5 Wildlife Information

Wildlife species in Nunavut are ecologically important and serve as overall indicators for the health of the land and its people – they provide food and subsistence for Nunavummiut. A number of key species (or species groups) were selected for the Kivalliq region, including barren ground caribou, muskoxen, polar bear, grizzly bear, and raptors. For any particular species, visualizing its distribution across the landscape is fundamental in understanding intensity of use, movement patterns, and the variation in seasonal distribution. While a single home range map for one species can be illustrative (Map 5-1 provides an example for caribou), a more complete perspective can result from examining seasonal variations or combining species distributions. The level of detail provided in the maps in this section facilitates a better understanding of regional scale, seasonal variation in wildlife distributions throughout the region. The information they provide informs the decisions made by biologists, planners and policy-makers.

Nunavut Biologist Mitch Campbell classifying Qaminirjuaq caribou in the Edehon Lake area.

Photo: Lynne Rollin

The following sections briefly describe the projects and associated data used to create the wildlife information maps, which fall into two categories:

- Wildlife density and sensitivity mapping in the Kivalliq region
- Caribou spring and fall migration corridors in the Kivalliq region

5.1 Wildlife Seasonal Distribution, Density, and Sensitivity Mapping

In support of the land use planning initiatives being conducted by the Nunavut Planning Commission (NPC), the Nunavut Department of Environment (DoE) identified the need to delineate key wildlife habitat areas throughout the territory. Data (predominantly telemetry survey data) were gathered concerning the following species or species groups: barren ground caribou, muskoxen, polar bear, grizzly bear and raptors. These were the key species identified by the territorial biologists mandated to develop and initiate wildlife research programs and monitor distribution and movement of wildlife species across the territory. This involved the assembly of numerous data layers from a variety of sources, including:

- the regional offices within Nunavut
- various geospatial data layers in the territory's data warehouse;
- the Government of the Northwest Territories (GNWT);
- the University of Alberta; and
- the Ontario Ministry of Natural Resources.

The various data layers were assembled and standardized according to seasons (both specific to each species and unique to each region) and then a series of density maps were developed to identify locations key to major life cycles or seasons. The atlas displays the results of these analyses for the Kivalliq region (portions of the adjacent Kitikmeot region are also displayed as they fall within the map extent).

- Caribou densities for eight seasons: spring, calving, post-calving, summer, fall, rut, early winter and late winter (maps 5-2 to 5-9)
- Caribou sensitivity (Map 5-10)
- Spring and fall caribou migration corridors (maps 5-11 and 5-12)
- Muskoxen summer density: Map 5-13.
    - Other seasonal maps for muskoxen have been excluded because survey data were only available for the summer season in the Kivalliq region. However, this does not indicate the absence of muskoxen in Kivalliq in other seasons.
- Muskoxen sensitivity (Map 5-14)

- Map 5-15 illustrates the extent of how muskoxen distribution has changed between 2000 and 2012. The map depicts the original area of distribution (July 2000) and the expansion area as it stands in July of 2012. Note the boundaries on the map are general and are intended for interpretation at a regional scale only. The distribution of muskoxen is potentially influenced by a number of factors, including:
    - Harvesting restrictions and the establishment of the Thelon Game Sanctuary – management practices that have allowed the species to recover
    - The expansion of grizzly bear distribution within the Kivalliq region in recent years is potentially exerting population pressure on muskoxen as it is a prey species
    - The effects of climate change may be altering patterns in food availability
- Polar bear densities for three seasons: spring, minimum ice and winter (maps 5-16 to 5-18)
- Polar bear sensitivity (Map 5-19)
- Grizzly bear densities for four seasons: spring, summer, late summer and fall (maps 5-20 to 5-23)
- Grizzly bear sensitivity (Map 5-24)
- Raptor density (not seasonal): Map 5-25

The sensitivity maps for each species are based on ratings developed by the regional biologists assigned to the seasonal density data layers. In addition, they integrate data related to human activities, the ELC mapping (where available), and habitat utilization information unique to each species. Each of the sensitivity layers were subsequently integrated into an overall sensitivity map ranking key wildlife habitat locations (Map 5-26).

5.1.1 Data Limitations

- It is important to note that a variety of different source data, of varying quality, were integrated to generate the derivative map layers. As a result, the density and sensitivity datasets are best suited for use at a regional or territory-wide scale and are not intended for local or site-specific planning.
- Data deficiencies exist for all species and, as a result, an area of low density/sensitivity does not necessarily indicate it is unimportant to, or uninhabited by, a species. It could simply be an area where no surveys have been conducted (i.e., it could potentially be an area of high density).
- Due to variation in survey type and sampling intensity, absolute density values could not be compared directly. To facilitate comparison, individual density analyses were generated for various subsets of the data (e.g., by herd, population or geographic area) which resulted in relative densities that could be integrated into a territory-wide layer. The density layers and their derivative sensitivity scores cannot be directly linked to population size or duration of use.
- Raptor sensitivity was based on nest locations that did not include specific date information. As a result, seasonal variation related to use could not be determined. While this may overstate the importance of raptor density on a seasonal basis, it was considered critical to account for the potential repeated use of nests from year to year.

Caribou Trails through tundra horsehair (*Bryoria nitidula)* habitat

Photo: Page Burt

5.2 Caribou Spring and Fall Migration Corridors Caribou seasonal ranges and migraitory ranges

Spring and fall migration corridors for the four caribou herds centred in the Kivalliq region of Nunavut were developed based on satellite and GPS collar data. The four herds are Eastern Kitikmeot, Lorillard, Qamanirjuaq, and Wager Bay. Spring migration is considered a critical time as females expend energy to move toward calving grounds – the survival of the mother and calf, and even the fidelity of the population, depend on making it to the calving area. Fall migration is important because the caribou are moving towards their rutting area and eventually, their over-wintering area.

Movement rates for individual collars were isolated and subsequently associated with migration start and end dates for each of the two migration periods. Yearly migration corridors were derived from transect densities for individual populations (again derived for both the spring and fall seasons). Higher use areas represent areas recurring over multiple years – the greater the number of years, the higher the use.

- Caribou spring migration corridors: Map 5-11
- Caribou fall migration corridors: Map 5-12

5.2.1 Data Limitations

- The migration corridor map datasets are best suited for use at a regional or territory-wide scale and are not intended for local or site-specific planning.
- It is important to note that the data are limited to the movement of animals that have been collared. Data deficiencies exist, and as a result, an area outside of a migration corridor does not necessarily indicate it is unimportant to, or uninhabited by, caribou. It could simply be an area where collared animals have not been located (i.e., it could potentially be an area of high use for non-collared animals).
- Due to variation in survey type and sampling intensity, absolute density values are not established. The migration corridors cannot be directly linked to population size or duration of use.

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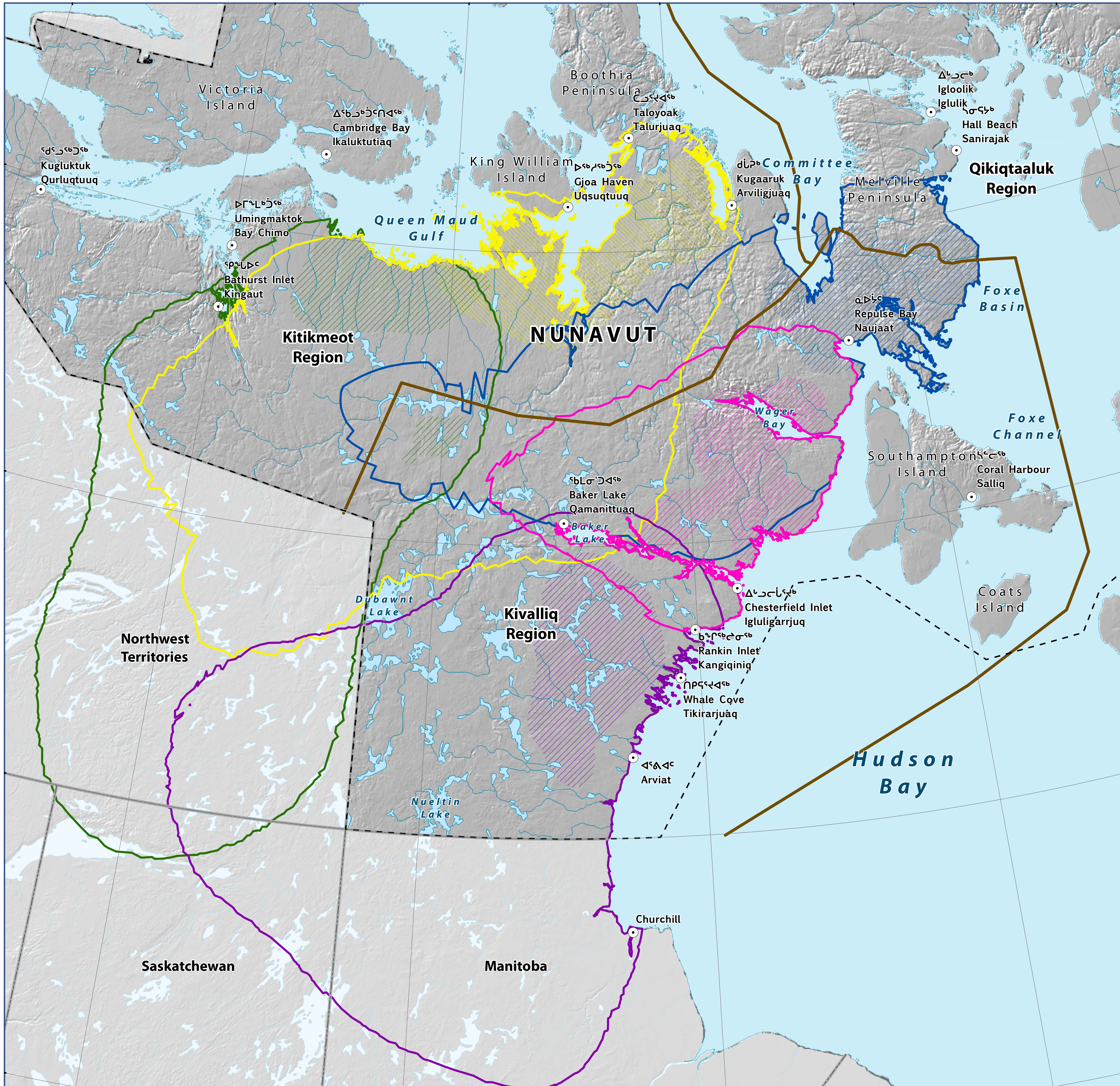
Map 5-1
Caribou Distribution-Overview



Legend

- Nunavut Settlement Area boundary
- Region boundary

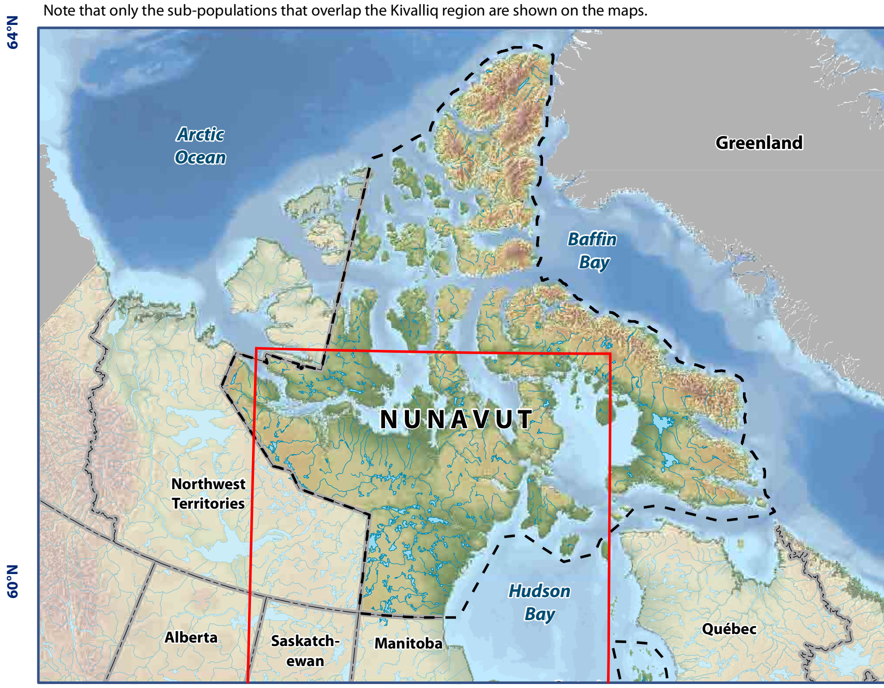
Official Annual Home Ranges*

- Lorillard
- Wager Bay
- Qamanirjuaq
- Eastern Kitikmeot
- Beverly

Official Calving Grounds*

- Lorillard
- Wager Bay
- Qamanirjuaq
- Eastern Kitikmeot
- Beverly

*Official home ranges and calving grounds are part of a publication. The ESA citation is as follows: Nagy, J. A., D. L. Johnson, N. C. Larter, M. W. Campbell, A. E. Derocher, A. Kelly, M. Dumond, D. Allaire, and B. Croft. 2011. Subpopulation structure of caribou (Rangifer tarandus L.) in arctic and subarctic Canada. Ecological Applications [doi:10.1890/10-1410.1]. Note that only the sub-populations that overlap the Kivalliq region are shown on the maps.



0 100 200
Kilometres

Canada Lambert Conformal Conic WGS 84

Data Sources:
Natural Resources Canada, Caslys Consulting Ltd.
Department of Environment (Government of Nunavut)
Government of Northwest Territories

Prepared by:

Nunavut
Avatiliqiyikkut
Department of Environment
Ministère de l'Environnement

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Map 5-2
Caribou
Spring Density (April 1 to May 25)

Legend

- - - - Nunavut Settlement Area boundary

—— Region boundary

Density*

1	
2	
3	Increasing density
4	
5	

* Density values include survey and telemetry data collected up to 2010.

0 100 200
Kilometres

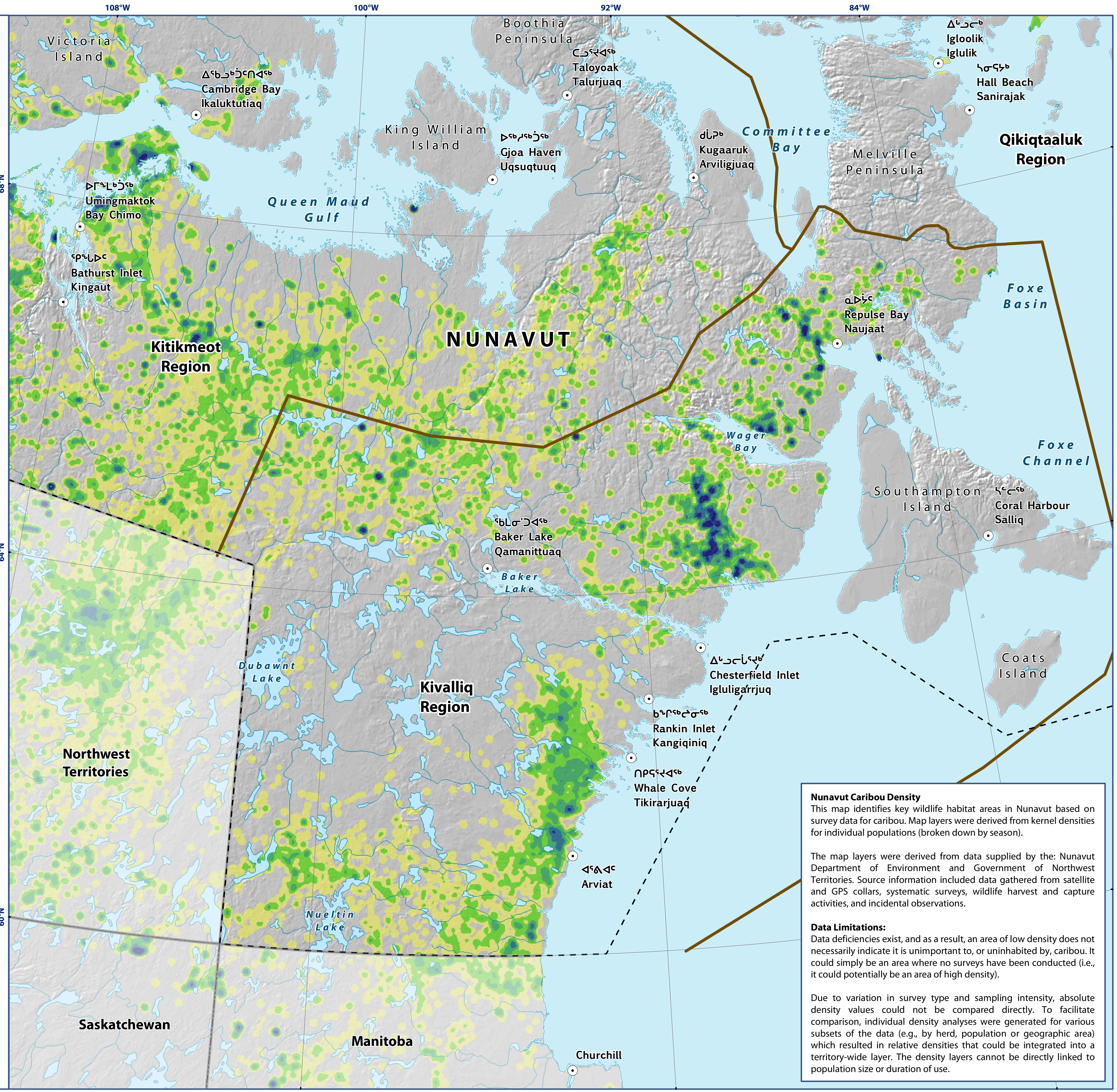
Canada Lambert Conformal Conic WGS 84

Data Sources:
Natural Resources Canada, Caslys Consulting Ltd.
Department of Environment (Government of Nunavut)
Government of Northwest Territories

Prepared by:

Avatiliqiyikkut
Department of Environment
Ministère de l'Environnement

CASLYS CONSULTING



Nunavut Caribou Density

This map identifies key wildlife habitat areas in Nunavut based on survey data for caribou. Map layers were derived from kernel densities for individual populations (broken down by season).

The map layers were derived from data supplied by the: Nunavut Department of Environment and Government of Northwest Territories. Source information included data gathered from satellite and GPS collars, systematic surveys, wildlife harvest and capture activities, and incidental observations.

Data Limitations:
Data deficiencies exist, and as a result, an area of low density does not necessarily indicate it is unimportant to, or uninhabited by, caribou. It could simply be an area where no surveys have been conducted (i.e., it could potentially be an area of high density).

Due to variation in survey type and sampling intensity, absolute density values could not be compared directly. To facilitate comparison, individual density analyses were generated for various subsets of the data (e.g., by herd, population or geographic area) which resulted in relative densities that could be integrated into a territory-wide layer. The density layers cannot be directly linked to population size or duration of use.

Map 5-3
Caribou
Calving Density (May 26 to June 25)

Nunavut Caribou Density
This map identifies key wildlife habitat areas in Nunavut based on survey data for caribou. Map layers were derived from kernel densities for individual populations (broken down by season).

The map layers were derived from data supplied by the: Nunavut Department of Environment and Government of Northwest Territories. Source information included data gathered from satellite and GPS collars, systematic surveys, wildlife harvest and capture activities, and incidental observations.

Data Limitations:
Data deficiencies exist, and as a result, an area of low density does not necessarily indicate it is unimportant to, or uninhabited by, caribou. It could simply be an area where no surveys have been conducted (i.e., it could potentially be an area of high density).

Due to variation in survey type and sampling intensity, absolute density values could not be compared directly. To facilitate comparison, individual density analyses were generated for various subsets of the data (e.g., by herd, population or geographic area) which resulted in relative densities that could be integrated into a territory-wide layer. The density layers cannot be directly linked to population size or duration of use.

Legend

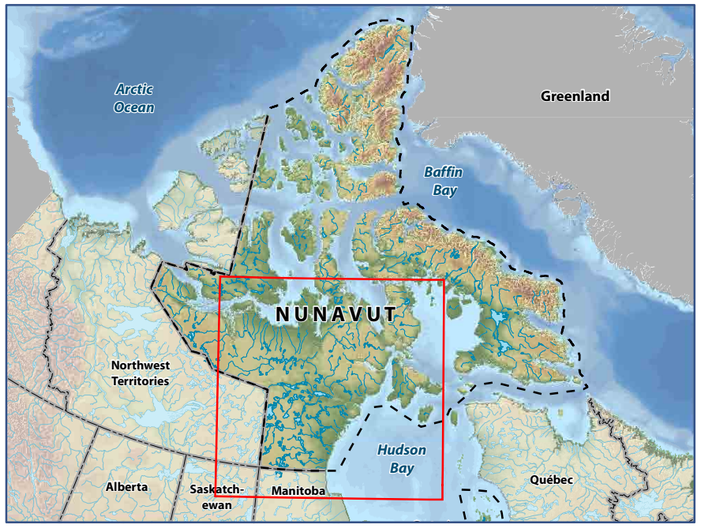
- Nunavut Settlement Area boundary
- Region boundary

Density*

1	
2	
3	
4	
5	

Increasing density

* Density values include survey and telemetry data collected up to 2010.



0 100 200
Kilometres

Canada Lambert Conformal Conic WGS 84

Data Sources:
Natural Resources Canada, Caslys Consulting Ltd.
Department of Environment (Government of Nunavut)
Government of Northwest Territories

Prepared by:

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Avatiliqiyikkut
Department of Environment
Ministère de l'Environnement

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Map 5-4
Caribou
Post-calving Density (June 26 to July 31)

Legend

- - - - Nunavut Settlement Area boundary

—— Region boundary

Density*

1
2
3
4
5

Increasing density

* Density values include survey and telemetry data collected up to 2010.

0 100 200
Kilometres

Canada Lambert Conformal Conic WGS 84

Data Sources:
Natural Resources Canada, Caslys Consulting Ltd.
Department of Environment (Government of Nunavut)
Government of Northwest Territories

Prepared by:

Avatiliqiyikkut
Department of Environment
Ministère de l'Environnement

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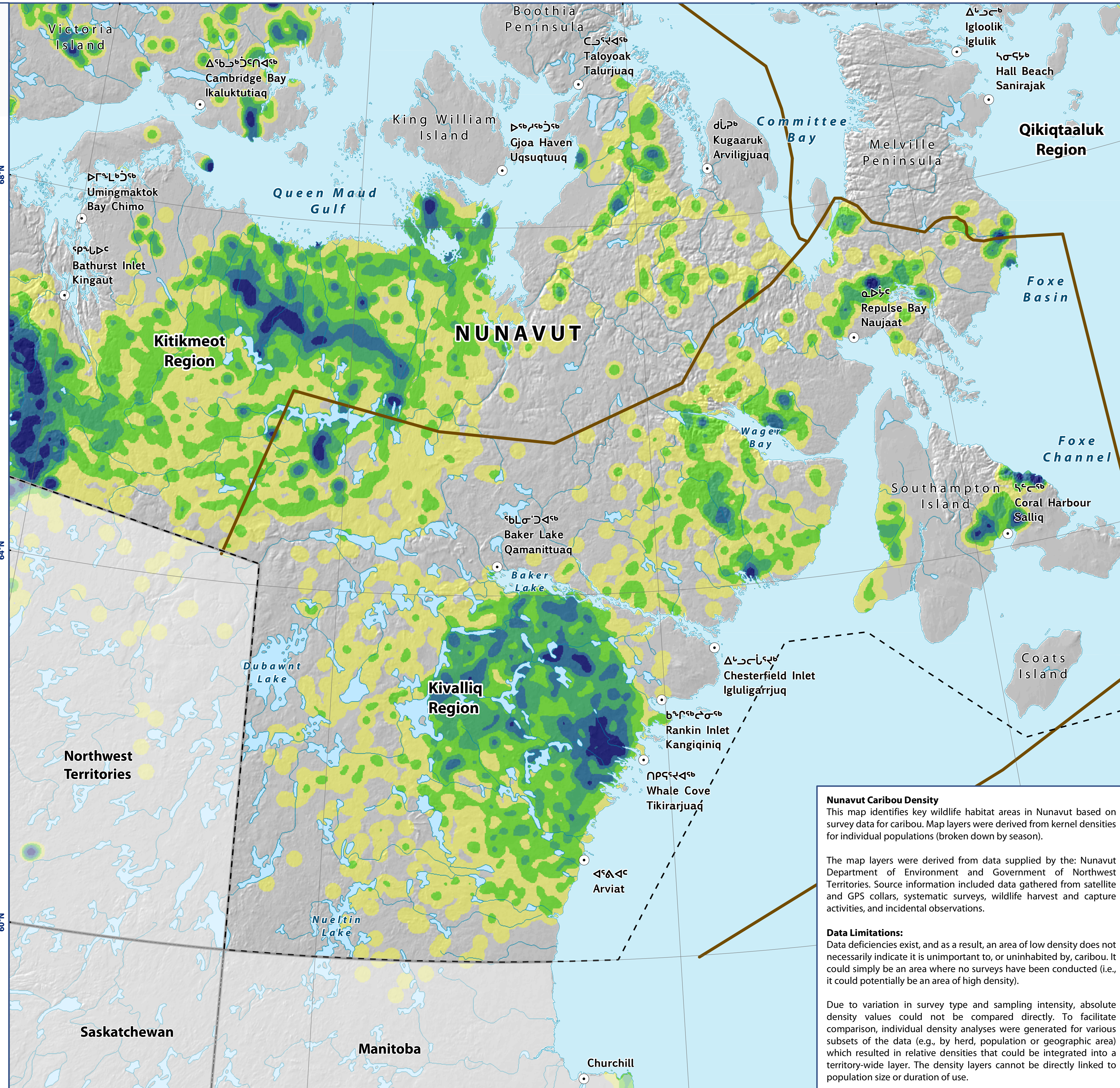


Nunavut Caribou Density
This map identifies key wildlife habitat areas in Nunavut based on survey data for caribou. Map layers were derived from kernel densities for individual populations (broken down by season).

The map layers were derived from data supplied by the: Nunavut Department of Environment and Government of Northwest Territories. Source information included data gathered from satellite and GPS collars, systematic surveys, wildlife harvest and capture activities, and incidental observations.

Data Limitations:
Data deficiencies exist, and as a result, an area of low density does not necessarily indicate it is unimportant to, or uninhabited by, caribou. It could simply be an area where no surveys have been conducted (i.e., it could potentially be an area of high density).

Due to variation in survey type and sampling intensity, absolute density values could not be compared directly. To facilitate comparison, individual density analyses were generated for various subsets of the data (e.g., by herd, population or geographic area) which resulted in relative densities that could be integrated into a territory-wide layer. The density layers cannot be directly linked to population size or duration of use.

Map 5-5
Caribou
Summer Density (August 1 to September 15)

Nunavut Caribou Density
This map identifies key wildlife habitat areas in Nunavut based on survey data for caribou. Map layers were derived from kernel densities for individual populations (broken down by season).

The map layers were derived from data supplied by the: Nunavut Department of Environment and Government of Northwest Territories. Source information included data gathered from satellite and GPS collars, systematic surveys, wildlife harvest and capture activities, and incidental observations.

Data Limitations:
Data deficiencies exist, and as a result, an area of low density does not necessarily indicate it is unimportant to, or uninhabited by, caribou. It could simply be an area where no surveys have been conducted (i.e., it could potentially be an area of high density).

Due to variation in survey type and sampling intensity, absolute density values could not be compared directly. To facilitate comparison, individual density analyses were generated for various subsets of the data (e.g., by herd, population or geographic area) which resulted in relative densities that could be integrated into a territory-wide layer. The density layers cannot be directly linked to population size or duration of use.

Legend

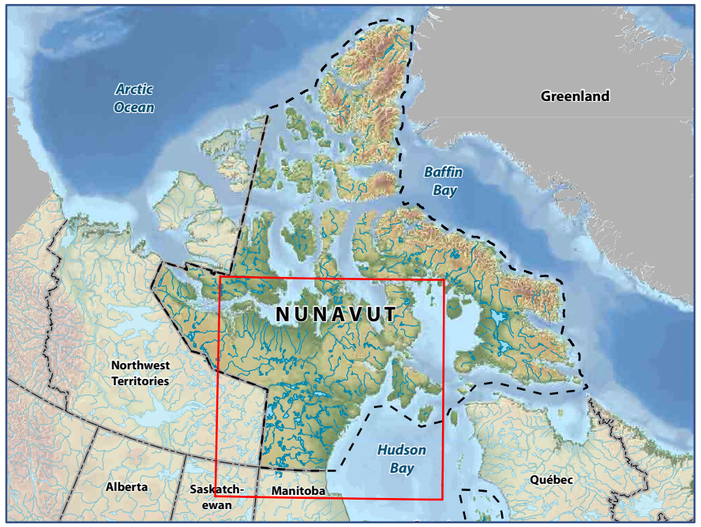
- Nunavut Settlement Area boundary
- Region boundary

Density*

1	
2	
3	
4	
5	

Increasing density

* Density values include survey and telemetry data collected up to 2010.



0 100 200
Kilometres

Canada Lambert Conformal Conic WGS 84

Data Sources:
Natural Resources Canada, Caslys Consulting Ltd.
Department of Environment (Government of Nunavut)
Government of Northwest Territories

Prepared by:

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Avatiliqiyikkut
Department of Environment
Ministère de l'Environnement

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108°W 100°W 92°W 84°W
69°N 64°N 60°N

Map 5-6
Caribou
Fall Density (September 16 to October 14)

Legend

- - - Nunavut Settlement Area boundary

—— Region boundary

Density*

Colour	Density
(light yellow)	1
(light green)	2
(green)	3
(blue)	4
(dark blue)	5

Increasing density ↓

* Density values include survey and telemetry data collected up to 2010.

0 100 200
Kilometres

Canada Lambert Conformal Conic WGS 84

Data Sources:
Natural Resources Canada, Caslys Consulting Ltd.
Department of Environment (Government of Nunavut)
Government of Northwest Territories

Prepared by:

Avatiliqiyikkut
Department of Environment
Ministère de l'Environnement
Nunavut

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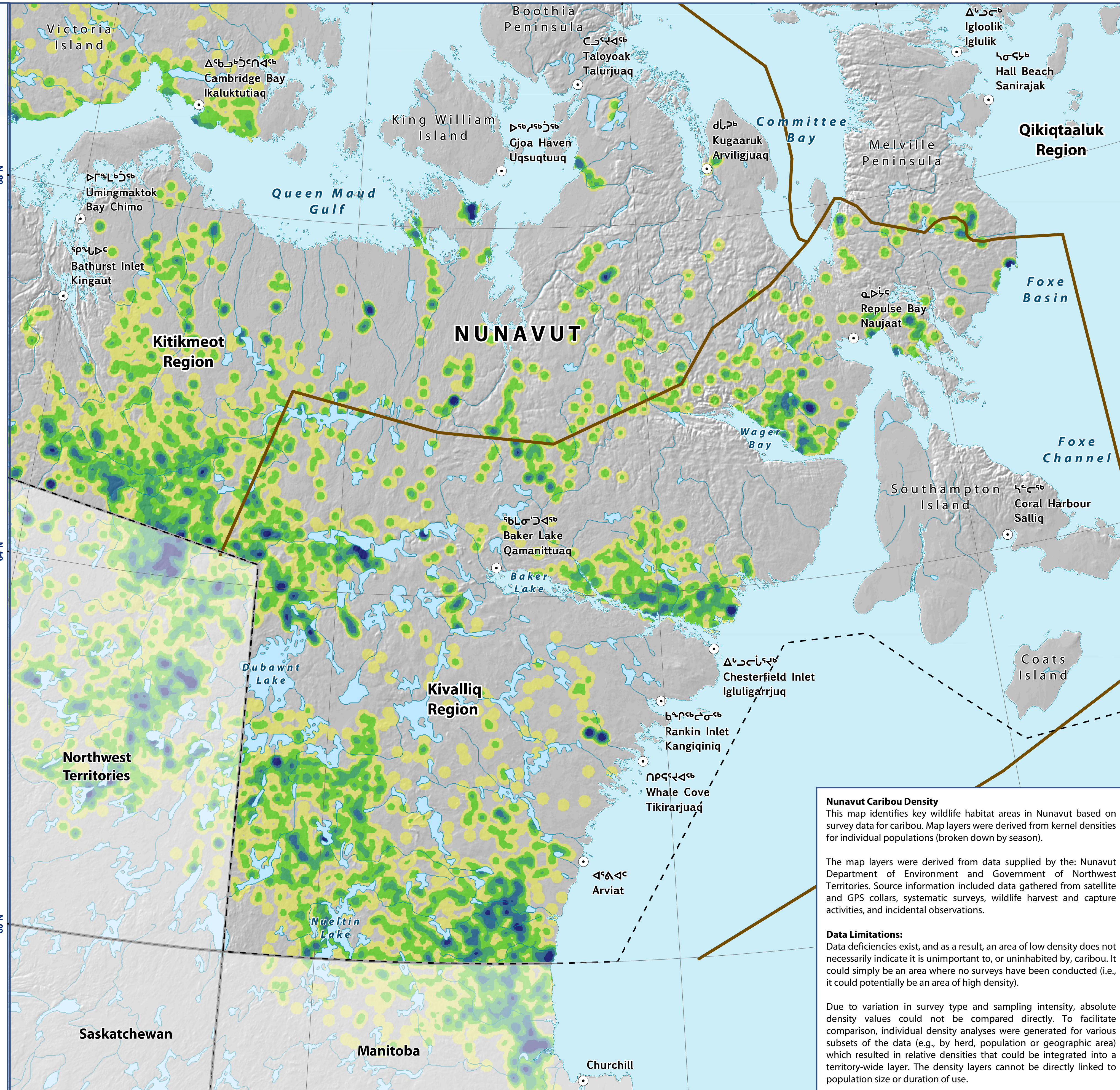

Nunavut Caribou Density
This map identifies key wildlife habitat areas in Nunavut based on survey data for caribou. Map layers were derived from kernel densities for individual populations (broken down by season).

The map layers were derived from data supplied by the: Nunavut Department of Environment and Government of Northwest Territories. Source information included data gathered from satellite and GPS collars, systematic surveys, wildlife harvest and capture activities, and incidental observations.

Data Limitations:
Data deficiencies exist, and as a result, an area of low density does not necessarily indicate it is unimportant to, or uninhabited by, caribou. It could simply be an area where no surveys have been conducted (i.e., it could potentially be an area of high density).

Due to variation in survey type and sampling intensity, absolute density values could not be compared directly. To facilitate comparison, individual density analyses were generated for various subsets of the data (e.g., by herd, population or geographic area) which resulted in relative densities that could be integrated into a territory-wide layer. The density layers cannot be directly linked to population size or duration of use.