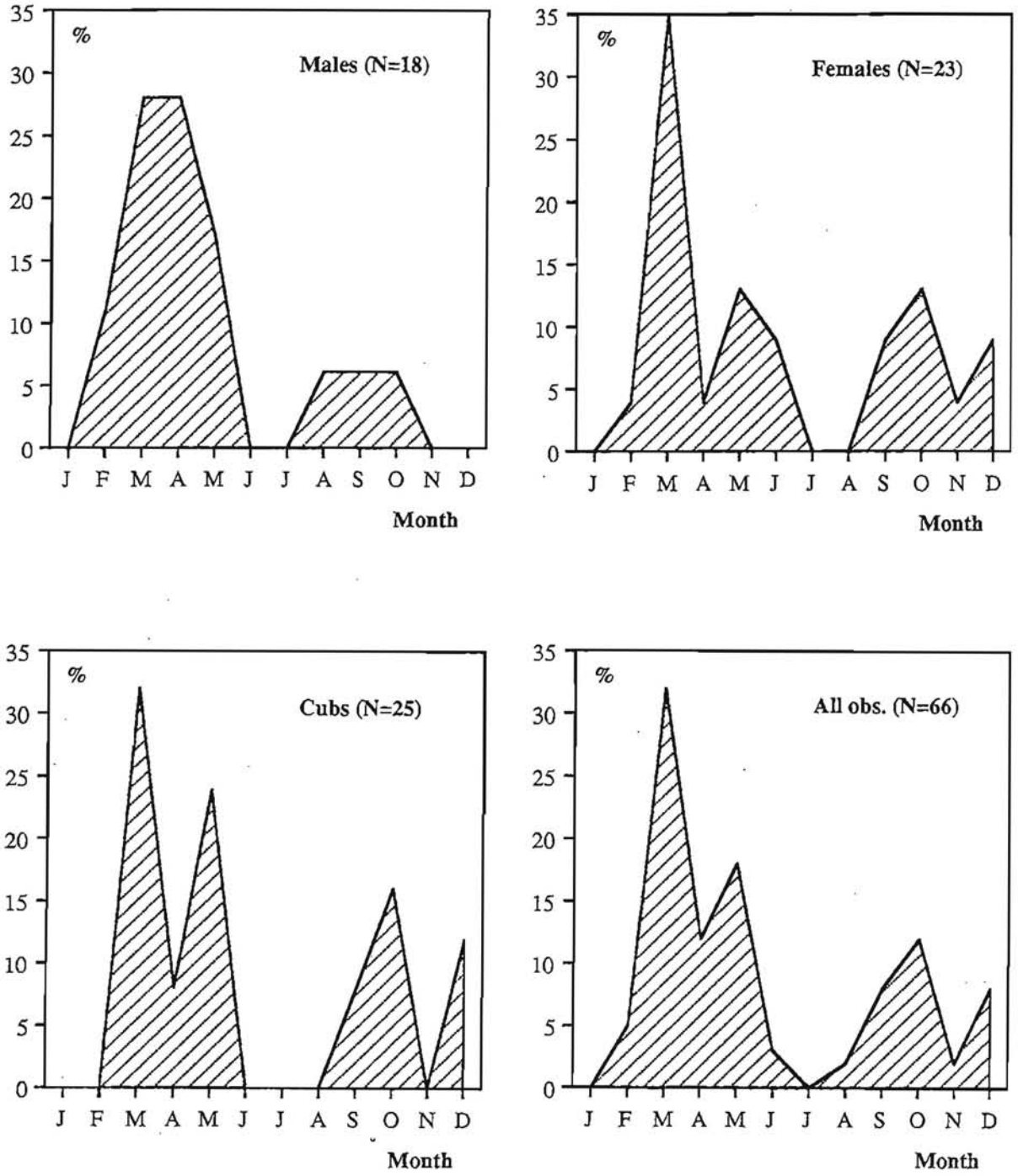


Figure 33. The percentage of male (adult), female (adult) and young polar bears shot in different months of the year from 1986-1991.

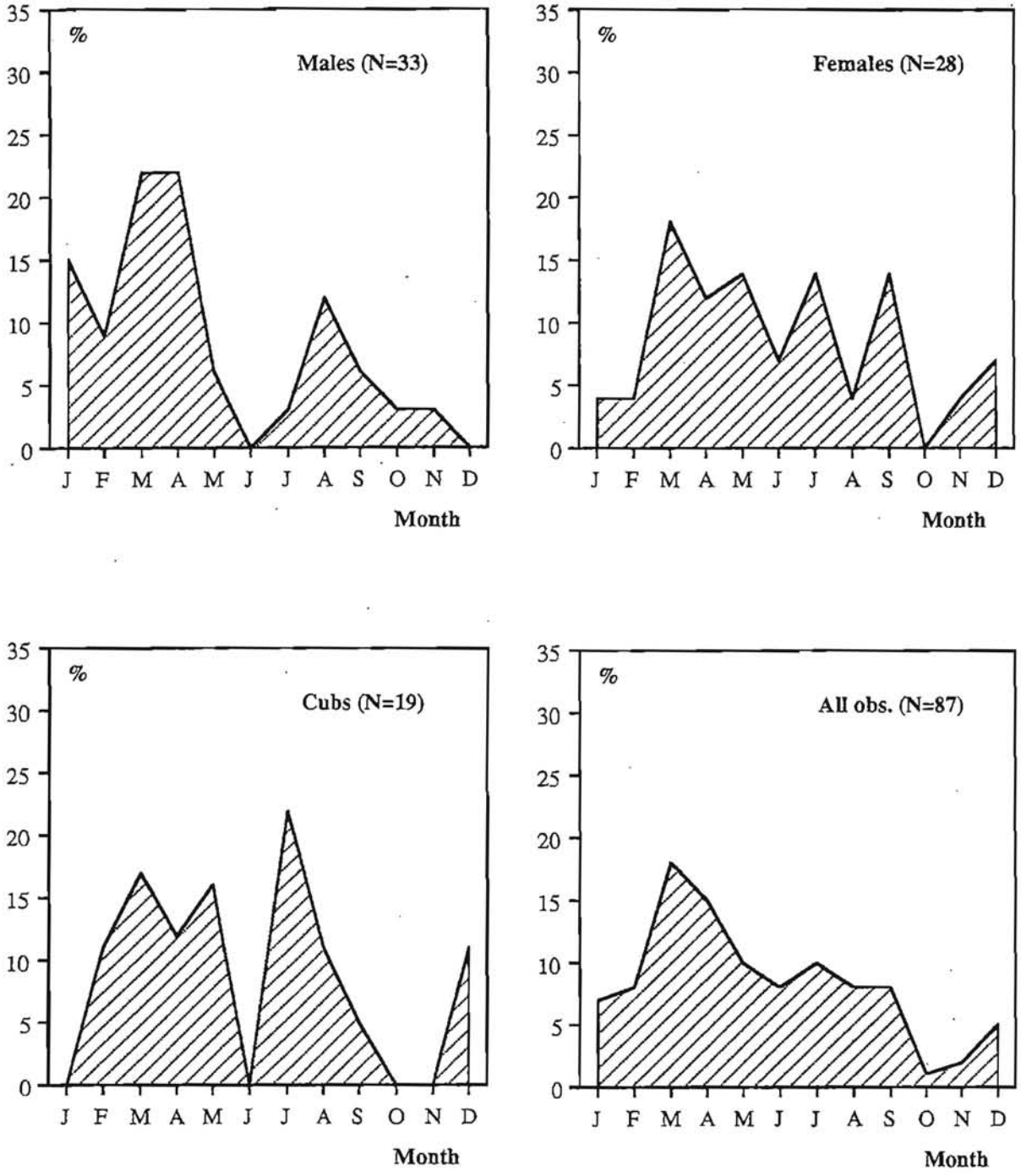


Figure 34. The percentage of male (adult), female (adult) and young polar bears shot in different months of the year from 1951-1983.

and 40). There is a destinct difference between the catch in Kangerlussuaq for the two periods. Inside a radius of 20 km of the hunters village (an area which includes Watkins Fjord, the entrance to Amdrup Fjord, Kap Deichmann and Miki Fjord) 48 polar bears (50%) were shot and 4 were seen in 1951-83, while in 1986-89 only one (2%) was shot and 3 seen in the same area. Inside a radius of 21 to 40 km from the hunters village (an area which includes Courtauld Fjord, Amdrup Fjord, Kap Edvard Holm (but not Aputiteq) and J.C. Jacobsens Fjord) 15 polar bears (16%) were shot and 1 was seen from 1951-83, while from 1986-89, 22 bears (33%) were killed in the same area. In recent years (1986-91) polar bears have also been hunted considerably larger distances from the hunters village that earlier. These days the hunters go on long journeys up to Søkongen Ø for example, and longer journeys into Kangerlussuaq itself than they did in the past.

12.6 Age and sex ratio

Of the 162 polar bears shot from 1951-91, the sex is known for 142. Of these 47.9% were male and 52.1% female. Independent (= "Adult") males constituted 35.9% of the catch (84% of the males were given as having been large, 16% as small), and independent females constituted 42.3%. Dependent young constituted 28.4% of the 155 polar bears shot (7 polar bears of unknown sex and age were not included). A total of 28 family groups were reported (i.e. a female with one or two young), which indicates that 46.7% of the independent females had young. The average litter size was 1.6 cubs per litter. Of the 31young bears for which the sex was known, 55% were male and 45% were female. Of the 46 dependent young, 32 can be divided into age categories: 4 were 3 years of age (9%), 9 were 2-3 years of age (20%), 11 were 2 years of age (24%), 3 were 1-2 years of age (7%), 3 were 1 year of age (7%) and 2 were 0 years of age (4%). For 14 of the young (40%) no age was given. Thus, most of the young were given to be 2 years of age or more.

In the period from 1951-83, 96 polar bears were shot, and the sex of 81 of these was

given. 48.1% were male and 51.9% were female. Independent males constituted 40.7% of the catch (82% of the males were given as having been large, 18% were small), and independent females constituted 45.7% . Dependent young constituted 21.3% of the 89 polar bears that were shot (7 polar bears of unknown sex and age were not included). A total of 13 family groups were reported, which indicates that 35.1% of the inderpendent females had young. The average litter size was 1.5 young per litter. Of the 11 young for which the sex was known, 55% were male and 45% female. Of the 19 dependent young that were shot, 11 can be divided into age categories: 0 were 3 years of age, 1 was 2-3 years of age (5%), 3 were 2 years of age (16%), 3 were 1-2 years of age (16%), 2 were 1 year of age (11%) and 2 were 0 years of age (11%). There was no age given for 8 of the young polar bears (42%).

Finally, there were 66 polar bears killed from 1986-91, 61 of which the sex was known. 47.5% of these were male and 52.5% were female. Dependent males constituted 29.5% of the catch (83% of the males were given to have been large, and 17% were small), and independent females constituted 37.7%. Dependent young constituted 37.9% of the 66 polar bears that were shot. A total of 15 family groups were reported, which indicates that 62.5% of the independent females had young. The average litter size was 1.8 young per litter. Of the 20 young for which the sex was known, 55% were male and 45% female. Of the 27 dependent young that were shot, 19 can be divided into age categories: 4 were 3 years of age (15%), 6 were 2-3 years of age (22%), 8 were 2 years of age (30%), 0 were 1-2 years of age, 1 was 1 year of age (4%), 0 were 0 years of age. There was no age given 8 of the young polar bears (30%). Thus, most of the young were given to be 2 years of age or more.

12.7 Hunting methods

Hunting polar bear from sledges is carried out in two ways, either the hunters catch up to the bears in their sledges and shoot them or one or more of the dogs are released to surround and stop the bear while the hunters get close enough to shoot. One hunter told us that he often lets his dogs loose, particularly if the snow is thick and his load

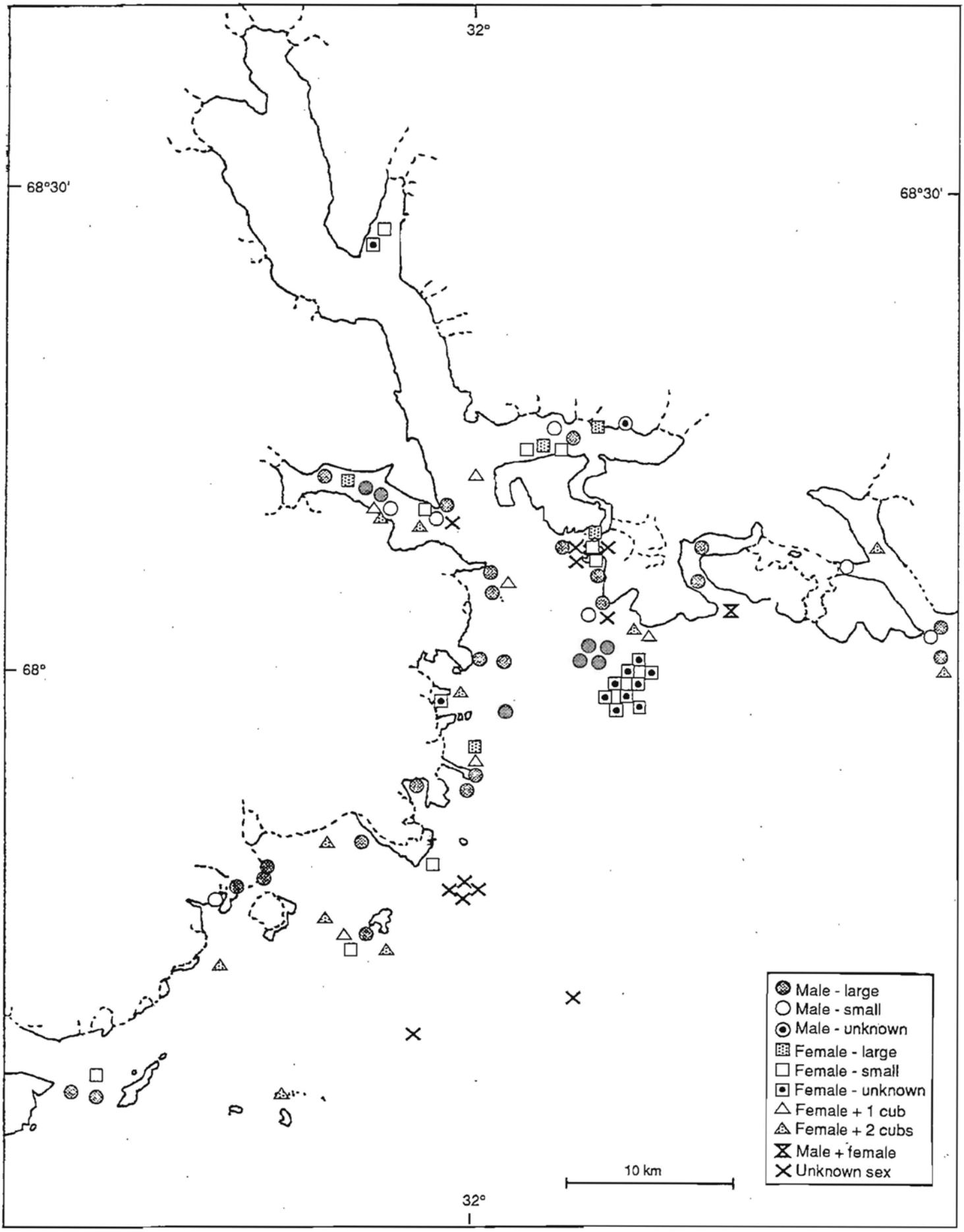


Figure 35. Polar bears shot and seen in the Kangerlussuaq region from 1951-1991, divided into sex, age and family groups (females with 1 or 2 cubs).

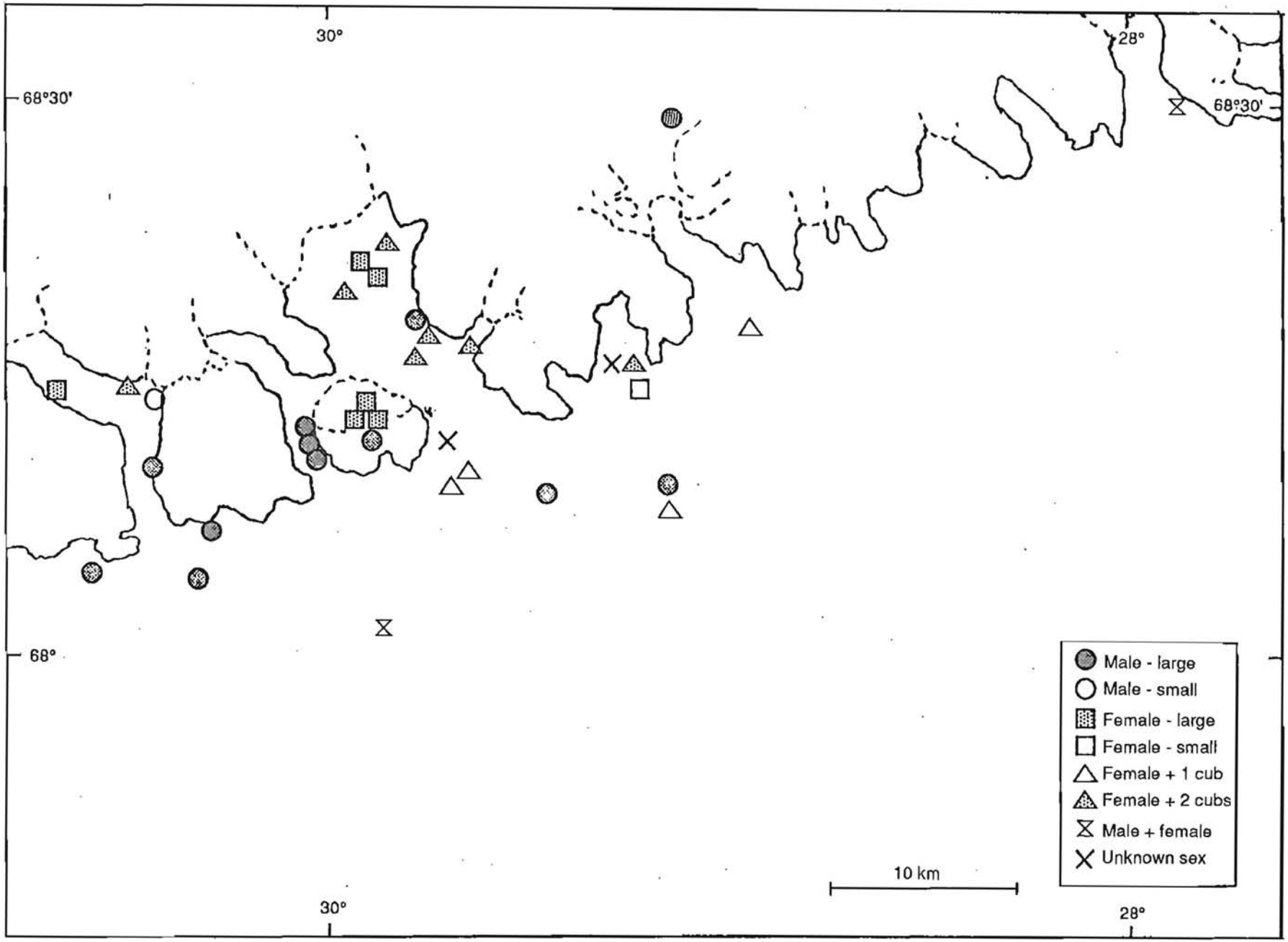


Figure 36. Polar bears shot and seen in the Søkongen Ø area from 1951-1991, divided into sex, age and family groups (females with 1 or 2 cubs).

is heavy. If a polar bear is some distance away, the dogs are also often released. Another hunter told us he usually lets 3-4 of his dogs loose. Only one hunter mentioned that one of his dogs was actually injured by a polar bear. Dogs are not released if the polar bear runs over unstable ice. Dogs may be released before a polar bear is seen if fresh tracks are found. One hunter, who estimated that his dogs probably would not be able to stop a mother polar bear with two cubs, left the dogs behind an iceberg and sneaked up on the polar bears himself; the mother was shot first followed by the cubs.

If the hunters are in motorboats or dinghis, polar bears are usually shot on the ice and also if they are discovered in the water.

12.8 Marked polar bears

In the interview-investigation the hunters were also asked whether they had shot any marked polar bears, or if they knew of anyone who may have. All the hunters replied "no". From 1973 to 1975, 64 polar bears were marked in North East Greenland (between 72°N and 77°N) and from 1966 to 1988 a total of 220 polar bears were marked mainly at Svalbard, but also in North East Greenland (1977) and at Franz Joseph Land (1980)(Born & Rosing-Asvid 1989). Some of the marked animals were recaptured in Scoresbysund, Kulusuk and Nanortalik respectively.

12.9 Breeding dens and other dens

There are few reports in the literature regarding dens in the Kangerlussuaq region. One den with fresh excrements was found at Nordre Aputiteq in August (Amdrup 1908), and it is presumed that the area along the coast at Blosseville, from 69°N to Kangerlussuaq, is a den area (Vibe 1976).

Only two definate finds of breeding dens were mentioned during the interviews. One

of the breeding dens was found east of the entrance to J.C. Jacobsen fjord at the end of August, 1990. It was located in a precipitous area and there were no cubs inside of it. It was not clear whether or not the den had been abandoned in spring the same year, or why the hunter thought it may have been a breeding den. The other breeding den was found a little inside of J.C. Jacobsen fjord on the eastern side in February, 1976. Inside the den there was found a thin, dead polar bear cub. The location of this breeding den is illustrated in figures 37 and 38, where the rest of the breeding den area is also marked.

One indication that there might be breeding dens in an area is the occurance of a large number of small polar bear footprints. These small prints are often compared with dog prints. Another indication could be that a female with small cubs (0 years in age) is either shot or seen in the area in March and April. In March 1967 a female polar bear with two cubs 0 years in age were shot between Fladø and Nordre Aputiteq. In April 1988 a female was shot in Nordre Aputiteq after the dogs had attacked and killed her 0 year old cub. In May 1987 large and small polar bear prints were seen in the area at Deception Ø and Fladø. The tracks were interpreted as belonging to two family groups, each consisting of one female with a 0 year old cub. One of the family groups came from the north while the other group came from inland. The two family groups met on an island. Finally, between 1987 and 1991 a female with small cubs were seen at the back of Kangerlussuaq near Courtauld Fjord; the time of the year was not mentioned.

From the findings and indications discussed above, the following areas can be designated as possible breeding den areas:

1. "Tre små øer" - the islands Deception Ø, Igtutarajik and Patuulaajivit are located approx. 25 km southwest of Nordre Aputiteq.Most of the small footprints are seen at Deception Ø, and it was also here that the two above mentioned family groups met. In addition, one of the hunters who came past the islands in a motorboat in summer noticed dens. Other hunters mentioned that they had seen small polar bear footprints in the area.

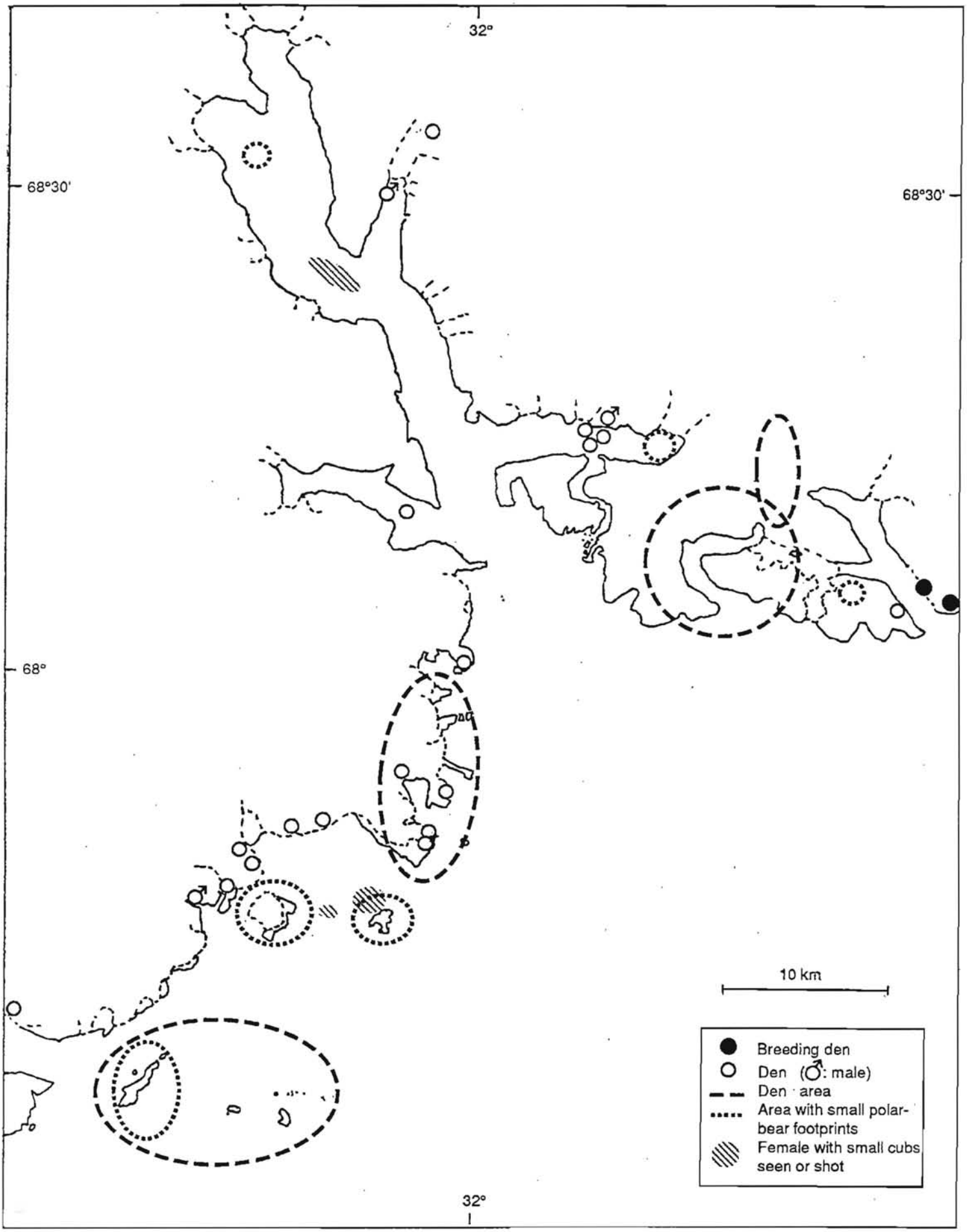


Figure 37. The location of dens, denning areas and small polar bear footprints in the Kangerlussuaq region.

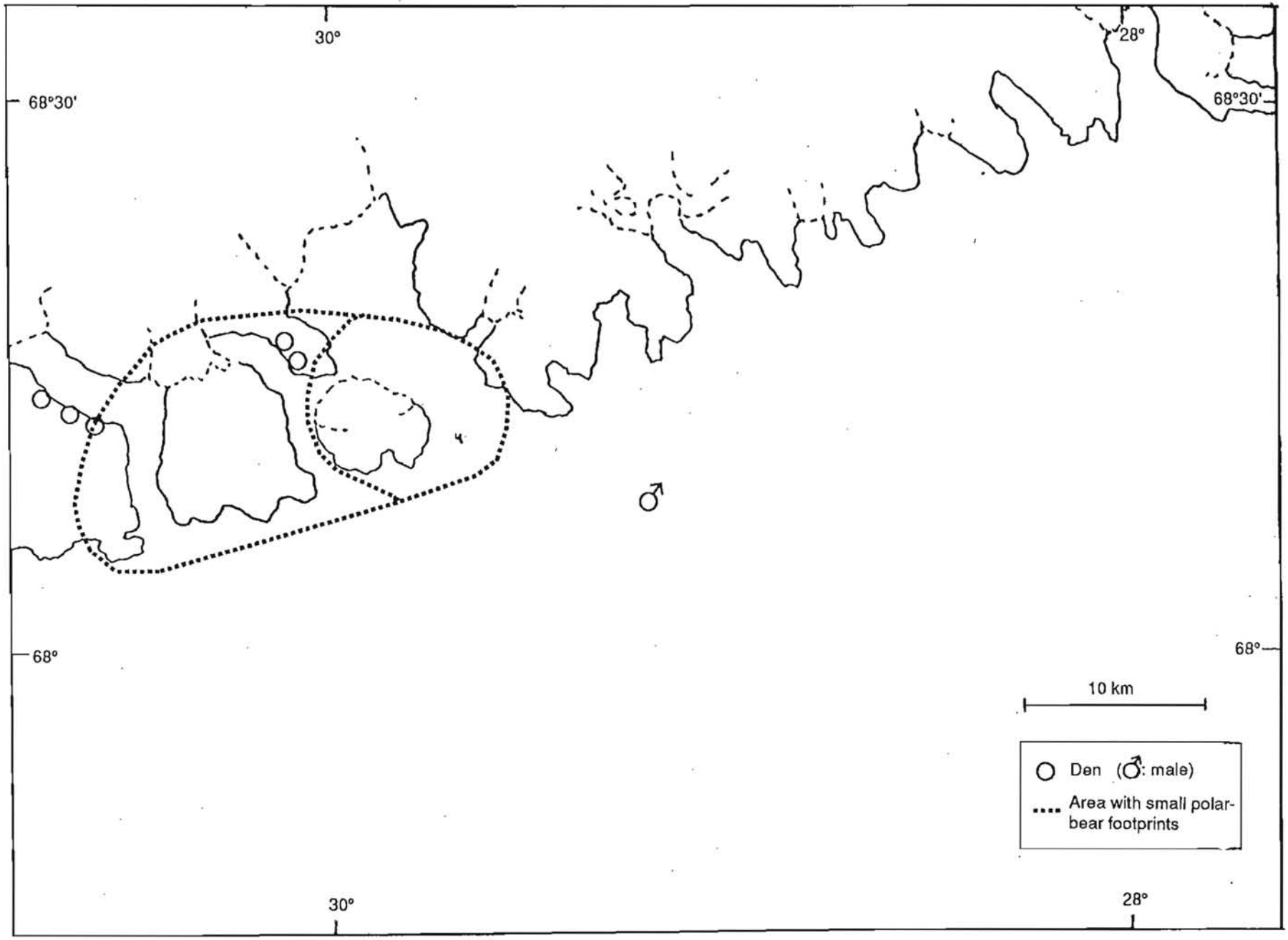


Figure 38. The location of dens, denning areas and small polar bear footprints in the Søkongen Ø area.

2. Fladø and Aputiteq.

In this area family groups with 0 aged cubs have been shot. One of the earlier mentioned family groups probably came from this area. In addition, many of the hunters have observed polar bear prints as small as dog prints in the area around Aputiteq. One hunter told us about large numbers of small footprints in this area in March-April. The hunter that was a cook at the Aputiteq weather station, said he had seen polar bear dens close to Aputiteq in the period from 1951-54. Many dens have also been seen along the coast.

3. The back of Kangerlussuaq.

In March or April, at the end of the 1960's or the beginning of the 1970's, a number of small polar bear footprints were seen disappearing onto a glacier - i.e. the polar bears had come from the glacier. From 1987-91 one female with small cubs was seen in the area. The hunters were especially asked about the distribution of the breeding dens and the small polar bear footprints in this area, as I had expected that the back of Kangerlussuaq was a breeding den area. Unfortunately there was very little information for this area, due to the fact that hunters very seldom go there. This is because they think that the area is dangerous due to the many glaciers and iceberges.

4. The back of Watkins Fjord.

Small polar bear prints were seen disappearing into the glaciers in March and April at the end of the 1960's or the beginning of the 1970's. In addition to this many dens are seen in the area.

5. J.C. Jacobsen Fjord.

The only definate observation of breeding dens related to this area was mentioned earlier. In March-April 1987 small polar bear prints were seen in the area south of the westerly branch of J.C. Jacobsen Fjord.

6. Søkongen Ø.

A large number of hunters have seen small polar bear prints in the area around

Søkongen Ø including Nansen -, J.A.D. Jensen - and Ryberg Fjord. From the general information about small footprints in the area includes observations made in February 1988 or 1989, when there was a thich layer of snow, and in March or April at the end of the 1970's and 1980's. Some of the hunters thought that most family groups are found in this area, which is confirmed by reports of the number of polar bears shot here (as discussed earlier).

In addition to the 6 areas mentioned above, which can be regarded as breeding den areas, there were a number of observations made by the hunters of dens other than breeding dens (refer to figures 37 and 38). These den areas were mentioned to be in the following areas: a) Around Nugalik at Søndre Aputiteq, b) The glacier area between Aggas Ø and "Tre små øer", c) The area from Kap Edvard Holm to Den lav Pynt (given to be a den area in the 1960's, dens were also found here in 1970-71 and in March in 1987 or 1989), d) Miki Fjord and the Sødalen area (the hunters informed us that they had been told of this area, and that the dens at Sødalen should be high up on the sides of the glaciers).

The situation of dens can be highly variable. We were told that some of the dens were high up on the glaciers. An old male was shot in a den (in Watkins Fjord) which had a "staircase" leading up to it. In the den area around Sødalen the dens were given to be located high up on the sides of the glaciers. The hunters were not able to make it up to one den on Courtauld Gletscheren because it was too far up. However the hunters could see footprints that lead up there. A breeding den in J.C. Jacobsen Fjord was situated on a glacier in a precipitous area, and similarly small polar bear footprints were found quite high up. Contrary to this, a den at Kap Edvard Holm was found only 3 m away from the shore, and another den found opposite Nansen Fjord was 15 km out on the sea. 4 dens were observed on the fjord ice in Watkins and Amdrup Fjord respectively. They were discovered due to obvious bumps in the terrain and footprints leading to them. The times at which dens are actually used is highly variable. For instance one male was shot as he left his den in September while another was shot in his den in November. A male was shot in J.C. Jacobsen Fjord in March or April, after a hunter had followed his footprints from his den at the back of Courtauld Fjord. A

mother bear had already left her breeding den in J.C. Jacobsen Fjord in February, but this may have been due to the fact that her cub had died. Small polar bear footprints are also seen around Søkongen Ø in February. According to the hunters, it is most normal that the small footprints are seen in March and April.

12.10 Migratory routes and annual rythms

Earlier observations of polar bears in the Kangerlussuaq region suggest that the bears migrate to the north (Dietz et al. 1985). The information from the interview-investigation shows that early in the year (around March) polar bears migrate northward following the edge of the fast ice. This may be close to the coast or far out towards the sea. Polar bears migrate early in spring from the area west of Fladø northward along Polaric Gletscheren. We were told that this was one of the "main routes". The migrating bears sometimes encounter open water opposite the entrance to Kangerlussuaq if a "piteraq" has passed through the area and broken up the ice. At these times the polar bears are forced to go a little way inside the fjord and swim accross. In spring there is often open water at the entrance to J.C. Jacobsen Fjord. As a result, according to the hunters, many polar bears gather here. At Søkongen Ø, where open water is also encountered in spring, many tracks have been seen heading off in a northward direction from May to July. During summer polar bears arrive at the Søkongen Ø area from the north. Most polar bears migrate northward in spring along the ice edge. One hunter thought that about 100 bears migrate past out on the ice. The polar bears may make detours into the fjords and continue on their way. A few, especially the family groups, search further into the fjords; family groups search for ringed seal breeding lairs on the fjord's ice. The polar bear routes up through fjords are for instance through Uttental Sund, Vandfaldsdalen, Sødalen, Hammerdalen and over Forbindelsesgletscheren. Support for the "route" between Sødalen comes from the following observations: In August 1986 a female with two cubs (approx. 1 year of age) migrated from Miki Fjord up through Sødalen (B. Gannicott and D. Wilson, Planitova Resources Ltd, 1991, pers. comm.). In August 1990 polar bear footprints were seen between Sødalen airport and Miki Fjord (H.C. Langager, GFI, 1991, pers.

comm,). The route between Watkins Fjord and Miki Fjord was mentioned as being a definate over land polar bear route which the polar bears use to avoid the area around Kap Hammer (Degerbøl 1937). During summer and autumn the polar bears follow the drifting ice southward movement in the East Greenland Polar Current. Many of the bears search for food either along the glaciers at the coast, or deep in the fjords, or on land if there are too few seals available. On land polar bears have been found at heights of 200-300 m. Once on land, they can survive for 2-3 months with virtually no food possibly eating seaweed, mos and herbs. T. Nielsen (GGU, 1992, pers. comm.) assumed that a polar bear he heard rummaging outside of his tent was eating black berries. One of the hunters thought that polar bears go onto land when they shed their hair.

Pregnant females go into hybernation in October or November, and don't break out of their lairs with cubs until the end of March or the beginning of April (Born & Rosing-Asvid 1989). Other polar bears also go into hybernation during autumn and winter, which is presumably a mechanism which enables polar bears to survive during periods with bad weather and/or low food availability (Born & Rosing-Asvid 1989). An example was mentioned in the interview-investigation: an old male was shot September 1990 (at Fladø) just after it had come out of its den. Figure 29. illustrates that polar bears do not hybernate throughout the winter period, as polar bears are shot or seen all through the year.

12.11 Pairs and mating

Observations of only four pairs of polar bears were collected in the interview-investigation. One pair was killed at Vedel Fjord on March 21, 1991. The pair of bears first attempted to chase the hunter and his dogs away as they slid down towards them. When that didn't work they then tried to escape up the mountain side, but the female was not able to get up; the male, which was further up the slope, stood up on its hind legs and roared. Apparently the female had milk in her breasts, indicating that she had had cubs which the male could have chased away. Another pair were shot in

Miki Fjord in May 1975. The female succeeded in getting away while the male was being shot. The third pair was hardly a pair; a male was observed to be following a female, although it appeared to be keeping some distance away . The time of the year was not noted, but the hunter mentioned that the mating usually takes place in April and May. Finally, one hunter reported having seen and followed tracks belonging to a pair of bears. These few pairs were seen in the period from March to May, which corresponds well with the findings of Born & Rosing-Asvid (1989) who state that mating normally occurs in the period from March to May, and into June.

12.12 Food preference

The most important food item for polar bears is seal, especially seal blubber. 14 of the 23 hunters commented about polar bear feeding, 13 of these had found seal blubber in the stomachs. Sealskin is also often found in stomachs while seal meat is found less frequently. Ringed seals are the most important prey, but the remains of young hooded seals have also been found. Apart from seals, the hunters mentioned different types of plant foods e.g. herbs, grasses, mosses and seaweed. One polar bear that was shot in October had so much moss in it's stomach that it found it difficult to walk. In the middle winter one year a thin bear was shot that was found to have seaweed in it's stomach. Amdrup (1902B) observed a polar bear at Nordre Aputiteq in August that was pulling up plants and moss, and remains of plants were present in it's fresh faeces. One hunter saw pieces of other polar bears inside the stomachs of male bears, while another hunter had heard about this sort of thing. It was suggested that male bears often eat young cubs after the female has been frightened away. One hunter found a bird feather in the stomach contents, and another hunter had heard that polar bears eat Arctic char. In this interview investigation one hunter described a ringed seal hunt: a ringed seal lay on the edge of the ice resting. The polar bear swam closer and dived under water in order to sneak up on the seal. It then came up a little to the left and immediately dived again. When it came up again, a little to the right of the seal, it orientated itself and quickly dived again. The polar bear then came up close in front of the seal, which then recieved a deadly blow with the bears left paw. That the left

paw is used to kill the prey with has also been mentioned by other hunters.

12.13 Trade and utilization

Until the end of the 1960's and the beginning of the 1970's polar bear skins were used to make pants. One hunter told us that the skin from the young bears were for childrens pants. The pants were described as being especially good in rainy weather. At that time mittens, parkas and kamiks were also made from the skins. At the beginning of the 1970's, when hunters were offered good prices for the skins, it was no longer worth their while to use the skins for clothing. Following this all the skins were sold to KGH/KNI or to private buyers. In 1966-67 the value of a skin was between 1,500 and 3,000 kr.; a very large male with extraordinarily beautiful skin (a hunter told us that the pubic hair could be about 50 cm long) was sold for 3,000 kr. +6,000 kr. bonus. The KGH/KNI prices are normally a couple of thousand kroner lower than if the skins are sold privately. In the 1970's the sale price was around 5,000

Polar bear skins bleached in the sun. Skærgården.

kr. (KGH), and in the mid 1980's the price was between 4000 and 7000 k.r. The prices mentioned above were given by the hunters. The current sale prices for polar bear skins purchased by KNI (in 1991) was given by U. Witthaus (Great Greenland, 1992, pers, comm.). The sale price is dependent on the length of a skin (measured from snout to the tip of the tail) and the quality. The smallest skins accepted are 190 cm in length. The sale price for a skin of 1st quality is 3,300 kr. per m, 2nd quality is 2,200 kr. per m and 3rd quality is 1,100 kr. per m. Thus, an average 1st quality polar bear skin that is 240 cm in length is worth approx 8,000 kr. to the hunter.

12.14 Disturbances

During the interviews, the hunters were asked whether they thought that polar bears would be disturbed by future or present mining activities. Many of the hunters responded by refering to the situation around the Aputiteq weather station and the radar station at Kulusuk. The weather station was manned from 1949 to 1979. During this period ships visited the area a couple of times every summer. After 1979 the weather station was converted to an automatic weather station. The hunters told us that the polar bears had become accustomed to the constant noise from the generators at Aputiteq and are still in the area, but probably avoid the weather station. One hunter did not think that more polar bears came to Nordre Aputiteq after the weather station ceased to be manned. At Kulusuk hunters had observed polar bears walking around the radar station in an effort to avoid it. As a result the hunters have been forced to move further away from the coast to hunt them. One hunter thought that there were more polar bears at Kulusuk before the radar station was established. However the situation at Kulusuk is different to Nordre Aputiteq, where the possible disturbances are caused by helicopter flights in Kulusuk. According to the hunters the polar bears respond to the presence of helicopters by moving away from the area. One hunter did not think the helicopters caused any real disturbances as polar bears are still seen in the area despite all the flights. However, most of the hunters thought that the helicopters did disturb the polar bears. In general it is thought that the bears have a good sense of hearing and therefore can hear noise over long distances. They would normally avoid

a noise source by walking around an area. Polar bears have been seen to react somewhat differently to noise. If bears are hungry, they would probably disregard the noise and continue to walk along the edge of the ice in search of food. One hunter thought that the smell of the machinery among other things would force the bears to avoid areas with mining activities. It was the opinion of one of the hunters that hybernating polar bears would not be disturbed in their dens.

Besides this, the hunters were asked about whether the polar bears would be attracted by the mining activities, for example due to the wastes. Polar bears have been seen to be attracted to the hunters village and have eaten supplies. However they seldom come to Skærgård hunters village after supplies or wastes, and in the mining camps wastes are burried, burnt or taken away from the area.

12.15 Discussion

This interview-investigation involved the shooting of 162 polar bears between 1951 and 1991. It is estimated that this number represents 30-40% of the total number of polar bears shot during this period. There are a number of reasons for this. One of the reasons is that it was not possible to get in contact with all of the hunters who have been in Kangerlussuaq. Some of them are dead, some lived too far away to be included in the investigation, and others were away on hunting trips, possibly to Kangerlussuaq, and thus our paths were crossed. In addition it is also likely that there were some hunters which we do not know about. Of the hunters we did interview, many could not remember all the hunts especially if they had shot many polar bears. It was usually the first polar bears hunted that were remembered, while the later ones were difficult to seperate from each other. As polar bears are a highly desirable quarry, it is fairly certain that the hunters reported the majority of all the bears they had shot. Besides the polar bear catch, the interview-investigation also placed some emphasis on the details of the polar bears that were shot. Naturally enough this presented some difficulty, especially when hunters were asked to recount details from their previous hunts. Nevertheless it was astonishing how many details many of the hunters were able to

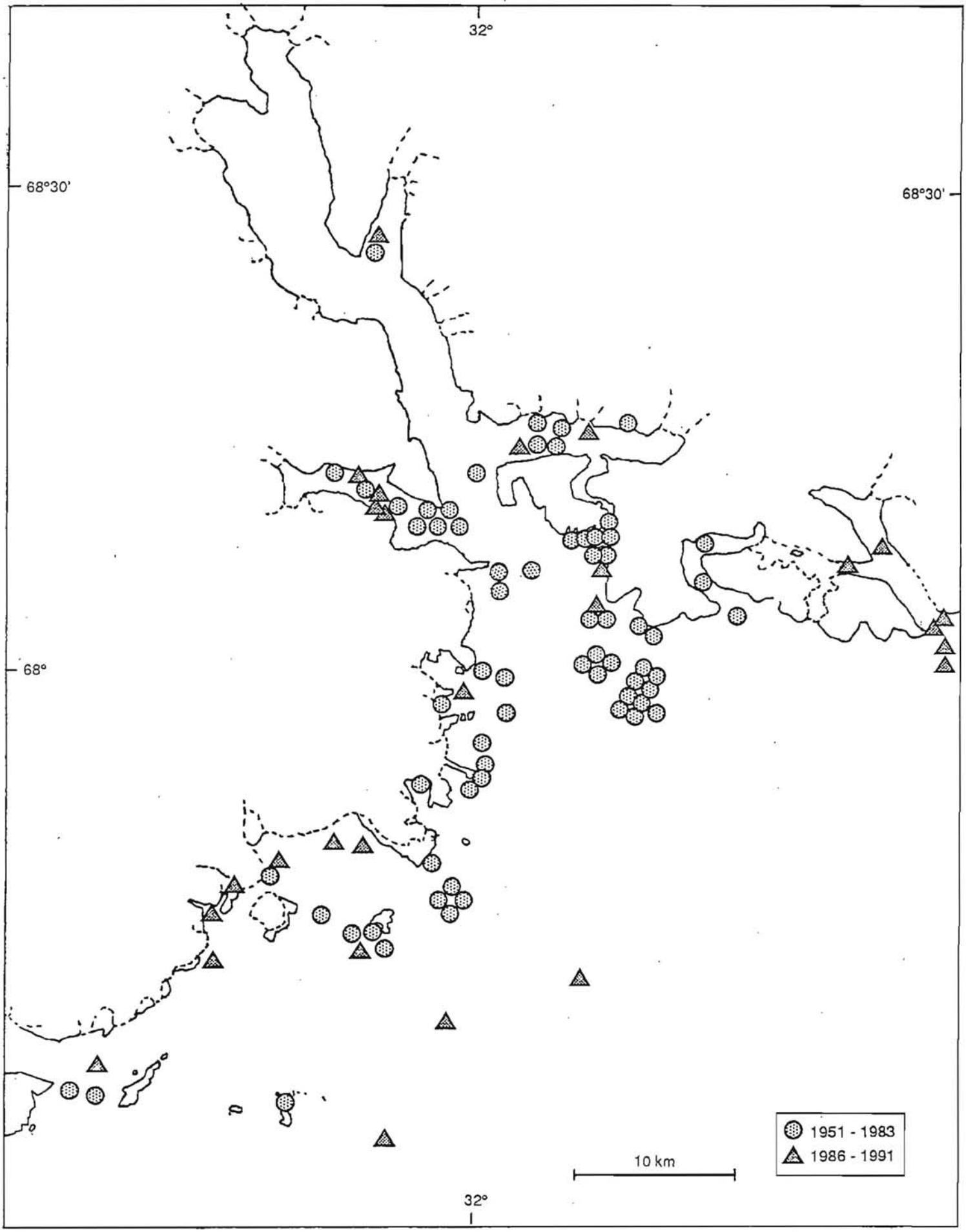


Figure 39. Polar bears shot and seen in the Kangerlussuaq region from 1951-1983 and from 1986-1991.

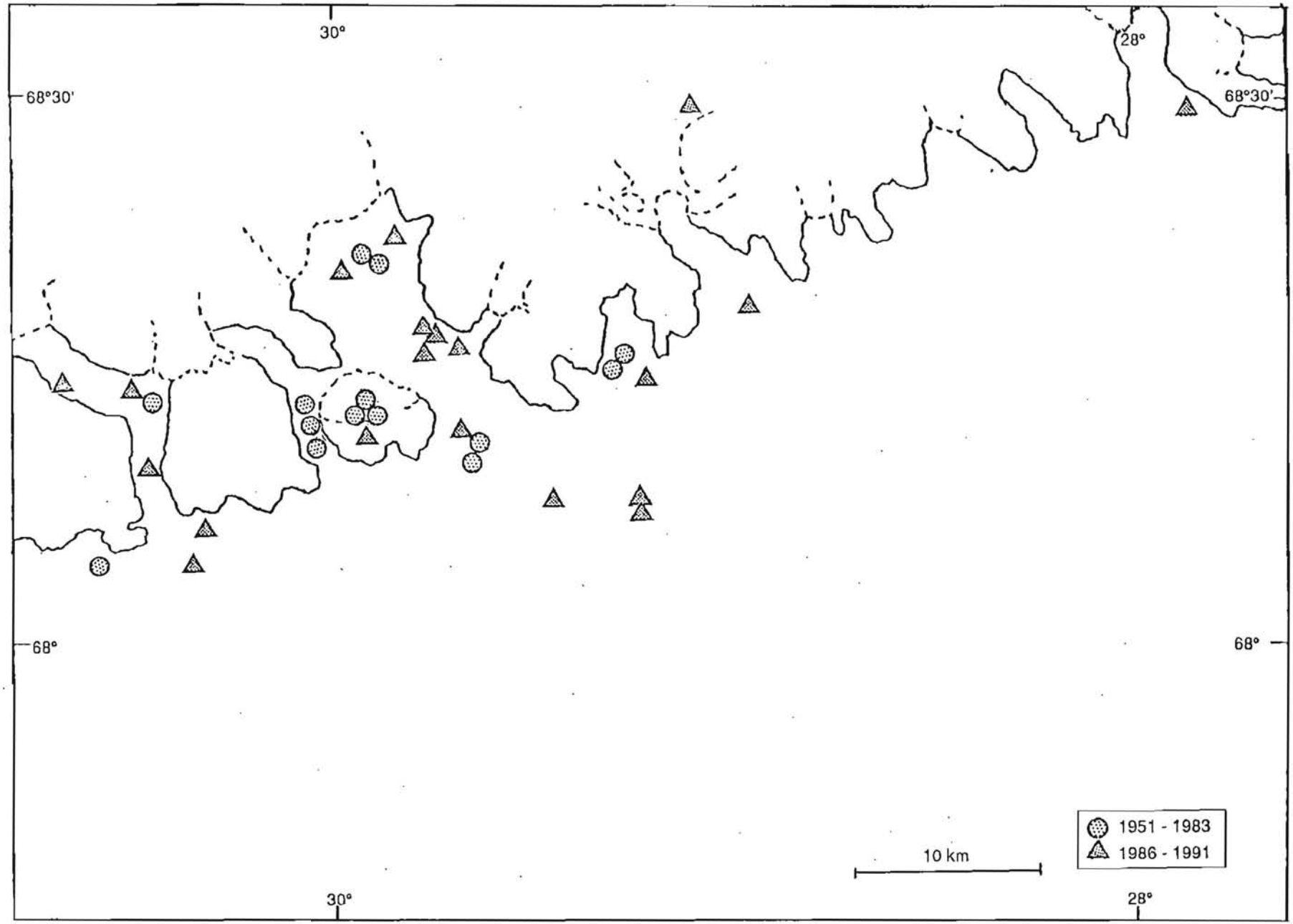


Figure 40. Polar bears shot and seen in the Søkongen Ø area from 1951-1983 and from 1986-1991.

recall. The fact that they were able to remember such details as the location of a hunt, the date, the sex and age of the bear shows how much it must mean for the hunters that shot the polar bear.

From 1966 to 1980 3/4 of all polar bears shot were hunted in the Kangerlussuaq region i.e. Kangerlussuaq and the adjacent fjords, J.C. Jacobsen Fjord in the north east, and Aputiteq and Fladø in the south west. Half of these were shot inside a radius of 20 km from the hunters village. Approx. 1/5 were shot at Søkongen Ø. During this period polar bears were shot relatively frequently over the years, with most being shot in March and April.

From 1986 to 1991, half of the polar bears shot were hunted in the Kangerlussuaq region, but only approx. 2% of these were within a radius of 20 km from the hunters village. The other half were shot at Søkongen Ø. In this period most of the bears were shot in spring (March and May), however many were also shot in autumn (October). There were nearly no polar bears shot in summer (June, July, August) during this period.

The difference between polar bear hunting in these two periods is that the hunters from 1966 to 1980 hunted in the area close to the hunters village all through the year, while the hunters in more recent years have concentrated their efforts in spring and autumn. This is most marked with the spring catch around Søkongen Ø (see figures 41 and 42).

There were no comments made during the interview-investigation that could help to explain the changes in hunting patterns over the years. One possible explanation might be the hunting regulations that came into force in January 1975. According to these regulations, all polar bears were protected during the summer, and females with cubs were protected all through the year (see section 12.3.). Because of Kangerlussuaq's position on the border between two municipalities with different protective policies for polar bears, the rules that came into effect 1978 meant only that polar bears were protected in August and that females and their cubs (if under 1 year of age) were protected for the whole year. To compensate for the loss of summer hunting and the

hunting of females with cubs, the hunters had the possibility of increasing their efforts at other times of the year and in other periods e.g. at Søkongen Ø in spring. If the number of polar bears that were shot or sighted (3 animals) from 1975 to 1980 is combined with the period from 1986 to 1991, the most marked difference is that more polar bears were shot in July and August 1986 to 1991. At the same time it can be seen that 67% of the 24 bears mentioned from 1975 to 1980 were either seen or shot within a radius of 20 km of the hunters village (50% in 1966-1980), and only 13% were shot at Søkongen Ø (15% in 1966-1980). The polar bear catches from 1975-80 are therefore not essentially different to the catches for the whole period between 1966-80, thus the changes in the hunting regulations do not seem to explain the difference of the catch from 1966-80 and 1986-91. Another explaination could be the increased level of activity that has take place in the area since 1986, partly in connection with the mineral exploration and partly in connection with the reintroduction of over wintering hunters in the area after a pause since 1980. The increased level of activity and associated disturbances in the area could mean that polar bears avoid the area, as was seen at Aputiteq weather station and the radar station at Kulusuk.

Actual mineral exploration started in the area in 1986 with the use of helicopters and different types of drilling machinery. In 1986 the only activity took place in July when the helicopters were used frequently. In the following years the level of activity was increased. Helicopters were used more often in the Skærgård area and in Sødalen first, and from 1989 they were also used in the Kap Edvard Holm area. In 1988 saws were used to take geological samples and in 1989, 1990 and in 1991 drilling rigs and hand held drills were also used. In 1989 and 1990 snow scooters were introduced to the area. This information was obtained from T. Nielsen (GGU, 1992, pers, comm.).

A second activity that started in the area in 1986 was the reintroduction of over wintering hunters after a pause since 1980. In the 1987/88 season approx. 100 people were at the hunters village, possible the largest number ever. In 1988/89 there were 39 people and in 1990/91 there were only 16. Some of the disturbances that may result from hunting include the noise from dinghis or motorboats, rifles and barking dogs. In comparison to the catch in the 1960's and 70's, the level of disturbance in the area

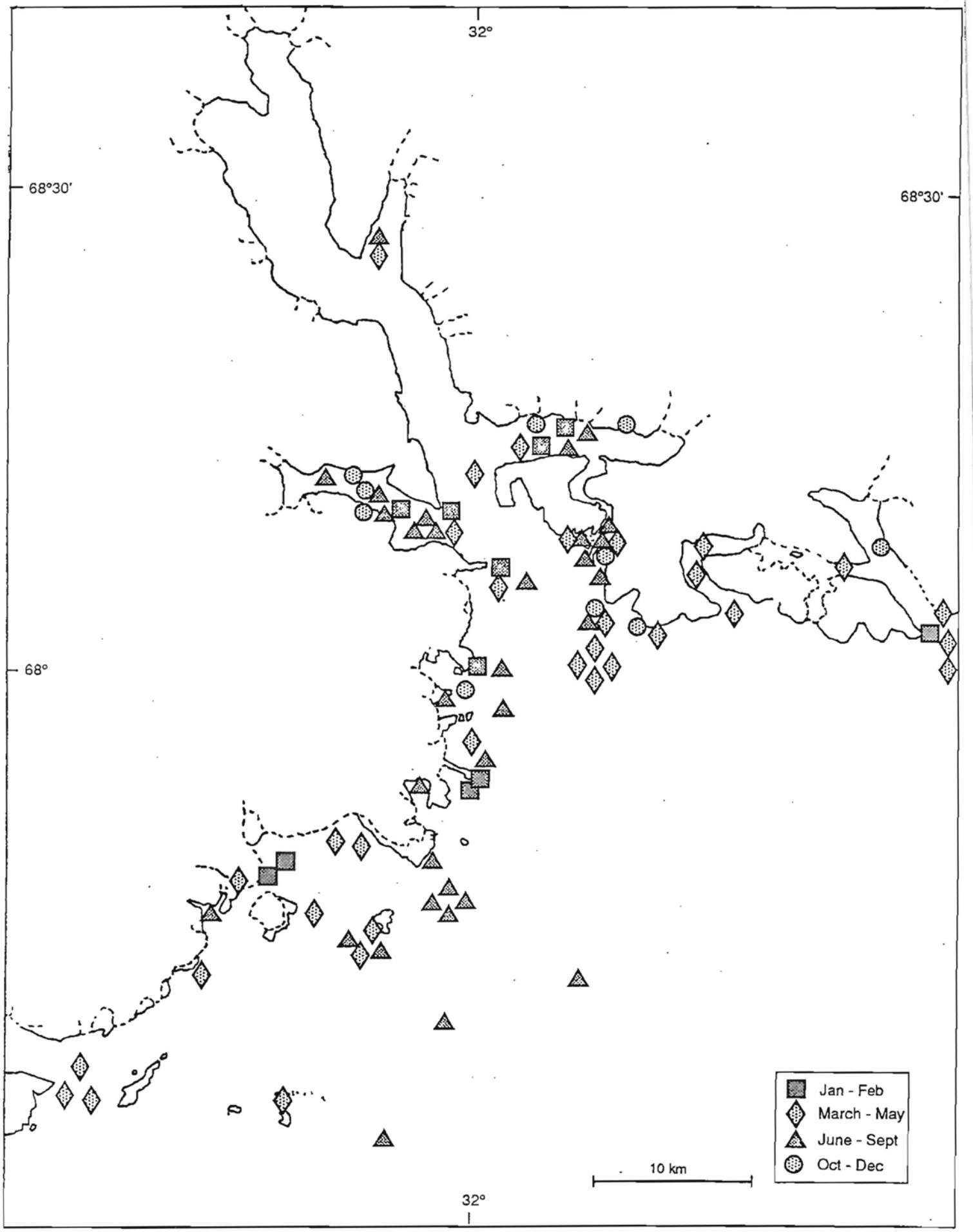


Figure 41. Polar bears shot and seen in the Kangerlussuaq region during different times of the year.

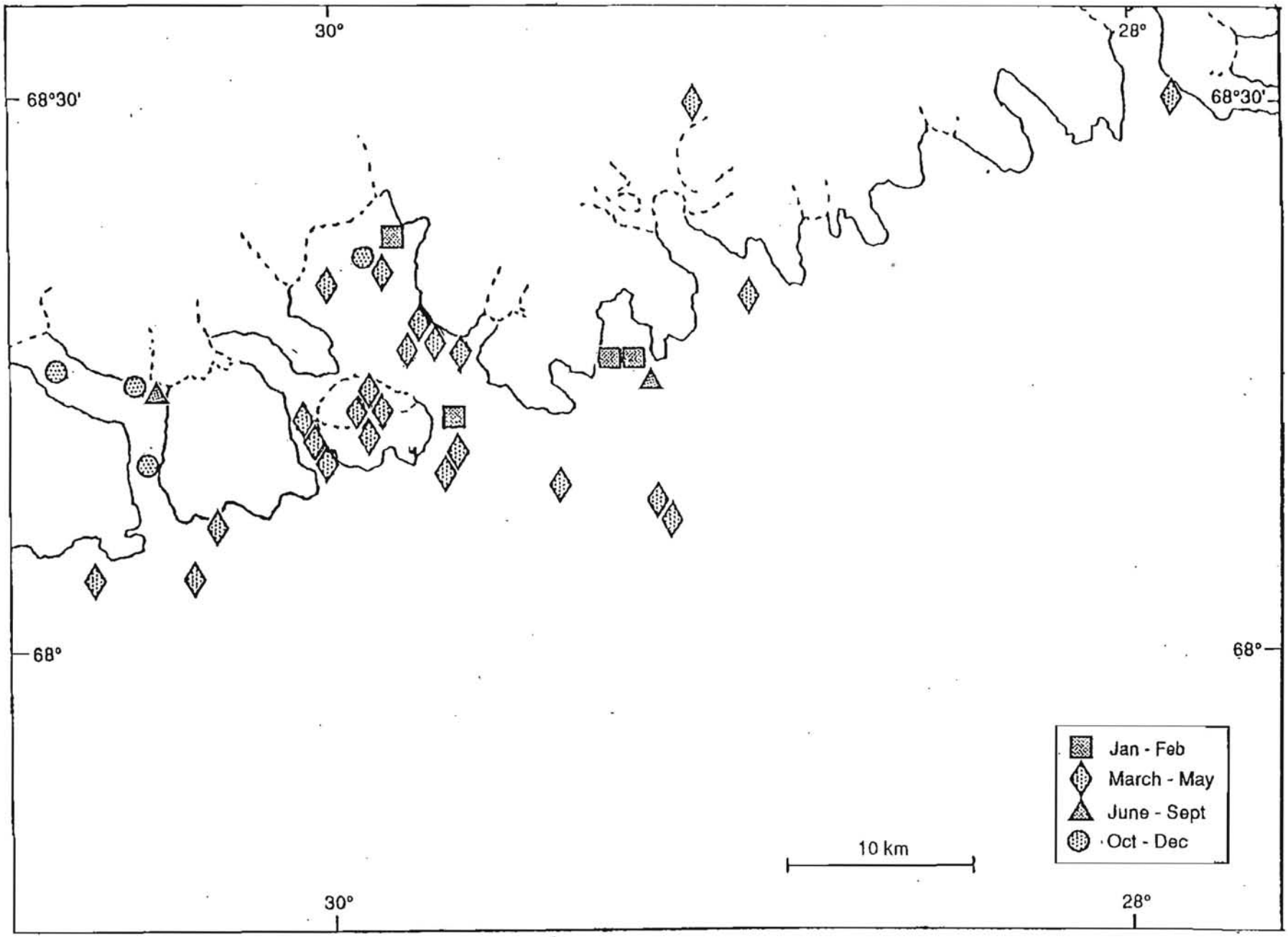


Figure 42. Polar bears shot and seen in the Søkongen Ø area during different times of the year.

could have been greater in the 1980's if one considers the noise from the dinghis and the greater number of people in the area (in a single season). The combined effect of the two activities (i.e. hunting and mineral exploration) could also have forced polar bears to move to the outermost areas in Kangerlussuaq. Of all the polar bears shot in the Kangerlussuaq region between 1951 and 1991, 42.3% were independent females (142 animals). This is a rather large proportion when compared with other studies. Born & Rosing-Asvid (1989) reported that, of 41 polar bear catches from Scoresbysund, 34% were independent females. In a tagging study in Northeast Greenland carried out from 1973 to 1975, independent females constituted 31% of a total of 51 polar bears. From an interview-investigation in Northwest Greenland (Rosing-Asvid & Born 1990) it was found that independent females constituted 31.1% (of 151 bears) in Avanersuaq municipality and 27.0% (of 48 bears) in Upernavik municipality. Thus it can be seen that the proportion of independent females in the Kangerlussuaq region is high compared with other studies. This proportion is important when estimating size of the sustainable catch of a polar bear population, as the number of reproducing females is considered to be the critical factor (Born & Rosing-Asvid 1989). Born & Rosing-Asvid (1989) estimated that the sustainable annual harvest of the polar bear populations in East Greenland population, Svalbard and Franz Joseph Land is between 130 and 300 animals. For this estimate, it is assumed that the population consists of between 3000 to 6700 animals, and that reproducing females constitute 34% of the catch. The average annual catch in Ittoqqortoormiit and Tasiilaq municipalities is 76 polar bears. Born & Rosing-Asvid (1989) estimated that this was a sustainable catch rate (there are no polar bears shot at Svalbard and Franz Joseph Land). The catch in the Scoresbysund area is probably between 50 and 70 bears (Born 1983), which is higher than the average of 35 animals per year that is reported in the catch lists. According to this interview-investigation, the catch in Kangerlussuaq is between 25 and 35 animals per year, and it is estimated that 10-15 bears per year are shot in the Ammassalik area. According to the catch lists, the average for both areas is 37 polar bears per year (Born & Rosing-Asvid 1989). On the basis of the above, I estimate that the total number of polar bears shot annually in East Greenland is between 85-120. If the number of independent females constitutes 42.3% of the polar bears shot, then the annual sustainable harvest would be between 110 and 240 polar bears. With the new assumptions , especially

regarding the catch of reproductively active females, it still seems likely that the catch rate is within the sustainable level.

The proportion of the the catch in the Kangerlussuaq region that was made up of dependent cubs has been rather high in recent years. From 1986-1991 cubs have constituted 37.9% of the total catch, compared with 23.3% from 1951-1983. In Avanersuaq municipality 10.6% of the bears shot between 1974-1989 were dependent cubs (Rosing-Asvid & Born 1990). The proportion of independent females with cubs shot has also been very high in recent years (65.2%) compared with earlier years (35.1%). In Avanersuaq this proportion is 27.1% (Rosing-Asvid & Born 1990). In order to estimate the sustainable catch rate, the survival of adult females has to be taken into account as well as other factors of some importance. Among these is the rate of survival of the young polar bears (Born & Rosing-Asvid 1989),which appears to have been rather high in recent years, due to the catch at Søkongen Ø in particular.

As earlier discussed, many of the family groups were shot around Søkongen Ø in recent years. This suggest that this area could be similar to the area at Traill Ø on the Eastcoast (Born & Rosing-Asvid 1989), which is an important denning area and nutritional area for the family groups after they break out of the dens. It is possible that the Søkongen Ø area houses a relatively local population of adult females in particular, which was found to be the case around Traill Ø (Rosing-Asvid 1990). An increaseed catch in such an area has a relatively greater impact on the local population than on the entire population in East Greenland, Svalbard and Franz Joseph Land.

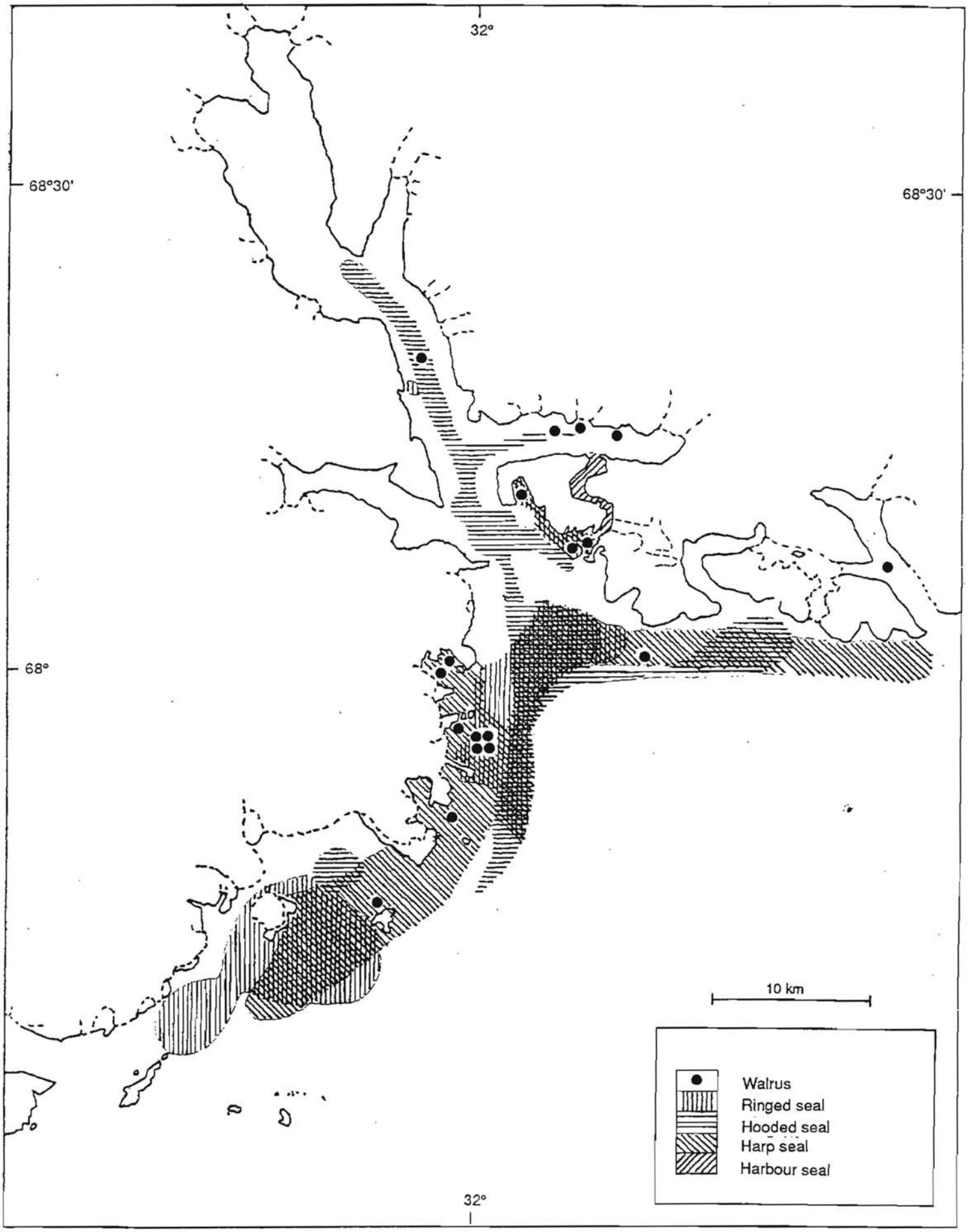


Figure 43. The areas and place where seals (except ringed seal) and walrus are seen and hunted in the Kangerlussuaq region. The observations of Harbour seals in Uttental Sund are from the 1940's. See section 13. regarding times of the year.

13. WALRUSES AND SEALS

13.1 Walrus (*Odobenus rosmarus*)

The hunters reported a total of 20 incidences where walrus were either observed or hunted in Kangerlussuaq. Figure 43. shows the locations where walrus were hunted. Approximately half of walrus observations were made in the 1980's, one from 1990, 2 from the 70's, three from the 60's and one from the period between 1951-1954. Information about the month or the time of the year was provided for 12 of the incidences; 5 of these were during the summer period (July-August), 5 from the autumn period (September-October) and 2 from the winter period. One hunter told us that walruses were seen most often in the autumn. 9 of the incidences mentioned involved walrus that were hunted.

Many of the hunters told us that when hunters first started to spend the winter at the Skægård hunters village in 1966, walrus were seen crawling up onto the beach beside the village. There were not that many walrus seen at that time, just as there are not many seen at Kangerlussuaq. One walrus was seen at Bagnæsset, at the entrance of Amdrup Fjord, in August 1979 (T. Nielsen, GGU, 1992, pers. comm.). A walrus was also seen in the entrance of Kangerlussuaq on August 7, 1990, during the research cruise (Glahder 1990).

In East Greenland a small number of walrus are found south of Scoresby Sund (Holm 1887, Poulsen 1900, Jensen 1909, Holm and Petersen 1922, Petersen 1951). The catch list for the Ammassalik district from 1970-1980 shows that there was an average catch of 2 walruses per year (Dietz et al. 1985). Dietz et al. (1985) refers to walrus observations in Kangerlussuaq; in 1930 one was seen (Chapman 1932), in 1932 some were seen (Iversen 1936) and 3 were seen at Kap Hammer in 1980 (Andersen 1982). All these observations were made in August. Siegstad (1989) reported that in 1967/68 2 walrusses were killed, and in the years 1966/67, 68/69, 86/87, and 87/88 no walruses were killed. At the entrance of Scoresby Sund and at Stewart Ø walruses are seen from February until the middle of June, although individuals are encountered from time to

time at other times during the year. The walrus catch at the beginning of the 1970's was approx. 5 per year at Scoresby Sund, rising to 10 per year by the 1980's (Born 1983).

13.2 Bearded seal (*Eringnathus barbatus*)

Bearded seals are frequently seen in the Kangerlussuaq region from May to October, and also during the winter. They are normally shot during summer (July -August) and autumn (September-October), usually 1-5 bearded seals per year per hunter. One individual shot 20-30 one winter. One hunter had caught a bearded seal with nets. Bearded seals are seen mainly in the area around Aputiteq and Fladø, along the coast from Kap Edvard Holm to Kap Deichmann, at the entrance over to Kap Hammer and at Kraemer Ø - Skærgården (see figure 43). Most are seen and shot presumably in the area between Barberkniven and Kap Deichmann. Besides this there are many at Aggas Ø in October. In the autumn (October) the bearded seals move out into the open sea. According to the catch lists (Anon.1966-69, Anon. 1966-71) an average of 12 bearded seals were caught per year from 1966 to 1970, ranging from 1 to 24.

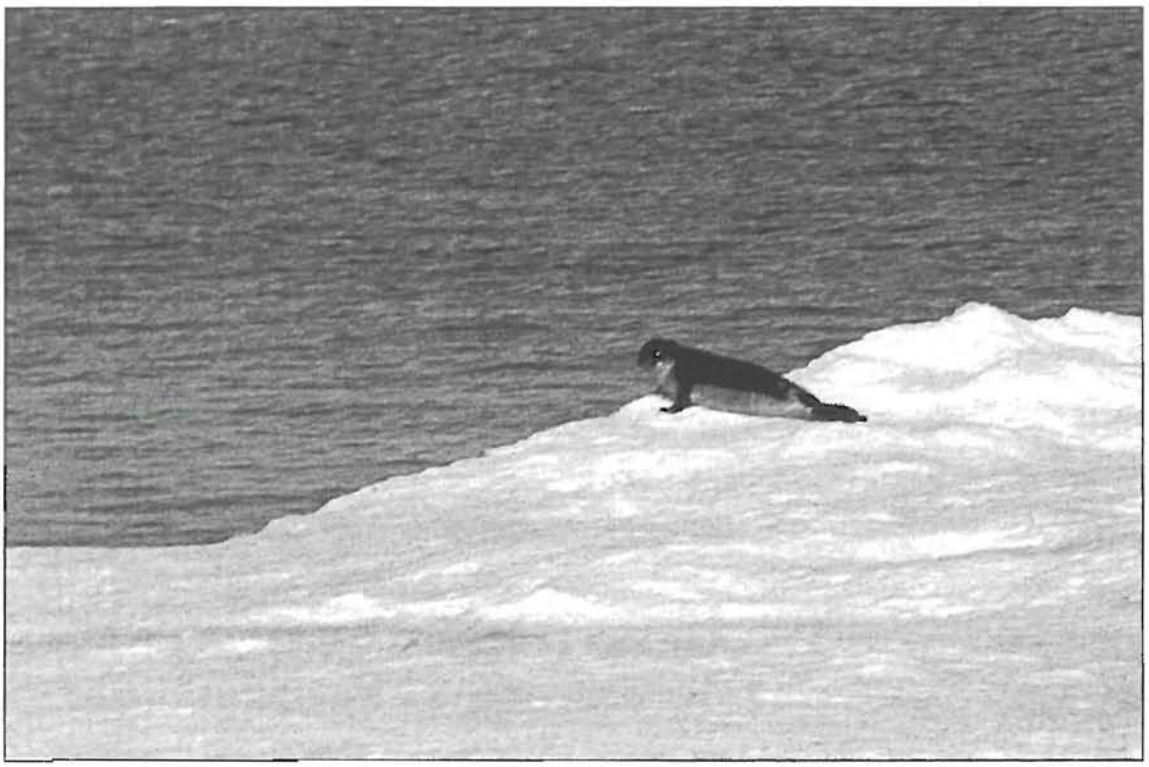
Bearded seal skins are used for whips, traces and for the soles of kamiks. Today a bearded seal ropes can be purchased for approx. 8 kr. per m; 30 m of rope can be made from a single skin.

In the Ammassalik area bearded seals are present all year round. In the 1970's there was an average catch of 182 animals pr year (Dietz et al. 1985). In the past more bearded seals were seen in Kangerlussuaq and Miki Fjord (Degerbøl 1935, 1937, Iversen 1936). At the entrance to Scoresby Sund bearded seals are seen all year round, although the majority move away from the area when ice begins to form. The annual catch at the end of the 1970's and early 80's in Scoresby Sund is estimated to be between 30-50 (Born 1983).

13.3 Hooded seal (*Cystophora cristata*)

Hooded seals are normally seen all over Kangerlussuaq, mainly from August to November. Since many hooded seals sink in the summer, most are shot in the autumn in numbers of 5-10 per hunter. Over three seasons one hunter shot a total of 75. Another hunter shot approx. 30 hooded seals per year in the 1960's and 1970's. Hooded seals are frequently seen in the area between the hunters village and Amdrup Fjord, at the entrance to Kangerlussuaq and Kap Edvard Holm, and opposite the entrance to Miki Fjord. In addition, hooded seals are seen north of Nordre Aputiteq and in Kangerlussuaq up to Courtauld Fjord (see figure 43.). When the fast ice begins to form, the hooded seals disappear. According to the catch lists (Anon.1966-69, Anon. 1966-71) an average of 2 hooded seals were hunted per year from 1966 to 1970, ranging from 0 to 11.

In the Ammassalik area hooded seals are seen in small numbers in spring and again from summer to autumn, although some individuals are also seen in the fjord during the



A young hooded seal in the entrance of Kangerlussuaq in August.

winter (Dietz et al. 1985) During the 1970's an average of 1533 hooded seals were caught per year in the Ammassalik district (Dietz et al. 1985).

In Kangerlussuaq hooded seals frequently occur from the end of July to the end of August (Pedersen 1931). Hooded seals do not appear to be very numerous in Scoresby Sund (Born 1983). Although a few are seen between May and June, most are seen from the middle of August until ice forms in the middle of October. The annual hooded seal catch in Scoresby Sund at the beginning of the 1980's was estimated by Born (1983) to be 10 to 30 animals.

13.4 Harp seal (*Pagophilus groenlandicus*)

Harp seals are normally found at the entrance to Kangerlussuaq and along the coasts from July to October. As harp seals sink in July and August in particular, most are shot in autumn; normally 5-10 per hunter. Individual hunters have shot between 30 to 40 harp seals per year. The annual catch of bearded seals, hooded seals and harp seals in Kangerlussuaq in the present can be estimated to be 10-25 animals per hunter. 5 to 10 active hunters at the hunters village kill an estimated 50 to 200 seals per year (including all three types). According to Siegstad (1989) there were approx. 75 and 100 seals caught in 1966/67 and 67/68 respectively. There is no more recent count. Harp seals are seen from Nordre Aputiteq and southwest along the coast to the entrance of Kangerlussuaq and further to J.C. Jacobsen Fjord, and also opposite the hunters village and Kraemer Ø (see figure 43). Most of the harp seals are seen from Nordre Aputiteq to Kap Deichmann. On the whole, most of the harp seals seen are immature harp seals. According to the catch lists (Anon.1966-69, Anon. 1966-71) an average of 12 harp seals per year were caught from 1966 to 1970, ranging from 0 to 29.In the Ammassalik area harp seals are seen in July and again in September (Holm & Petersen 1921). During the 1970's an average of 174 harp seals were caught in the area per year (Dietz et al. 1985). Kangerlussuaq is an area in which a large number of harp seals are found according to Pedersen (1931), Degerbøl (1935) and Mikkelsen & Sveistrup (1944). In Scoresby Sund the first flock of harp seals, which is made up of

young seals in particular, arrives in August. When the ice forms most of the harp seals move away from the area, although some individuals are seen at the edge of the ice up until February (Born 1983). Born (1983) estimated the annual catch in Scoresby Sund at the beginning of the 1980's to be between 100 and 200 animals.

13.5 Harbour seal (*Phoca vitulina*)

Harbour seals have not been seen in Kangerlussuaq by any of the hunters interviewed. One hunter had heard that there were many in Uttental Sund in the 1940's. One hunter had only seen harbour seals at Skjoldungen and Tingmiarmuit, which are in the southerly part of East Greenland. According to the the catch lists (Anon. 1966-71) one harbour seal was caught in Kangerlussuaq in 1970.

In Scoresby Sund harbour seals are seldom seen (Pedersen 1931), however this information and more recent information from 1974 are said to be ambiguous (Born 1983).

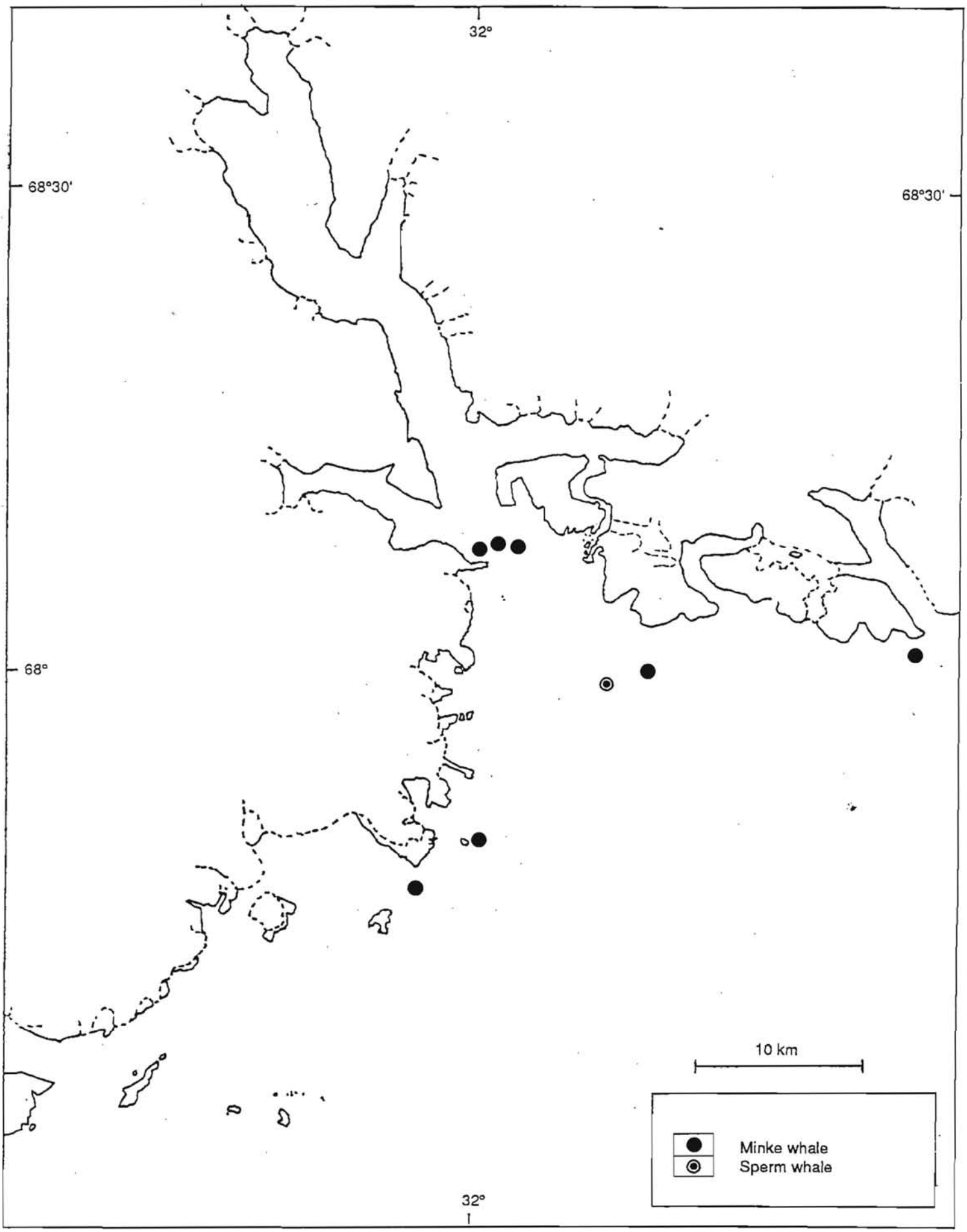


Figure 44. Minke whale and Sperm whale sightings in the Kangerlussuaq region in August and September.

14. WHALES

Apart from narwhals, which have already been described in detail in section 11, rather few whales are seen in the Kangerlussuaq reqion and none of these whales were hunted. Apart from the minke whales, which are seen relatively often, there has been only one sighting of a sperm whale and one possible sighting of killer whale. Although no bowhead whales have been seen in the area, one hunter told us that some were seen in 1939 or 1940, when some people travelled by umiak from Ammassalik to Kulusuk. It can be seen from questionaire 5 (see appendix 19.5) that the hunters were also asked sightings of humpback whales, blue whales, fin whales, sei whales and belugas. According the the catch lists (Anon. 1966-71), in 1970 one beluga (*Delphinapterus leucas*) was caught in Kangerlussuaq.

14.1 Minke whale (*Baleanoptera acutorostrata*)

There are reports of at least 8 minke whales, of which the place where sighted was provided for 7 (see figure 44). The 8th minke whale was sighted some distance outside of the entrance to Kangerlussuaq. The year of the observation was given for given for 5 of the sightings, with one sighting per year in 1968, 1986, 1987, 1988, and 1987/88. 4 of the minke whales, for which the month of the sighting was given, were seen in September. So far minke whales have not been hunted. One hunter told us that the minke whale he saw at Amdrup Pynt could not be hunted because there was too much ice at the time. Another hunter told us that the hunters in the area were not interested in minke whales. Minke whales appear in the Ammassalik area after the ice breaks up (Holm & pedersen 1921) and are normally seen and hunted. At the entrance to Scoresby Sund minke whales occur from June until the ice begins to form in October. The importance of minke whales to hunters increased in the beginning of the 1980's (Born 1983).

14.2 Sperm whale (*Physeter catodon*)

A sperm whale was seen at the entrance to Kangerlussuaq in August 1987 (see figure 44). It was not hunted because it was too big.

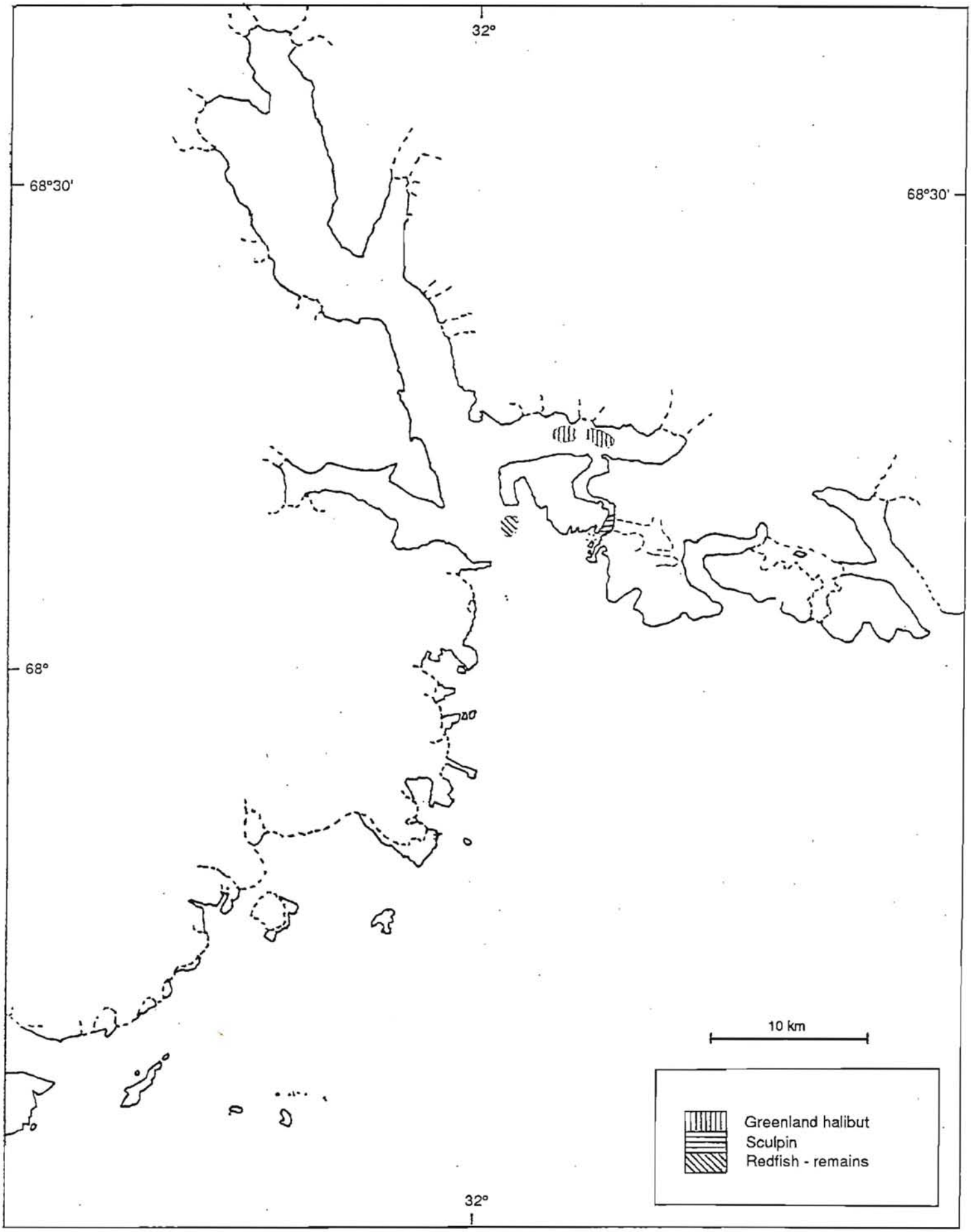


Figure 45. The areas within the Kangerlussuaq region where Greenland halibut and Sculpin are caught, and where the remains of the red fish were observed.

15. FISH

There is generally speaking no fishing in the Kangerlussuaq region, partly because the area is so rich in other animals and partly because it is believed that there are few fish. Today about the only fish seen are sculpins. During the last few years Greenland halibut, polar cod and catfish have been caught. Fish are also seen in ths stomachs of seals, narwhals and polar bears. In questionaire 5 (see appendix 19.5.) the hunters were asked asked about the the catch of atlantic cod (*Gadus morhua*), Greenland cod (*Gadus ogac*), arctic cod (*Arctogadus glacialus*) and Lumpfish (*Cyclopterus lumpus*), but none of these fish are caught in the area. Atlantic cod have been found by one hunter in the stomach of a ringed seal. Only few fish other than four species of sculpin were caught with nets and long lines in Uttental Sund, Kangerlussuaq and Miki Fjord in connection with the biological background investigation in August 1990 (Glahder 1990). The sculpin species constituted more than 90% of the catch. The fish species in the area are discussed in brief below:

15.1 Arctic char (*Salvelinus alpinus*)

None of the hunters themselves had caught arctic char, but many had heard that there are some at Sødalen and at the back of Miki Fjord. One hunter had seen a film about Aputiteq which showed fishermen looking for arctic char at Vandfaldadalen and Sødalen, both of which run out into Miki Fjord, but he was not sure whether any were actually caught. One hunter didn't think that it would worth while fishing for arctic char. One hunter had heard that polar bears eat arctic char. Three large anadromous (migrating) chars (35 to 44 cm in length and 520 to 1070 g in weight) were caught in Miki Fjord opposite Vandfaldsdalen during the biological background investigation in August 1990 (Glahder 1990). In connection with the interview-investigation, over 30 young fish (with parr marks) were seen in the river at Sødalen, from the landing strip to the entrance of Miki Fjord. The fish were between 5 and 12 cm in length. In addition to this, more than 10 young fish approx. 2 cm in length were also seen.

15.2 Greenland halibut (*Reinhardtius hippoglossoides*)

Greenland halibut were first caught by the hunters in the area in 1988, and since then relatively few have been caught, possibly not more that 10. Greenland halibut are only caught in Watkins Fjord. They are caught in the winter using a long line and jig. Jigging for greenland halibut has been attempted at Kap Diechmann, but without success. Greenland halibut are often found in the stomachs of narwhales. One hunter had also seen small Greenland halibut in the stomach of a ringed seal (see section 10 and 11 about ringed seals and narwhals respectively).

15.3 Spotted wolffish (*Anarchichas minor*)

One hunter told us that there are a few spotted wolffish in the area, and a hunter has seen one.

15.4 Polar cod (*Boreogadus saida*)

Only a few polar cod are caught in the Kangerlussuaq region. Many hunters have seen these fish, but usually only small fish. Polar cod are found in the stomachs of ringed seals (see section 10 about ringed seals). 7 small polar cod (11 to 23 cm in length) were caught in Uttental Sund during the research cruise in August 1990. One polar cod that was 23 cm in length was also caught in Miki Fjord.

15.5 Red fish (*Sebastes marinus*)

Catching red fish has been attempted but without success as the fjord was too deep. Red fish have only been seen at Jagtlejren on Kraemer Ø. Some red fish, which were probably the remains of a ringed seal meal, were washed ashore. Small red fish are often seen in the stomachs of narwhals, and according to one hunter the remains of red fish were seen in a ringed seal breathing hole (see section 10 and 11 about ringed seals and narwhals respectively).

15.6 Sculpin species (*Myoxocephalus-, Cottunculus- and Triglops species*)

Sculpin are only caught occasionally, and are apparently only eaten by older people. Two young hunters said that did not like sculpin and that there were too many bones in them. 160 sculpins were caught during the research cruise in August 1990. These included 4 different species. The most comman species caught (71 individuals) was the four horned sculpin (*Myoxocephalus quadricornis*).

15.7 Herring (*Clupea harengus*)

Two herring were caught in Miki Fjord (18-20 cm in length) during the research cruise in August 1990.

15.8 Capelin (*Mallotus villosus*)

During the research cruise in August 1990 two capelin were caught (12-14 cm in length) in Miki Fjord. One hunter has occasionally seen capelin in the stomachs of ringed seals, and another hunter said that this was especially the case in winter (see section 10 - ringed seal).

15.9 Greenland shark (*Somniosus microcephalus*)

Greenland shark are only occasionally caught. One was caught south of Kraemers Ø. These fish can be a problem in connection with net hunting of seals. The meat of Greenland shark is dried and used as dog food, but can also be eaten by people. 2 Greenland sharks were caugh with long lines in Miki Fjord during the research cruise in August 1990.

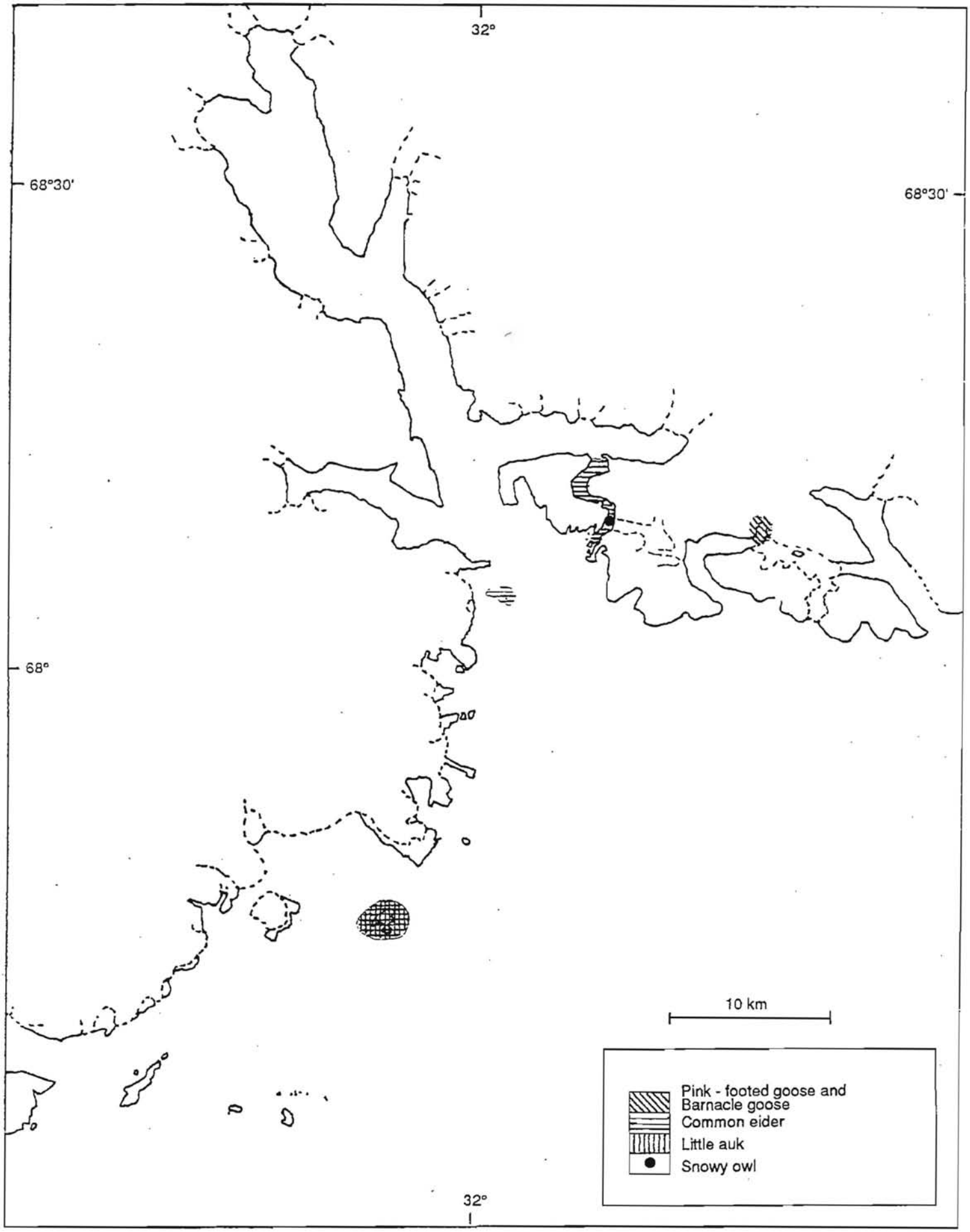


Figure 46. The areas within the Kangerlussuaq region where some bird species have been observed.

16. BIRDS

In the interview-investigation the hunters were asked about the use of 15 species of birds, and in addition to these the hunters added another 2. Besides those already on the list, an additional 10 bird species were added, partly from the interview investigation and partly from the biological background investigation carried out in August 1990 (Glahder 1990). Only four of the bird species included in this list occur in large numbers. These included fulmars, common eiders, ivory gulls and black guillemots. Most of the other species are relatively rare. The hunters only shoot 4 species of birds, and of these only the common eider and the black guillemot are of any importance, while the pink-footed geese and barnacle geese are seldom hunted. The different species of birds that occur in the area are discussed in brief below, starting with the 4 species that are hunted:

16.1 Pink-footed goose and barnacle goose (*Anser brachyrhynchus* and *Branta leucopsis*)

When questioned in relation to these two species, the hunters talked about geese in general. It is possible that only the pink-footed goose is seen, however it is also possible that barnacle geese appear in the area during their spring and autumn migration. Geese are seen in May and in the summer migrating northward. It was also mentioned that they come in the summer. One hunter told us that he had heard that the geese nest in Sødalen (see figure 46). T. Nielsen (GGU, 1992, pers. comm.) both heard and saw barnacle geese at the back of Miki Fjord. Few geese are actually shot. On the August 16, 1990, during the research cruise, 16 pink-footed geese were seen flying into Miki Fjord from a great height. On August 17, 2-300 pink-footed geese were disturbed at the delta at Sødalen. Footprints were found here and also in the delta at Vandfaldsdalen.

16.2 Common eider (*Somateria mollissima*)

Many common eider are seen in the Kangerlussuaq region in summer. Common eider

breed at Sortskær, south of Amdrup Pynt, and at Nordre Aputiteq (see figure 46.). 65 were seen in Uttental Sund during the research cruise in August 1990. The hunters shoot and eat a number of eiders; one hunter told us that he hunts them especially before the narwhal hunting season starts. I personally saw approx 40 male and 2 female common eiders opposite Skærgårdshalvøen in July 1991.

16.3 Black guillemot (*Cepphus grylle*)

The hunters see many guillemots, some of which they shoot and eat. During the research cruise in August 1990, 25-50 guillemots were seen in Kangerlussuaq and 100-200 were seen around Hængefjeldet and at the entrance to Miki Fjord. It is highly likely that they breed in the latter area.

16.4 Common loon (*Gavia immer*)

Few common loon are seen in the area. One hunter saw some common loons at the entrance to Kangerlussuaq. I also saw two common loons in Skærgårdsbugten in July 1991. Two were seen at the back of Miki Fjord in August during the research cruise.

16.5 Red throated loon (*Gavia stellata*)

Red throated loon are normally seen in the area but are normally very few in number. A single was seen in Uttental Sund during the research cruise in August 1990. One red throated loon was seen in Miki Fjord, while another was found drowned in one of our fishing nets.

16.6 Fulmar (*Fulmarus glacialus*)

Fulmars are frequently seen in Kangerlussuaq, especially in September and October. During the research cruise in August 1990, 10-15 fulmars were seen in Kangerlussuaq

(opposite the entrance to Amdrup Fjord) and another 10-15 were seen at the entrance to Miki Fjord. In July 1991, I saw approx. 10 fulmars in Kangerlussuaq, opposite Skærgården.

16.7 Long tailed duck (*Clangula hyemalis*)

Some long tailed ducks have been seen near Nordre Aputiteq.

16.8 King eider (*Someteria spectabilis*)

King eiders are seldom seen in Kangerlussuaq, and only if their are a lot of common eiders present .

16.9 Gyr falcon (*Falco rusticolus*)

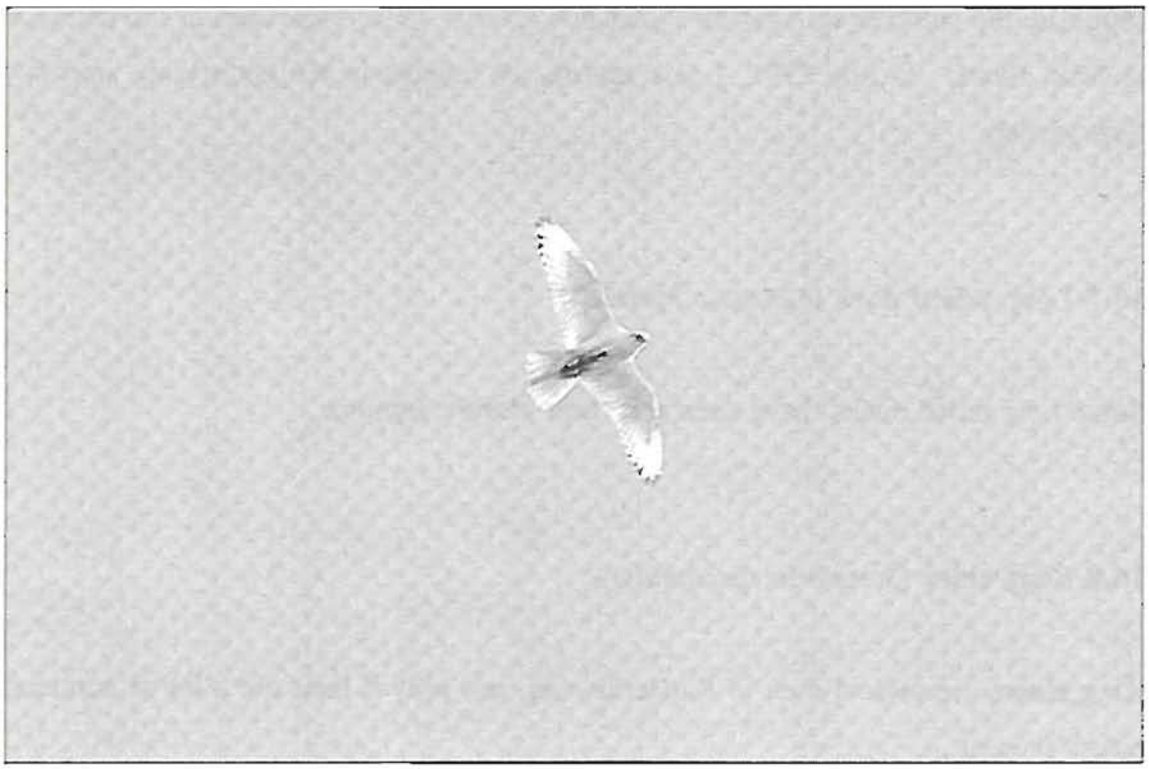
Gyr falcon are seen occasionally, most often during summer. Both white and grey phases are seen in the area.

16.10 Ptarmigan (*Lagopus mutus*)

Ptarmigan are seen in the area all through the year, but are few in number. Only one hunter told us that he had shot ptarmigan. Many ptarmigan were reported in Sødalen in 1990 (Glahder 1990).

16.11 Ringed plover (*Charadrius hiaticula*)

8 old and 15 young ringed plovers were seen at the back of Miki Fjord in August 1990 (Glahder 1990). In July 1991, I saw 1 ringed plover at Skærgårdshalvøen, and a pair with 2 chicks in Sødalen.



Gyr falcon

16.12 Turnstone (*Arenaria interpres*)

During the research cruise in 1990, 7 turnstones were seen in their winter phase in Uttental Sund on August 11. Another 8 were seen in connection with the interview-investigation in July in full summer phase.

16.13 Knot (*Caldris canutus*)

I saw 5 knots in summer phase in July 1991. One of them had an aluminium ring on its right leg.

16.14 Sanderling (*Caldris alba*)

During the background investigation in 1991, 6 sanderlings in winter phase were seen at the back of Miki Fjord.

16.15 Dunlin (*Caldris alpina*)

One dunlin was at Skærgårdshalvøen in July 1991.

16.16 Ivory gull (*Pagophila eburnea*)

A number of ivory gulls have been seen in the area, particularly around the hunters village where they come to eat dried meat and fat. The hunters told us that they had seen some young birds in spring and some in September-October. Young birds have also been seen in August. The hunters do not hunt ivory gull. In August 1990, 20 adult birds were seen at the entrance to Kangerlussuaq and up to Bagnæsset. I personally counted approx 75 adult birds at the hunters village.

16.17 Glaucous gull (*Larus hyperboreus*)

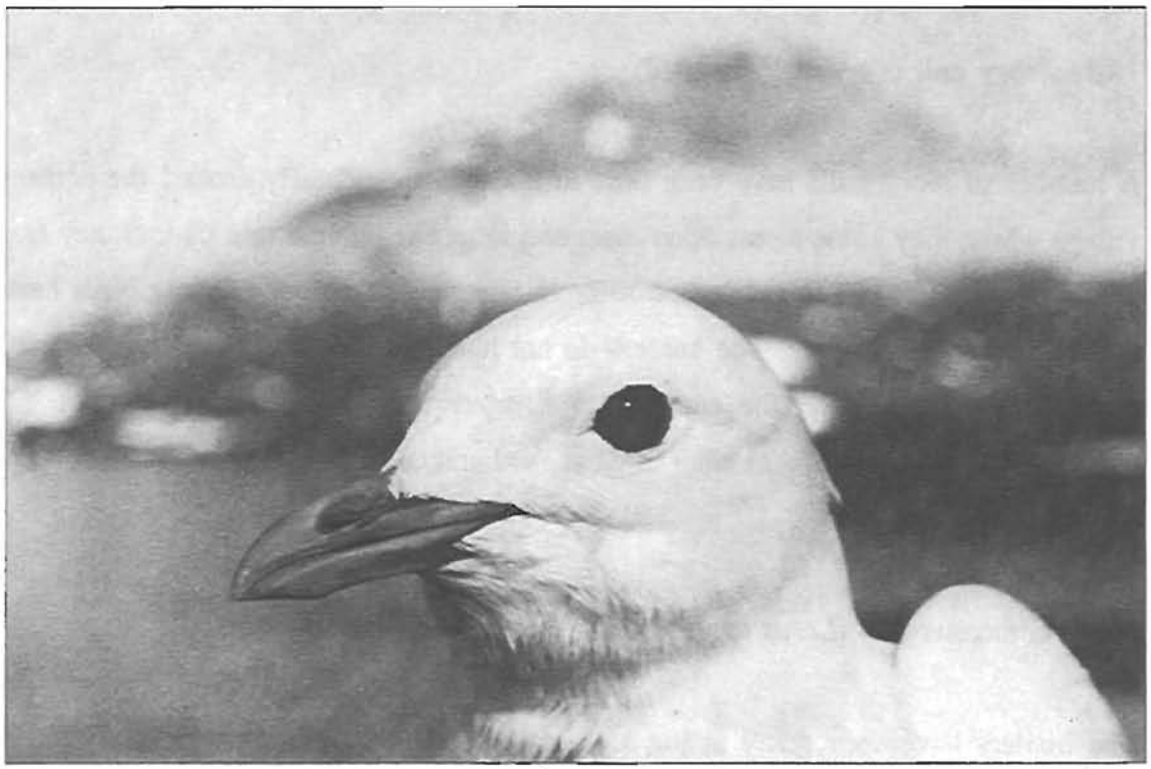
The hunters have seen many in the area, and I saw 5-10 glaucous gulls myself at Skærgården in July 1991.

16.18 Black headed gull (*Larus ridibundus*)

One adult black headed gull was seen together with the ivory gulls (above) in July 1991 at the hunters village. This was the second sighting of this bird in Southeast Greenland (D. Boertmann, GM, 1991, pers. comm.).

16.19 Kittywake (*Rissa tridactyla*)

One hunter told us that he had seen a few in the area. During the background study in 1990, 40 kittywakes were seen in Miki Fjord, most of which were young birds.



Ivory gull

16.20 Brünnich's guillemot (*Uria lomvia*)

One of the hunters had seen a few guillemots, which were in all probability were Brünnich's guillemots.

16.21 Little auk (*Alle alle*)

Many little auk are seen at Nordre Aputiteq, but the hunters did not know whether this was their breeding area. One hunter had seen some in autumn.

16.22 Snowy owl (*Nyctea scandiaca*)

A few snowy owls have been seen in the area. One hunter told us that in the summer of 1973 or 1974 he saw two young snowy owls that were hunting black guillemots in Uttental Sund. Another hunter told us that snowy owls live off black guillemots and ptarmigans.

16.23 Raven (*Corvus corax*)

One raven was seen during the background study in 1990, and another three were seen at Skærgårdshalvøen in July 1991: T. Nielsen (GGU, 1992, pers. comm.) saw up to 5 ravens at one time in the Kangerlussuaq region.

16.24 Weatears, common redpoll and snow bunting (*Oenanthe oenanthe, Cardulis rostrata* and *Plectrophenax nivalis*)

Only few individuals of these three passerines were actually seen during the background study in 1990. In addition, I saw 3 male snow buntings singing at Skærgårdshalvøen.

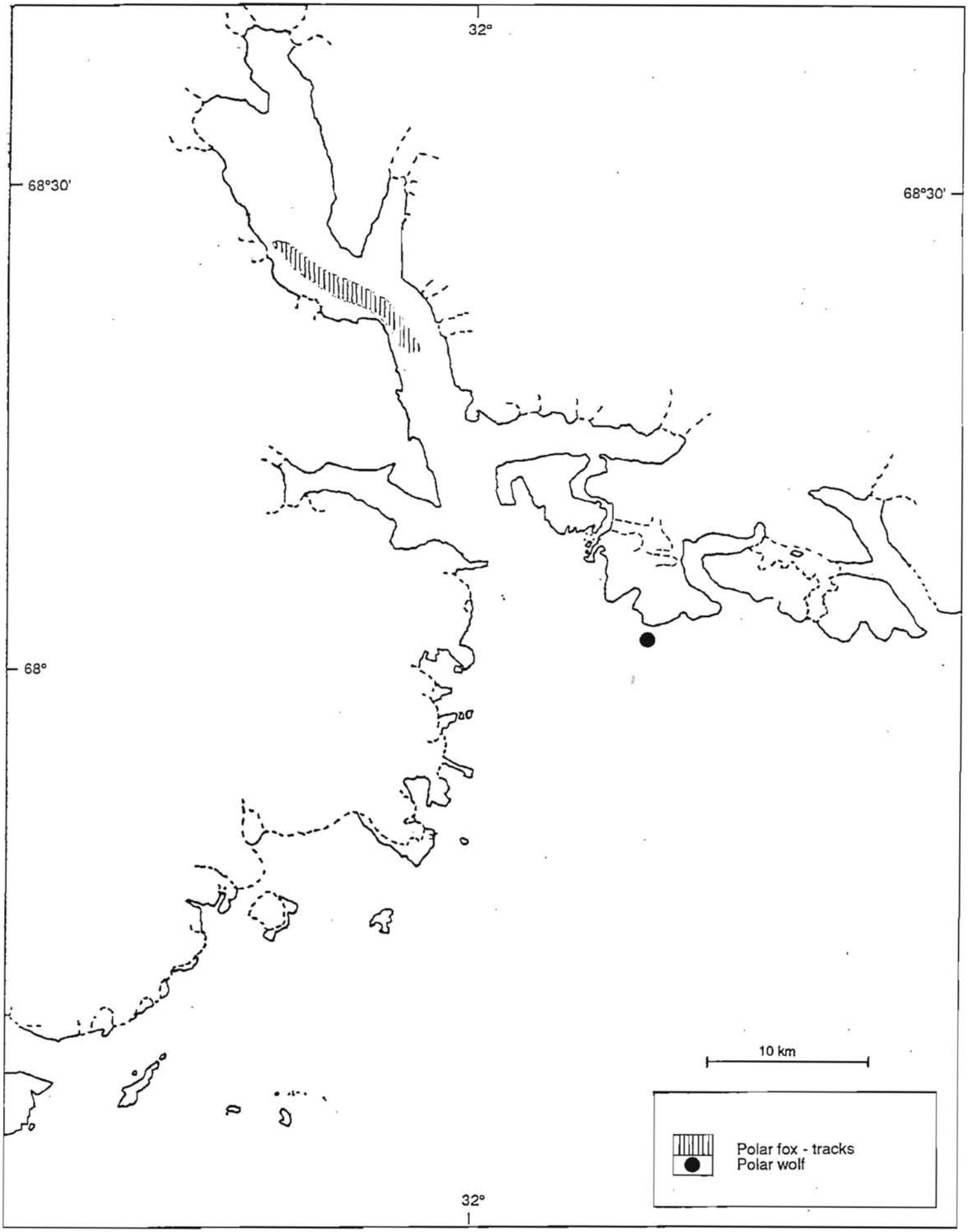


Figure 47. Observations of polar foxes and polar wolves in the Kangerlussuaq region.

17. LAND MAMMALS

Only polar foxes are seen frequently in the Kangerlussuaq region, few of which are shot. Regarding other land mammals in the area, a polar wolf was seen on one occasion, while hare (*leptus arcticus*) and reindeer (*Rangifer tarandus*) are not seen at all.

17.1 Polar fox (*Alopex lagopus*)

Most of the hunters stated there are many polar foxes in the area, although some of hunters had only seen polar fox footprints at the back of Kangerlussuaq and at Søkongen Ø. One hunter explained that where there were polar foxes, there were polar bears. Only few foxes are actually shot. One hunter told us that he uses the skins to sew gloves and caps for his daughters, while another hunter said he threw the skins away because he did not know how to flay them. In August 1990, one polar fox was sighted on a number of occasions at the basecamp at Sødalen (Glahder 1990).

17.2 Polar wolf (*Canis lupus*)

One of the hunters told us that he knew of a hunter who had seen a wolf at Hængefjeldet in 1986. Apparently the wolf had followed some polar bears and eaten the remains of their kill. Wolves disappeared from East Greenland at the end of the 1930's, although in the 1980's they migrated back to the area they previously occupied, which is a little further south of the entrance to Scoresby Sund (Dawes et al. 1986). Thus, the wolf that was seen in Kangerlusuaq represents the southernmost sighting of wolves in East Greenland.

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Signatures:

+ Indicates that the information from this reference was cited in Born 1983, without consulting the original article.

* Indicates that the information from this reference was cited in Dietz et al. 1985, without consulting the original article.

o Indicates that the information from this reference was cited in Born & Rosing-Asvid 1989, without consulting the original article.

19. APPENDIX

19.1 Questionnaire 1, General

Hunter:

0 Date of interview, name, occupation, address, size of family, children, adults.

The use of Kangerlussuaq:

Which periods have you been in Kangerlussuaq ?

1 during winter (date of arrival and departure)

2 during summer (date of arrival and departure)

3 How many people were you in those periods ?

4 What were the names of the hunters that were with you ?

5 Do you know of hunters that may have been up here earlier ? (during winter/summer)

6 How do you come here ?

7 Do you keep a hunting diary ?

Mining activities:

8 What does it mean that the mining company is here ?

9 How do you think the animals you hunt will be effected if a mine is established in Kangerlussuaq ?

10 Will you continue to come here if a mine is established ?

11 Advantages/disadvantages with a mine

Ice:

12 Where and when is there fast ice ?

13 Where is the ice edge during winter ?

14 Does the fast ice often break up with the "piteraq" ?

15 Are there always a lot of icebergs ?

16 What routes do you take during your sledge jurneys ? (map)

17 Where are the places where there are currents under the ice ? (map)

19.2 Questionnaire 2, Narwhal

Catch:

1 Did you hunt narwhal in 1990/91 ?

2 Where ? (map)

3 How many ?

4 When ?

5 Sex ?

6 Age ?

7 How many whales were there in the flock ? (sex, age)

8 Were any of the other whales shot ?, and if so by whom ? (name)

9 Who was with you ? (name)

10 Have you hunted narwhal in the past ? (the questions above asked again)

11 Have you seen any narwhals that were not shot ? (most of the questions above asked again)

12 Were any of the narwhals you shot subsequently lost ? (sink, escape)

13 How many narwhals were shot overall in 1990/91 ?

14 How many narwhals overall were shot in the past ?

Hunting trips:

15 Where did you go hunting in 1990/91 ?

16 How many times and when ?

17 Describe the journey and observation posts (map)

18 How many hunters accompanied you on the hunting trip ?

19 Why did you choose these observation posts ?

Hunting methods:

20 How was the hunt carried out ? (motor boat, kayak, harpooned-shot, shot-harpooned, shot-hooked, other)

21 Did you hunt more or less whales than in the past ?

Migratory routes:

22 Did you notice the direction the whales you shot were moving ?

23 Did you notice the direction the whales you saw (did not shoot) were moving ?

24 Do the whales always migrate along the same route ?

Other behavior:

25 In what months do fetuses first appear in the females ?

26 How big is the fetus ?, when ?

27 Nutrition ? (stomach contents)

Trade:

28 How many tusks did you take in 1990/91 ?

29 Size ?, value ?

30 Males with 2 tusks ?

31 Females with tusks ?

32 Mattaq - sale, quantity, value, storage ?

33 I would like to buy mattaq

Disturbances, the mining company and hunting:

34 Disturbances - have you observed any disturbance in relation to helicopters, ships and rubber dinghis ?

35 Other influences of mining activities ?

36 Disturbances from your motor boat ?

37 If yes, at what distance ?

38 What does it mean to the hunting ?

19.3 Questionnaire 3, Polar bear

Catch:

1 Did you hunt polar bear in 1990/91 ?

2 Where ? (map)

3 How many ?

4 When ?

5 Sex ?

6 Age ?

7 Was the bear together with other bears ?

8 If yes - what was the family composition ? (number 0-1 and -2 years of age)

9 Were any of the other bears shot ?, and if so by whom ? (name)

10 Who was with you ? (name)

11 Have you hunted polar bears in the past ? (the questions above asked again)

12 Have you ever shot a tagged bear ? (tag colour, number, location of tag, tattooed number in the upper lip, sattelite transmitter (neck band))

13 Do you know anybody who has shot a marked bear ? (name & address)

14 Have you seen any polar bears that were not shot ? (most of the questions above asked again)

15 How many polar bears were shot overall in 1990/91 ?

16 How many polar bears overall were shot in the past ?

Hunting trips:

17 Where did you go hunting in 1990/91 ?

18 How many times and when ?

19 Describe the route (map)

20 How many hunters accompanied you on the hunting trip ?

21 How many sledges ?

22 How many dogs ?

23 Why did you choose this route?

24 Do other hunters (from Scoresbysund - Søndre Aputiteq) shoot bears here ?

Hunting methods:

25 How was the hunt carried out ? (tracking, dogs, the weapon)

26 Did you hunt more or less polar bears than in the past ?

Migratory routes:

27 Did you notice the direction the bears you shot were walking ?

28 Where have you seen bear tracks ?

29 Which direction were they going and at what time of the year ?

30 Which sex ?

31 Is there a fixed migratory route ?

32 Have you seen any small bear tracks ?, where ?, in what months ?

33 Where do you think the polar bears migrate to during summer ? (outside Kangerlussuaq)

Dens:

34 Have you seen a breeding den - where ? (map)

35 How many and when ?

36 Size ?

37 Location in the terrain ?

38 Have you seen other dens ?

39 Do you know anybody who has seen dens ? (questions above & name)

40 Do you know of any dens/denning areas outside of Kangerlussuaq ?

Other behavior:

41 Breeding or breeding behavior ? (possibly tracks which suggest this)

42 Where and when ?

43 Nutrition ? (stomach contents, observations of bears while hunting)

Trade:

44 What do you use the skins for ? (pants, sell)

45 How many are used to make pants/sold ? (who buy the skins)

46 At what price ?

The mining company:

47 Disturbances ?

48 Are the polar bears attracted by the mining company ? (e.g. to wastes)

19.4 Questionnaire 4, Ringed seal

Catch:

1 How many did you shoot in 1990/91 ?

2 Where ? (the approx. number of different places)(map)

3 When ?

4 How many were shot in 1990/91 ?

5 How many were shot in the past ?

6 How many overall were shot in 1990/91/in the past ?

7 Have you shot any tagged seals ? (tag colour, number, location)

8 Do you know any hunters who have shot tagged seals ? (name & address)

9 At what times have the males you have hunted been rutting ?

Hunting trips:

10 Where is the best place to hunt in summer - why ?

11 Where is the best place to hunt in winter - why ?

Hunting methods:

12 Ice nets: Where are the nets set ? (map)
Precisely which places ? (headlands, ice bergs, cracks in the ice)
When ?
How much net ?
How many seals per net ?

13 Ice edge: Where, how, how many, when ?
How many are lost ?

14 Ice floe: Where, how, how many, when ?
How many are lost ?

15 Breathing hole:
Where, how, how many, when ?
How many are lost ?

16 Do you hunt more or less seals than in the past ?

Migratory routes:

17 Where do the young and adult seals migrate during summer ?

18 Is there a fixed route the seals follow (do they come close to the headlands, islands, etc.)

Breeding lairs:

19 Have you seen a breeding lair - where ? (map)

20 How many and when ?

21 Location in the terrain ?

22 Do you know anybody who has seen breening lairs ? (questions above + name)

23 Have you seen lairs that been broken by polar bears ?

24 How many, where and when ?

Other behavior:

25 When do the seals moult ? (qatsimalit)

26 When do you see most of the seals moulting ?

27 Nutrition ? (stomach contents)

Trade:

28 How many skins could you sell in 1990/91 ?

29 In the past ?

30 What is the selling price per skin ?

The mining company:

31 Disturbances ? (helicopters, snow scooters, rubber dinghis, ships)

19.5 Questionnaire 5, Marine mammals, birds, fish, land mammals

Which other animals do you hunt ? (see list)

Which of them is most important ?

When and how many have you hunted (H), seen (S)

		1991	1990	1989	1988	1987	1986	1985
1	Walrus, *aaveq*							
2	Bearded seal, *anneq*							
3	Hooded seal, *niiniarteq*							
4	Harp seal, *nalanginnaq*							
5	Harbour seal, *qittalivaq*							
6	Humpback whale, *qipoqqaq*							
7	Blue whale, *tunnulik*							
8	Fin whale, *arpeq/tunnulik*							
9	Sei whale, *tunnuttit ilaat (?)*							
10	Minke whale, *tigaanguttik*							
11	Sperm whale , *arpeq neqqisilittivagajik kigutilissuaq*							
12	Bowhead whale, *arpeq*							
13	Beluga, *qialivarnaq*							
14	Common loon, *qartiimoortoq*							
15	Fulmar, *qarattuk*							
16	Glaucous gull, *quseeq*							
17	Kittywake, *taalaqqaaq*							
18	Ivory gull, *quseerngaajik*							
19	Brünuich's Guillemot, *saarngittiit/-ttik*							
20	Little auk, *kutsuulaq*							
21	Pink-footed goose, *siggukitsoq-sikkigseq*							

22 Barnacle goose, *?*

23 Long tailed duck, *alleq-atleq*

24 Common eider, *maleesartaq*

25 King eider, *qingaliqialik*

26 Ptarmigan, *nagalarngaq*

27 Gyrfalcon, *nappaligitseq*

28 Snowy owl, *kiialik*

29 Arctic char, *kaporniarngaq*

30 Greenland halibut, *qalarngalik*

31 Wolf fish, *qeerngaq*

32 Arctic cod, *aalisakkat*

33 Greenland cod, *uuvaq*

34 Polar cod, *?*

35 Atlantic cod, *?*

36 Lumpfish, *niisa*

37 Sculpin, *qivaareq*

38 Arctic fox, *oritsernaq*

39 Hare, *ugaleq*

40 Reindeer, *tuttoq*

41 Arctic wolf, *amarngoq*

19.6 Observations of the diving rythm of narwhal flocks in search of food at Kap Deichmann - Den lave Pynt, 28.7.1991

The narwhal flock was monitored from an observation post located west of Kap Deichmann approximately 500 m above sea level. The narwhals were 5-6 km from the observation post. The narwhals were observed with Nikon 10X40 binoculars and the diving time was recorded to the nearest minute with a wrist watch. Time 0 represents a period of 0-30 sec., time 1 = 30-90 sec., time 2 = 90-150 sec., etc.. In order to calculate the mean and variance of a single diving period, the mid-point of each time interval was used i.e. for time 0, 15 sec. was used, 1 : 60 sec., 2 :120 sec., etc. "?" indicates that the flock had probably been up and down a number of times without actually being observed. In the table the means and variances are given in minutes to one decimal place. As the basis for recording the diving rythm was minutes, the values for the mean and variance should be viewed with some discretion. (e.g. the numbers stated could be reported such that the feeding narwhals on average were on the surface for approx. 1 min and that thet were under water a little more than 4 minutes, and that the ratio approached 5 min.).

Time (whole min.)		Time period (whole min.)		
Surface	Underwater	Surface	Underwater	
	10.03 - 10.06		3	Flok B
10.06 - 10.07	10.07 - 10.11	1	4	C. 10 individuals
10.11 - 10.12	10.12 - ?	1	?	
? - 10.26	10.26 - 10.29	?	3	Surface:
10.29 - 10.30	10.30 - 10.31	1	1	$\bar{x}$ = 0,7 min.
10.31 - 10.31	10.31 - 10.35	0	4	s = 0,4 min.
10.35 - 10.36	10.36 - 10.37	1	1	
10.37 - 10.37	10.37 - 10.42	0	5	Underwater:
10.42 - 10.42	10.42 - 10.44	0	2	$\bar{y}$ = 3,4 min.
10.44 - 10.44	10.44 - 10.49	0	5	s = 1,5 min.
10.49 - 10.49	10.49 - 10.54	0	5	
10.54 - 10.55	10.55 - 10.58	1	3	
10.58 - 10.59	10.59 - 11.04	1	5	
11.04 - 11.05		1		
	10.02 - ?		?	Flock A
? - 10.08	10.08 - ?	?	?	C. 12 individuals
? - 10.16	10.16 - ?	?	?	
? - 10.23	10.23 - 10.28	?	5	
10.28 - 10.29	10.29 - ?	1	?	
? - 10.45	10.45 - 10.53	?	8	
10.53 - 10.53	10.53 - ?	0	?	
? - 11.05		?		
12.50 - 12.50	12.50 - 12.56	0	6	Flock A
12.56 - 12.57	12.57 - 13.03	1	6	C. 10 individuals
13.03 - 13.04	13.04 - 13.06	1	2	15-20 individuals
13.06 - 13.07	13.07 - 13.10	1	3	from 1.52 p.m.
13.10 - 13.11	13.11 - 13.18	1	7	
13.18 - 13.19	13.19 - 13.24	1	5	Surface:
13.24 - 13.25	13.25 - 13.26	1	1	$\bar{x}$ = 0,9 min.
13.26 - 13.26	13.26 - 13.30	0	4	s = 2,0 min.
13.30 - 13.31	13.31 - 13.37	1	6	
13.37 - 13.38	13.38 - 13.44	1	6	Underwater:
13.44 - 13.45		1		$\bar{y}$ = 4,6 min.
				s = 2,0 min.
12.52 - 12.53	12.53 - 12.58	1	5	Flock B
12.58 - 12.59	12.59 - 13.07	1	8	C. 10 individuals
13.07 - 13.08	13.08 - ?	1		two flocks (c. 10
13.31 - 13.32		1		+ 7-10) moved
				together from 1.38
Separated				p.m.
into two				
flocks				
	13.39 - 13.44	1	5	
13.38 - 13.39	13.45	1		
13.44 - 13.45				
Combined data:	Surface (N=31): $\bar{x}$ = 0,8 min. s = 0,3 min.		Underwater (N=27): $\bar{y}$ = 4,4 min. s = 2.0 min.