



FINAL REPORT

OF THE INUIT BOWHEAD KNOWLEDGE STUDY

NUNAVUT, CANADA



Nunavut Wildlife Management Board
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By Inuit Study Participants from:

Arctic Bay, Arviat, Cape Dorset, Chesterfield Inlet,
Clyde River, Coral Harbour, Grise Fiord,
Hall Beach, Igloolik, Iqaluit, Kimmirut, Kugaaruk,
Pangnirtung, Pond Inlet, Oikiqtarjuaq, Rankin Inlet,
Repulse Bay, and Whale Cove

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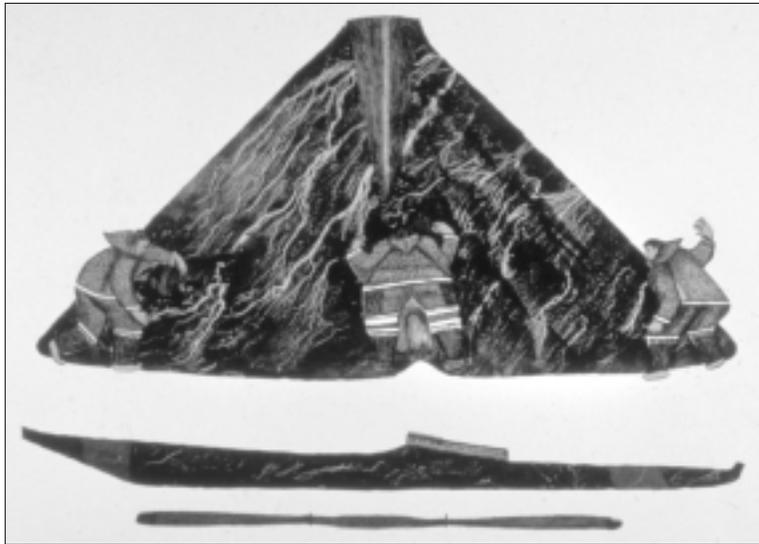
Summary and Conclusions

4.1 INUIT KNOWLEDGE OF POPULATION ECOLOGY OF BOWHEADS

1. Inuit recognize that bowhead whales were numerous prior to commercial whaling, citing as evidence the abundance of old whale bones in many localities where ancestral Inuit whaled and made their homes. They believe that ancestral Inuit whaling did not have any significant impact on bowhead whale populations. Many elders (e.g., the late Aksayuk Etuangat of Pangnirtung) testified that bowheads were very scarce in the decades following the cessation of commercial whaling, and many others reported hearing about this from their elders as well. Inuit, realizing that commercial whaling depleted these stocks, pointed out that Inuit were not responsible for over-harvesting. They believe that the infrequent harvesting of bowheads by Inuit after about 1915 reflected both the low abundance of bowhead whales as well as a common notion that a ban on the taking of bowheads was in effect. Inuit stated that they generally refrained from harvesting bowheads after the end of commercial whaling in spite of at least some continuing opportunities to do so.

2. Many elders, who are still active in hunting and traveling, and some senior hunters from throughout the Study Area testified that, when they were children or younger adults, they saw bowheads only rarely or in very small numbers, but in recent years or decades they have seen greater numbers of bowheads.

In northern **Foxe Basin** (particularly in the mouth of *Ikiq/Fury* and *Hecla Strait*), Inuit provided evidence for an increase in the number of bowhead whales during recent decades, particularly since about the mid 1960s, when several bowheads were harvested in this area. Elderly informants and senior hunters, as children or younger adults, reported seeing few bowheads; in recent decades, they have seen greater numbers. Some reported that the increase since the 1960s has been fairly steady.



"Measuring the Whale's Tail," Oshoochiak Pudlat, Cape Dorset

In the **Hudson Strait** area, informants reported that sightings of bowheads have increased in comparison with earlier times. However, some informants were uncertain if this reflects a real population increase, suggesting instead that increased hunter mobility and redistribution of bowheads might be contributing factors. The testimony suggests that the increase in sightings in the *Sullualuk/Hudson Strait* area is

not as marked as the increases observed in other parts of Nunavut.

In the **Hudson Bay** area, Repulse Bay and Chesterfield Inlet residents also noted changes in the number of bowheads they have sighted in recent years or decades as compared to when they were children or younger adults. Bowhead numbers began to increase in the Repulse Bay area around 1965. Prior to that time, the residents of small settlements

outside Repulse Bay took especial note of any bowhead sightings, expressing surprise or a feeling of awe.

In the **Baffin Bay** region, many Arctic Bay elders related that bowheads were rarely seen during their childhood and early adulthood, but that bowhead sightings have been increasingly frequent in recent decades, particularly since the early 1960s. Some informants provided other dates for noticing an increase: 1973-1974 with an accelerating rate of increase in the 1990s; the 1970s; or the early 1990s. A bowhead sighting before the 1960s tended to elicit much excitement and curiosity, but not so nowadays. One informant suggested that the increasing abundance of bowheads near Arctic Bay may be due to changes in their distribution.

Elders from Clyde River pointed out that bowheads were rarely seen near their settlements (e.g., Igaliqtuuq/Isabella Bay) prior to re-settlement at Clyde River in the early 1960s. At that time, sightings of bowheads started to become more frequent throughout the Clyde River resource-use area.

In recent decades, Inuit have noticed more bowheads at the floe edge (in May/June) south of Pangnirtung. At the time of their childhood or young adulthood, elders saw whales only infrequently, but in recent decades they have sighted more and more whales in Tinnujivik/Cumberland Sound. The testimony suggests that bowheads were still scarce in the Sound during the 1960s, with the increase becoming detectable by the 1980s.

As children or younger adults, Pond Inlet informants saw bowheads infrequently, but in recent years or decades they have seen bowheads in larger numbers. While the rarity of a sighting had created much excitement among the people, this is not so nowadays. At the Pond Inlet floe edge, sightings have increased, especially from about 1942. The reported time when the increase in sightings of bowheads in the Pond Inlet area became detectable varied widely (1942 to 1992) among informants, with most suggesting that this occurred in the late 1960s to mid 1970s.

Elders of Qikiqtarjuaq also reported increased numbers of bowhead whales in recent times as compared to when they were children or younger adults. At least one person, however, wondered if there had been a real population increase or merely a change in feeding distribution.

3. Many elders testified that, as children or younger adults, they saw bowheads only rarely or in very small numbers, but have heard from other hunters that bowheads have become more numerous in recent decades. These elderly informants, no longer active in hunting and traveling in recent years, have relied largely on information from active hunters.

In the **Hudson Strait** region, several informants provided testimony of this general nature.

From **Hudson Bay**, Coral Harbour informants reported that they rarely saw bowheads at the floe edge in the past, and that hunters now relate to them that bowheads are abundant at the floe edge during May and June. This increase in sightings at the floe edge began in the late 1980s. Informants from Chesterfield Inlet reported that bowheads were scarce or absent in the area until about 1950, but hunters have been seeing more bowheads in recent years. As children or younger adults, Repulse Bay informants infrequently saw bowheads; they have heard that hunters have been seeing more bowheads in recent years, beginning in the 1970s, especially at the floe edge. Prior to the 1960s and the extensive utilization of motorboats, hunters traveled extensively by sail boat, yet reported seeing few bowheads. One informant, maintaining that bowhead numbers have increased, also suggested that increased frequency of sightings could be attributed to changes in bowhead distribution and/or increased hunter mobility.

In the **Baffin Bay** region, one elder from Arctic Bay saw very few bowheads when she was a young woman, and related that hunters nowadays frequently see bowheads at the floe edge. While suggesting that increased sightings may partly reflect modern, faster transportation methods, she concluded that the bowhead population is increasing. Another informant, recalling that bowheads were frequently seen at the floe edge during the late 1930s, stated that *“The hunters say there are more bowhead whales now than there have been in past times when I would go out and camp with my family”*.

Aksayuk Etuangat of Pangnirtung was born about 1900 and was raised at Qikiqtan/Kekerten Island in Tinnujivik/Cumberland Sound. He was involved with the final phase of commercial whaling there around 1918-1920, and reported that at that time bowheads were infrequently seen and harvested at Kekerten. He has heard from hunters about the increased numbers of bowheads in recent times at Qikiqtan/Kekerten. The scarcity of whales at Qikiqtan/Kekerten by 1920 was confirmed by Pauloosie Angmarlik. This testimony, combined with that of Inuit with lifetime experience regarding bowheads (section 3.1.1.iii), along with recent observations of bowheads by hunters (section 3.1.1.vi), provides strong evidence for a post-commercial increase of bowheads in Cumberland Sound.

Kooneeloosie Nutarak, Sr. of Pond Inlet contrasted his infrequent childhood observations of bowheads with hunters' recent reports of abundance of bowheads in the Clyde River and Pond Inlet areas.

4. Active hunters from throughout the Study Area have reported seeing large numbers of bowhead whales within their communities' resource-use areas. In spite of not having the benefit of their own base-line observations from earlier parts of the 1900s, many have concluded that bowhead populations have increased in numbers over the past few



decades. However, many of these same hunters do refer, in other parts of their testimony, to elders' observations of the scarcity of bowheads in earlier times.

In **Foxe Basin**, hunters from Igloolik have sighted large concentrations of bowheads near their community in recent decades, and they believe that the bowhead population has been increasing.

In **Hudson Strait**, informants from Cape Dorset and Kimmirut report sightings of large numbers of bowheads in their respective areas.

In **Hudson Bay**, Ben Ell (now residing in Iqaluit) witnessed an abundance of bowheads (in groups of 10 to 20) in the Coral Harbour area when he resided there in 1955-56. People see good numbers of bowheads every summer in the Chesterfield Inlet area nowadays, as compared to elders' accounts of the absence of bowheads at the end of the commercial whaling period.

Bowheads are numerous in the Repulse Bay area from spring to fall, and the population has increased according to informants. John Kaunak noted that whales are concentrated and numerous at the floe edge in June, but that after ice break-up, they disperse and are seen in smaller numbers. Whales then gather inshore in August.

In the **Baffin Bay** region, Arctic Bay hunters have reported an abundance of bowhead whales in their community's resource-use area, and they believe that the population has increased.

Clyde River informants mentioned the large numbers of bowheads seasonally occurring and migrating/feeding within the community's marine-use area, including the large feeding aggregation that occurs at Igaliqtuuq/Isabella Bay in late summer and fall. Considering the large number of whales that they see, some informants believe that the bowhead population in this area has grown.

Many informants from Pangnirtung emphasized that they frequently sight large numbers of whales. The floe edge southwest and south of Pangnirtung (off Qikiqtan/Kekerten Island) has been occupied by increasing numbers of bowheads in recent decades during the months of May and June (sometimes as early as March and April), and the bowheads tend to be concentrated or occur in large groups. After ice break-up, the whales disperse widely in small groups, so that the overall rate of sightings decreases during the summer. Based on reports of elders (some of whom were present at the whaling stations of Qikiqtan/Kekerten and Ummanagjuaq/Blacklead Island during or just after the last days of whaling) that bowheads were sighted infrequently several decades ago, many informants have concluded that the population of bowhead whales in Tinnujivik/Cumberland Sound has increased since the end of commercial whaling.

One informant from Pond Inlet reported an annual occurrence of bowheads at the floe edges off Pond Inlet, Navy Board Inlet, and Tallurutiit/Lancaster Sound. Others have reported that bowhead whales occur in large numbers in the Pond Inlet area during summer. One informant reported that his wife counted a minimum of 74 bowheads on migration in Navy Board Inlet during summer 1996. Some informants reported that their elders had seen very few bowheads in the Pond Inlet area at the conclusion of commercial whaling in the early 1900s.

Many informants from Qikiqtarjuaq reported seeing large numbers of bowheads in summer and fall within the community's resource-use area. As a child many years ago, Jaycopie Audlakiak observed, in the vicinity of Palligvik/Padloping Island and near Qivittuuq/Kivitoo, "so many bowheads you could hardly see the water." Hunters reported many more bowhead whales in Qikiqtarjuaq's waters in summer/fall of 1994 than in 1993. In 1994, bowheads occurred in large numbers at the spring floe edge, and in summer/fall they were numerous in nearshore waters in many localities. Killer whales came into Qikiqtarjuaq's waters also in the summer of 1994. Some informants believe, on the basis of the large numbers of whales seen in the area in recent years, that the bowhead whale population has been increasing.

5. Several informants did not provide their own observations of bowhead abundance and/or changes in abundance, and instead have cited the observations of other hunters that bowheads are very numerous nowadays, or that bowhead numbers have increased in recent years/decades. Informants from Igloolik and Hall Beach have heard from other hunters about the abundance of bowhead whales in northern **Foxe Basin**. In **Hudson Strait**, informants have heard about the large numbers of bowheads that seasonally visit their areas. While they suggested that the bowhead population is increasing, their testimony indicates that increases have been quite modest in the Sullualuk/Hudson Strait area. In **Hudson Bay**, informants from Coral Harbour, Chesterfield Inlet, Repulse Bay, and Whale Cove stated that hunters have recently sighted many bowheads in their respective community areas. As a result, they have also concluded that bowhead numbers have increased since the end of commercial whaling. In the **Baffin Bay** region, some informants from Arctic Bay, Clyde River, Pangnirtung, Pond Inlet, and Qikiqtarjuaq have heard about the large numbers of bowheads encountered by local hunters in recent years. Many related these observations to population increase. One Pond Inlet informant related that an elder from Clyde River noticed that the increase in bowhead numbers began in the 1950s.

6. Seven active hunters, representing all four regions of the Study Area, testified that they have observed, in recent years, steady increases in bowhead numbers from year to year.



7. Many informants from all regions associated the large numbers of bowheads seen in recent times with the effective cessation of whaling after 1900. Although many merely assumed that bowhead numbers must have increased because of the absence of whaling, many of these same informants did provide substantial evidence of bowhead abundance and/or increase in population size.

8. A fair number of informants from all four regions of the Study Area believe that bowhead numbers have increased in recent times, but they did not provide substantiating evidence in the immediate context of their remarks. However, many of the same informants, in other parts of their testimony, have provided more substantial evidence for population growth of bowheads.

9. One informant from the **Hudson Bay** region provided evidence of a local decrease in bowhead numbers. This informant, an elder from Coral Harbour, reported that bowheads seem less numerous nowadays at Nuvualuk/Terror Point (on southeastern Southampton Island) compared to the 1960s. In the **Baffin Bay** region, an elder from Pangnirtung stated that bowheads were numerous in 1946 (when a bowhead whale was harvested); but after 1946, killer whales began to appear in Tinnujivik/Cumberland Sound and the bowhead population declined. Another elder from Pangnirtung also related a recent decline and/or dispersal of bowheads and other marine mammals in Cumberland Sound to the presence of killer whales, especially in Isuittuq/Clearwater Fiord. He also related that bowheads were plentiful at the time Inuit (including his parents) worked with the commercial whalers, and that the population later declined. Several informants reported that bowhead numbers and their distribution may fluctuate from year to year within the marine-use regions of their communities, but that such fluctuations are normal aspects of bowhead population ecology.

10. A small number of informants from **Hudson Strait**, **Hudson Bay**, and **Baffin Bay** suggested that bowhead numbers have been stable over recent decades. One informant stated that bowhead whales are infrequently sighted near Uqsuriaq/Marble Island (off the mouth of Rankin Inlet), and suggested that bowhead whales have not greatly increased in numbers in the Kivalliq/Keewatin region.

11. Although they may see bowheads frequently, many informants from all four regions could not comment on changes in their abundance. In **Foxe Basin**, one informant thought that increased numbers of bowheads in the area could be due to immigration or a population increase. Some informants deemed themselves unable to comment on population changes because they did not know what population numbers were in the past. Because bowheads are not hunted and hunters tend to focus their efforts on other species, some informants stated that they were not able to comment on population changes. In **Hudson Strait**, a few informants from Cape Dorset and Kimmirut attributed their lack of knowledge of bowhead population changes to a relative scarcity of bowheads in the

region. In **Baffin Bay**, informants from Grise Fiord could not comment on population changes, perhaps because this community was only recently established, i.e. in the early 1950s.

12. Several informants stated that they had heard through the local community radio station, portable CB radio, and/or other sources, that bowhead numbers have increased or that bowheads are now quite numerous, in certain parts of Nunavut. The abundance of bowheads near Igloolik in summer and fall is well known to many informants. Two elderly informants from Repulse Bay had spent their childhood/early adulthood in the Igloolik area, and had rarely seen bowheads there. One believed that recent bowhead abundance near Igloolik is due to an immigration of bowheads as they are trying to get away from killer whales. Two Arctic Bay informants expressed the opinion that the abundance of bowheads near Igloolik in recent years is due to emigration from the Arctic Bay area, in particular because of disturbance at the Tununirusiup Kangiq&ua/Admiralty Inlet floe edge by hunters shooting narwhals. One of the informants from Arctic Bay suggested that this influx of bowheads into the Igloolik region began after the 1950s. Similarly, two Pond Inlet informants suggested that bowheads have moved from Pond Inlet to the Igloolik area, because of either better feeding opportunities or the disturbance due to commercial whaling in the Pond Inlet region earlier in the century. One in fact stated that Igloolik hosts many more bowheads than Pond Inlet and that bowheads have increased in numbers in the Igloolik region.

Clyde River and nearby Igaliqtuuq/Isabella Bay are well known for hosting relatively large numbers of bowheads; informants have attributed these large numbers to population growth. An informant from Kimmirut stated that bowheads are not as numerous in south Baffin Island as in the Clyde River area.

Many informants referred more generally to the high frequency of sightings of bowheads throughout eastern and central Nunavut, which they attributed to population growth. An informant from Kugaruk noted that this population growth seems to have become noticeable in the late 1950s. Inuit informants from **Hudson Strait** frequently mentioned increases in numbers of bowheads in other areas, such as Clyde River and Igloolik.

Informants referred mainly to Clyde River, Igloolik, and Pangnirtung as places of significant bowhead abundance, with fewer mentioning Qikiqtarjuaq, Repulse Bay, and Coral Harbour. They generally attributed this abundance to growth of the bowhead population.

13. Informants from nearly all communities provided detailed observations and comments on the seasonal distribution, migrations, and behaviour of bowhead whales in the Study Area. These transcribed



observations (section 3.1.2.i) are complementary to the six maps of seasonal distribution and migration (section 3.1.2.iv), which are composites of the mapped data contributed by all informants in the Study.

In **Foxe Basin**, bowheads tend to concentrate during summer in the mouth of *Ikiq/Fury* and Hecla Strait after aggregating at the floe edge off Igloolik and Hall Beach.

In **Hudson Strait**, informants' observations and remarks give the impression that bowheads are not very numerous in this region. Bowheads apparently use the south Baffin Island coast mainly as a migration route. This, and a possible offshore distribution of migrants, could partly explain the irregularity and/or scarcity of sightings.

In **Hudson Bay**, *Repulse Bay* informants sight bowheads in small numbers in summer, only one to three at a time. The testimony of informants from *Chesterfield Inlet* suggests that bowheads are regularly sighted every year in their area, but only in small numbers. Informants from *Rankin Inlet* and *Whale Cove* apparently do not sight many bowheads in their communities' hunting territories.

Informants from all **Baffin Bay** communities provided a wealth of information on the seasonal distribution, migrations, and activities of bowhead whales in their marine-use areas. Bowheads are very rarely seen in winter, but they are often seen in spring at the floe edge, where large aggregations may occur (e.g., at *Pangnirtung*). During and after ice break-up, they move into nearshore waters where they engage in activities such as feeding, playing, mating, and occasionally calving. This inshore movement into shallow waters could also be related to avoidance of killer whales. In summer, bowheads tend to be more dispersed as they seek out the best feeding locations, although summer aggregations are also reported. In the fall, bowheads group up and begin their migrations back to wintering areas before or at the time of freeze-up. Superimposed on this general pattern, many informants reported annual variations in the occurrence, distribution, and number of bowhead whales in their communities' resource-use areas, which they generally attribute to variations in availability of the bowhead whales' food.

Informants also gave a great deal of information on the size/age composition and number of whales seen in groups at different seasons, and often attempted to relate this information to the behaviour and activities of the whales.

14. A small number of informants from **Hudson Bay** and **Baffin Bay** stated that bowheads return to the same locations every year for feeding and other activities. A few informants indicated that the same whales are involved and thus demonstrate site fidelity; e.g., the same whales return every year to *Igaliqtuuq/Isabella Bay*. Some informants speculated that the bowheads seen in spring at the floe edge are also seen later on (in

summer) along with smaller whales. Informants did not present observations or speculations on stock identity and discreteness.

15. Many informants from all regions reported the relatively new occurrence of bowheads in areas where they were not seen before, and this was often related to or attributed to an increase in the population. However, some informants raised the possibility that a new occurrence of bowheads in an area may reflect a re-distribution of animals and not an actual population increase. One informant suggested that Inuit may lack this kind of knowledge, since bowheads have not been harvested and utilized for a long time. Informants also suggested that killer whales may cause bowheads to temporarily abandon traditional and favoured areas. *Kugaaruk* residents sighted bowheads during the early 1990s in their hunting area, previous to which bowheads were apparently rarely seen in the area. All sightings from 1992 through 1994 have been in the same general area near *Kugaaruk*. However, one informant inferred that increased hunter mobility may be involved in the increase of reported sightings in the *Kugaaruk* region.

16. Only a very few informants explicitly reported an increase in group size of bowheads in recent years. Most of them related this to concurrent increases in frequency of sightings and in the overall numbers of bowheads. Several informants stated that in earlier times bowheads usually were solitary, but that they now occur in groups.

17. Informants from all four regions of the Study Area reported the occurrence of bowhead calves with their mothers. Many calves are seen near *Igloolik (Foxe Basin area)* in summer, suggesting that this is a nursery area for bowhead whales. One informant witnessed a female bowhead giving birth at *Siorat* in the *Igloolik* area, and believes that this could be a bowhead calving area. Another informant reported that mother/calf pairs were not seen in this area when he was young. In **Hudson Strait**, only a few sightings of bowhead calves were reported. One informant suggested that the lack of attention paid to bowheads nowadays accounts for the lack of sightings of calves and observations of trends in their abundance. Informants from **Hudson Bay** have reported calf sightings, especially around southeastern *Southampton Island* and in the *Repulse Bay* area. One informant suggested that *Repulse Bay* may be a bowhead nursery area. In the **Baffin Bay** region, only *Kugaaruk* informants did not report sightings of calves. Calves are frequently sighted in the vicinity of *Arctic Bay*, where the spring migration and arrival of mothers with calves occur later compared to other bowheads. In the *Clyde River* area, mothers with calves are occasionally seen in late summer/early fall at *Igaliqtuuq/Isabella Bay*, and some informants surmised that calving occurs here. A few informants have observed or otherwise provided evidence of calving in *Isabella Bay* and at other locations, while other informants reported not seeing calves at *Igaliqtuuq* or elsewhere. The locations of calving areas for the bowhead whales in this region seem to be unknown. Newborn calves are described as being reddish in colour, while solitary juveniles



(*ingutuit*) are also seen during fall at Isabella Bay. One informant reported that southbound, fall-migrating bowheads had many calves with them as they passed Isabella Bay. Near Pangnirtung, informants reported mother/calf sightings mostly in spring (when whales are concentrated at the floe edge) and early summer, rather than in late summer or fall; calving may occur in the area, as a few informants reported seeing the birth of a bowhead and/or direct evidence of a very recent birth. Similar to the situation at Clyde River, Pangnirtung informants reported the occurrence of red-coloured calves, probably newborns. Many informants also reported the occurrence of solitary *ingutuit*/yearlings in the Pangnirtung region. Pond Inlet informants reported seeing mother/calf pairs at the floe edge at Sanirut/Button Point, where it is believed that calving may occur. Informants also reported seeing a female bowhead with a newborn and an older calf. Qikiqtarjuaq informants reported seeing mother/calf pairs in the shallow waters off Qivittuuq/Kivitoo (which may be a calving area), and calving was also suggested to occur in the waters around Qikiqtarjuaq. One informant indicated that he had seen evidence of actual calving. As in other communities, the older, solitary *ingutuit* are also seen.

Although many informants from all regions reported the presence of calves and small juveniles, only a few informants representing all four regions commented on the connection between the presence of calves and juveniles and the growth of the bowhead population. Only one informant from Repulse Bay and two from Igloolik reported that more calves are seen nowadays compared to times past. As noted previously, the reduced interest and lack of attention paid nowadays to bowheads could be responsible for the paucity of information about increases in number of calves and other particulars about bowhead whales.

18. An important question with regard to increased sightings of bowheads in recent decades relates to possible changes in 'observer effort' over this time period. Many informants pointed out that Inuit knowledge of bowheads has been diminishing in recent years, especially regarding certain details such as presence of calves and changes in bowhead distribution. In good measure, this is because the bowhead has not been regularly harvested for many decades. Furthermore, Inuit no longer live in widely-dispersed settlements (as they did before the 1960s), and thus may have less opportunity today to observe these specific and more subtle changes. On the other hand, hunters nowadays can travel great distances by snowmobile or boat to reach various distant hunting areas (where the Inuit population used to live), and they could have the opportunity to observe bowheads, trends in their abundance, and other changes. However, the hunters tend to ignore bowheads because they are looking for other wildlife. 'Observation effort' is difficult to describe and quantify. The factors involved are many, and some of the most significant of these factors at either end of a particular time series (e.g., pre-1960 versus the present time) probably tend to balance out. Thus, the dispersed nature of Inuit settlement within a present-day community's marine-use territory would tend to be offset by the ability of hunters and

their families to travel with speed to these outlying regions. The result may be a fairly constant level of 'observer effort' since the 1960s, when the move to new communities began.

19. Notwithstanding the quantification of 'observer effort' or changes in effort, it is not possible, from the Inuit testimony, to quantify the magnitude of bowhead population changes in any region of Nunavut. There is a tendency for increases in bowhead numbers to have become noticeable during the 1950s or later, especially the 1960s and early 1970s. Increases appear to be greatest in northern Foxe Basin (Igloolik and Hall Beach) and along the western coast of Baffin Bay (Clyde River, Pangnirtung, Qikiqtarjuaq, Pond Inlet, and Arctic Bay). Bowhead whales have been sighted in the Kugaaruk area in small numbers only since the early 1990s, while Grise Fiord residents have reported the summer/fall occurrence of small numbers of bowheads in their region. Inuit testimony from the Hudson Strait communities (Kimmirut, Cape Dorset, and Iqaluit) suggests that bowheads have increased in numbers only modestly in Frobisher Bay and along the northern shore of Sullualuk/Hudson Strait. In Hudson Bay, communities of the South Kivalliq region (Arviat, Whale Cove, Rankin Inlet, and Chesterfield Inlet) do not appear to host large numbers of bowhead whales. However, sightings have become more regular in the Chesterfield Inlet area in recent years, and some informants from this community believe that the bowhead population is growing. In northwestern Hudson Bay, informants from both Repulse Bay and Coral Harbour reported substantial increases in the numbers of bowheads, both at the floe edge in spring and in open water during summer. The collective testimony indicates that the number of bowhead whales seasonally visiting Nunavut's nearshore waters has increased significantly since the end of commercial whaling, and especially since the 1950s and 1960s.

20. Inuit informants reported on the occurrence of killer whales during the summer in all regions of the Study Area. They have documented through observation and the oral tradition the interactions between killer whales and bowheads, including predation and the effects of killer whales on bowhead behaviour, distribution, and migrations. Stranded bowhead whales have been found by Inuit over the past few decades; in some of these cases the evidence suggests that killer whales were fundamentally responsible. Many informants reported on an inverse relationship between the occurrence of bowheads and killer whales. Sightings of killer whales have declined in some parts of the Study Area since the 1950s to 1960s, coincident with increased bowhead sightings in these areas. Bowheads and other marine mammals often exhibit a pronounced fright reaction to the presence of killer whales. This reaction, called '*aarlirjuk*' in the South Baffin dialect of Inuktitut, involves the movement of marine mammals into areas of broken sea ice or shallow inshore waters, which may provide some measure of protection from the killer whales. Inuit hunters in the past



have taken advantage of this fright reaction, which enabled them to more easily harvest the frightened bowheads and other marine mammals.

Repulse Bay informants stated that there was an influx of killer whales into the Repulse Bay area in the mid 1960s, and a concurrent decrease in the bowhead population. In recent years, killer whales have been only rarely seen in the area, and bowheads are now more numerous. One informant from Repulse Bay suggested that the recent increase in the number of bowheads near Igloolik since the 1950s is due to two factors: growth of the population and an avoidance reaction to killer whales. On the other hand, some Arctic Bay and Pond Inlet informants suggested that the increase at Igloolik was actually due to an emigration of whales from their respective community areas. Killer whales were numerous and bowheads were scarce in Tinnujivik/Cumberland Sound in the 1950s and 1960s, but fewer killer whales have been visiting the Sound in recent decades, coincident with an increase in bowhead numbers. A similar situation has been reported for the area around Palligvik/Padloping Island on the east coast of Baffin Island. Killer whales appear to have a significant impact on the distribution of bowheads during summer and fall in much of eastern Nunavut, but their impact on the population numbers of bowhead whales is unknown.

21. Bowheads seem to prefer areas where there is some ice cover, or the edge of the ice or floe edge. Bowheads enter fiords and bays as the ice is breaking up, melting and dispersing in the spring. They leave Nunavut's nearshore waters and bays in late fall as fast ice begins to form, and they are infrequently sighted at the floe edge near communities during winter. Some informants interpret that sea ice does not seem to be a significant problem for the bowhead whale. However, bowheads avoid areas where the ice cover is very extensive or apparently continuous. Informants only infrequently reported on bowheads found dead due to ice-entrapment.

22. Informants from communities in the **Hudson Bay** and **Baffin Bay** regions reported on the foods and feeding of bowhead whales, noting also that bowheads and other marine mammals are strongly influenced by the tidal cycle. '*Piturnirtuq*' is the time around the full moon when tidal variation is greatest and the tidal currents are strongest. During *piturniq*, bowhead whales are very active and feed heavily in areas where the currents are strongest. Movements of bowheads are also related to the daily tidal cycle; whales move inshore as the tide rises and offshore as the tide ebbs. Feeding occurs throughout much of the Study Area during spring at the floe edge and during summer and early fall in nearshore waters. Although bowheads show strong fidelity to some specific inshore areas for feeding, they also exhibit year-to-year variation in their distribution and abundance which informants attribute to variation in the distribution of bowhead prey. Some informants have witnessed and described bowhead feeding behaviour. The prey of bowhead whales is predominately *igllirait*/copepods.

23. Informants expressed a diversity of observations and opinions regarding the effects of noise on bowhead whales. Many informants reported that bowheads do not seem to be adversely affected by canoes or small boats powered by outboard engines, even when hunters are shooting at other species. Because bowheads are no longer an object of hunting and hence not always closely observed, some informants were uncertain about impacts of noise on bowheads. As bowheads are not hunted any more, some informants believe that they may readily habituate to the presence of skidoos and boats. On the other hand, in the late commercial/post-commercial whaling days, bowhead hunters had to be very quiet and make no sudden noises in their sail boats or row boats when pursuing a whale, lest the whale hear the noise, submerge and flee.

However, some hunters perceive that bowheads can be disturbed by skidoos and/or small vessels, which cause the whales to flee the source of the noise or to move towards the shore. The use of outboard engines was given as a possible explanation for the relative scarcity of bowheads near Cape Dorset and in Frobisher Bay. Several informants perceive that marine mammals nowadays avoid the immediate vicinity of communities because of a variety of land- and marine-based noises.

Some Inuit believe that bowheads may be disturbed by large vessels which could displace them from important habitat into marginal areas where food may not be adequate. Other informants believe that, although sea mammals may have been disturbed by large ocean-going ships in the past (when large-vessel traffic first started to increase), due to habituation they may now not be very affected or disturbed by large ships. Although uncertain about the impacts of large vessel traffic on bowheads and other marine mammals, some elders do not worry a lot about this as most large ships are necessary for today's economy. In the **Hudson Bay** region as well as at Kugaaruk, ship traffic may not be a big concern because of the relatively low number of bowheads in these two areas. On the other hand, two Qikiqtarjuaq informants believe that increasing ship traffic is not a concern because there are so many bowheads now and they are increasing in numbers.

Inuit fear that oil spills (from oil tankers and drilling) could have negative impacts on bowheads and other marine mammals. They believe that bowheads and other marine mammals would have to leave the area of an oil spill, lest they be damaged or killed by contact with oil.

The bowhead and other marine mammals are sensitive to land-based and marine explosive (seismic) charges and may avoid areas of such disturbance.



General hunting activity could disturb bowhead whales. Some Arctic Bay hunters believe that, during the 1990s, some bowhead whales and narwhals were disturbed by hunting activity at the Tununirusiup Kangiq&ua/Admiralty Inlet floe edge and have re-located to the Igloodik area. One informant from Pond Inlet expressed the belief that the present-day abundance of bowheads near Igloodik is due to emigration from the Pond Inlet area where bowheads were heavily hunted until about 1910. During the late stages of commercial whaling in Tinnujivik/Cumberland Sound, bowhead hunters were not allowed to shoot into the water, make unnecessary noises, or even pursue a herd of migrating belugas, as bowheads were deemed certain to be coming behind the belugas.

24. Informants from several communities noted that collisions and/or near-collisions between hunters' boats and bowhead whales have occurred in recent years; however, there were no explicit indications that the incidence of actual collisions/near-collisions has changed over the years. Some informants reported that Inuit hunters are often fearful or anxious when boating through or near groups of whales, or are reluctant to go boating when bowheads are around. The frequencies of collisions/near-collisions and hunter anxiety seem to be greatest in northern Foxe Basin (Igloodik and Hall Beach) and along the western shore of Baffin Bay (Pangnirtung, Qikiqtarjuaq, Clyde River, Arctic Bay, and Pond Inlet). All these areas have reported more bowheads in recent decades. Although Hudson Bay (Coral Harbour and Repulse Bay) informants have reported increases in bowhead population, only a very few commented on bowheads as a hazard to small boats.

25. Inuit hunters traditionally recognized bowheads of two types with respect to ease or difficulty of hunting: those that tended to be aggressive, retaliatory and very difficult or dangerous to hunt, and those that tended to be more docile and easier or less dangerous to hunt. Inuit bowhead hunters usually sought out and pursued the more docile bowheads. The aggressive bowheads were identified by a high, pointed, prominent protuberance on top of the head on which the blowhole is located, while the more peaceful, docile bowheads have much less of a raised protuberance so that the blowhole is located on a rather flattened area on top of the head. The testimony suggests that these bodily and behavioural differences are age-related, with the aggressive whales being younger than the docile ones. Hunters also tended to avoid bowheads asleep at the surface; those that were splashing with their tail flukes; and those whose breathing had a noisy, cracking sound. Bowheads with these and other characteristics were considered to be aggressive and were not hunted.

26. In traditional times, female bowheads and their calves were usually avoided by Inuit hunters. If the hunters wanted to harvest a calf, the mother would have to be killed first. If a calf is hunted or killed first, the female bowhead may become very aggressive and vicious and attack the kayak or small boat from which the calf was hunted. The mothers are

very protective of their young. If the calf was killed or separated from its mother in any other way, the female bowhead would linger around the area where it lost contact with its calf. In the succeeding summer, the mother would return to this same general area and be seen to grieve the loss of its calf and emit sad-sounding mourns, cries, or calls suggesting that she was still looking for her calf. This elicited a great deal of sympathy from the Inuit and is one additional reason why Inuit did not hunt bowhead calves.

27. Inuit recognize and have specific names for several age/size categories of bowhead whales (*arviq*; *arviit* -plural), from newborn calves to large adults.

28. Workshop informants at Repulse Bay distinguished two categories of bowhead whales based on size, fatness, and tastiness or desirability of the maktak and meat. These categories are: *kivaaqi* (the larger, fatter animals) and *papijjuq* (the smaller, thinner specimens). The elders preferred the fatter *kivaaqi*. However, it should be noted that in the Pond Inlet area, *kivaaqi* refers to any large mature female bowhead, and *papijjuq* refers to any medium-sized bowhead. This distinction appears to be one based on size and age, with the larger, older, fatter animals (*kivaaqi*) being preferred for eating. At Igloodik, *kivaaqi* refers to any bowhead.

29. Some bowhead whales, when harpooned, will head toward the shore while others will head out to sea. The whale's behaviour, after being harpooned, is believed to depend on the identity of the particular harpooner. According to this belief, a bowhead may desire to select its hunter; if harpooned by an undesired hunter, it will struggle and resist and pull the kayak or boat at great speed.

30. Clyde River informants described the look-out or leader bowhead – *silaaq*. This very large and apparently old bowhead has much white on its body, and keeps watch over the remainder of the herd, in particular warning the group of the presence of killer whales. The *silaaq* of Igaliqtuuq/Isabella Bay was named *Aallaaluk* (the Stranger). For at least several decades and until about the late 1990s, *Aallaaluk* returned every year to Isabella Bay.

31. Informants reported the occurrence, since about 1950, of beached (stranded) and ice-entrapped dead bowhead whales in several locations in the Study Area. The deaths of stranded bowheads were often attributed to killer whales. In September-October 1999, four dead bowheads (three with body lengths ranging from 7.3 to 9.1 metres) were found by Inuit in northern Foxe Basin in the vicinity of Igloodik and Hall Beach. Inuit had previously reported the occurrence of killer whales in the area, and at least two of the carcasses had scratches or marks suggesting killer whale attacks. Informants reported only two stranded and one dead ice-entrapped whale in the Igloodik area in past years. Hudson Strait informants (most from Cape Dorset) reported a few instances of stranded bowheads in that region. Over the last few



decades, a few strandings have occurred in the **Hudson Bay** area, especially in the Coral Harbour and Repulse Bay regions. Since about 1965, approximately six stranded whales have been found in the Repulse Bay region, and all but one were described as being 'young' whales. Some informants suggested that killer whales were involved in the deaths of some of these bowheads, while others suggested that some whales may have died from other natural causes. A stranded bowhead (body length of 9.4 metres) was found at Native Point, Southampton Island, in September 1999. In **Baffin Bay**, ice entrapments of bowheads appear to occur very infrequently.

However, one bowhead was discovered entrapped on March 20, 1997 in a *polynya* (an area of open water maintained by rapid currents) in Easter Sound, which is at the head of Tununirusiup Kangiq&ua/ Admiralty Inlet. The whale was alive and in apparent good condition until the time of ice break-up, and is believed to have survived. Pond Inlet informants stated that they had not seen or heard of an ice-entrapped bowhead in their region. Ice entrapment appears to occur very rarely and is probably not a



A bowhead undulates through the water. Photo by Susannah Weins, Department of Fisheries and Oceans

significant source of mortality at the population level. Informants from the **Baffin Bay** study region (except those from Kugaaruk and Arctic Bay) reported occurrences of stranded bowheads over the past few decades, and they often implicated killer whales in these bowhead deaths. Elders from Clyde River and Pangnirtung have found beached bowhead carcasses with broken bones but no other wounds and attributed the deaths to killer whale attacks. Several stranded bowheads have been reported in the Pangnirtung area in recent decades, and at least two in the Pond Inlet area. Informants have observed or heard about dead, stranded bowheads in the Qikiqtarjuaq region as well. At the floe edge in Tinnujivik/Cumberland Sound, bowheads sometimes swim into nets set for belugas or narwhals (or fish) and they damage or carry the nets away. However, no bowhead deaths due to contact with nets have been reported.

32. A small number of informants from the **Baffin Bay** region commented on the interactions between bowheads and species other than their predators and prey. Narwhals and/or belugas are sometimes seen in the company of bowheads at the floe edge or moving into inlets at the time of ice break-up, or on migration to and from the summering areas.

4.2 CULTURAL AND TRADITIONAL IMPORTANCE OF BOWHEADS TO INUIT

In former times as now, Inuit survival and well-being depended on wildlife. The Inuit strongly believed that wildlife was put on the earth to be used by them. They had strict guidelines and laws regarding harvesting of wildlife. Their beliefs and values required them to respect the animals in order to ensure that the wildlife would always be available to them.

The bowhead whale was one of the most important species harvested by Inuit. As with all other species, the Inuit had to respect the whale. Whaling was an important part of Inuit life. The Inuit ancestors developed specific tools and techniques to hunt the bowhead. At that time, all parts of this marine mammal were used; there was no waste. With the arrival of the commercial whalers, Inuit lifestyles began to change. The commercial whalers were only interested in the blubber, baleen, and sometimes the bones of the bowhead whale.

With the help of Inuit, they over-hunted the bowhead whale populations. By the time the whalers left the Arctic, the Inuit way of life had totally changed. Their hunting techniques and equipment were no longer the same. Later on, since the whale populations were so low, the government prohibited the bowhead hunt. These developments deeply affected the Inuit traditional way of living, to the extent that it was originally based on whale hunting.

Most Inuit would like to see the bowhead hunt resumed on a limited but continuing basis. There is a concern about losing Inuit knowledge of the bowhead whale and techniques for hunting it. The Inuit have a strong desire to preserve their culture, so intimately linked with bowheads and whaling. Many Inuit would like to respect and satisfy the wishes of many elders to once again have access to bowhead maktak. The bones from any bowhead whales harvested in future would have some modern uses, such as providing raw material for carvings and jewelry. However, future harvests would mostly be providing a highly valued source of country food. Most of the soft parts of the bowhead whale are edible, tasty and nutritious.

A few Inuit are reluctant to endorse the resumption of bowhead whale hunting. They believe that today's Inuit, based on their modern life styles



and new goals, do not need to harvest bowheads, and that they no longer demonstrate particular interest in hunting them. In addition, there is general concern about the state of knowledge and ability to actually hunt the bowhead whale. Bowhead whales have not been hunted for so long that today's generation of hunters does not have specific expertise in the matter. Consequently, several elders recommended that hunters should get thorough training before further bowhead hunting occurs. This would involve obtaining the knowledge, expertise, and advice of the elders, coupled with confirmation of a deep interest and commitment on the part of younger hunters and youth. With the help of elders, the traditional and cultural importance of the bowhead whale and the whale hunt, and the underlying system of values and beliefs, could be made part of the educational system.



Inuit Bowhead Knowledge Study Workshop, Repulse Bay, February 1996. Photo by Keith Hay

Many informants believe that Inuit knowledge about bowhead whales and about techniques for hunting them is being eroded, in large part as a result of hunters no longer paying much attention to bowheads which have not been a regularly hunted species for several decades. Some informants are concerned that this lack of attention and erosion of knowledge could lead to a general lack of concern and respect for and valuation of the bowhead, which in turn could lead to situations promoting abuse of this animal. Some view a renewed, ongoing limited hunt as a means of enhancing and restoring concern and respect for, and intimate knowledge about, this species. In this way, a renewed, sustainable hunt for bowhead whales may comprise one important element of a successful conservation strategy for the bowhead whale in Nunavut. Some Inuit also consider that a renewed hunt would contribute to the re-vitalization and preservation of a vanishing part of Inuit culture and identity, and of Inuit socio-cultural values and functioning, in the face of significant external forces of change in recent decades.

4.3 INUIT HUNTS OF BOWHEADS AFTER 1915

From examination of historical and archival records and the literature, Mitchell and Reeves (1982) obtained evidence that 24 bowhead whales had been harvested and/or found dead by Inuit in the Hudson Bay/Foxe Basin and Baffin Bay/Davis Strait regions, between 1919 and 1975 (see their Table 1). Through the Inuit Bowhead Knowledge Study (IBKS),

good evidence has been obtained of 12 bowhead hunts (with eight animals landed) that are not included by Mitchell and Reeves (1982). We believe, along with Mitchell and Reeves (1982), that the hunts, kills, and strandings uncovered in the historical and archival literature and in the IBKS represent only a portion of all the hunts, kills and strandings of bowheads that have actually occurred in the post-commercial whaling period (up to 1979). The information documented by Mitchell and

Reeves (1982) and the IBKS indicates that most post-commercial Inuit whaling occurred in northern **Hudson Bay** until about 1940, and in northern **Foxe Basin** in later years.

The 12 'new' hunts documented from the IBKS were distributed regionally as follows: **Baffin Bay** (3), **Hudson Strait** (2), **Hudson Bay** (6), and **Foxe Basin** (1).

4.4 MANAGEMENT AND POSSIBLE FUTURE RATES OF HARVESTING OF BOWHEAD WHALES

Many Inuit expressed the view that a limited and on-going harvest of bowheads is feasible and would be sustainable, given the evidence of present abundance and growth of the bowhead population in recent decades. However, many Inuit also pointed out that one bowhead can not provide for the needs of all Inuit in Nunavut in any given year. A regionally-based system of harvesting is generally favoured, with meat and maktak from a particular region remaining within that region. Considering both regional needs and the currently-perceived abundance of bowheads, the most frequent suggestions for an appropriate rate of harvesting were: one per year; one per two years; and two per year, one for each of Baffin and Kivalliq regions. Inuit would like to see bowhead populations properly and carefully managed, in order to ensure population growth and sustainable hunting well into the future.

