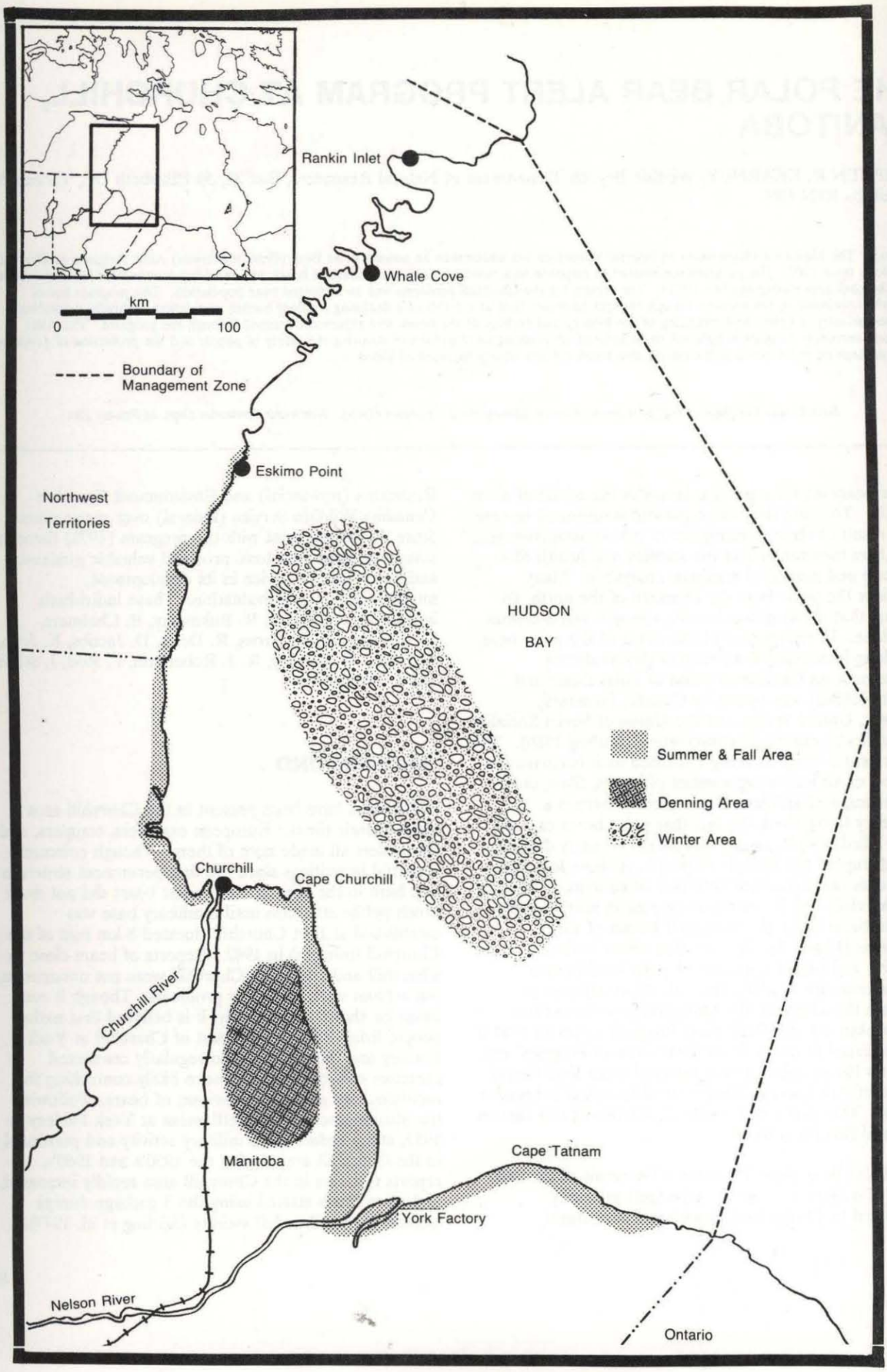

Figure 1. Location of Churchill, boundaries of Polar Bear Management Zone A1, and main areas used by bears in their annual movement.

THE POLAR BEAR ALERT PROGRAM AT CHURCHILL, MANITOBA

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Abstract: The Manitoba Department of Natural Resources has undertaken an annual Polar Bear (*Ursus maritimus*) Alert Program at Churchill, Manitoba since 1969. The program was started in response to a rapid increase in numbers of bears, and resulting human-bear interactions, in the Churchill area during the late 1960's. The reason for the Churchill problems was an increased bear population. The program has of necessity continued to the present, though changes have occurred as a result of a declining resident human population, a rapidly expanding tourism industry, a better understanding of the biology and ecology of the bears, and experience learned through the program. The Alert Program currently in place is believed to be successfully meeting its objectives of ensuring the safety of people and the protection of property from damage by polar bears, and ensuring that bears are not unduly harassed or killed.

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Polar bears create a positive image in the minds of many people. To some they can represent a source of income as a result of their consumptive or non-consumptive use; to others they can reflect the stability and health of a delicate and unspoiled northern ecosystem. Many consider the polar bear the monarch of the north, an animal that shows grace, beauty, strength and a certain mystique. In recognition of the status of the polar bear, a unique international agreement (International Agreement on the Conservation of Polar Bears and Their Habitat) was signed by Canada, Denmark, Norway, United States, and the Union of Soviet Socialist Republics to ensure its conservation (Stirling 1986). The polar bear's image is being enhanced as it becomes the subject of an increasing number of books, films, documentaries, and articles. Consequently there is a tendency to overlook the fact that polar bears can and have killed people, caused significant property damage, and disrupted the lifestyle of people at those locations where its range overlaps with that of humans. The town of Churchill, and its surrounding area in northeastern Manitoba, is likely the most well known of such locations (Figure 1). It is an area where both the positive and negative aspects of polar bear-human interactions are readily apparent. In an attempt to manage the situation, the Manitoba government has undertaken a Polar Bear Alert Program (prior to 1984 it was referred to as the Polar Bear Control Program, but because the program now consists of more than simply the control of bears it was renamed to reflect is broader scope). This paper reviews the development and current status of this program.

The Polar Bear Alert Program is the result of the hard work of a large number of individuals primarily employed by Manitoba's Department of Natural Resources (provincial) and Environment Canada's Canadian Wildlife Service (federal) over many years. Since my involvement with the program (1976) there are several persons who have provided valuable guidance, assistance and/or advice in its development, implementation and evaluation. These individuals include H. J. Boyle, I. R. Bukowsky, B. Chalmers, D. Chranowski, D. Cross, R. Dean, D. Jacobs, K. John, N. Lunn, M. Ramsay, R. J. Robertson, P. Rod, I. Stirling and I. Thorleifson.

BACKGROUND

Polar bears have been present in the Churchill area since historic times. European explorers, trappers, and fur traders all made note of them. Though commonly reported in writings since the first permanent structure was built in the area in 1717, polar bears did not draw much public attention until a military base was established at Fort Churchill (located 8 km east of the Churchill townsite) in 1942. Reports of bears close to Churchill and later Fort Churchill were not uncommon, but seldom were there any problems. Though it can never be shown conclusively, it is believed that native people living 220 km southeast of Churchill at York Factory and the military who regularly conducted exercises east of Churchill, were likely controlling the numbers, and perhaps behaviour, of bears. Following the abandonment of the settlement at York Factory in 1957, and a reduction in military activity and personnel in the Churchill area during the 1950's and 1960's, reports of bears in the Churchill area rapidly increased, and more bears started using the 3 garbage dumps located in the Churchill vicinity (Stirling et al. 1977).

Incidents between humans and bears had increased substantially by the late 1960's. In 1968, up to 40 bears at a time could be seen in the dump near Fort Churchill and an estimated 60 to 80 bears were staying in the vicinity of settled areas. Serious human-bear interactions occurred in 1963, 1966, 1967, and 1968 in the Churchill-Fort Churchill area. The 1968 incident resulted in a human death and the others in human injury. Problems with bears breaking into houses, killing dogs, and frightening people were numerous (Stirling et al. 1977).

This intolerable situation led to discussions in 1968 and 1969 between local, provincial, and federal government officials. Initially, discussions were directed at correcting the problem of garbage disposal (there were 3 dumps at this time including 1 on the immediate periphery of the townsite), but it was also recognized that a control program would be required, at least for the short term. The first organized program was started in 1969. At the same time it was recognized that little was known about the ecology of the bears in the area. An intensive research program was started to develop and evaluate management alternatives for the purpose of understanding and solving, or at least alleviating, the problems at Churchill (Stirling et al. 1977). Both programs have continued to the present. The Polar Bear Alert Program is coordinated by the Manitoba Department of Natural Resources, and the research program by the Canadian Wildlife Service.

THE PROBLEM

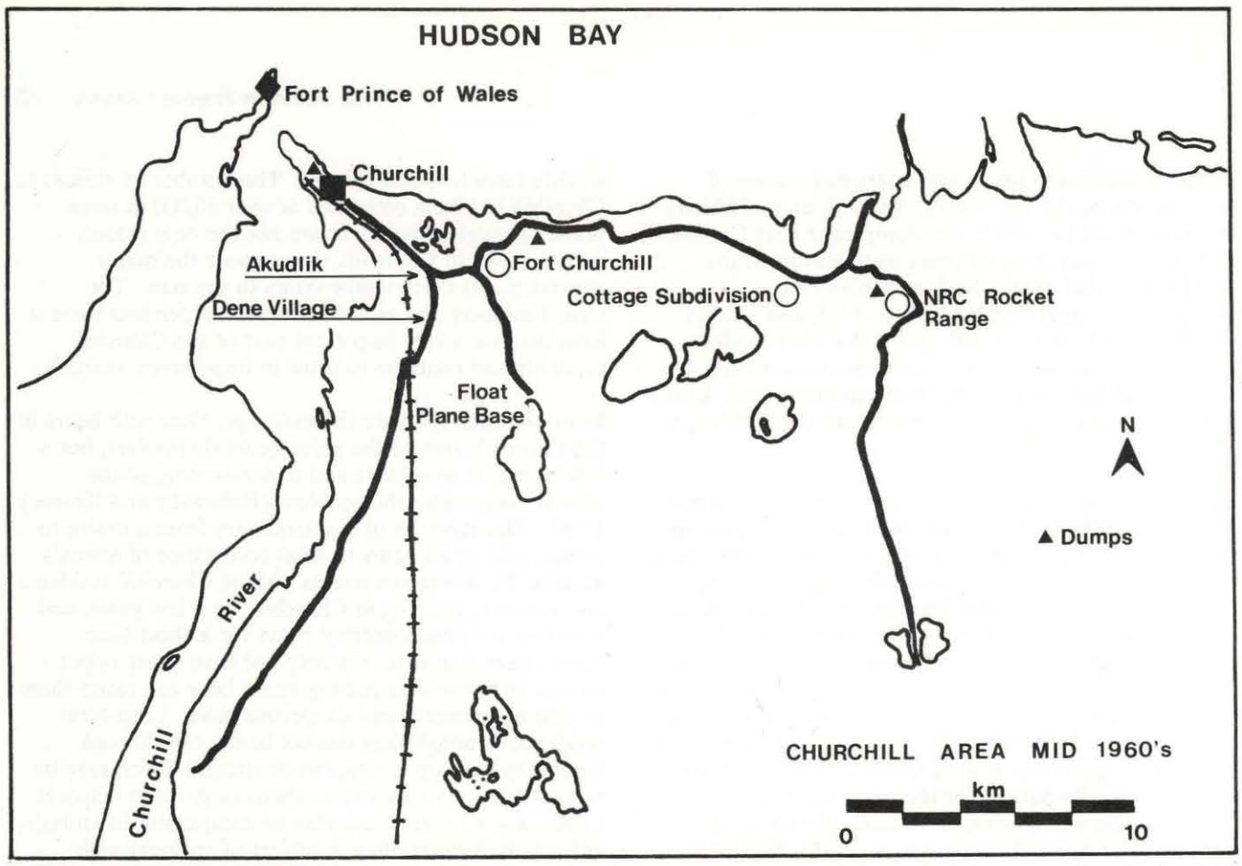
Churchill is a small but unique town situated at the mouth of the Churchill River. The resident population in the area has fluctuated considerably over the years and has steadily declined for the past 2 decades, though it now seems to have stabilized at approximately 1,000. The primary reasons for the decline have been the withdrawal of all military staff from Fort Churchill, the transfer of the administrative staff for the Keewatin Region of the Northwest Territories from Akudlik to Rankin Inlet, the relocation of the Churchill Indian Band from Dene Village to Tadoule Lake, and the closing of the National Research Council Rocket Range. Many of the facilities which were used by these groups of people have also been removed, though in some cases they have been taken over by other groups (Figure 2).

Though the resident population may be lower than what it was in the 1950's and 1960's, in recent years the numbers of tourists visiting Churchill have increased considerably from July through November, attracted largely by the abundance and diversity of the area's wildlife resources and habitat. The number of visitors to Churchill has been estimated at over 10,000 in some years. Though polar bears are not the only reason people travel to Churchill, they remain the major attraction and every visitor wants to see one. The tourist industry and an infrastructure dependent upon it have become a very important part of the Churchill economy and continue to grow in importance annually.

Most accounts attribute the entire problem with bears in the Churchill area to the polar bears themselves, but a lack of public awareness and understanding of the animal exaggerates the problem (Bukowsky and Kearney 1978). The attitudes of residents vary from a desire to rid the area of all bears to total acceptance of animals walking the downtown streets. Many Churchill residents are transient, residing in Churchill for a few years, and therefore only encountering bears for a short time. Their realization that they may not have many opportunities to observe or photograph a bear can cause them to take unnecessary and dangerous risks. Long-term residents, although they respect bears, can through familiarity develop a complacent attitude which may be reflected in unsatisfactory methods of garbage disposal. Children in Churchill can also be complacent in attitude, and a polar bear is often a subject of curiosity with which they do not identify potential danger. Unfortunately it seems to require a serious human-bear incident for residents to recognize or remember the dangers of polar bears, and when this occurs positions become based more on emotions than facts.

Tourists who come to Churchill specifically to see and photograph a polar bear generally are less of a problem than would be expected. They have often researched the topic, have an attitude of respect for the bears, and avoid hazardous situations. Conversely, tourists who come to Churchill to see the town and incidentally catch sight of a bear display an attitude of curiosity as opposed to respect. The increasing availability of professionally guided tours has helped to reduce the number of potentially dangerous human-bear interactions.

The annual polar bear problem in Churchill provides sensational material for the media and results in an influx of professional photographers and writers. The determination of this group to produce high quality photography and to experience close contact with the polar bears, in pursuit of a good article, makes them vulnerable to dangerous encounters. Also, the resulting film or article, though dramatic, may fail to objectively report the potentially dangerous nature of bears, or conversely, may provide an image of a town under siege by bears.



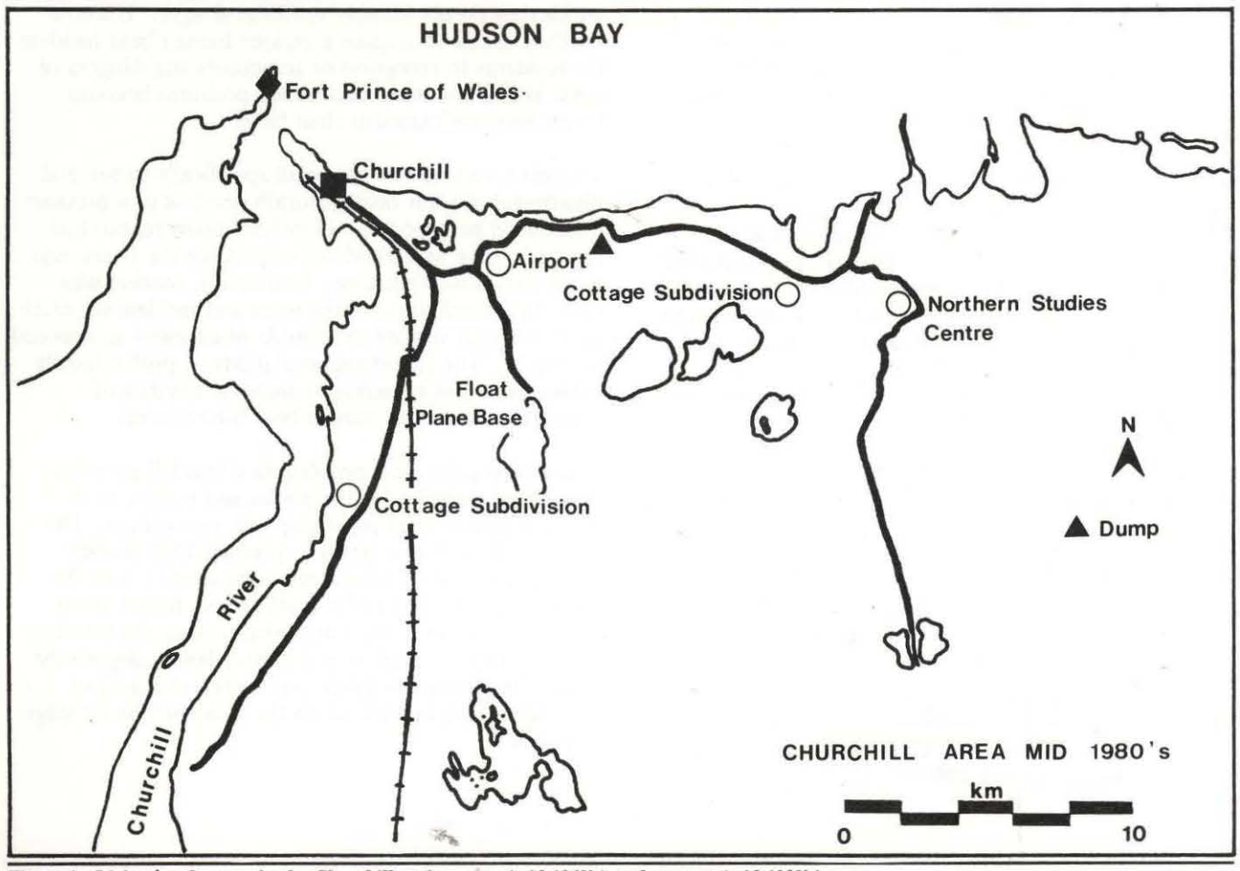


Figure 2. Living/work areas in the Churchill region, past (mid-1960's) and present (mid-1980's).

POLAR BEAR MOVEMENTS

Since 1966, over 1,800 individual bears have been marked in the vicinity of Churchill along with several hundred more in areas to the north and south (Stirling and Ramsay 1986). These data have shown that the polar bears of the Churchill area are part of a relatively discrete subpopulation of bears for which there are reasonably well-defined boundaries (Figure 1). For management purposes, subpopulations of bears have been assigned to Polar Bear Management zones by a Federal/Provincial Polar Bear Technical Committee. Currently, there are 10 such zones in Canada. The subpopulation in the Churchill area is in Management Zone A1 (Urquhart and Schweinsburg 1984).

Of the 1,800 bears marked in Zone A1, over 400 have been marked in the accessible area around Churchill, which has allowed for a better comparison and understanding of those bears using the Churchill area relative to the entire Management Zone. Further studies concerning the reproductive biology and ecology, behaviour, on-land feeding habits, and physiology have all added to the knowledge and understanding of polar bears in this Zone. This information, where applicable, has been incorporated into the Polar Bear Alert Program.

Polar Bear Management Zone A1

The annual movements of polar bears within Management Zone A1 are relatively well understood in general terms (Figure 1), though research continues on movements of individual bears. With the exception of pregnant females that are occupying dens (the majority of which are located southeast of Churchill and 30 to 60 km inland), the entire bear population spends the winter and spring months on the ice of Hudson Bay hunting seals, its primary prey species. The females in dens give birth to cubs in late December or early January. The family groups remain in the dens until late February or March, when they move rapidly in a northeasterly direction to the bay and on to the ice (Ramsay and Andriashek 1986). From March until late July, all the bears will be on the ice and observations of animals on land at this time are rare. It was originally assumed that the bears would remain on the ice as long as possible and would then move to land when the broken ice could not support them (Stirling et al. 1977). New data indicate this may not be the case. Rather, individual animals may show fidelity to a specific area of the coast, and the timing and distribution of ice break-up may be of less significance in determining their summer distribution (Stirling and Ramsay 1986). Once ashore the animals tend to segregate by age and sex classes. Adult males are more abundant along the coast, adult females with cubs and pregnant females go inland, and subadult males occur in both areas. As the summer season progresses those bears on the coast generally move north, and most bears which earlier travelled inland move north, northeast, or east to the coast. Pregnant females remain inland to den. In fall, many bears, particularly the adult males, stage at several points of land from Cape Churchill south, apparently in anticipation of freeze-up. Up to 50 bears have been observed at Cape Churchill in the late fall, and groups of 10 to 15 bears are not uncommon at other sites. Once at these staging areas, the bears show great tolerance for one another and tend to remain at these locations until sufficient ice has formed on the Bay. This normally occurs in mid-November. Subadults and females tend to be more mobile and can be observed along the entire coast, but tend to avoid areas where adult males are concentrated. They also move on to the sea ice as soon as possible. Normally by mid-November only pregnant females remain on the land and they have entered maternity deans (Stirling et al. 1977, Latour 1981, Lunn and Stirling 1985, Stirling and Ramsay 1986).

Churchill Area

The data show that the numbers of bears in the Churchill area increase as the season progresses. Few bears are found in the Churchill area in July or August, the numbers increase in September, and reach a maximum in October and November. The bears virtually disappear from the Churchill area as soon as sufficient ice forms on Hudson Bay, which is normally mid-November. Therefore, as expected, in years of early freeze-up the number of bears and resulting problems in the Churchill area usually fewer. When freeze-up occurs later than normal, the number of animals in the Churchill area will sometimes increase.

There is considerable variation among years in numbers of bears in the Churchill area, and the reasons for this are not yet fully understood (Table 1). The date of freeze-up of Hudson Bay influences the numbers, but it does not account completely for the observed variations. Other factors such as the time of break-up of ice in the Bay, the physical condition of the bears when they move on to land, and climatic conditions during the time bears are on land could play some role in determining the numbers of bears in the Churchill area each year. Within any one year, the numbers of bears which visit the area usually represent less than 5% of the Management Zone A1 population (Stirling and Ramsay 1986).

Table 1. Number of reported occurrences of polar bears and number of bears handled in the Churchill area, 1969 to 1986.

Year	Number of Occurrences	Number of Bears Handled[a]
1969	112	29
1970	249	34
1971	227	56
1972	73	30
1973	74	24
1974	206	41
1975	184	41
1976	207	50
1977	99	32
1978	87	16
1979	102	27
1980	31	18
1981	74	27
1982	70	32
1983	210	92
1984	59	18
1985	85	76
1986	69	26
Total	2218	669

[a] Includes individual bears that have been captured in the Churchill area in more than 1 year.

The marking program has provided information on the use of the Churchill area by individual bears. Most bears which travel to the Churchill area do so only once, particularly bears that come to Churchill on their own and not accompanied by their mother. Of those bears that do return to Churchill, most do so only one more time, and normally in the first or second year following their first visit to Churchill. Cubs or yearlings taken to Churchill by their mothers, subadult males, and adult females are most often the repeat offenders. The fact that most bears only travel to the Churchill area only once or twice, and usually as subadults, could be interpreted as meaning many individuals learn at a young age to avoid the Churchill area as opposed to learning to move to the area. Likely, both situations occur depending on the individual animal.

Subadult males show a marked affinity to the Churchill area compared to other sex/age groups. Significantly more adult females than adult males have been handled in the Churchill area, and in most cases these females have been accompanied by cubs or yearlings. Females with young normally confine their activities to the dump and immediate area rather than the Churchill townsite. Though these females seldom cause problems themselves, their offspring can show a high affinity for the area once they are on their own and are often removed as problem animals at a relatively young age.

POLAR BEAR ALERT PROGRAM

Program Background

Since 1969, the Manitoba Department of Natural Resources has undertaken a fall Polar Bear Alert Program. It continued without major incident from 1969 to 1982. During this time it was reviewed regularly and revised to reflect the changing situation in Churchill, to incorporate the results of mark-recapture studies and other research, to provide for the use of new and better equipment, and to eliminate potentially hazardous situations. Other actions to reduce the bear problem were tried but were not always successful. The program functioned well, and if there was a criticism from the public it was that the Department killed too many bears. Though neither human-bear interactions nor occasional property damage were eliminated, there were no serious human-bear confrontations resulting in a human injury or death during this period. However a number of bears were killed by people defending life or property.

The 1983 problem period proved to be one of the longest and most difficult since 1969 with a record number of bears (92) being handled. There were 2 serious human-bear interactions, including 1 in downtown Churchill which resulted in a human fatality. These 2 incidents (both the result of human error), coupled with a longer-than-normal season, resulted in considerable consternation by Churchill residents about the bear situation. In August 1984, before the "normal" problem bear period had begun, another Churchill resident was severely mauled by a bear while on a fishing trip north of town. This was the final evidence required by many Churchill residents to conclude that polar bears were becoming more numerous and aggressive, and that the Department of Natural Resources must take more decisive action to alleviate the situation. At the same time a tourism industry based on bears was expanding rapidly. This resulted in a major review of all data relevant to the program, and in revisions and additions to the policy and procedures in place at the time. The revised policy and procedures have been used in the 1985 and 1986 programs.

Program Policy

The primary objective of the Program is to ensure the safety of people and the protection of property from

damage by polar bears. No bears are tolerated in or within close proximity to any inhabited area in the immediate Churchill area that is accessible by the existing road system. The Churchill townsite is given priority. Other inhabited areas, including the Churchill airport, recreational areas, isolated residences/ recreational cabins, and some temporary sites, will be given priority provided the situation in and around the Churchill townsite is under control. Action can also be directed at polar bears in that area peripheral to the priority areas to reduce the potential for bears encroaching on inhabited areas.

A second objective is to ensure that polar bears are not unduly harassed or killed. This consideration has become more important in recent years as a competitive tourism industry has developed to meet the growing demand to view, photograph, and write about the bears. This objective is intended to prevent such activities from having a negative impact on the bears.

Program Considerations

In meeting its objectives the Alert Program must attempt to incorporate the attitudes and actions of the different segments of the Churchill population, both residents and non-residents, with what is known about the biology and ecology of the bear. For example, mark-recapture studies have shown that the permanent removal of all bears found in the Churchill area would have been disastrous to the polar bear population given that most individuals are only one-time offenders. The same studies have shown that the polar bears that occur in the Churchill area belong to a population that is shared with the Northwest Territories. Any bears killed or removed from the population through the Control Program must be included as part of the total quota for Zone A1.

Experience gained since 1969 has also shown that there is no way to accurately predict the length of the problem period or the degree of the problem in any year. This means that the Department cannot become complacent in the delivery of the program, particularly after several years with few problems. The public must recognize this also.

Finally, if the bear population is to be maintained at its current level, a factor of considerable importance to the success of the existing tourism industry, individual animals will likely to continue to occur annually in the Churchill area simply due to its physical location.

For the purpose of polar bear control, the Churchill region has been subdivided into 3 areas: (1) the living/work area, including the Churchill townsite and other inhabited sites and areas regularly used for work, such as the airport and its adjacent warehouses; (2) the perimeter area, including most areas accessible by the existing all-weather road system; and (3) the remote area, being that area which is inaccessible to regular vehicles (Figure 3). Specific procedures have been identified for each of these areas, with the level of control increasing from the remote area through the perimeter area to the living/work area (Table 2).

In a bear program of this nature, certain procedures, particularly new ones, can be controversial. This was true for several procedures revised or added to the program following its review in 1984. For example, the dump and its surrounding area were included as part of the living/work area. Consequently all bears would be removed from the dump. Previously, bears in the dump were only marked and no action was taken unless an animal moved to an inhabited area. This happened each year with some bears. This procedure only became feasible with the building of an indoor compound (Polar Bear Compound) in 1982 which allows the Department to hold up to 20 individuals and/or family groups in separate cages. There was concern that this action could have a negative impact on tourism, but to date this does not appear to have occurred probably in a large part due to the existing tourist operations which provide opportunities to see animals in a more natural setting than a dump.

Program Procedures

The procedures of the Polar Bear Alert Program are intended to provide for the consistent delivery of the program by staff of the Department of Natural Resources. The procedures clearly indicate the roles and responsibilities of individuals within the Department for the development, budgeting and evaluation of the program; for organizing, monitoring and evaluating the program delivery; and for reviewing and revising program guidelines as necessary. The guidelines outline staff responsibilities, equipment maintenance and use, the handling of bears (scaring, live-trapping using culvert traps and leg snares, chemical immobilization, shooting), the holding of bears in the Polar Bear Compound, handling of emergency situations (human fatalities/ maulings), Local Government District and Royal Canadian Mounted Police involvement and assistance, and data collection.

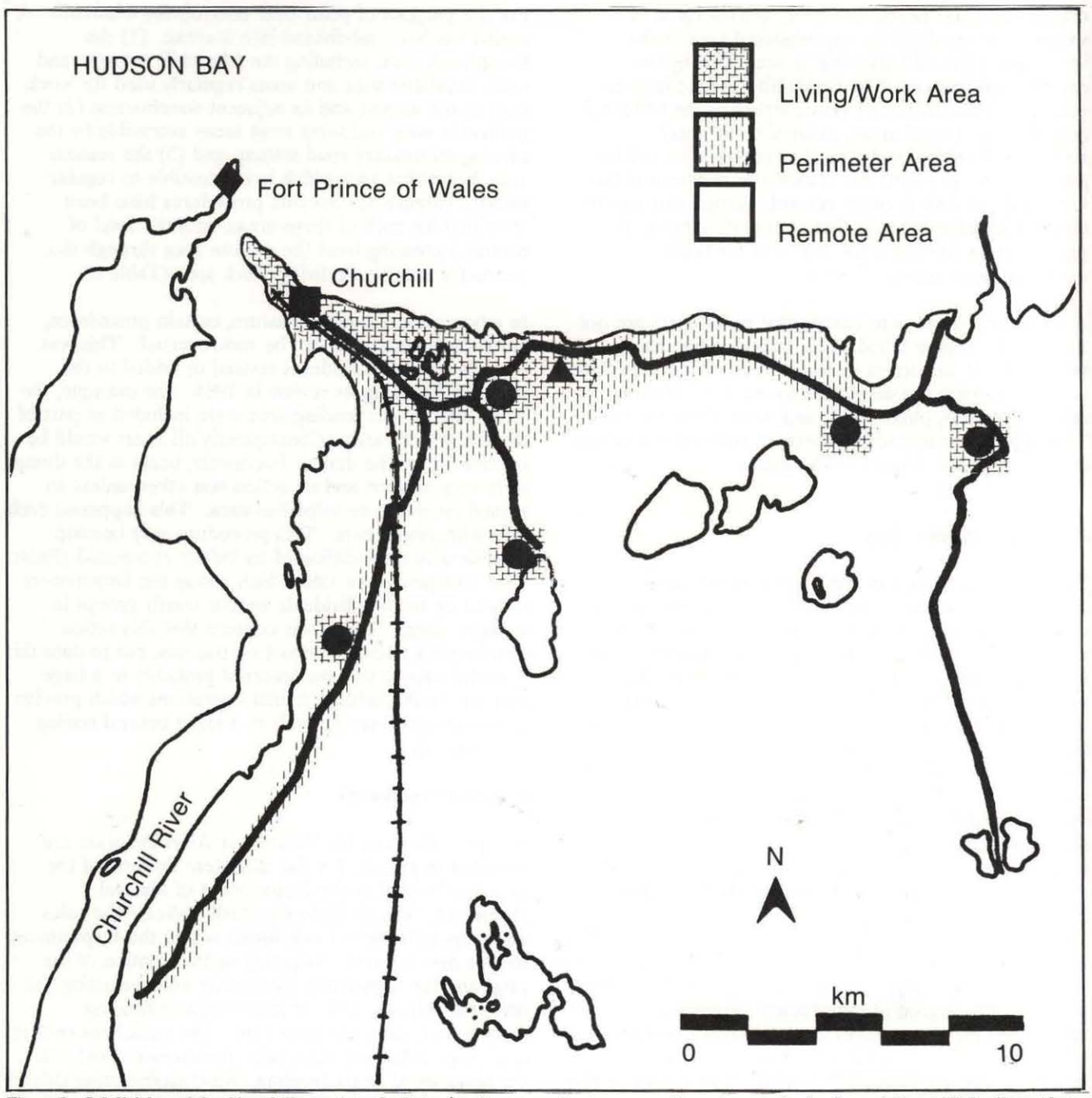


Figure 3. Subdivision of the Churchill area into the living/work area, perimeter area and remote area for implementation of Polar Bear Alert Program procedures.

Table 2. Polar Bear Alert Program procedures directed at the living/work area, the perimeter area, and the remote area.

Procedure	Living/ Work Area	Peri- meter Area	Remote Area
Removal[a] of all bears by scaring, live-capture or shooting.	Yes	No	No
Removal[a] of all bears previously captured in the living/work or perimeter area by live-capture.	Yes	Yes	No
Removal[a] of all polar bear family groups by live-capture.	Yes	Yes	No
Permanent removal[b] from the population of those bears which have been captured in 3 or more years previously in the living/work area.	Yes	Yes	No
Regular meetings between Department staff and the Local Government District Council to inform, plan and evaluate the program.	Yes	Yes	No
Annual questionnaire to Churchill residents to assist in program evaluation	Yes	Yes	No
Enactment and/or enforcement of by-laws and regulations to minimize the sources of attractants to bears.	Yes	Yes	No
High profile signing in specific areas.	Yes	Yes	No
Public information/education program to increase the awareness of potential dangers of polar bears.	Yes	Yes	Yes
Prohibition of polar bear baiting for any purpose unless by permit.	Yes	Yes	Yes
Continued capture and marking of polar bears.	Yes	Yes	Yes

[a] All bears captured are placed in the Polar Bear Compound until Hudson Bay is frozen, or they are transported away from the Churchill area.

[b] Bears to be removed from the population permanently will be placed in zoos if possible.

The procedure of removing all family groups from the living/work area and the perimeter area as soon as possible was also added in 1984, in an attempt to prevent cubs and yearlings from becoming problem animals.

Though some bears had been sent to zoos since the program started, it was not until the most recent review that a criterion for the permanent removal of specific individuals was introduced (Table 2). Unfortunately, implementing this procedure resulted in the loss of some bears which, because of their age and frequency of returning, were providing new scientific information each year they returned. In these few cases, however, it was decided to put public safety ahead of the need for additional information, particularly given that such bears were exceptions to the "normal" bears handled in Churchill.

A regulation to prohibit the baiting of bears anywhere within 10 km of the Hudson Bay coast was also introduced with the new program. This practice had grown as the competitive nature of the tourism industry increased, but is now considered to require strict control. Introducing a large number of bears to human-food association could increase problems in the future.

In an effort to monitor the local residents' attitude toward the bears and the Alert Program, an annual questionnaire is sent to each household. The revised program seems to have been well-received by the local public based on the results of questionnaires done at the end of the 1985 and 1986 problem seasons.

CONCLUSION

A program such as the Alert Program requires a dynamic approach incorporating regular review and evaluation. Changes made in program procedures must be monitored to determine their effectiveness. Continued research efforts by the Canadian Wildlife Service and others provide new information on the biology and ecology of polar bears which must be considered. Finally, the Churchill situation continues to change and this must also be considered in the program design.

Under existing conditions, the actual and potential polar bear problems in the Churchill area will not abate without the complete abandonment of the townsite or permanent removal of large numbers of bears. Neither of these solutions is acceptable. Consequently, the annual Polar Bear Alert Program will be required to ensure the safety of people and their property and the perpetuation of a healthy polar bear population.

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