



**SUBMISSION TO THE
NUNAVUT WILDLIFE MANAGEMENT BOARD**

FOR

Information:

Decision: X

Issue: **Requests to change boundary of muskox management zone in Northern Kivalliq and Eastern Kitikmeot region, and to change TAH.**

Background:

Following a joint Qikiqtaaluk/Kitikmeot/Kivalliq RWO meeting with the Department of Environment (DOE) and NTI, held in April, co-management partners are proposing to change the boundary as well as the total allowable harvest (TAH) for muskoxen in the Northern Kivalliq and Eastern Kitikmeot regions. The new management area is labeled as MX/10 in the attached map (Figure 1.)

Acknowledging that the muskoxen in the Eastern Kitikmeot and the Northern Kivalliq are part of the same population, the RWOs took to resolution to remove the regional boundaries between the north Kivalliq, the east Kitikmeot and Melville Peninsula. The rationale for this request is that the two areas were assessed at the regional level but most of the information (mainly based on continuity of distribution over time and local knowledge) indicates that they are part of one large population. As per the NLCA, TAH are to be set for a given population. Since the regional boundary has no biological meaning, co-management partners have agreed to remove it in order to set one TAH for this shared population. The TAH will be set as the sum of the previously recommended TAH in each of the two areas being merged.

The current TAH for the Northern Kivalliq muskox sub-population is 42. Based on population survey results, reflecting an increase from 1,522 adult muskoxen in July 1999, to 2,341 in July 2012 (Figures 2 and 3, and Campbell and Lee, 2013), DOE recommends a TAH increase from 42 to 90. This utilizes a 5% harvest ratio and information on the estimated calf crop and is considered to be a sustainable harvest rate for the sub-population.

The current proposal seeks to combine this new proposed TAH of 90 for the Northern Kivalliq subpopulation with the current TAH of 100 for East Kitikmeot, for a total of 190 tags for the new, larger management unit (MX/10 in Figure 1.) RWOs will decide how the tags will be distributed.

Consultations:

As mentioned above, DOE and NTI met with the RWOs, and at their meeting in Taloyoak, the KRWB passed a resolution (see KRWB resolution, April 2013, attached) to support the development of a proposal to request approval from the NWMB to change the management boundaries and TAH. KRWB and KWB both consulted extensively with their respective HTOs in advance of proceeding with this resolution. Since 2010, DOE has been consulting extensively with Kitikmeot region HTOs to inform the development of a management plan for Kitikmeot muskox. HTOs are in support of the proposed new management unit boundaries, as well as the TAH change.

Recommendations:

Based on support received at the recent joint RWO meeting in Taloyoak in April, 2013, DOE recommends the removal of boundaries separating the Northern Kivalliq and Eastern Kitikmeot muskox management units, to create an amalgamated management unit: MX/10. This is consistent with current understanding on the muskox population distribution.

It is also recommended to increase the TAH level from 42 to 90 for the Northern Kivalliq sub-population, based on recent evidence of population increase. Upon combining the formerly separate management units, the new TAH for the newly created MX/10 would become 190.

References:

Kitikmeot Regional Wildlife Board/Hunters and Trappers Organizations Resolution Number 0413003. April 25, 2013.

Campbell, M. and Lee, D. Re-evaluation of Muskoxen (*Ovibos moschatus*) populations in the Kivalliq Region of Nunavut. Draft Report, January 2013.

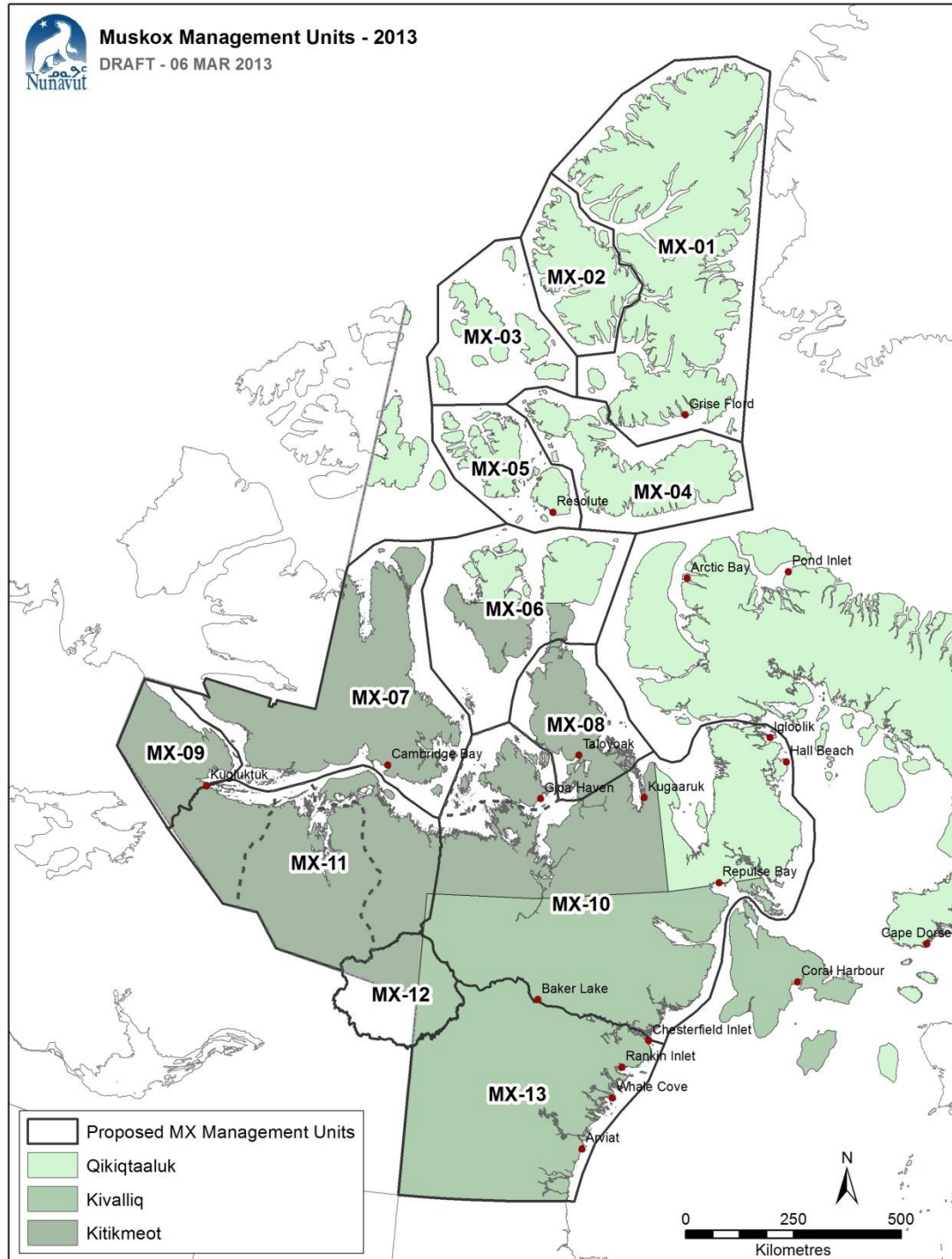


Figure 1. Proposed new Muskox Management Units.

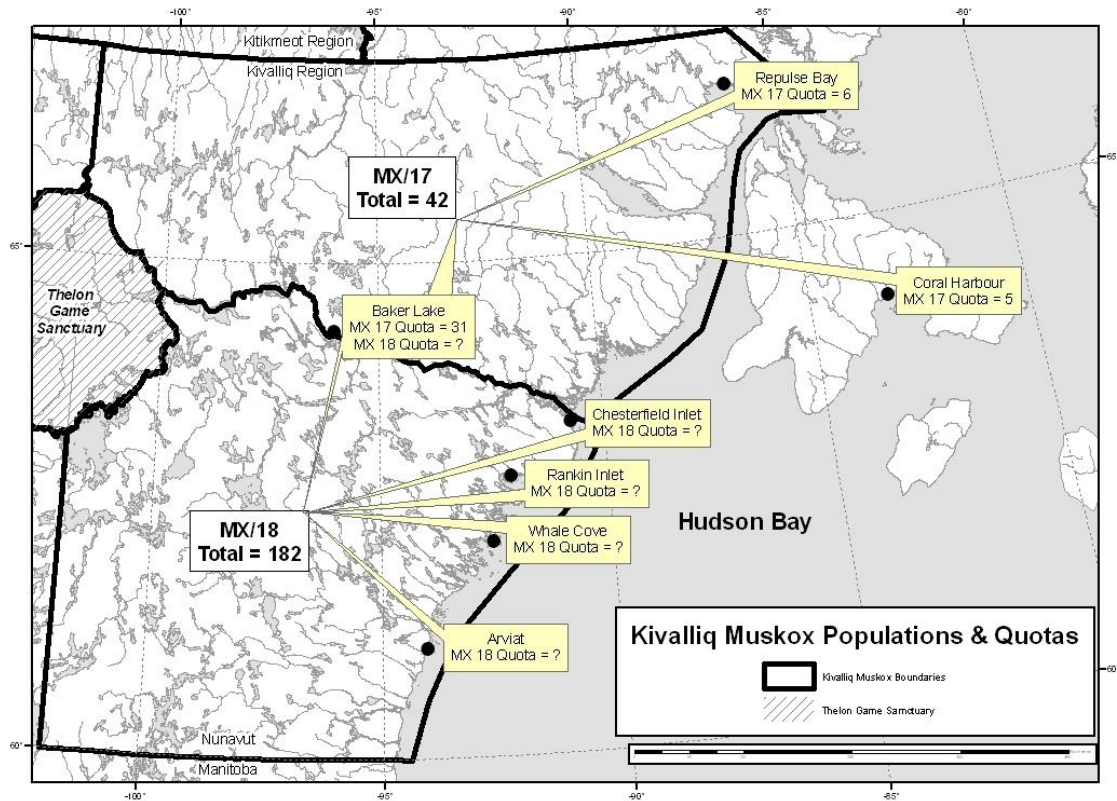


Figure 2. The Northern (MX/17) and Central (MX/18) muskox subpopulations and associated quotas based on the current 2012/2013 exemption permit.

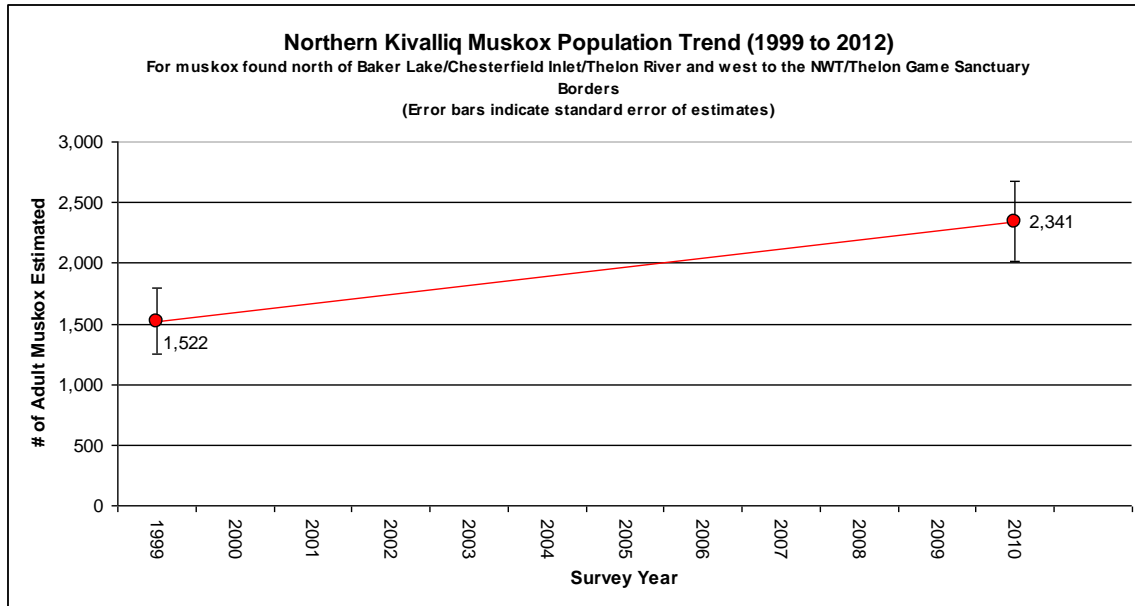


Figure 3. Trends of muskox abundance within the Northern Kivalliq subpopulation, July 2012.

***Re-evaluation of Muskoxen (Ovibos moschatus) Populations in
the Kivalliq Region of Nunavut***

Status Report to Co-Management Partners

Draft Report

January, 2013

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Introduction/Summary:

Prior to the enactment of protection in 1917 (Burch, 1977), muskox subpopulations throughout the central arctic were hunted to near extirpation. Muskox subpopulations throughout Nunavut are currently re-colonizing much of their historical range, but there remain gaps of information on the status of muskox subpopulations in much of the eastern Mainland (Fournier and Gunn, 1998). At its greatest extent the distribution and abundance of muskox in the Kivalliq region of Nunavut have occurred within an area extending south of Latitude 66° north, west to the NWT/Thelon Game Sanctuary boundaries, east to the Hudson Bay coast line and south to the Manitoba border. Distribution and abundance of muskox within the Kivalliq reliably occurs within a slightly smaller geographic area that has been expanding for over 50 years. Some of the early management zones, reflecting muskox distribution of the time are shown in Figure 1. Kivalliq muskox subpopulations were last estimated using fixed-width line transect surveys in July of 1985, July 1986, July 1991, and July 1999. By 2010 concern was raised over the ten year lapse of information coupled with hunters observations of muskox closer to communities. A re-evaluation of the muskox status for this region was conducted in July 2010 and 2012. Based on these most recent survey results, muskox numbers within the central and northern Kivalliq region have steadily increased.

To date there are no indications of health problems within the Kivalliq subpopulations. A research program examining the distribution of the lungworm (*Omingmakstrongylus pallikuukensis*) amongst mainland muskox was initiated in MX/18 but all tests have shown no indication of presence in the Kivalliq subpopulations. The collection of lower jaws to examine age structure has been ongoing. Future research should examine the extent to which muskox have occupied range outside presently defined management areas.

Recently, hunters have been reporting increased observations of muskox closer to their communities both south and east of previously known distributions (Mulders and Bradley, 1991; Rankin Inlet HTO Pers. Comm.; Baker Lake HTO Pers Comm.; Arviat HTO Pers Comm.; Chesterfield Inlet HTO Pers Comm.; Repulse Bay HTO Pers Comm.; Coral Harbour HTO, Pers Comm.; Whale Cove HTO, Pers Comm. 2008). Ideally communities in the Kivalliq region would like to have easier access to healthy muskox. Both subpopulation estimates and distribution observations discussed herein will provide information that will enable regional wildlife organizations, local HTOs and biologists to determine the potential long-term effects of current harvest regimes on muskox subpopulations in the Kivalliq while providing information on the continued expansion of muskox into their historical range.

Based on the results derived from strip transect quantitative methods, total allowable harvests for the 2 subpopulations of muskox within the Kivalliq region (one north of the Thelon/Chesterfield Inlet waterways (Northern Kivalliq - MX/17)

and the second south (Central Kivalliq – MX/18) are currently based on 5% of the estimated adult muskox population (lower 95% confidence limit). At present within the Nunavut Wildlife Act Regulations a total allowable harvest of 42 is recommended for MX/17 and 182 indicated for MX/18 (Figure 2).

Sight-resight and distance sampling analysis are ongoing and will appear in their entirety following the completion of a fully reviewed GN DoE file report. The completion of the file report is expected in the fall of 2013 and will replace any and all previous reports produced for co-managers including the present work. As other analyses are ongoing, the authors of this report and the GN DoE reserve the right to update the results presented in this report. Any and all GN DoE research projects are required to produce a comprehensive thoroughly peer reviewed File Report following the completion of the research program. The GN file reports represent the most comprehensive and complete reporting format and as a result will be the main documents used to make management recommendations.

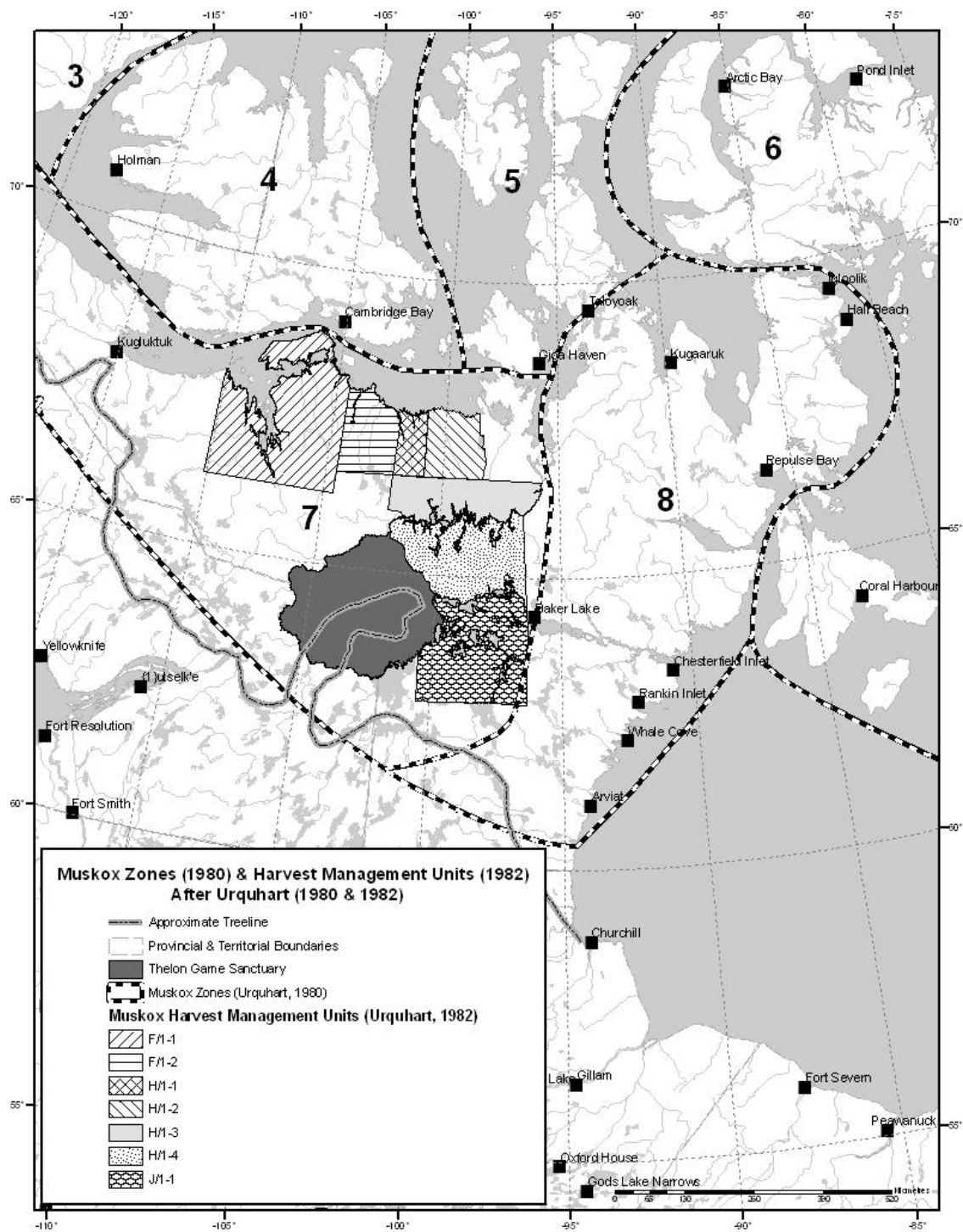


Figure 1 Early muskox management zones used to promote range expansion. During these periods muskox were scarce outside of indicated zones.

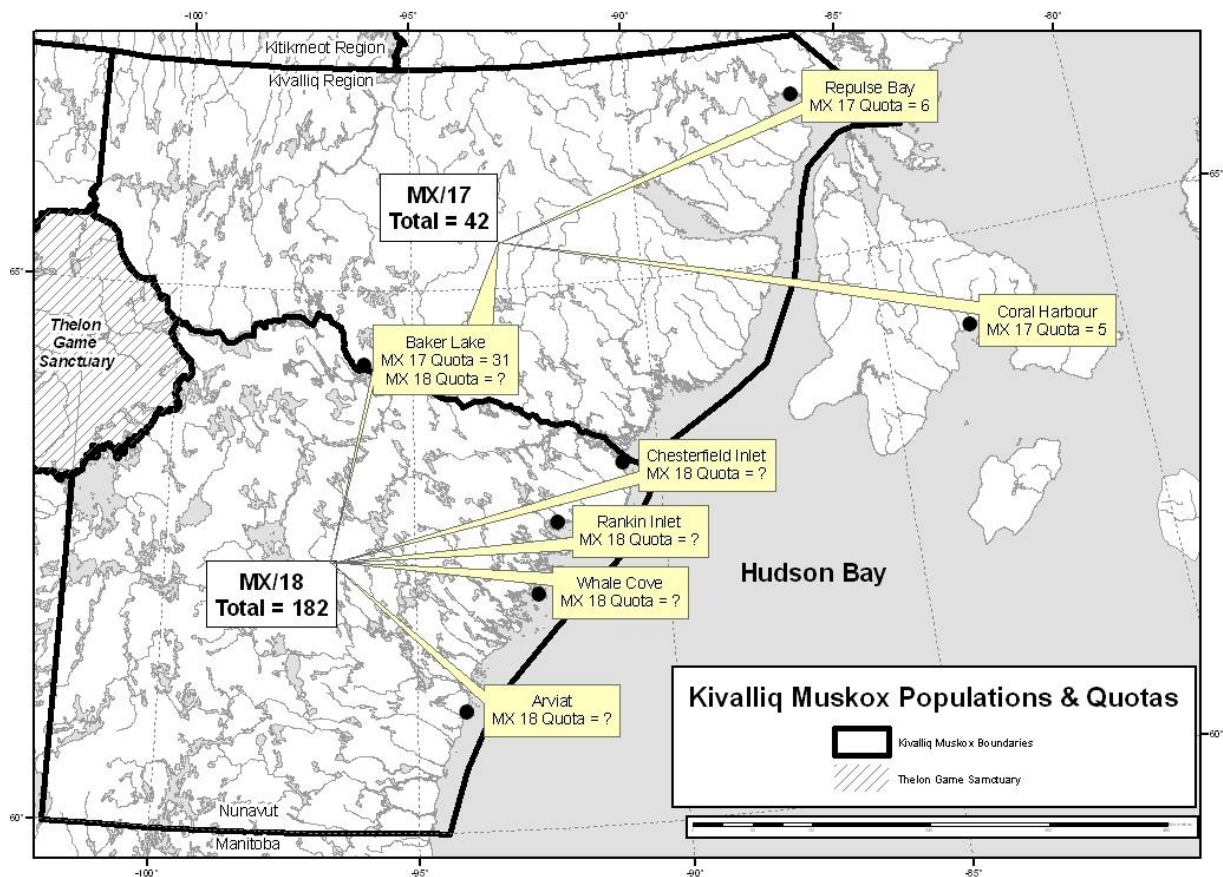


Figure 2 The Northern (MX/17) and Central (MX/18) muskox subpopulations and associated TAH. The Kivalliq Wildlife Board carries the mandate of harvest distribution amongst Kivalliq communities (TAH is subject to revision).

Objectives:

The objectives of the project were to utilize *Inuit Qaujimajatuqangit* and aerial survey methods to determine the subpopulation status of muskox in the Central (MX/18) and northern (MX/17) Kivalliq Region of Nunavut. The results are currently being used to address requests by Kivalliq HTOs to sustainably harvest more muskox closer to their communities. The results of the surveys have provided recommendations for harvest levels (TAH) and population boundaries as well as the adjustment to non quota limitations (NQL). Specifically, the information from these surveys has been used to:

- 1) Determine the numbers of muskoxen within MX/17 and 18 as part of the requirement outlined in the central Kivalliq muskox management plan developed by the Kivalliq Regional Wildlife Board (KWB) in partnership with Nunavut Tunngavik Inc., and the Department of Environment, Government of Nunavut. Muskox subpopulations in the Kivalliq must be estimated regularly in order to provide recommendations on sustainable harvest.
- 2) Determine the number of muskoxen on the periphery of previously delineated distributions. A comprehensive estimation of the muskoxen subpopulation outside known and historic distributions needs to be updated. Observations made by hunters suggest that there has been an increase in the number of muskox and that muskox had occupied a much larger range than reported in July 1999. The expansion of muskox beyond previously delineated boundaries is confirmed in this report. The shorter growing season and thicker snow cover reported for the eastern arctic could make muskox expansion into historic range more sensitive to harvesting (Gunn, 1983; Forchhammer and Boertmann, 1993). In order to develop harvest management recommendations, effort was put into determining the present status of the periphery of muskox subpopulations to previous management zones.

Study Area:

The July 2010 and 2012 central and northern Kivalliq muskox surveys incorporated an area stretching from the Hudson Bay coast to the Kivalliq regional boundary in the West, and north from the Manitoba boundary to latitude 66° north. The study area exists primarily within tundra habitats characterized by continuous permafrost, while a smaller portion extends along the fringe of the forest ecotone (Taiga) (Figure 1).

The central and northern study areas included portions of the Maguse River Upland, Dubawnt Lake Plain/Upland, Back River Plain, and the Garry Lake Lowland ecoregions of the Southern Arctic ecozone, and the Wager Bay Plateau ecoregion of the Northern Arctic ecozone (Environment Canada 2001;

Table 1). These ecoregions are characterized by a cover of shrub vegetation consisting of dwarf birch (*Betula glandulosa*), willow (*Salix* spp.), and alder on warm, dry sites. Poorly drained sites are dominated by willow, sphagnum moss, and sedge. The region is associated with areas of continuous permafrost and Turbic Cryosolic soils, but unfrozen organic (Mesisol and Regosolic) soils also occur. Bedrock forms broad, sloping uplands and lowlands. Hummocky bedrock outcrops covered with till are dominant, and prominent esker ridges occur in some parts of the area. Twenty-five to 50% of the Maguse River Upland ecoregion is wetlands that are characteristically lowland low- and high-centered polygon fens (Environment Canada 2001). Sandy flats sparsely covered with vegetation characterize the Dubawnt Lake Plain/Upland ecoregion, and the southwestern portion is characterized by rolling terrain forming broad sloping uplands and lowlands where small and medium sized lakes are common. Soils in most of the southern study area are Turbic and Static Cryosols on level to undulating discontinuous veneers of sandy morainal and fluvio-glacial deposits. The small portion of the central study area that falls within the northern Arctic ecozone is characterized by discontinuous cover of tundra vegetation including dwarf birch, willow, Labrador tea, *Dryas* spp., and *Vaccinium* spp. Lichen-covered rock outcroppings are common (Environment Canada 2001).

Table 1. Ecoregions of the central and northern muskox survey study areas in the Kivalliq and northeast Kitikmeot region of Nunavut.

Study Area	Ecozone	Ecoregion
Central	Southern Arctic	Maguse River Upland
		Dubawnt Lake Plain/Upland
		Back River Plain
		Garry Lake Lowland
Northern	Northern Arctic	Wager Bay Plateau
	Southern Arctic	Chantrey Inlet Lowland
		Queen Maud Gulf Lowland
	Northern Arctic	Wager Bay Plateau
		Victoria Island Lowlands
		Boothia Peninsula Plateau

Methods:

Survey Area:

Two methods were used to meet the stated objectives. The first was a collection of *Inuit Qaujimajatuqangit* and local knowledge to determine currently known distributions of muskox. Detailed maps were drafted and multiple copies sent to the communities of Rankin Inlet, Baker Lake, Whale Cove, Chesterfield Inlet and Arviat. Wildlife officers collected muskox location and abundance information through discussions with active hunters within their communities. The information collected was then mapped using GIS (Geographical Information System) software, and used to delineate the survey area including a buffer. The information collected included a waypoint of the observation, the date, the number and composition of the herd observed, and an estimation of their condition. Once the survey study area was designated, systematic transects, drawn with a random starting point, were placed throughout the survey study area at a spacing of 7.0 km which when flown at an altitude of 152 meters (500 ft) with a maximum strip width of 2000 meters yielded 29.2 percent coverage of the entire survey area (Figure 3). Due largely to the exceptional sightability of muskox in July, visual transect survey methods are widely accepted as being the most cost effective means of estimating muskox subpopulations while still providing an acceptable level of precision (Case and Graf, 1986; Graf and Case, 1989; Graf *et al*, 1989; Gunn, 1995; Mulders and Bradley, 1991).

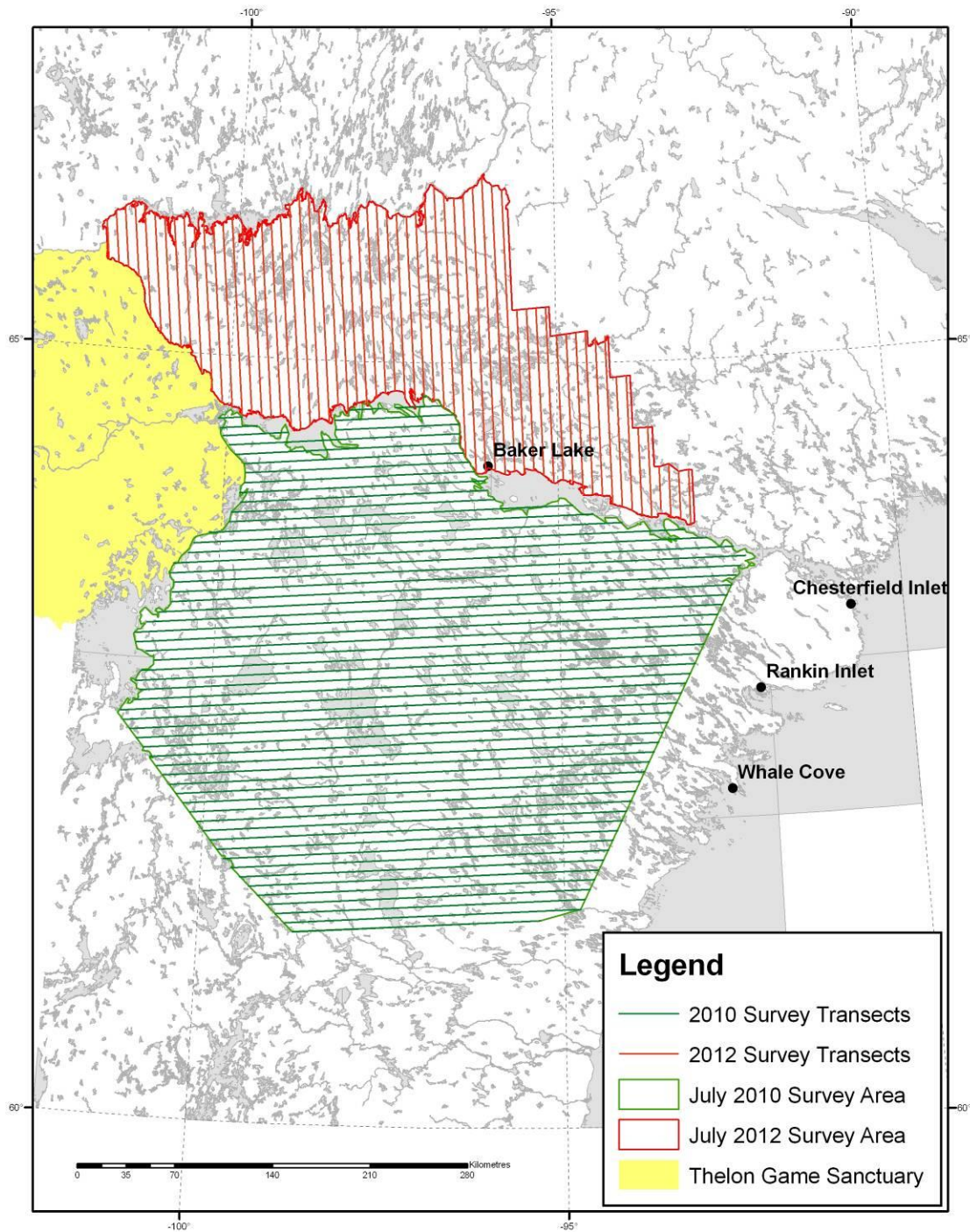


Figure 3 Study area and transects for the July 2010 and 2012 central and northern Kivalliq Muskox surveys. Study area in 2010 was divided into a western and eastern stratum based on estimated densities from IQ studies and past survey results.

Aircraft Configuration

Both surveys were flown using a Cessna 206 Grand Caravan high wing single engine turbine aircraft based out of Rankin Inlet and Baker Lake. Strip widths of 0 to 250 meters, 250 to 500 meters, 500 to 750 meters and 750 to 1000 meters were established on the wing struts on both sides of the aircraft using streamers to mark off the 0 meter, 500 meter and 1000 meter markers and tape to delineate the remaining 250 and 750 meter segments (Figure 4). Strip width (w) was calculated using the formula of Norton-Griffiths (1978):

$$w = W * h/H$$

where:

W = the required strip width;

h = the height of the observer's eye from the tarmac; and

H = the required flying height

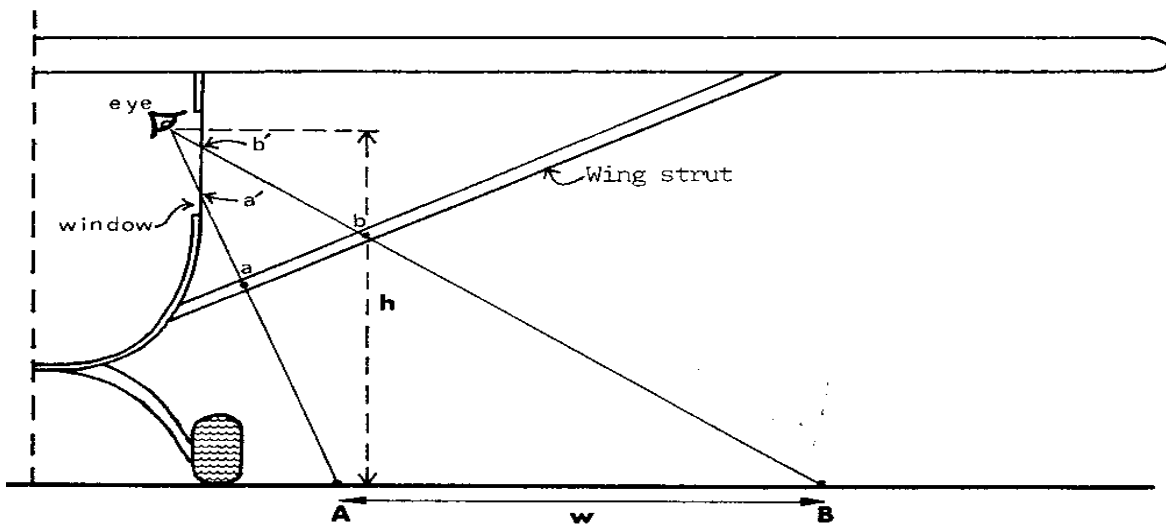


Figure 4. Schematic diagram of aircraft configuration for strip width sampling (Norton-Griffiths, 1978). W is marked out on the tarmac, and the two lines of sight $a' - a - A$ and $b' - b - B$ established. The dowels are attached to the struts at a and b . a' and b' are the window marks.

Strip width calculations were confirmed by flying perpendicularly over runway distance markers periodically throughout the survey. The strip width area for density calculations was 1000 m out each side of the aircraft, for a total of 2000 m along each transect. The further division of the 1000 meter markers into 250 meter segments was to facilitate estimates using distance sampling techniques.

Due to the size of the study area, the relatively limited data on muskox densities within much of the study area, and time and other logistic limitations, it was

decided to allocate all of the survey effort into one systematic random transect survey over both survey years. Survey altitude was maintained as close as possible to 185 m above ground level (agl) using a radar altimeter. Ground speed was maintained between 125 and 190 kilometers per hour. The central Kivalliq muskox survey was initiated July 10, 2010 and completed July 22, 2010, while the July 2012 northern Kivalliq muskox survey was initiated July 6th, 2012 and completed July 11th, 2012.

The entire survey was set up as an independent double observer sight-resight (capture/mark-recapture) distance sampling platform utilizing a survey crew of 7; two data recorders/navigators, two left side observers, two right side observers and the pilot (Figure 5). Two of the selected observers, one for each side of the aircraft, had experience surveying wildlife visually from aircraft. The two remaining observers were selected by the local HTO pertinent to each of the survey areas (Rankin Inlet, Baker Lake, and Arviat). The observers were further divided into front and rear teams, each isolated from the other using visual barriers between the seats as well as isolated through the use of two independent intercom systems monitored by each of a front data recorder/navigator and a rear data recorder/navigator. The pilot's responsibilities were to monitor air speed and altitude while following transects pre-programmed on a Garmin GPS 176 Geographic positioning system (GPS). The data recorder/navigators were responsible for monitoring a second and third identically programmed GPS unit for the purposes of double-checking the position as well as to record the waypoints and numbers of observed adult and calf muskox groups on data sheets. The responsibilities of the observers were to monitor their 1000 meter segmented strips and call out numbers of muskox, separated by adults and calves observed within each designated 250 meter wide sub-strip (distance sampling). The rear right and front left observers, the pilot and the two data collector/navigators remained consistent throughout the 2010 survey while the front left observer was switched out once following two days of surveying and the rear left switched out three times throughout the duration of the survey. The front and rear data recorders, and left front observer, remained constant throughout the 2012 survey while the remaining observers were replaced at least once. Only counts of adults and yearlings were used in the population estimate.

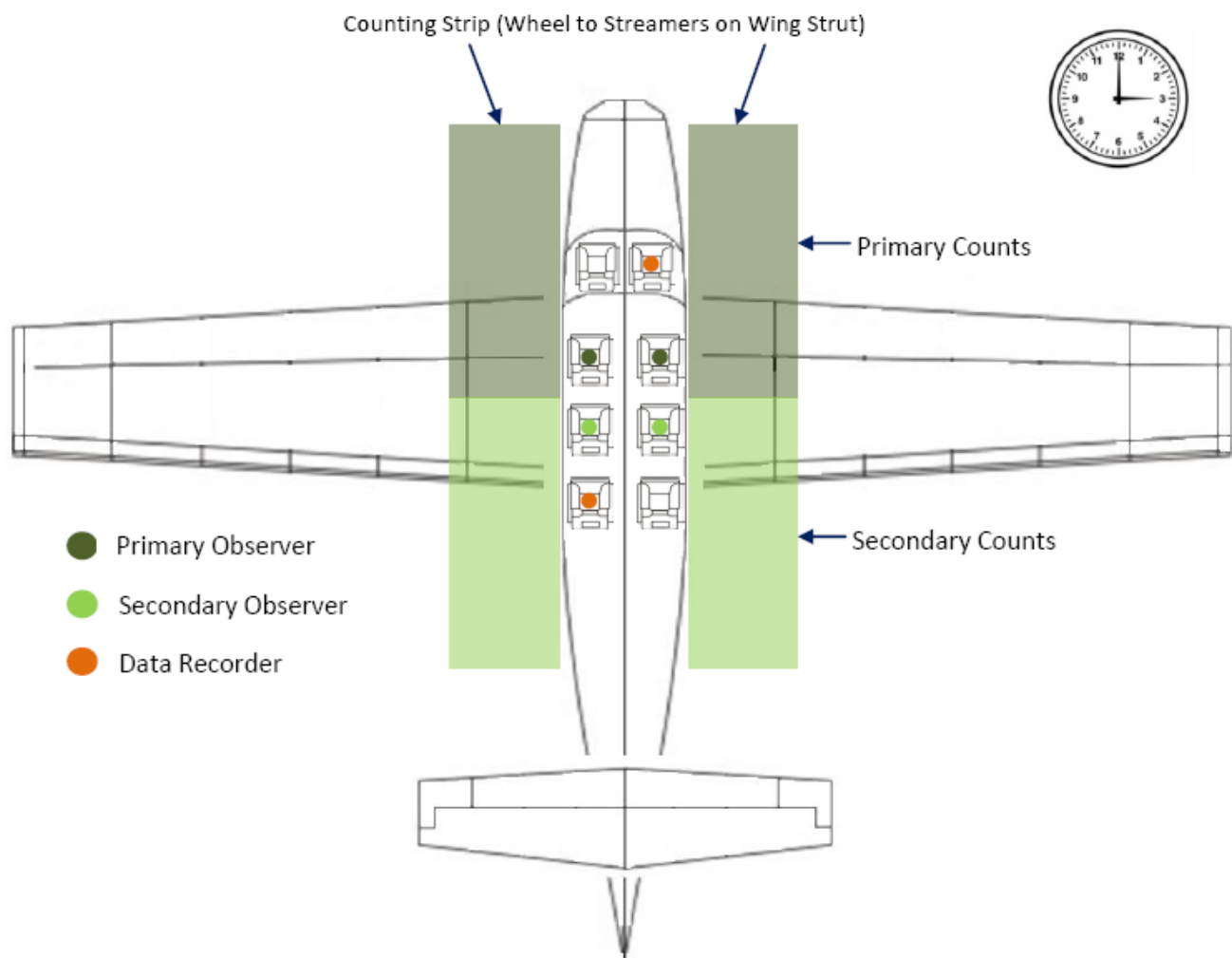


Figure 5 Observer position for the double observer method employed on this survey. The secondary observer calls muskox not seen by the primary observer after the muskox have passed the main field of vision of the primary observer. The small hand on a clock is used to reference relative locations of muskox groups (e.g. “muskox group at 3 o’clock” would suggest a muskox group 90° to the right of the aircrafts longitudinal axis.).

Statistical Analyses

Survey data collected July 2010 within each of two pre-stratified stratum, and July 2012 were analyzed using Jolly's Method 2 for unequal sample sizes (Jolly 1969 *In* Norton-Griffiths 1978). Only counts of adults were used for the final population estimates. Lake areas were not subtracted from the total area calculations used in density calculations.

Sight-resight and distance sampling analysis are ongoing and will appear in their entirety following the completion of a fully reviewed GN DoE file report. The completion of the file report is expected in the fall of 2013 and will replace any and all previous reports produced for co-managers including the present work. As other analyses are ongoing, the authors of this report and the GN DoE reserve the right to update the results presented in this report. Any and all GN DoE research projects are required to produce a comprehensive thoroughly peer reviewed File Report following the completion of the research program. The GN file reports represent the most comprehensive and complete reporting format and as a result will be the main documents used to make management recommendations.

Project Schedule:

Activity	Start Date	Completion	Status
IQ Study	Dec. 2009	March 2011/12	Complete
Survey Planning	Dec. 2009	July 2010/12	Complete
Aerial Survey	July 10 th , 2010	July 22 nd , 2010/12	Complete
Initial Reporting to HTOs	Jan. 10 th , 2011	Feb. 3 rd , 2011/13	Ongoing
Survey Analysis	July 22 nd , 2010	March 2013	Ongoing
Reviewed DoE File Report	July 22 nd , 2010	Oct. 2013	In Preparation
Community Consultation	August 2011	Jan. 2012	Awaiting KWB meeting

Preliminary Results and Discussion:

Central Kivalliq Muskox Survey

The Initial July 2010 estimate of 4,736 +/- 1,099 (95% CI) showed a significant increase from July 1999 results of 2,143 +/- 396 (95% CI) (Figure 6). In turn the July 1999 estimate showed an increase over July 1991 where 1,203 +/- 284 (95% CI) adult muskox were estimated (Figure 6; Table 2).

A survey flown in July 1991 found muskox in a much smaller area than the July 1999 survey over the same general area, yet at similar densities. The 2010 survey results did indicate an increase in abundance but for the first time since 1985 showed a dramatic decline in muskox density within the survey area. This could be an artifact of the much larger survey area or it could suggest a punctuated/accelerated range expansion since the July 1999 survey. Further research and analysis is necessary before making any conclusions as to the mechanisms behind these survey findings.

Limitations to comparisons made with pre-1999 muskox surveys in the central Kivalliq were noted above. The primary limitation relates to variations in survey study areas, whereas the 1999 and 2010 central Kivalliq surveys included a broader area designed to encompass all muskox within the central Kivalliq region and as a result were overlapping.

Central Kivalliq muskox were found over a much broader area than previously recorded suggesting not only an increase in abundance but an expansion of their range as well (Figure 7, Figure 8). During the July 1999 survey muskox were more concentrated within smaller geographic areas than observed in July 2010. One of the most surprising observations was the presence of numerous carnivores, and most specifically grizzly bears compared with earlier survey findings. A total of 15 grizzly bears were observed within the survey area. All were observed in very good to exceptional body condition (Figure 9). This represents a considerably higher number than observed during the July 1999 survey though the survey area in July 1999 was smaller.

Observations of muskox in what was previously considered marginal habitat raised several questions as at the same time densities in what was previously considered better quality habitat dropped substantially. All these observations raise questions as to whether muskox populations are poised to increase further or are reacting to some environmental or anthropogenic changes within the environment. Further analysis is ongoing in attempts to explain the changes observed in July 2010.

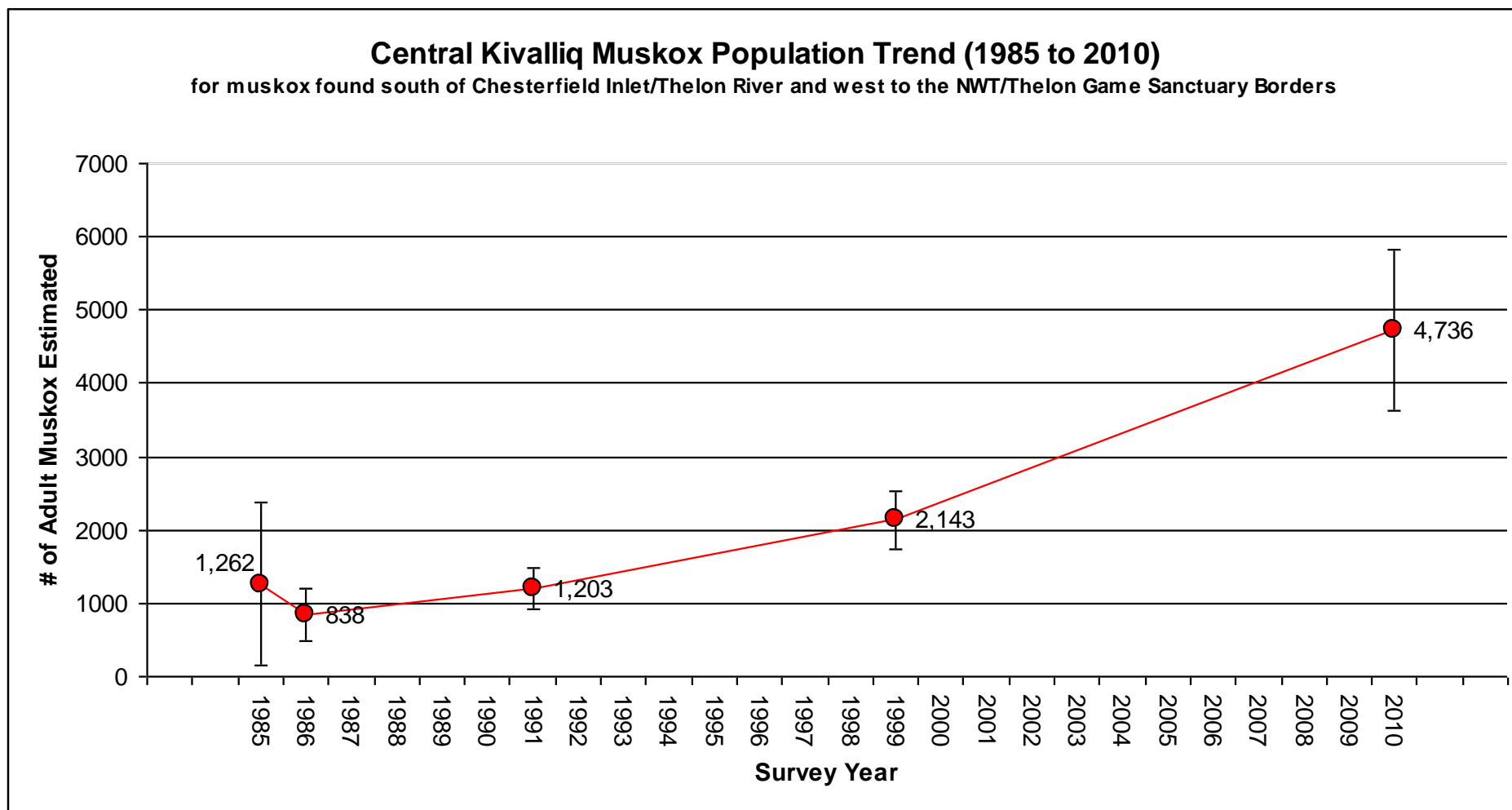


Figure 6 The trend of the central Kivalliq Muskox Population from 1985 through July 2010.

Table 2. A summary Central Kivalliq muskox survey results south of Chesterfield Inlet/Thelon River and west to the NWT/Thelon Game Sanctuary boundaries.(1985–2010).

<i>Year</i>	<i>Total stratum area (km²)</i>	<i>Population estimate</i>	<i>Standard error</i>	<i>CV</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>% calves</i>	<i>Authors</i>
1985 (Nov)	19,706	1,262	563	0.45	159	2,365	17.9	Case & Graf 1986
1986 (July)	8,261	838	176	0.21	476	1,200	11.5	Case et al. 1986
1991 (July)	12,555	1,203¹	145	0.13	919	1,487	15.9	Mulders & Bradley 1991
1999 (July)	19,475	2,143	199	0.09	1,747	2,539	15.0	Campbell & Setterington, 2001
2010 (July)	114,618	4,736	554	0.12	3,637	5,835	15.1	This Study

¹ This calculation of the 1991 population estimate includes lake areas, while Mulders and Bradley (1991) subtracted that area in their file report.

Figure 1

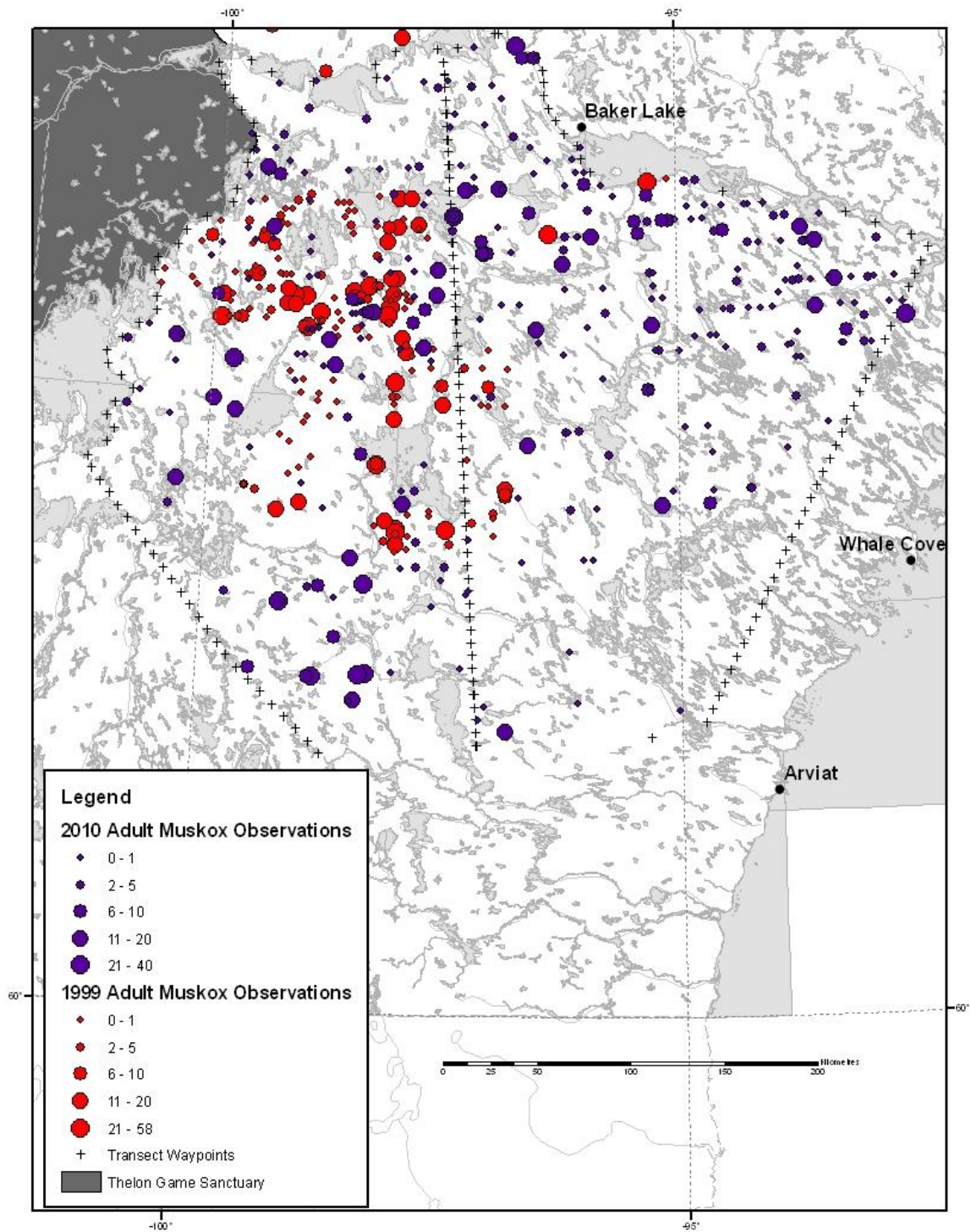


Figure 7 Central Kivalliq muskox survey results from July 1999 and July 2010.

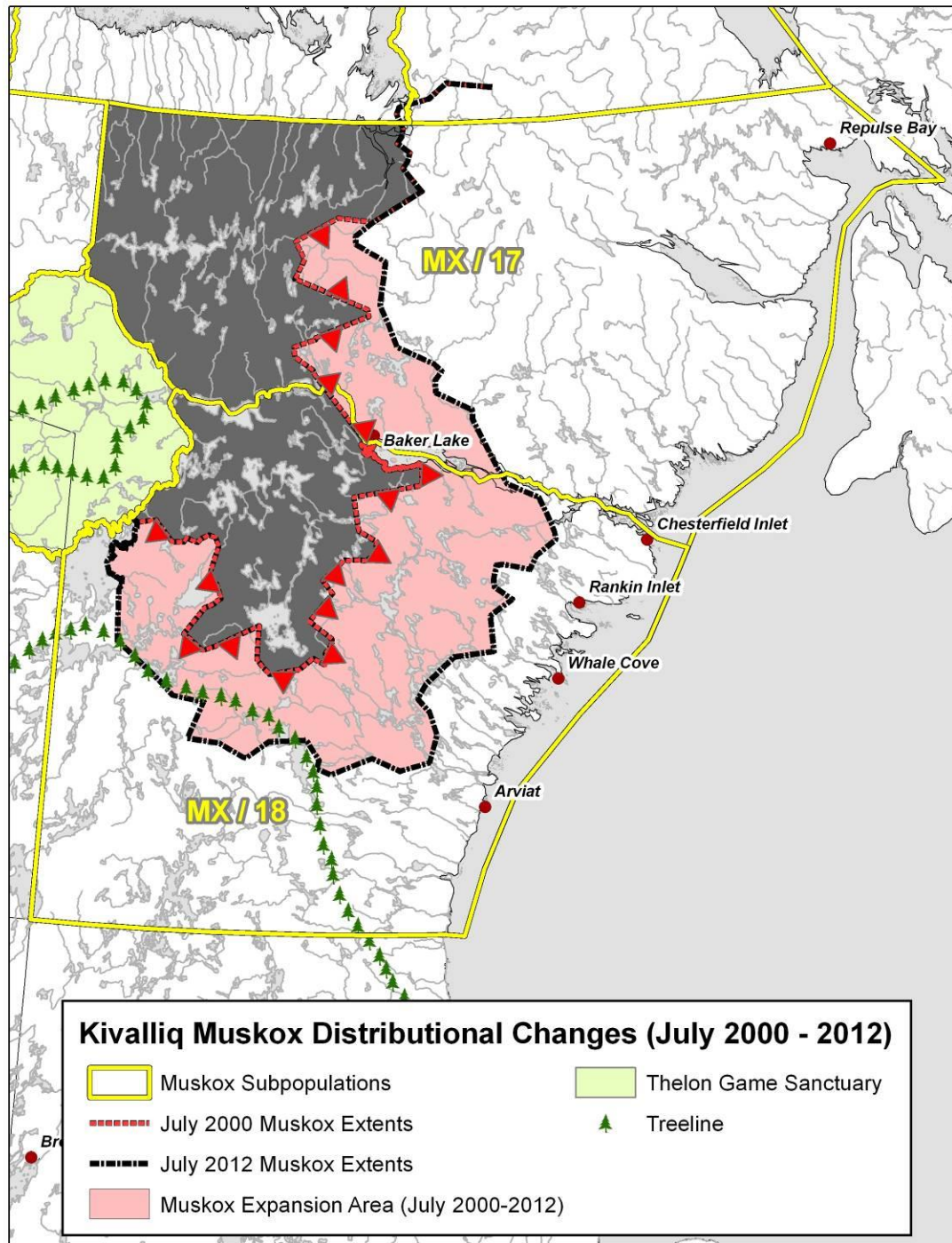


Figure 8 Indicated central and northern Kivalliq range expansion between July 1999 and July 2010 (Central Kivalliq) and July 2012 (Northern Kivalliq).

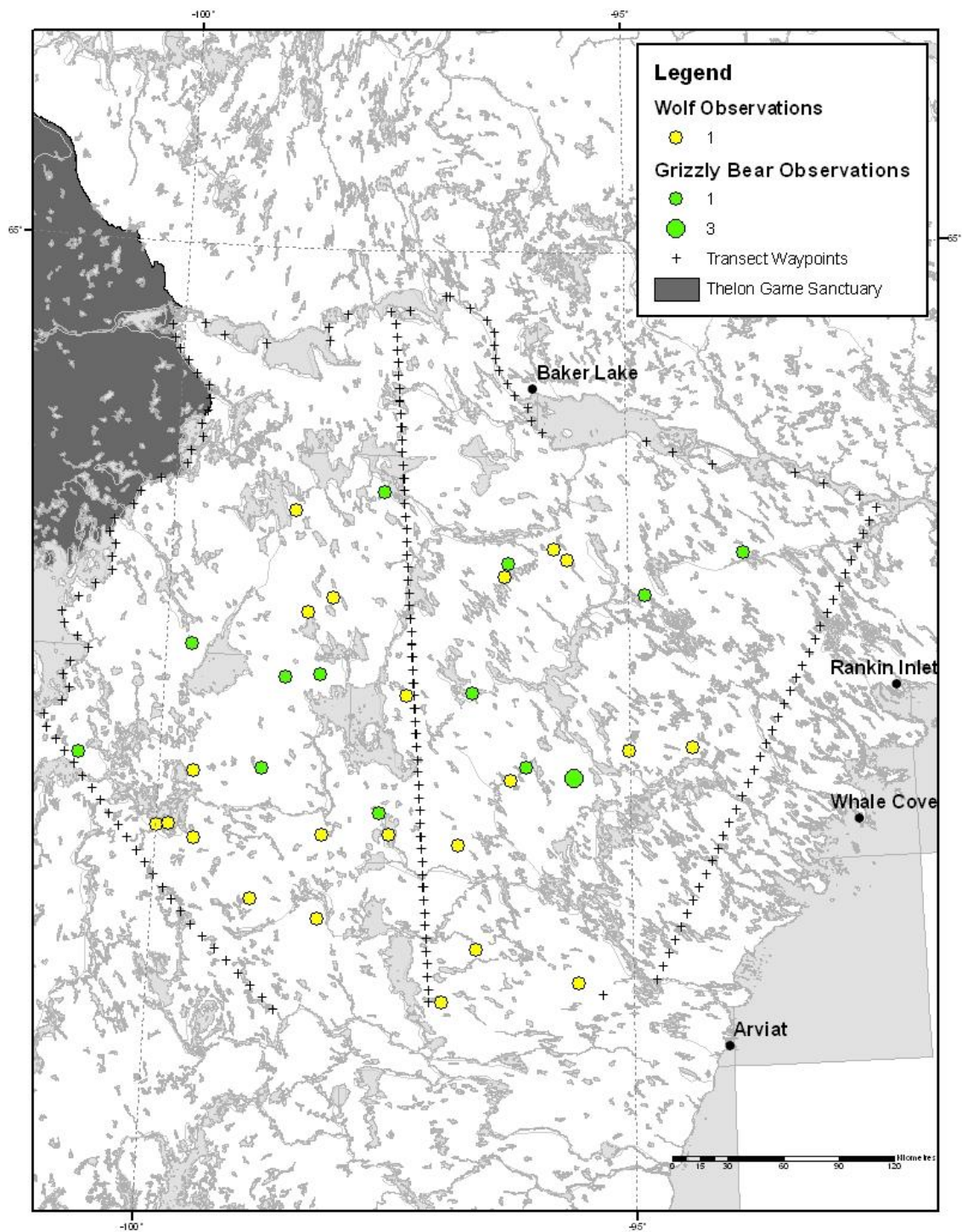


Figure 9 Carnivore observations during the July 2010 central Kivalliq muskox survey.

Northern Kivalliq Muskox Survey

Results of the 2012 northern Kivalliq muskox survey are still in the analysis stage but clearly indicate an increase from the July 1999 abundance estimates (Figure 10). Initial estimates show the northern Kivalliq muskox population to have increased from an estimated 1,522 (SE = 331; CV = 0.22) in July 1999 to 2,341 (SE = 275; CV = 0.12) in July 2012. As with the central Kivalliq population, survey observations (Figure 11) also suggest an expansion in the subpopulations geographic distribution eastward (Figure 8).

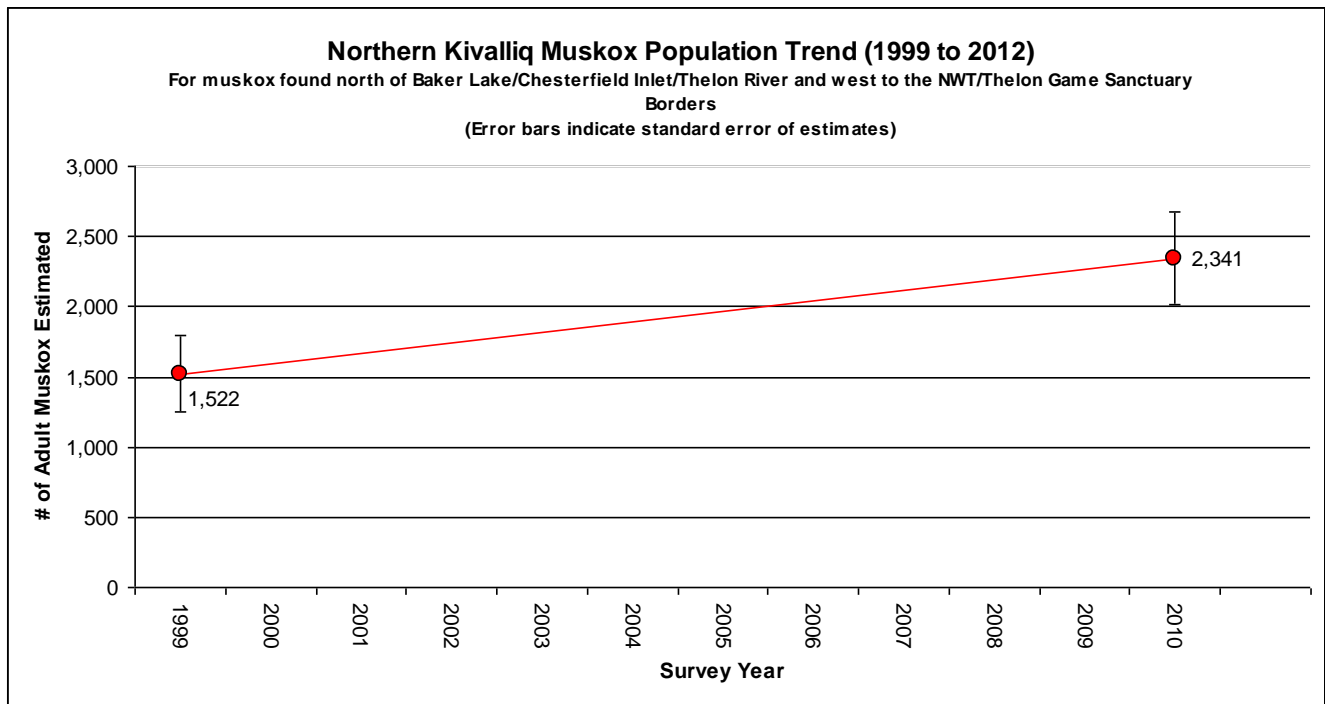


Figure 10 Trends of muskox abundance within the northern kivalliq subpopulation, July 2012.

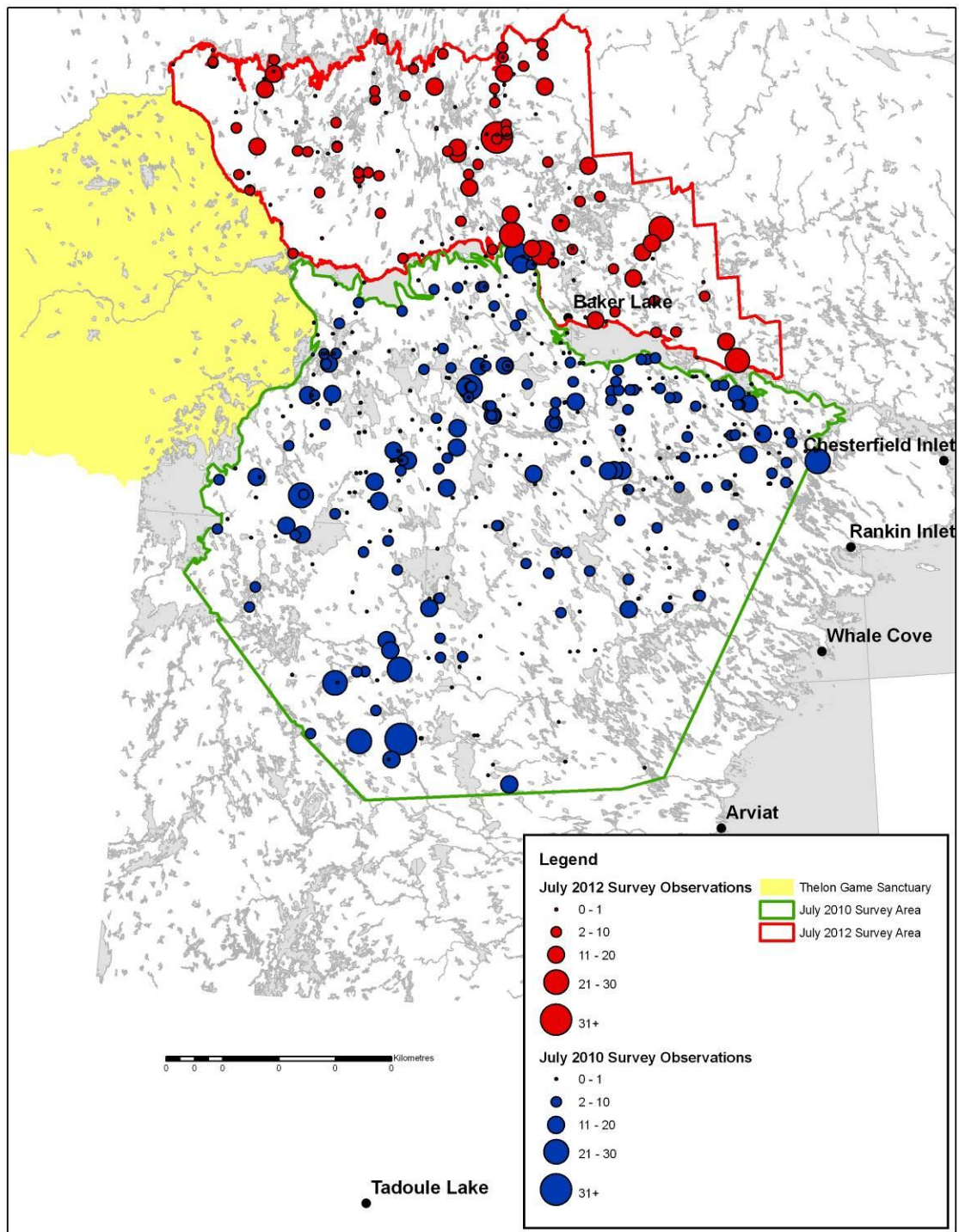


Figure 11 Survey observations of muskox groups for the July 2010 and 2012 central and northern Kivalliq muskox subpopulations.

Management Findings/Actions/Recommendations

Central Kivalliq Muskox Subpopulation

- 1.** The central Kivalliq muskox subpopulation (MX/18) has continued to expand outside of previously documented distributions, particularly to the south (towards the Manitoba Border) and eastward (to the coast of the Hudson Bay);
- 2.** A management plan was developed in 2010 by the Kivalliq Wildlife Board, NTI and GN DoE. The management plan utilizes the results of abundance surveys to help guide management actions and recommendations.
- 3.** The Central Kivalliq Muskox subpopulation has increased from 2,501 +/- 642 (95% CI) adult muskox in July 1999 to 4,736 +/- 1,099 (95% CI) in July 2010 (Figure 6 & 12).
- 4.** Utilizing a harvest ratio of 5% estimated to foster stability and based on the estimated calf crop, we recommend the central Kivalliq muskox subpopulation TAH (Total Allowable Harvest) be increased from 93 to 182 muskox.
- 5.** We also recommend that all NQL (Non Quota Limitations) for the central Kivalliq subpopulation of muskox be removed as there is currently no conservation issue that would benefit from these measures.
- 6.** To improve TAH recommendations and overall management, additional muskox research should also focus on barren-ground grizzly bear abundance, distribution and feeding behavior and their effects on muskox behaviour and ecology.
- 7.** The central Kivalliq muskox subpopulation (MX/18) boundaries should remain as indicated (Figure 12).

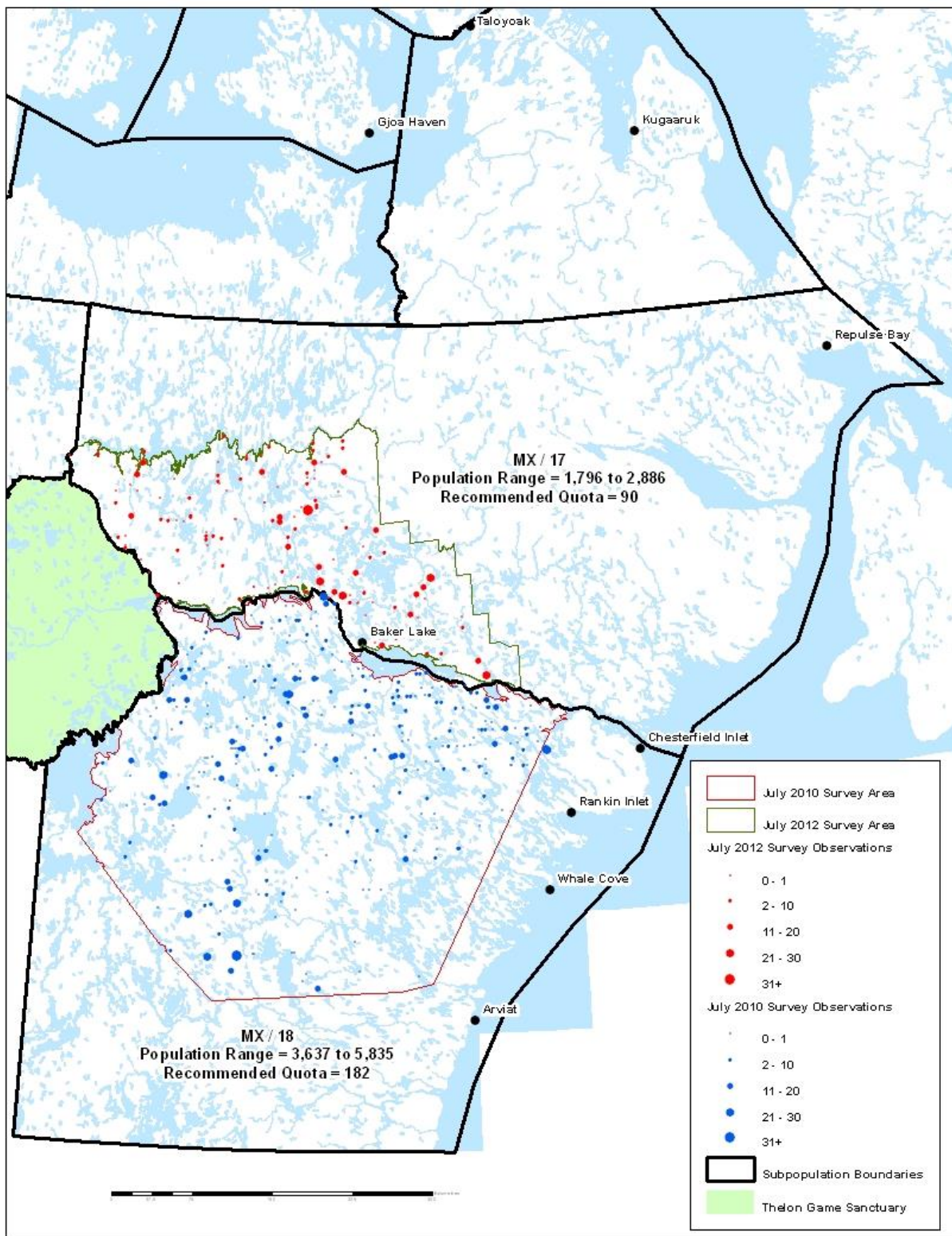


Figure 12 Recommended population boundaries and quota increases to the Central and Northern Kivalliq Muskox (MX/18) subpopulations based on the July 2010/12 preliminary survey results.

Northern Kivalliq Muskox Subpopulation

The DoE is scheduled to meet with the KWB to discuss survey results in January/February 2013. During this meeting quotas will be discussed and recommendations to the GN DoE and NWMB made.

- 1.** The Northern Kivalliq muskox subpopulation (MX/17) has continued to expand outside of previously documented distributions, particularly eastward along the north shore of Chesterfield Inlet.
- 2.** A management plan was developed in 2010 by the Kivalliq Wildlife Board, NTI and GN DoE. The management plan utilizes the results of abundance surveys to help guide management actions and recommendations for Kivalliq muskox populations.
- 3.** The Northern Kivalliq Muskox subpopulation has increased from 1,522 +/- 679 (95% CI) adult muskox in July 1999 to 2,341 +/- 545 (95% CI) in July 2012 (Figure 10 & 12).
- 4.** Utilizing a harvest ratio of 5% estimated to foster stability and based on the estimated calf crop, we recommend the northern Kivalliq muskox subpopulation TAH (Total Allowable Harvest) be increased from 42 to 90 muskox.
- 5.** We also recommend that all NQL (Non Quota Limitations) for the northern Kivalliq subpopulation of muskox be removed as there is currently no conservation issue that would benefit from these measures.
- 6.** To improve TAH recommendations and overall management, additional muskox research should also focus on barren-ground grizzly bear abundance, distribution and feeding behavior and their effects on muskox behaviour and ecology.
- 7.** The northern Kivalliq muskox subpopulation (MX/17) boundaries should be reexamined as to the relevance of their northern boundary (Figure 12).

Community consultation:

All seven Kivalliq communities (Arviat, Whale Cove, Rankin Inlet, Chesterfield Inlet, Baker Lake, Repulse Bay and Coral Harbour) and the Kivalliq Wildlife Board have been informed of the projects preliminary results and are in general agreement with the management recommendations for the central Kivalliq muskox subpopulation presented in this report. All Kivalliq community HTOs agreed that the 2010 survey results are consistent with local IQ. The Kivalliq Wildlife Board also indicated that Kivalliq communities would like to take an active role in the analysis and final presentation of survey results. Meetings with Kivalliq HTOs and the KWB to discuss the northern Kivalliq muskox survey results have been initiated and initial findings discussed. During a KWB meeting planned for February, 2013, the northern Kivalliq subpopulation survey results will be discussed in detail and management direction given to all stakeholders as outlined within the 2010 Kivalliq muskox management plan.

Validated results from the 2010 survey were used to apply an exemption permit to increase the TAH for the 2012/2013 harvesting season. Northern Kivalliq muskox survey results are now available and will be used to adjust the TAH for that subpopulation following in depth discussion amongst stakeholders. Presently HTO members, local wildlife officers and local hunters are taking part in the continued collection of local knowledge concerning the location of muskox groups across the central and northern Kivalliq, and incorporating IQ in the possible mechanisms surrounding their continued range expansion into marginal habitats and observed lower relative densities.

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Kitikmeot Regional Wildlife Board/Hunters and Trappers Organizations

Talokyoak, Nunavut

April 25, 2013

Resolution#:

0413003

Moved by:

Seconded by:

WHEREAS The KRWB/HTO met in Talokyoak and discussed the Muskoxen for East Kitikmeot and North Kivalliq (MX 10);

AND WHEREAS the KRWB/HTO discussed the draft changes to the boundary, Kivalliq has 90 TAH and 100 for East Kitikmeot, the KRWB, KWB and QWB will allocate tags to their members, and NTI has committed to assist the RWOs in drafting changes to the regulations ;

NOW, THEREFORE, BE IT RESOLVED THAT GN, NTI, RWOs draft a proposal to change the boundary, TAH and the season to be presented to the NWMB in JUNE.

In favor:

Against:

Abstentions:

Carried: ☐Defeated: ☐

Date: