

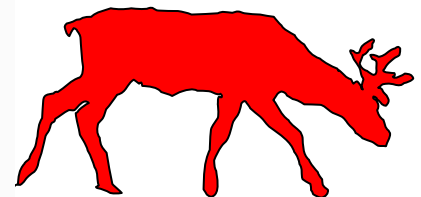
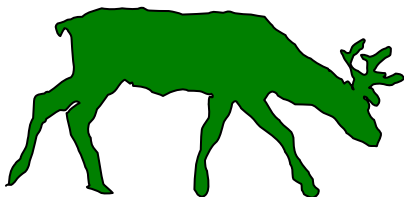
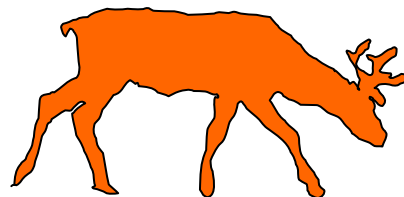
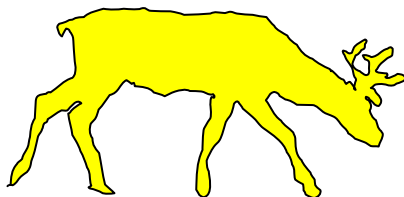
***“Setting a good trail for the younger generation”***

# HARVEST MANAGEMENT PLAN

for the Porcupine Caribou Herd in Canada

First Nation of NaCho Nyäk Dun  
Gwich'in Tribal Council  
Inuvialuit Game Council  
Tr'ondëk Hwëch'in  
Vuntut Gwitchin Government  
Government of the Northwest Territories  
Government of Yukon  
Government of Canada

March 2010



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*Photos in this report courtesy of Government of Yukon and Canadian Wildlife Service*

## List of Acronyms

AAH	Annual Allowable Harvest
GC	Government of Canada
GNWT	Government of the Northwest Territories
GTC	Gwich'in Tribal Council
HMP	Harvest Management Plan
HMS	Harvest Management Strategy
HTC	Hunters and Trappers Committee
IPCB	International Porcupine Caribou Board
IGC	Inuvialuit Game Council
NND	First Nation of NaCho Nyäk Dun
NWT	Northwest Territories
PCH	Porcupine Caribou Herd
PCMA	<i>Porcupine Caribou Management Agreement</i>
PCMB	Porcupine Caribou Management Board
PCTC	Porcupine Caribou Technical Committee
RRC	Renewable Resource Council
TH	Tr'ondëk Hwëch'in
VGG	Vuntut Gwitchin Government
YFN	Yukon First Nation
YG	Government of Yukon

# Glossary

**Aboriginal:** Yukon First Nation, NWT Gwich'in and Inuvialuit.

**Annual Allowable Harvest:** The number of caribou that can be taken by hunters each year.

**Caribou Calculator:** A computer program that was developed specifically for the Porcupine Caribou Herd as a tool to explore how harvest might affect the herd. See page 14 for more details.

**Conservation:** The management and use of Porcupine Caribou and its habitat that best ensures the long-term productivity and usefulness of the Herd for present and future generations (defined in PCMA).

**Indicators:** Information gathered from the many monitoring projects on the herd. See the full list and the descriptions on page 10.

**Population trend:** "Trend" describes a pattern of something over time. "Population trend" means whether the herd has been increasing or decreasing over time.

**Native User:** A person from a native user community who is an aboriginal traditional user of the Porcupine Caribou Herd (defined in PCMA).

**Native User Community:** Any one of Old Crow, Dawson, Mayo, Fort McPherson, Arctic Red River (Tsiigehtchic), Aklavik, Inuvik or Tuktoyaktuk (defined in PCMA).

**Party/Parties:** One or more of eight aboriginal organizations and governments that signed the PCMA.

**Photocensus:** A field project during which photos are taken of the caribou and an estimate of herd size is calculated from those numbers.

## Changing times

Today, all hunters, both native and non-native, use high-powered rifles and travel by truck, snowmobile and motor boat. Hunters can move more quickly from one place to another, and no matter where the caribou are we can find them. For these reasons we must all make sure that such mobile and efficient ways of harvesting do not cause undue hardships for the herd, especially when they are struggling to cope with natural stresses in their environment.



## Why make a plan now?

The Porcupine Caribou Herd is a magnificent population of migratory caribou that we must conserve for all time. When the herd is large, harvesting caribou poses little or no threat to it. When the herd is declining it can get to a point where hunting could become a serious problem.

**Harvesting like normal, when herd numbers are low and the herd is declining, could make the population of the herd go down further and faster so that it would take many, many years to recover.** We do not want this to happen. That is why it is really important that we get this plan going now.

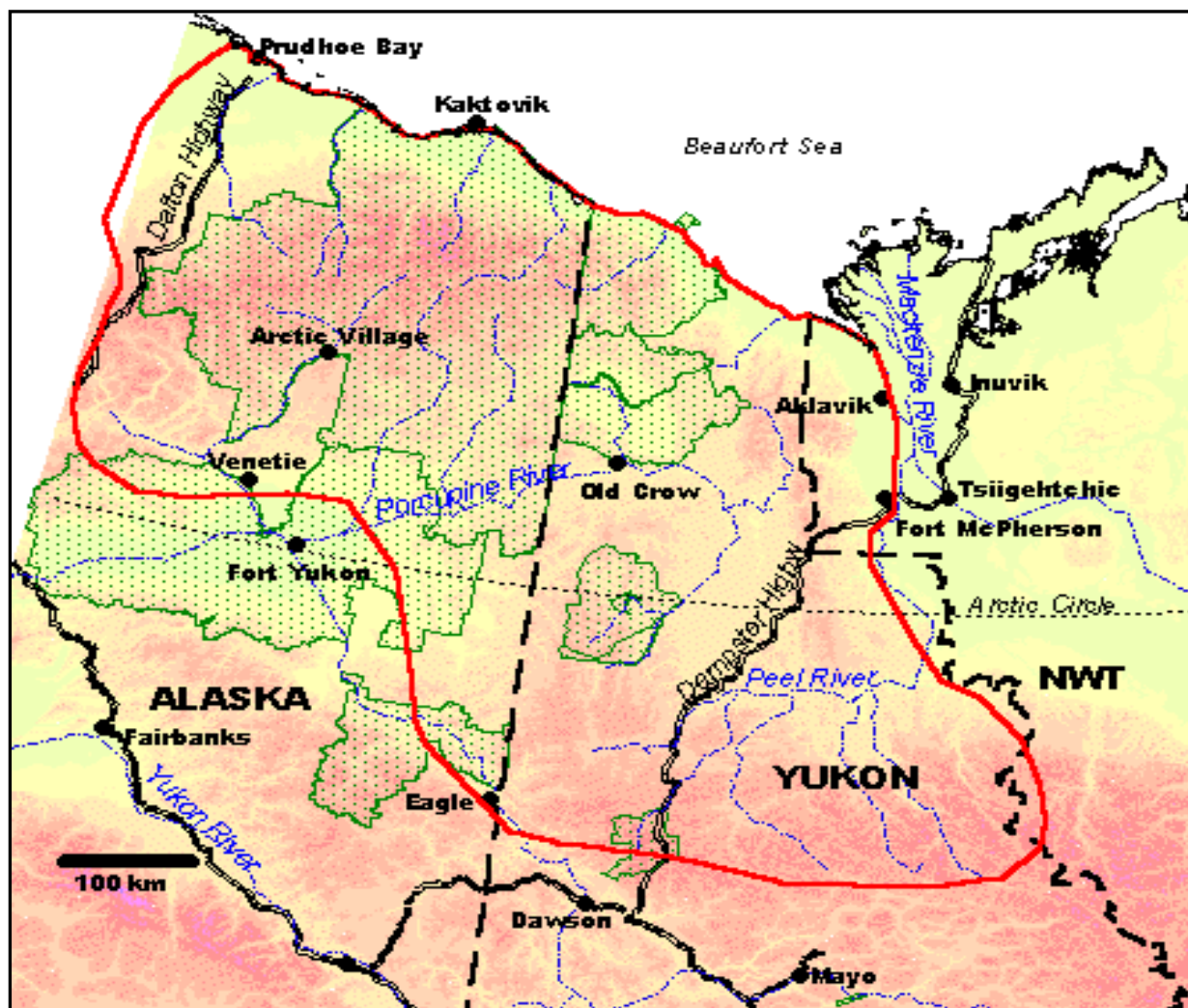
## Management Goal:

***We want to try to conserve the Porcupine Caribou Herd by adjusting the number and sex of caribou we harvest based on the changes in the herd size and population trend.***

The timing for a plan is also right because land claims have been settled everywhere on the herd's range, so now we can bring all the parties together to make a plan that will be very strong.

## This herd feeds us

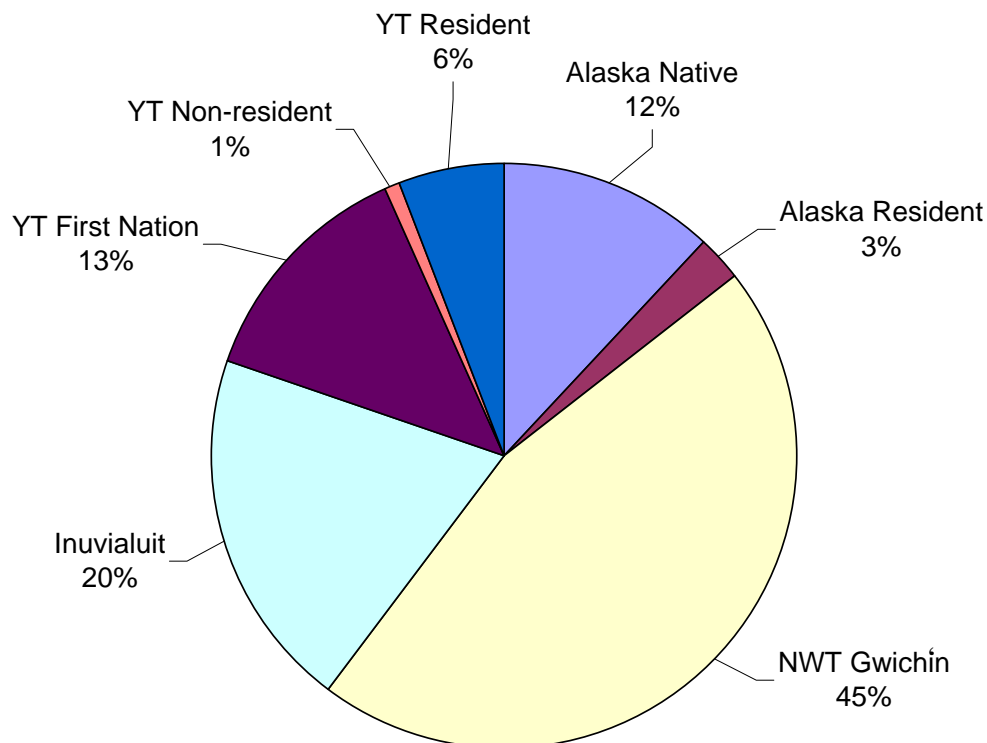
Porcupine caribou feed people - lots of people. Approximately 90 percent of the caribou harvested are taken by aboriginal users. Most of the hunters live in or near the herd's range and others come from farther south in the Yukon.



# Harvest Information

In the past, we have had a hard time figuring out just how many caribou are being harvested because good information has not been available from hunters in all the communities all of the time. We do have three years where data is available for all harvesters. The largest harvest was about 6,000 caribou and, in general, we assume that an average of 4,000 caribou is taken each year. For the plan to work really well, such information is not good enough. Good harvest information is needed *every year*. That is why this plan calls for all hunters to report their harvest.

## Average Portion of Harvest of Porcupine Caribou Herd



A few NWT residents also harvest (<1%)

We have incomplete historic harvest data. This pie chart is based on data from 1992-93 to 1994-95 when we had some kind of estimate from all PCH User Groups.

## Who is involved in this plan?

If you look at the table on the next page, you will see that there are eight parties responsible for managing hunters and caribou within the Canadian range of the Porcupine Caribou Herd. The first five come from land claim settlements. Involving so many parties makes it tricky to do things right, yet not step on anyone's toes. But it will work if everyone agrees on the main things to do and then each party works out the details for their own hunters.

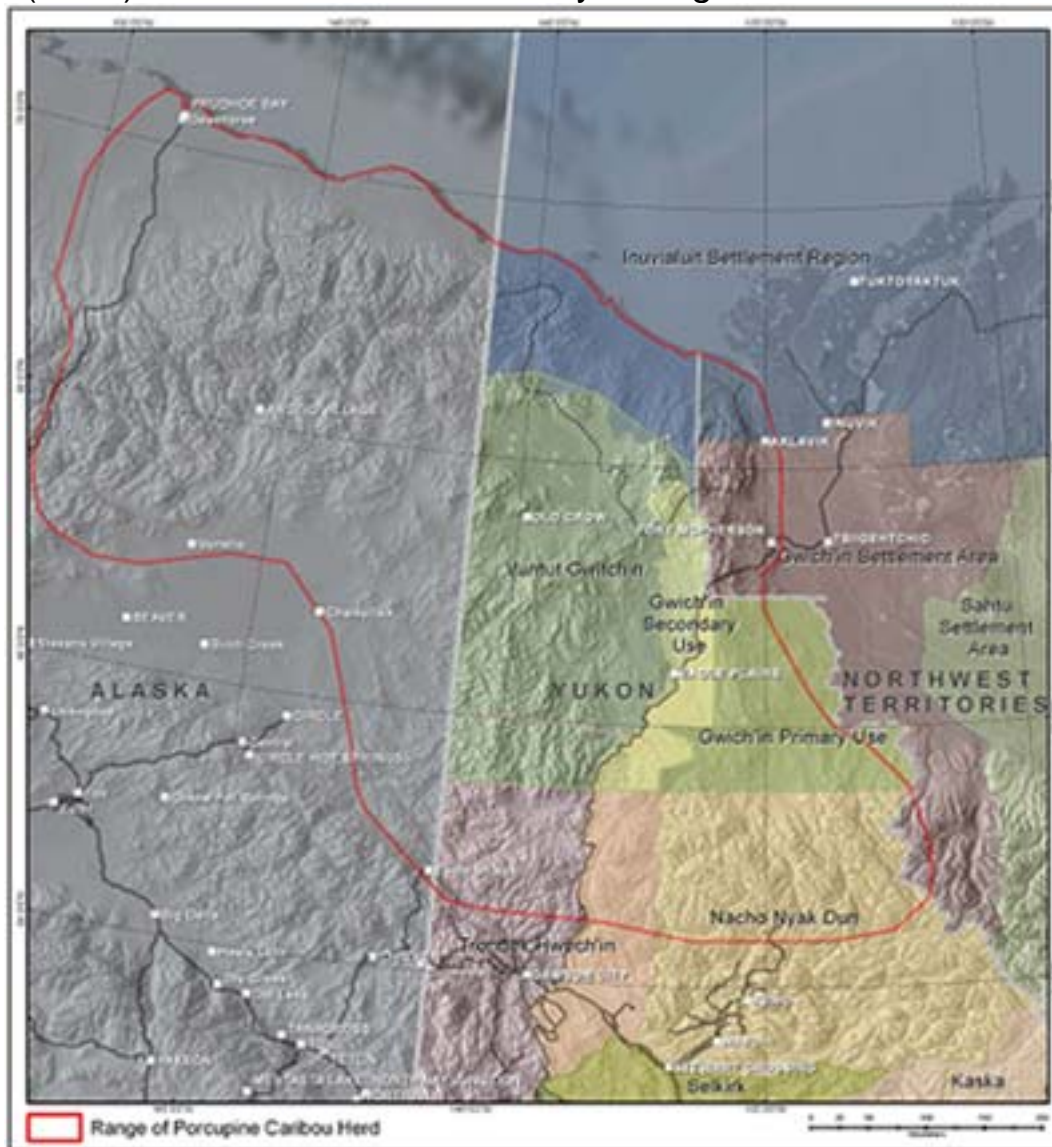


## Parties to Harvest Management Plan

Inuvialuit Game Council <b>IGC</b> Gwich'in Tribal Council <b>GTC</b> Vuntut Gwitchin Government <b>VGG</b> Tr'ondëk Hwëch'in <b>TH</b>	First Nation of NaCho Nyäk Dun <b>NND</b> Government of the Northwest Territories <b>GNWT</b> Government of Yukon <b>YG</b> Government of Canada <b>GC</b>
--	---

Commitments of the Parties under the HMP are outlined in Appendix A.

In addition to the parties, there are two management boards that deal solely with this herd. The Porcupine Caribou Management Board (PCMB) was established in 1985 by the *Porcupine Caribou Management Agreement* (PCMA) (in Canada). The International Porcupine Caribou Board (IPCB) was established in 1987 by the *Agreement Between the*





*Government of Canada and the Government of the United States of America on the Conservation of the Porcupine Caribou Herd.* The IPCB deals with international caribou management coordination and could become involved with this plan if the plan is later expanded to include Alaska.

In the PCMA “**Conservation**” means the management and use of Porcupine Caribou and its habitat which best ensures the long term productivity and usefulness of the Herd for present and future generations. The five **Objectives of the Parties** in the PCMA need to be kept in mind for the harvest management plan:

1. To co-operatively manage, as a herd, the Porcupine Caribou and its habitat within Canada so as to ensure the conservation of the Herd with a view to providing for the ongoing subsistence needs of native users;
2. To provide for participation of native users in Porcupine Caribou Herd management;
3. To recognize and protect certain priority harvesting rights in the Porcupine Caribou Herd for native users, while acknowledging that other users may also share the harvest.
4. To acknowledge the rights of native users as set out in this Agreement; and
5. To improve communications between Governments, native users and others with regard to management of the Porcupine Caribou Herd within Canada.

## **How was this plan put together?**

This plan is part of the Porcupine Caribou Harvest Management Strategy. The PCMB initiated the strategy, which has three parts:

1. The Harvest Management Protocol Agreement;
2. The Harvest Management Plan (this Plan); and
3. The Native User Agreement.

The Protocol, signed by all the parties, set out how the Plan was to be developed. This included the formation of a Harvest Management Plan Working Group to draft the Plan. The Working Group was made up of a representative from each of the eight parties. The Protocol also includes a separate Native User Agreement. This agreement will deal with allocation issues and harvest commitments for First Nations and Inuvialuit.

# Management using Indicators and the Colour Chart

In October 2007, PCMB coordinated a workshop in Inuvik on behalf of the Working Group to discuss how to:

- A. Decide what factors are used to say how well the herd is doing **(INDICATORS)**
- B. Decide what harvesting should take place depending on how the herd is doing **(COLOUR CHART)**
- C. Establish a means of agreeing on the above decisions and carrying them out **(ANNUAL HARVEST MEETING)**

## A. Indicators of How Well the Herd is Doing

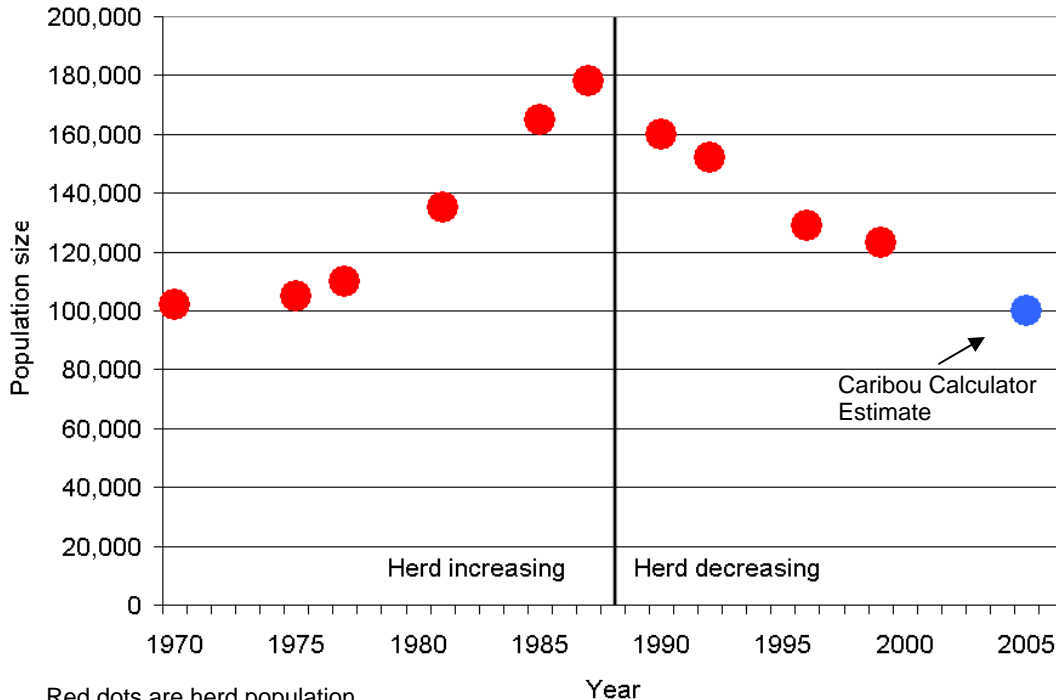
When you talk about what is happening with the herd you are basically discussing **indicators**. Indicators are expressed either as numbers or descriptions and allow us to better understand how the herd is doing overall.

### Indicator numbers

The following indicators are collected for the Porcupine Caribou Herd on a regular basis:

1. ***Estimated herd size (from photocensus or Caribou Calculator)***  
— Biologists from Alaska and Canada count caribou from photos they take of the herd when it is all bunched up together in July. These counts are used to estimate the total number of caribou in the herd. In many years a count is not possible for various reasons. Still, an estimate of herd size must be made. This is done by starting from the last photocensus and predicting whether the population has been going up or down using the Caribou Calculator and all the other indicator information. The last successful estimate based on a photocensus was 123,000 caribou in 2001. In 2007, the herd size was estimated by computer program to be around 100,000 based on all the indicator information collected since 2001.

## Estimated Herd Population



Red dots are herd population estimates from photocensuses

2. **Harvest information** — This is the number of caribou harvested by hunters each year. This indicator seems like it would be the easiest to get, but as noted earlier, it is not. In the absence of complete information, it is estimated that 4,000 caribou are taken each year.
3. **Adult cow survival** — This tells us what percentage of the cows survives each year. This is done by putting radio-collars on a number of cows and checking them every year to see how many died. (The collar itself has essentially no effect on the cow survival.) If more than 86% of the cows survive year after year, the herd is probably increasing. If less than 86% of the cows survive each year for several years, the herd is probably decreasing.
4. **Calf birth rate** — The birth rate is measured by monitoring the radio-collared cows on the calving ground to see if they give birth or are judged not pregnant. This has been measured since the 1980's. Over all those years, the average proportion of cows giving birth was 81% - but, of course, this varies every year. Comparing information from a number of years provides some insight into long-term up or down 'trends' in the herd size. For

example, if, year after year, the birth rate is low, then it is likely that the herd is going down.

5. ***Calf survival to nine months*** — This shows roughly how many calves will be entering the adult population to replace those adults that have died. It is measured by counting as many calves and adults as possible in March. These counts show that since 1992, an average of 36 calves per 100 cows survive to 9 months of age.
6. ***Body condition*** — This shows how healthy individual caribou are. It is done by measuring the depth of back fat and the amount of marrow in the lower leg bone of the caribou that hunters take and also by recording hunters' observations.

### **Indicator descriptions**

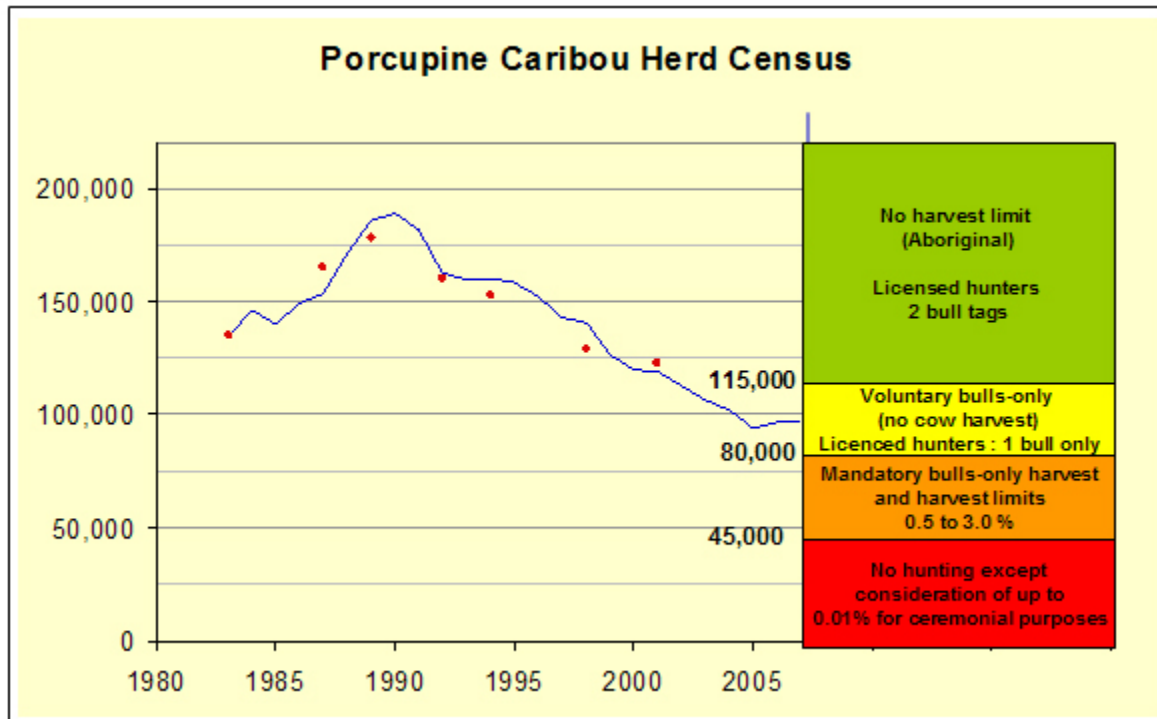
There are also many other descriptive indicators that come from people out on the land. Some of these are:

1. ***Caribou health*** — Hunters are very aware of the health of the animals. Their observations are an important part of deciding how well the herd is doing.
2. ***Hunting success*** — Hunters from different communities keep in touch with each other and are always talking about how the hunting is. Such information shows which communities are getting caribou and which are not.
3. ***Weather*** — People on the land watch the weather and they know what conditions (like snow depth and hardness, winds, etc.) are good or bad for caribou. The weather conditions over the year gives some idea of what kind of year it was for the herd.

### **B. Colour Chart**

At the Inuvik workshop it was agreed to use a colour chart for showing what the harvest should be in relation to how big the herd is. Such colour charts are already used for fire management and salmon management, and so many people understand what they mean and how to use them.

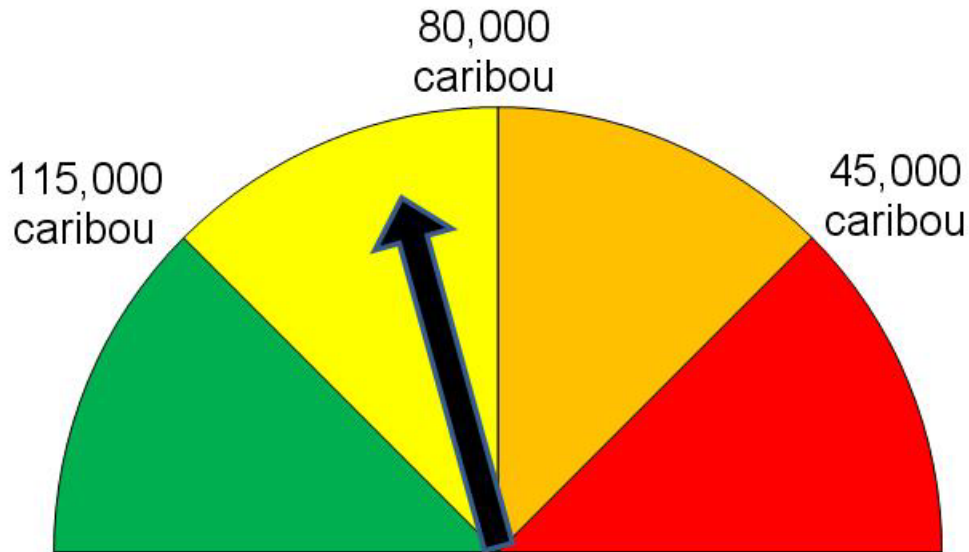
# Harvest Management Colour Chart



Red dots are estimates of the number of caribou from counts during the photocensus. Blue line is the trend in population size predicted by the Caribou Calculator using available data each year.

**All hunters in all colour zones must report their harvest at all times. Rigorous and verifiable harvest monitoring will be an important information source for ongoing herd management.**

- Green** 'Take what you need' — This means no aboriginal harvest restrictions; in other words, nothing special would be done, and people could hunt for what they need. Of course, respect for the caribou would always be emphasized. Licensed hunters would receive a maximum of two bull tags.
- Yellow** 'Voluntary Bulls only' — Bulls-only harvest, with the understanding that the goal is to have no cows harvested — governments will use tools like education initiatives, legislation, regulations, and/or bylaws to work cooperatively to achieve this 100% bulls-only target. Licensed hunter harvest would be reduced to one bull tag. The Parties are committed to achieving 100% bulls-only harvest. If this target is not effectively met, the Parties will commit to review the measures, including the potential application of a mandatory bulls-only harvest.
- Orange** 'Mandatory bulls only and harvest limits' — This means that the Parties would take steps to ensure hunters took only bulls and the total harvest and the related sub-allocations are collectively within the annual allowable harvest.
- Red** 'No hunting' — This means all hunting would cease except for the opportunity of a very small (0.0%-0.1%) bull-only subsistence-ceremonial aboriginal harvest.



Signs like this, with an arrow indicating current herd status, will be posted in the communities and along the highway to advise hunters about the status of the herd and hunting requirements.

## The Caribou Calculator

Many of the number indicators have been put into a computer program called the Caribou Calculator. This program shows what might happen to the herd depending on how the harvest or indicators (i.e. cow survival, calf survival) are changed. This program can do two things. First, it provides an estimate of the current population (between photocensus estimates) based on the data collected historically. This is the estimate of herd size that we will use in years when there is no photocensus estimate. Second, the computer program can show what might happen in the future if the harvest or other indicators change.





At the Inuvik workshop, in order to look at the effect of harvest on the herd we used the Caribou Calculator. We put indicator numbers into the Caribou Calculator that were the typical values recorded for calf birth rate and calf survival rates. Average adult cow survival when the herd was growing (1985 to 1989) was 85% and when the herd was declining (1989 to 2001) it was 83%. An average cow survival value of 81% was used on all future projections in case the effects of other factors, such as climate change and development, make cow survival worse in the future. We then changed the number and sex of the harvest to make the Caribou Calculator predict what might happen to the herd size in the future.

Charts 1 to 4 (pages 17 and 18) in the plan are based on the information presented using the Caribou Calculator at the Inuvik Harvest Management Planning Workshop in the fall of 2007. It was based on the best information available at the time and was used to predict the effect of different harvest regimes on the herd. It is important to realize that the Caribou Calculator is a model that will need to be updated as new information is gathered. According to the plan, in years when there is no photocensus, the herd size will be estimated using the Caribou Calculator. Note that this is merely an estimate to start discussions at the Annual Harvest Meeting. The confidence in that estimate will be reduced the further we are from the last successful photocensus. The Caribou Calculator estimates can be improved with better data on the number and sex of caribou being harvested. Again, this Caribou Calculator is just one tool that informs the decision-making process.



On each of the following charts, the red dots are the photocensus results, the blue line is the trend of the herd predicted by the Caribou Calculator using available data each year, and the red line is the predicted herd size from the Caribou Calculator using the indicator data as stated above.

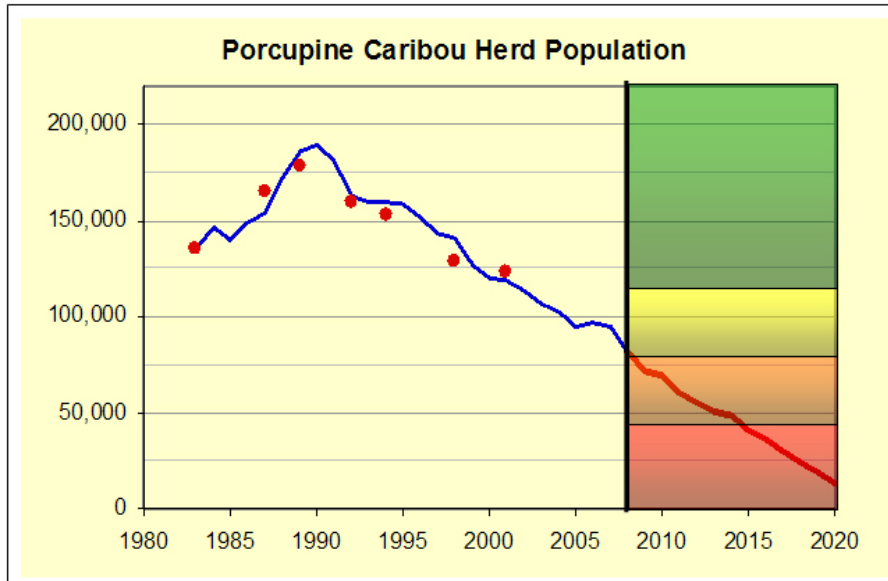
The colour boundaries you see in the following charts are the result of many hours of discussion, not only at the workshop, but later at Working Group meetings. What it all boils down to is how comfortable we feel about changing the harvest in relation to the effects that change will have on the population in the next 10 years. This is called 'risk management'; meaning we can help reduce the risk of the herd becoming smaller by adjusting the level of harvest when the herd drops to a certain size.



# Combining the Colour Chart & the Caribou Calculator

to predict what might happen to the herd with different harvest levels  
(October 2007 Inuvik Workshop)

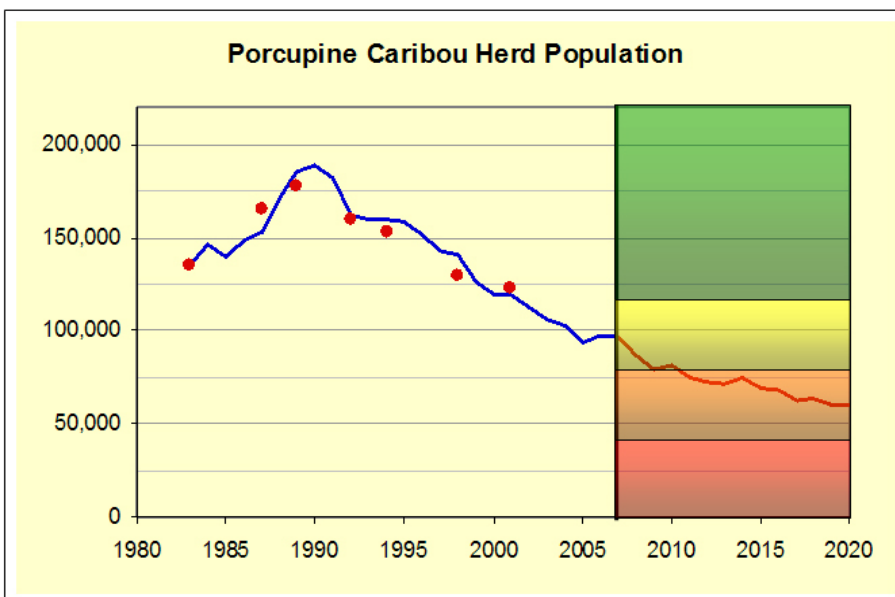
**Chart 1: No Harvest Restrictions (Average annual harvest 4,000)**



If we continue to harvest as we currently do (approx. 4000 animals with 60% cows) and cow survival doesn't increase, the herd is predicted to continue declining to under 20,000 caribou by 2020.

The red line is the future herd size predicted by the Caribou Calculator (see pg. 14 for details). Red dots are estimates of the number of caribou from counts during the photocensus. The blue line is the trend in population size predicted by the Caribou Calculator using available data each year.

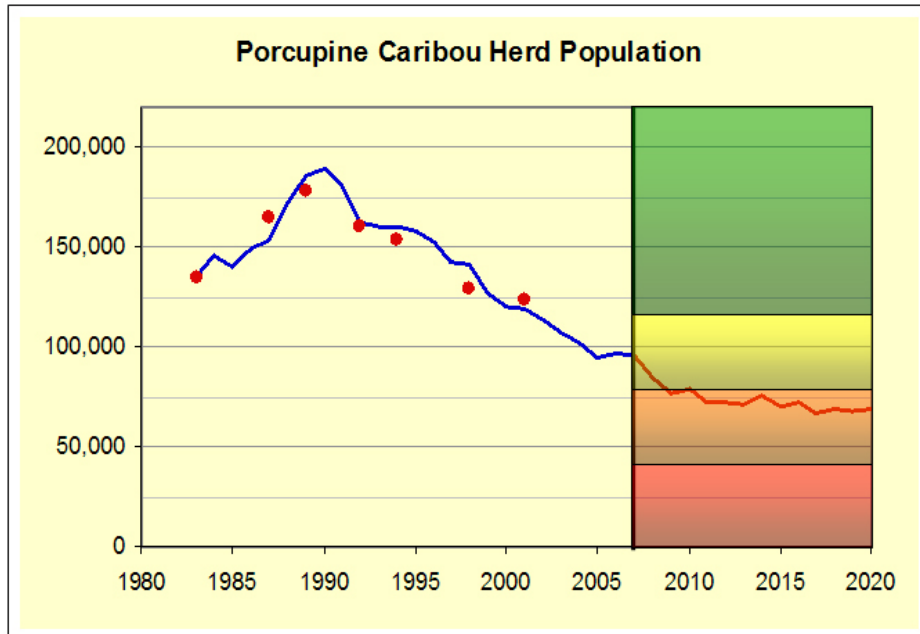
**Chart 2: Harvest Reduced from 4,000 to 2,000**



If we reduce the harvest to 2,000 caribou (approx. 60% cows) as of Oct. 2007 and cow survival did not increase, the herd will still decline and be in the orange colour by 2010.

The red line is the future herd size predicted by the Caribou Calculator (see pg. 14 for details). Red dots are estimates of the number of caribou from counts during the photocensus. The blue line is the trend in population size predicted by the Caribou Calculator using available data each year.

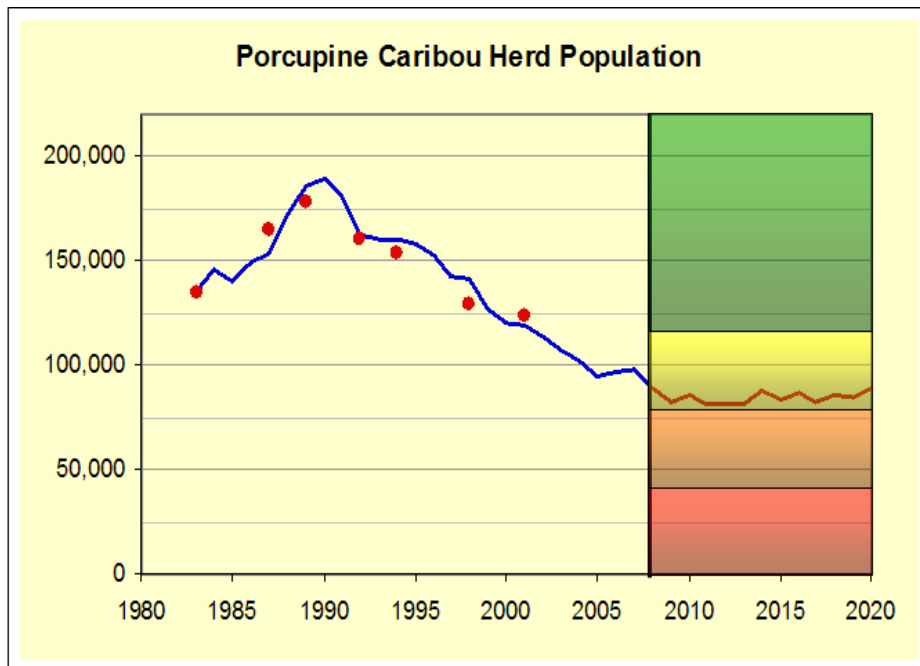
**Chart 3: Harvest Bulls Only (Average annual harvest 4,000)**



If we started a bulls-only harvest (Oct. 2007) and cow survival did not increase, the herd is predicted to continue declining and enter the orange colour by 2010.

The red line is the future herd size predicted by the Caribou Calculator (see pg. 14 for details). Red dots are estimates of the number of caribou from counts during the photocensus. The blue line is the trend in population size predicted by the Caribou Calculator using available data each year.

**Chart 4: Harvest 2,000 animals AND Bulls Only**



If we could start a harvest of only 2,000 animals and bulls only (Oct 2007) and cow survival did not increase, the herd is predicted to stabilize and stay in the yellow/orange boundary.

The red line is the future herd size predicted by the Caribou Calculator (see pg. 14 for details). Red dots are estimates of the number of caribou from counts during the photocensus. The blue line is the trend in population size predicted by the Caribou Calculator using available data each year.

## Management using the Colour Chart

Each year, the Porcupine Caribou Technical Committee will summarize the available information related to the herd and provide the summary to the PCMB and user groups (see Appendix B).

The population estimate of caribou (by photocensus or computer program) will provide an idea of which colour zone we might be in. Other indicators are then used to determine how conservative management actions should be. For example, say the herd size has been estimated at 81,000 animals. The initial indication might show we are in the yellow zone; however, if other indicators show that the herd is still considered to be declining, and there is a very low birth rate and low calf survival rate, it might warrant a decision to use orange management actions instead of yellow.

This list of indicators is not a recipe book but the indicators are guidelines that need to be taken into consideration when making decisions about how vulnerable the herd is and which management actions are appropriate. Both traditional and scientific information will be considered.

<b>Indicators for Harvest Management Assessment</b>	
<p><b>Population size and trend</b></p> <ul style="list-style-type: none"> <li>• Population size by photocensus</li> <li>• Estimated population based on computer program</li> <li>• Population trend</li> </ul>	<p><b>Population dynamics</b></p> <ul style="list-style-type: none"> <li>• Adult cow survival</li> <li>• Calf birth rate</li> <li>• Calf survival to nine months</li> <li>• Peak of calving</li> </ul>
<p><b>Harvest</b></p> <ul style="list-style-type: none"> <li>• Total harvest</li> <li>• Percentage of females in harvest</li> <li>• Hunters' needs met? (Arctic Borderlands data)</li> </ul>	<p><b>Body condition</b></p> <ul style="list-style-type: none"> <li>• Average backfat</li> <li>• Hunter assessment</li> <li>• Health</li> </ul>
<p><b>Habitat and other considerations</b></p> <ul style="list-style-type: none"> <li>• Snow conditions (Dempster measurements/local observations)</li> <li>• Major fires</li> <li>• Weather events</li> <li>• Human activity</li> </ul>	



# Management Actions

**GREEN** The estimated herd size is above 115,000

- Harvest only the amount needed;
- Licensed hunters receive a maximum of two bull tags;
- Shooting will be accurate and wounded animals will be retrieved;
- Parties will collect rigorous and verifiable harvest data, to be provided for the Annual Harvest Meeting.

**YELLOW** The estimated herd size is between 115,000 and 80,000

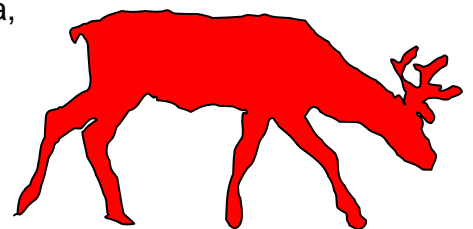
- Voluntary bulls-only harvest, with the understanding that the goal is to have no cows harvested – Parties will use tools like education initiatives, legislation, regulations, and/or bylaws to work cooperatively to achieve this 100% bull-only target;
- The Parties are committed to achieving 100% bulls-only harvest. If this target is not effectively met, the Parties will commit to review the measures, including the potential application of a mandatory bulls-only harvest.
- Hunters are encouraged to take fewer animals;
- Licensed hunters harvest reduced to one bull tag;
- Shooting will be accurate and wounded animals will be retrieved;
- Parties will collect rigorous and verifiable harvest data, to be provided for the Annual Harvest Meeting.

**ORANGE** Estimated herd size is between 80,000 and 45,000

- Mandatory bulls-only harvest. If cows are shot, appropriate parties will take appropriate action(s);
- The Annual Allowable Harvest decreases as the population estimate declines;
- The range for harvest is 0.5%-3% of the herd estimate in this zone.
- The Annual Allowable Harvest will be allocated to the Parties as laid out in this plan, the YG/YFN Agreement, and the Native User Agreements;
- Shooting will be accurate and wounded animals will be retrieved;
- Parties will collect rigorous and verifiable harvest data, to be provided for the Annual Harvest Meeting.

**RED** Estimated herd size below 45,000

- No harvesting except for a small (up to 0.1%) bulls-only subsistence-ceremonial harvest, if desired.
- Parties will collect rigorous and verifiable harvest data, to be provided for the Annual Harvest Meeting.





## Annual Harvest Meeting

The Harvest Management Plan uses a hands-on approach through the Harvest Management meeting every year, which will involve the following:

1. The Porcupine Caribou Technical Committee will prepare an annual summary report by November 15 with the most current information about the herd (see Appendix B).
2. This report will be sent by the PCMB to all eight parties, with a request to provide additional information by January 20 and invite them to attend the Annual Harvest Meeting held by the PCMB the second week of February.
3. At the meeting, the PCMB will work through the steps in the flowchart on the following page.

(Terms of Reference for the Annual Harvest Meeting will be developed by the PCMB and approved by the Parties.)



## Annual Harvest Meeting Review

PCMB and parties review current information on the herd:

- How many caribou there are
- What the level of harvest is
- Whether the population is going up or down

Presentation session and discussion among PCMB and participants



PCMB decides which colour zone the herd is in, based on the above information and trends

PCMB figures out what the harvest management strategy should be, based on which colour the herd is in.

PCMB prepares a recommendation for consideration by the Parties

When all parties get the recommendation, they will review it and decide how best to make the management commitments work with their hunters.

Each party will also keep track of how well their actions are working, and their harvest data, and will report this to the PCMB. The PCMB will make sure this information goes into the next status report and is available to all parties prior to the next annual meeting.

## Precautionary Principle

The plan supports the use of the Precautionary Principle which is; in the absence of complete information, where there are threats of serious or irreparable damage, the lack of complete certainty shall not be a reason for postponing conservation measures. These measures must be reasonable; that is to the extent necessary to achieve conservation as defined.

The decision of which colour zone the herd is in will be made very carefully. The parties will err on the side of caution. When making the decision to change the zone the herd is in, reports from people on the land will be very important. Imagine if the population estimate is 81,000 and the herd appears to be rapidly declining. In a case like that, if observations on the land confirm the decline, the Plan might allow for transition into the Orange zone right away. By us acting quickly, the herd will get the best chance at recovery.

## Essential Requirements for the Plan

Up-to-date “indicator” information is essential, and without such information the plan cannot function. Therefore, by adopting this plan, it is agreed that the parties are committed to the following:

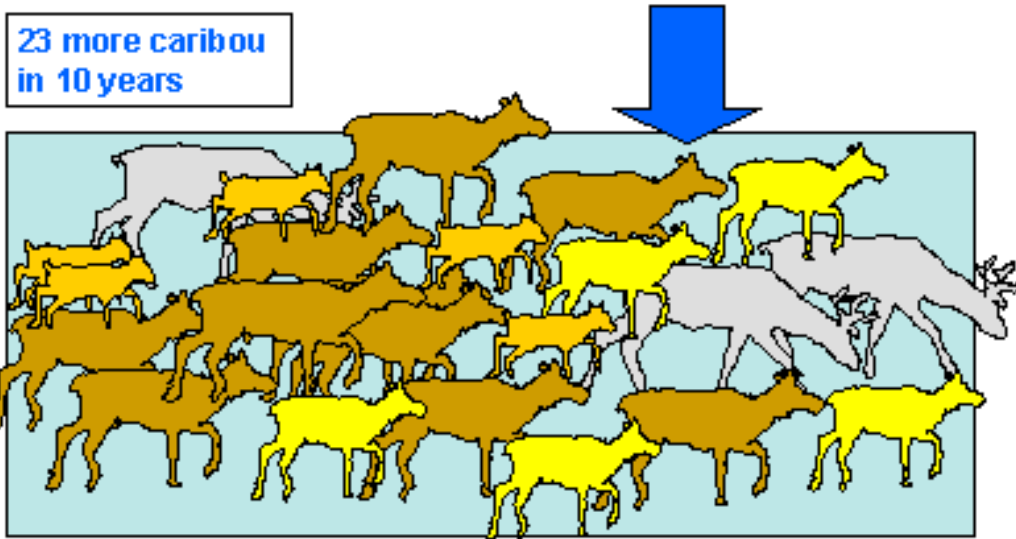
- **Photocensus** Participation by Yukon and NWT government staff in planning the caribou photocensus conducted by the Alaska Department of Fish and Game, and the U.S. Fish and Wildlife Service. Once a successful photocensus has been completed, another photocensus will be attempted in two to three years.
- **Indicators** The parties will continue to cooperate in the collection of all relevant indicator information including adult cow survival, calf birth rate, calf survival to nine months and body condition. Further, the parties will provide local observations to the annual PCMB harvest meeting.
- **Harvest Information** Harvest data will be critical in harvest management. The Parties are committed to the annual collection and reporting of rigorous and verifiable harvest information, required of all harvesters at all times. This information will be provided for the Annual Harvest Meeting. The Implementation Plan for this Harvest Management Plan will specify methods and actions that will clarify and detail the process by which the parties will collect and verify data.

## Key concepts of the plan

If you shoot 1 bull  
instead of 1 cow it  
will mean...



23 more caribou  
in 10 years



### Bulls Only

**Harvesting bulls only** is the best thing we can do for the herd and still give hunters maximum opportunities to get meat. Normally the harvest is over 50 percent cows. If a hunter kills one less cow every year, this amounts to about **23 more caribou** being available in the population over 10 years, based on her offspring, and their offspring, and so on. If 1,000 harvesters each killed one less cow annually, that would be equivalent to 23,000 more caribou in 10 years. If harvesting could be switched to mostly bulls, we might be able help the herd grow.

## Annual Allowable Harvest

If we enter the orange zone, this plan calls for a bulls-only annual allowable harvest (AAH). At the Annual Harvest Meeting the PCMB will determine AAH based on the reports from the parties and the Porcupine Caribou Technical Committee. Based on historical harvest data available, Alaska has taken an average of 15 percent of the total harvest. Therefore, 15 percent can be considered as Alaskan harvest, leaving 85 percent allocated to Canada. Since NWT users have historically taken 65 percent of the total reported harvest, it will receive that allocation. Since Yukon users have taken 20 percent of the total reported harvest, it will receive that allocation. As new harvest information arises, it will be shared, reviewed, and integrated where required in the allocation process within this plan. In the meantime, the allocation percentages identified shall be used as a guideline.

Section J3 of the PCMA states, “The Territorial Governments shall, upon taking into consideration the recommendations of the Board [PCMB] and consistent with the preferential right of native users to harvest;

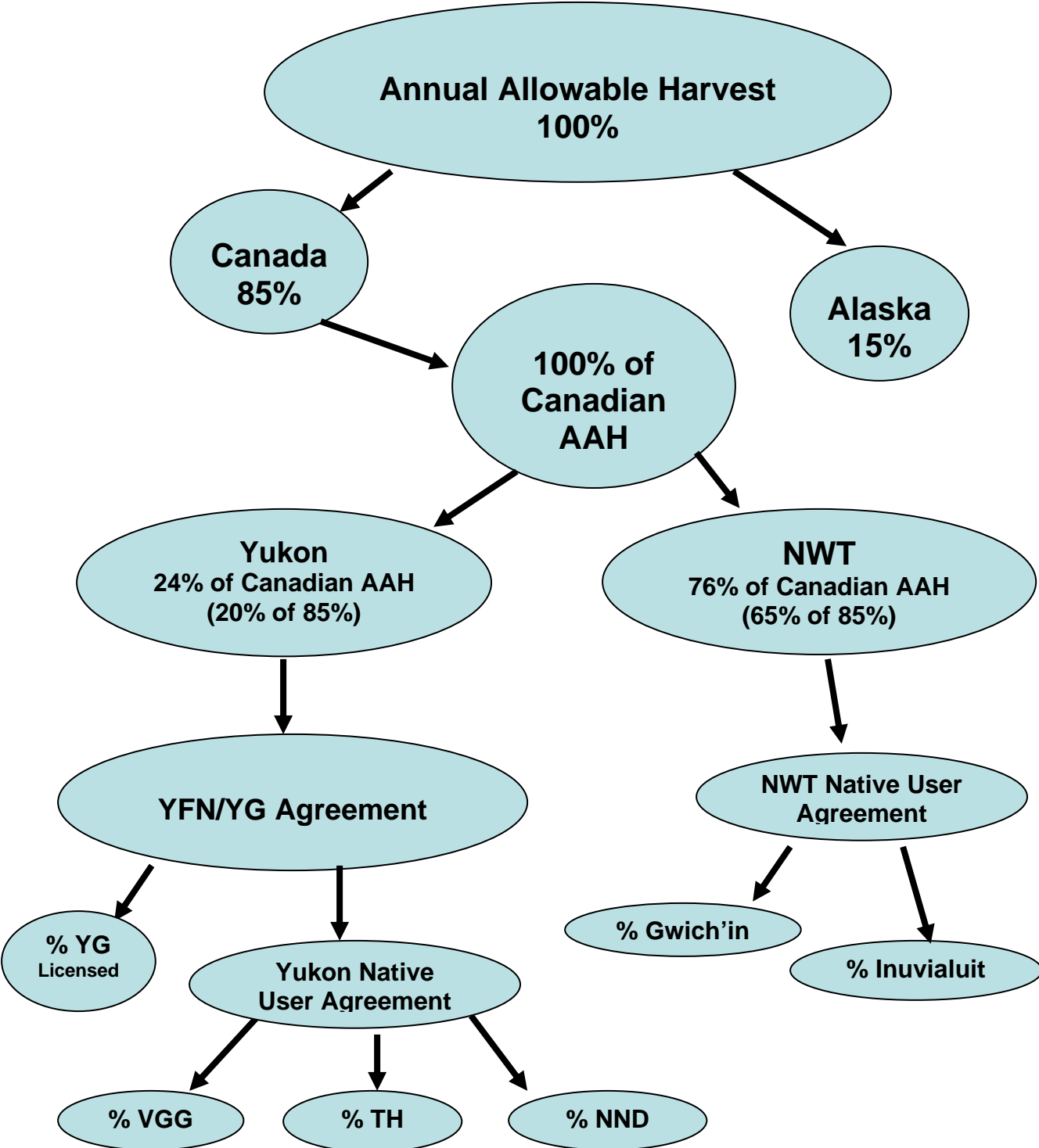
- a) Establish the total annual allowable harvest of Porcupine caribou in Canada; and
- b) Determine the allocation of the annual allowable harvest in Canada for native users, taking into account the criteria set forth in paragraph 2(c) of this part and the reservation of two hundred and fifty (250) Porcupine caribou referred to in paragraph 4 below.”

Even with the largest likely AAH according to this plan (for example, 2,400 bulls is 3 percent of 80,000 animals), the 250 figure would represent more than 10 percent of the AAH. As the AAH declines, this percentage would increase making it unacceptable to all parties. The intent of this provision was to ensure sharing between native and non-native harvesters, while recognizing the preferential rights of native users. The process below outlines how the governments will exercise their discretion.

Allocation within the NWT will be determined by the NWT native User Agreement. In accordance with land claim agreements, GNWT will allocate any portion of a limited harvest, where native users’ needs cannot be met, to aboriginal users.

Licensed harvest allocation in the orange zone shall be determined through agreement between the Yukon First Nations and the Yukon Government. The First Nation allocation in the Yukon will be determined by the Yukon Native User Agreement. The Yukon First Nation Agreement will recognize the unique dependence of the native users of Old Crow on the Porcupine Caribou according the section J8 of the PCMA.

**Harvest Allocation:**





## Education and Communication

These can be pretty empty words in a plan unless there is some way to put teeth into them. It is vitally important that such efforts are given top priority if this plan is going to succeed. So much depends on the cooperation and understanding of the hunters and their families. Fortunately, the Porcupine Caribou Management Board has a lot of experience in both education and communication and can be a sustaining and coordinating force for all such work.

### **Essential Requirements for the Plan**

By adopting this plan it is understood that the parties will support the Porcupine Caribou Management Board in devoting a large portion of its time and resources toward working closely with the communities on education and communication that:

- Improves marksmanship and use of accurate, flat-shooting rifles (reduces the use of underpowered rifles) so that fewer caribou are wounded and die without being found.
- Makes all hunters try their hardest to go after a wounded animal rather than letting it run off.
- Helps hunters identify bulls from cows.
- Makes people aware that rigorous and verifiable harvest information is required by all harvesters at all times.
- Encourages hunters to participate in projects that keep track of the health of the herd.

# Dempster Highway

The Dempster Highway is very important because it is the only road that cuts through the herd's range and makes it easy for hunters to get to the caribou. Over half of the entire caribou harvest comes from the Dempster and concentrated hunting can increase the potential for a conservation or safety issue. Management of the harvest near the highway can involve both laws and hunter awareness.

Since consensus was not reached on the universal application of any laws, the following are provided as Best Practises for the parties to implement as deemed appropriate. When implementing Best Practices, the highest degree of coordination among the parties is desirable. The community engagement phase undertaken for this plan demonstrated significant but not full support for the following:

## **Best ways to improve hunting success**

When caribou are hunted more and more often as the season progresses, they get more 'spooked' and wary of people. This can reduce hunting success so hunters should behave in ways that reduce disturbance to caribou. Your goal should be to hunt and retrieve animals quickly.

- Learn from an expert and take a hunter education course.
- Use your snow-machine to get to the areas that caribou are using, then make quiet stalks on foot.
- Minimize the number of times a group is approached and shot at per day and per week. Leave the groups near the highway and hunt isolated groups farther away.

## **Best ways to ensure all hunters are safe**

Large numbers of caribou draws large numbers of hunters in the field, especially near the Dempster Highway. This can set up situations where hunters are shooting in close proximity to each other and create safety concerns. The goal should be for all hunters to have a safe hunting experience.

- Be sure to take the time to notice other hunters or other caribou around your quarry before shooting.
- Never shoot toward a road or down the travelled portion of a road.
- Wear blaze orange so other hunters can see you; caribou are unable to see orange.

- Drive safely and park vehicles in safe spots along the road. Remember that when the north end of the highway is open hunters share the road with large semi trucks which cannot stop quickly.

### **Best ways to allow caribou to use the Dempster area**

Expert hunters are telling us that some hunting practices have reduced the number of caribou wintering south of the Richardson's in the Peel River Basin. Some hunting practices prevent the caribou from crossing the highway and are pushing the caribou to the west. The leaders and leading waves of caribou are important to those caribou farther back in the migration. The goal should be to reduce the chance of caribou learning to associate the highway with danger

- Take animals towards the rear of travelling groups. Hunt on the east side of the road in the fall and the west in the spring.
- Hunters should make one shot kills away from highway. Field dress your caribou away from the highway to disperse gut piles.
- Caribou follow trails of those before them. Waiting for caribou to walk by on existing trails is a good strategy for hunters.
- Slow down when driving in areas with large numbers of caribou crossing.

### **Best ways to reduce stress to caribou**

Vehicles that chase caribou or frighten them into running long distances can cause a problem called "stress syndrome". Violent exertion causes chemicals to build up in muscles faster than blood can remove them. The changes this causes in the muscle can bring death to the caribou hours, days or even weeks after the harassment occurred. These chemical changes can also affect the quality of your meat. The goal should be to ensure caribou meat is the best quality possible and prevent injury to other caribou.

- Hunters should make one-shot kills from a reasonable distance, and give caribou time and places to regroup.
- Experienced hunters have told us that the use of snow-machines to hunt caribou is the biggest factor spooking caribou. Snow-machines should be quiet and travel at slow, steady speeds.
- Hunters should get into shooting position without the caribou seeing them.
- A wounded animal should be immediately shot again to kill it. A quick death means better meat.

## **Best ways to protect caribou habitat**

Using snow-machines and other off road vehicles can damage the habitat that the caribou rely on. There are many examples of trails that have been created by these vehicles across the range of the herd. The goal should be to act in a manner that minimizes damage to the ground and plants.

- Avoid using snow-machines until the ground is frozen and there is enough snow to protect plants.
- Other off road vehicles such as four-wheelers and argos can also damage plants in the summer. Use the vehicle in a manner that doesn't kick-up plants and create trails across the ground. In severe cases, these trails will never disappear or will start to melt permafrost.

## **Best ways to protect female caribou and their young**

Like many other animals, caribou population growth rates are strongly affected by calf and adult cow survival. A decrease of 2 or 3 percent in cow survival can make the difference between a herd slowly increasing or slowly decreasing. There is no such thing as a "dry cow". Cows that lose their calves before they are normally weaned will be in better condition and are more likely to bear a calf the next spring.

The mating season or "rut" for Porcupine Caribou usually occurs between October 8 and 20. During this time, mature bull caribou eat very little and begin to emit strong odours. By the end of the rut season, breeding bull caribou are exhausted and depleted of the fat reserves they have built up over the summer. The goal should be to select for non-breeding males.

- Take any bull until October 8 when the rutting season starts.
- During the rut until mid November, take small antlered bulls. Avoid disrupting breeding groups of caribou.
- The large breeding bulls will start to drop their antlers in mid to late November so they are easy to identify.
- Some expert hunters tell us the breeding bulls taste fine once they start to eat again. Other hunters suggest waiting for several weeks before taking a big bull after the rut to allow them time to eat and regain body condition.

## **Let the leaders pass**

For some time now, when the caribou first reach the highway in the fall, hunting has been closed for a week, sometimes just on the north end but also, on occasion, on the south end as well. This was to let the caribou reach their winter ranges east of the highway. In the fall of 2007 and 2008 the closures were not enforced in the Yukon. In the NWT, legislation continues to be enforced if the 1 week closure is implemented.

## **Motor vehicles and habitat damage**

Currently the governments of Yukon and Northwest Territories have laws prohibiting the use of motorized vehicles including snowmobiles by hunters within 8 km of each side of the highway until the snow is at least six inches deep. Snow depth is determined by measurements at six locations along the highway (NWT and Yukon).

## **Other Best Practices**

A great deal can be accomplished through making hunters aware that harvesting caribou on the Dempster Highway is a big deal.

A person who is hunting must:

- Know how to tell a bull from a cow even after the bulls have shed their antlers
- Be a good shot and hunt with a flat-shooting rifle that is sighted in
- Realize that other people are out there and a stray shot is very dangerous
- Understand that leaving gut piles along the highway is disrespectful to the caribou and attracts predators
- Teach young people the right ways and be a good example
- Make sure to report their harvest

## **Monitoring and Enforcement**

There are many possible instruments to use for monitoring and enforcement in the different jurisdictions. These complexities make it all the more important that the parties get together and collaborate to harmonize the rules and their enforcement.



## ***Essential Requirements for the Plan***

Through adoption of this plan, the parties are committed to:

1. Increasing highway patrols during the hunting period by YG/GNWT officers in company with representatives from the other parties (Yukon First Nations/NWT Gwich'in/Inuvialuit)
2. Check stations at both the north and south end of the highway
3. Caribou signs advising hunters of the status of the herd and harvest requirements
4. Hunter Education Programs that, to the extent possible, deliver the same information across herd's range in both the NWT and Yukon communities
5. Signs on the highway warning drivers of caribou crossing areas
6. Cooperation to harmonize management action monitoring and enforcement.



## **Other Issues**

### **Predator Control**

Predator control is not called for in this plan. The Inuvialuit, NWT Gwich'in and Yukon First Nations may independently consider community driven initiatives.

### **Sale of caribou**

While the trade, barter and sale of Porcupine caribou with other native users is permitted under the Porcupine Caribou Management Agreement, commercial harvest of meat is not. Results from the community engagement meetings suggest sale is happening and there is a concern about it. This plan recommends the Board establish guidelines for the trade, barter and sale of caribou as per the PCMA.

## Alaskan Involvement

Caribou taken by Alaskans is about 15 percent of the total reported harvest of the Porcupine Caribou Herd and their participation in harvest management is vital to its overall success. A means of coordinating between Alaska and Canada exists through the *Agreement Between the Government of Canada and the Government of the United States of America on the Conservation of the Porcupine Caribou Herd (1987)*. Section 4 of the Agreement empowers the International Porcupine Caribou Board to "...make recommendations and provide advice on ... cooperative conservation planning for the Porcupine Caribou Herd throughout its range." Efforts should be made to revitalize this agreement.

Alaskan user communities and governments have been informed about the Canadian harvest planning process and a coordinated effort to include Alaska in harvest management will be undertaken at the earliest opportunity.

## Summary of Essential Requirements in this Plan

- A. Up-to-date "indicator" information is essential, and without such information the plan cannot function. Therefore, by adopting this plan, it is agreed that the parties are committed to the following:
1. **Photocensus** Participation by Yukon and NWT government staff in planning the caribou Photocensus conducted by the Alaska Department of Fish and Game, and the U.S. Fish and Wildlife Service. Once a successful photocensus has been completed, another photocensus will be attempted in 2 to 3 years.
  2. **Indicators** The parties will continue to cooperate in the collection of all relevant indicator information including adult cow survival, calf birth rate, calf survival to nine months and body condition. Further, the parties will provide local observations to the annual PCMB harvest meeting.
  3. **Harvest Information** Harvest data will be critical in harvest management. The Parties are committed to the annual collection and reporting of rigorous and verifiable harvest information, required of all harvesters at all times. This information will be provided for the Annual Harvest Meeting.



- B. By adopting this plan it is understood that the parties will support the Porcupine Caribou Management Board in devoting a large portion of its time and resources toward working closely with the communities on education and communication that:
- Improves marksmanship and use of accurate, flat-shooting rifles (reduces the use of underpowered rifles) so that fewer caribou are wounded and die without being found.
  - Makes all hunters try their hardest to go after a wounded animal rather than letting it run off.
  - Helps hunters identify bulls from cows.
  - Makes people aware that it is mandatory to report their harvest.
  - Encourages hunters to participate in projects that keep track of the health of the herd.
- C. Increasing highway patrols during the hunting period by YG/GNWT officers in company with representatives from the other parties (Yukon First Nations/NWT Gwich'in/Inuvialuit)
- Check stations at both the north and south end of the highway
  - Caribou signs advising hunters of the status of the herd and harvest requirements
  - Hunter Education Programs that, to the extent possible, deliver the same information across herd's range in both the NWT and Yukon communities
  - Signs on the highway warning drivers of caribou crossing areas
  - Cooperation to harmonize management action monitoring and enforcement

## Implementation and Review

Through the Annual Harvest Meeting, this plan is guaranteed to be used every year. So, there is no way it is going to gather dust on some shelf. After five years, or upon request of any party, there will be a review of how the plan is working and an opportunity provided to make revisions where necessary. The success of this plan requires the respective parties to implement it through a cooperative management process. From time to time this may require that they enter into separate arrangements for the effective adherence to the plan. We need to ensure all parties are kept informed about issues that are important to the continued longevity of the Porcupine Caribou Herd so as to ensure the ability of the herd to provide for the people in the future.

Within six months of the signing of this plan, the Parties will complete a detailed implementation plan, which will be reviewed at the annual harvest meeting and adapted as deemed necessary by the Parties. The Implementation Plan will include monitoring and evaluation processes. It will specify methods and actions that will clarify and detail the process by which the Parties will collect and verify data. The Implementation Plan shall take into consideration that harvest allocation arrangements are the subject of information-gathering and review exercises. As new information arises regarding allocation, it will be shared, reviewed, and integrated into the allocation process within the Plan. Until these exercises are concluded, the existing allocation percentages shall be a guideline.

## Appendix A: Commitments of the Parties under the Porcupine Caribou Harvest Management Plan

Organization	Commitments
<b>Government of Yukon</b>	<ul style="list-style-type: none"> <li>• Communicating about the Porcupine Caribou HMP</li> <li>• Providing input into and reviewing the annual technical report</li> <li>• Conducting consultations as required about Total Allowable Harvest and implementation</li> <li>• Collecting annual harvest and other data and providing the information to the PCTC and PCMB annually</li> <li>• Providing education programs and communication on Best Practices</li> <li>• Developing PCH hunter education package</li> <li>• Patrolling on the Dempster (joint w/NWT, FN)</li> <li>• Providing data to PCMB or Tech Committee annually and participating in the meeting as required</li> <li>• Continuing body condition monitoring, snow condition monitoring, PCH/Hart River herd monitoring</li> <li>• Develop legislation as required</li> </ul>
<b>Tr'ondëk Hwëch'in</b>	<ul style="list-style-type: none"> <li>• Communicating the PCH Harvest Management Plan to its citizens</li> <li>• Providing education programs and communication on Best Practices</li> <li>• Collecting annual harvest data and providing data to the Technical Committee or PCMB annually</li> <li>• Reviewing and providing comments to the annual technical report</li> <li>• Conducting consultation with TH Citizens on Porcupine Caribou Annual Allowable Harvest management process</li> <li>• Managing and administer the Porcupine Caribou harvest activities conducted by TH citizens</li> <li>• Developing regulatory and non-regulatory legislation when necessary</li> <li>• Participating at the annual meeting of the Porcupine Caribou Harvest Allocation</li> </ul>

<b>Organization</b>	<b>Commitments</b>
<b>First Nation of Nacho Nyäk Dun</b>	<ul style="list-style-type: none"> <li>• Communicating and implementing of the Porcupine Caribou HMP and the obligatory requirement for regulatory measures in regards to conservation of the herd</li> <li>• Continuing annual collection of harvest data and providing data annually or as requested to the PCMB or the Porcupine Caribou Technical Committee, including reviewing and providing comments in regards to the Porcupine Caribou annual technical report</li> <li>• Assisting in providing ‘standardized’ education programs and communication in regards to Best Practices and Hunter Ethics</li> <li>• Continuing communications and relations between resources users, signatory partners and assist partners in developing relations and communications with Alaska communities</li> <li>• Participating in the Porcupine Caribou Annual Allowable Harvest Management Process</li> <li>• Conducting consultation with NNDFN citizens in regards to Aboriginal Annual Allowable Harvest Allocation</li> <li>• Managing and administering the Porcupine Caribou harvest activities conducted by NNDFN citizens</li> </ul>
<b>Vuntut Gwitchin Government</b>	<ul style="list-style-type: none"> <li>• Communicating and implementing the Porcupine Caribou HMP</li> <li>• Providing regular monitoring patrols in VGFN Traditional Territory, including jointly on the Dempster Highway</li> <li>• Collecting harvest data semi-annually and provide information to the Technical Committee, YG or PCMB annually or as requested</li> <li>• Assisting in providing standardized education programs, communication on Best Practices and hunter ethics</li> <li>• Providing continued support and advocacy for any initiative that holds the conservation of the herd paramount</li> <li>• Assisting in developing relations and communications with Alaska First Nation communities</li> </ul>

<b>Organization</b>	<b>Commitments</b>
<b>Government of Canada</b>	<ul style="list-style-type: none"> <li>• Communicating HMP recommendations</li> <li>• Implementing HMS recommendations in Ivvavik National Park and Vuntut National Park</li> <li>• Funding research and other actions (e.g. education programs) recommended by the HMS</li> <li>• Reviewing technical information related to the Porcupine Caribou Herd</li> <li>• Continuing participation in the PCMB</li> <li>• Contributing to the operational funding of the PCMB</li> </ul>
<b>Government of the Northwest Territories</b>	<ul style="list-style-type: none"> <li>• Communicating about the Porcupine Caribou HMP</li> <li>• Providing input into and reviewing the annual technical report</li> <li>• Conducting consultations as required about Annual Allowable Harvest and implementation</li> <li>• Working with Inuvialuit and Gwich'in to collect annual harvest and other data and providing the information to the PCMB and the Technical Committee annually</li> <li>• Providing education programs and communication on Best Practices</li> <li>• Developing PCH hunter education package jointly with YG and other parties</li> <li>• Patrolling the Dempster Highway jointly with YG, Gwich'in and Inuvialuit</li> <li>• Providing regular updates (data) to PCMB or Technical Committee and participating in meetings as required</li> <li>• Continuing body condition monitoring, snow condition/depth monitoring jointly with YG and hunters</li> <li>• Annual sight-your-rifle events in collaboration with user communities</li> <li>• Operating check station at the north end of the Dempster Highway in collaboration with Gwich'in and Inuvialuit</li> <li>• Developing and post signs indicating the status of the herd</li> <li>• Developing legislation as required</li> </ul>

<b>Organization</b>	<b>Commitments</b>
<b>Inuvialuit Game Council</b>	<ul style="list-style-type: none"> <li>• Communicating about the HMP (WMACs)</li> <li>• Reviewing and providing comments to the annual technical report (WMACs, IGC)</li> <li>• Supporting education and communication on hunter education and best practices</li> <li>• Helping GNWT, YG and PCMB develop/finalize PCH hunter education package (HTCs)</li> <li>• Working with governments to collect and provide harvest data to the PCTC for the annual herd assessment (HTCs with help from WMACs)</li> <li>• Continuing to support operation of check stations in appropriate locations and encouraging the establishment of check stations outside ISR where appropriate (WMACs, Inuvialuit Game Council)</li> <li>• Continuing communications between resource users including Inupiat. Consider a user-to-user agreement with Inupiat, similar to polar bears, whales (Inuvialuit Game Council)</li> <li>• Following existing process to implement an annual allowable harvest where necessary (WMACs)</li> <li>• Working with Gwich'in using existing land-claim processes to develop the NWT Native User Agreement (WMACs, Inuvialuit Game Council)</li> <li>• Working with governments to help develop any necessary HTC bylaws and territorial regulations (WMACs, Inuvialuit Game Council, HTCs)</li> </ul>

<b>Organization</b>	<b>Commitments</b>
<b>Gwich'in Tribal Council</b>	<ul style="list-style-type: none"> <li>• Communicating about the HMP (participants, DGOs, RRCs, GRRB or Yukon First Nations, Inuvialuit and other user groups as may be required)</li> <li>• Reviewing and provide comments and input to the annual technical report (DGOs, RRCs, GRRB)</li> <li>• Helping government develop, finalize and where required help deliver a PCH Hunter/Harvester Education package</li> <li>• Supporting education and communication on hunter education and best practices</li> <li>• Working with governments to collect and provide harvest data to the PCTC for the annual herd assessment (participants, DGOs, RRCs and GRRB)</li> <li>• Continuing to support the operation of check stations in appropriate locations and encourage establishment of check stations in other locations within the Porcupine Caribou Herd range as may be required</li> <li>• Continuing communications between resource users, including the Gwich'in and Inupiat as may be required and requested. Consider user-to-user agreements with the Gwich'in in Alaska</li> <li>• Following processes established in our land claim agreements to gather harvest information which will be used to establish an Annual Allowable Harvest, where necessary</li> <li>• Working with the parties of the land claims agreements and PCMA to protect and manage caribou habitat</li> <li>• Working with government, Yukon First Nations and Inuvialuit to collaborate on integrated conservation efforts and planning and processes across jurisdictions</li> <li>• Working with government, Yukon First Nations and Inuvialuit to support and strengthen partnerships for a sustainable Porcupine Caribou Herd by promoting education and awareness of caribou and caribou ecosystems</li> <li>• Working with government, Yukon First Nations, Inuvialuit to reduce threats associated to range reductions and population decline</li> <li>• Working with government, Yukon First Nations and Inuvialuit to develop collaborative legislation policies and plans that maintain a sustainable Porcupine Caribou Herd</li> </ul>



## **Appendix B: Information on the PCTC and Example Data**

### **Information on the Porcupine Caribou Technical Committee and Example of 2008 Annual Summary Report**

In the *Agreement Between the Government of Canada and the Government of the United States of America on the Conservation of the Porcupine Caribou Herd (1987)*, the International Porcupine Caribou Board may “recommend a joint technical committee be formed to coordinate and report on research and monitoring of the Porcupine Caribou Herd.” In 1989 at one of the first meetings, the International Board made a resolution addressed to the 5 management agencies to continue support to the Technical Committee that had been functioning for more than a decade.

The current Porcupine Caribou Technical Committee (PCTC) is a group of operational level biologists and researchers who work on the herd. The aim of the PCTC is to coordinate research and monitoring activities among the members to optimize effort and funding. The committee also provides technical information and advice to various governments and boards. Although there is no formal membership, there is a core group of agency biologists who consistently participate. Other researchers, particularly academics, come and go as they initiate and conclude projects. Currently, there are 8 organizations who regularly participate (Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Geological Survey, Canadian Wildlife Service, Government of Yukon, Government of the Northwest Territories, Ivvavik National Park and Vuntut National Park).

# --- EXAMPLE DATA ---

## Indicators for Harvest Management Assessment

Prepared for the Porcupine Caribou Management Board by the PCTC

	Indicator	Value	5 year average	Notes
<b>Population size and trend</b>				
1	<b>Population size (2001 photocensus)</b>	123,000 in 2001	---	Declined by 55,000 caribou since peak in 1989
2	<b>Estimated population (2007 computer program)</b>	100,000 to 110,000 in 2007	---	Declined by 78,000 caribou in last 19 years
3	<b>Population trend</b>	Declining	---	Lambda = XXXX. Relatively slow decline
<b>Population dynamics</b>				
4	<b>Adult cow survival</b>	2006 = 0.825	---	Similar to 2001 estimate when the herd was declining.
5	<b>Calf birth rate</b>	2007 = 0.79	0.78	Good. 21-year average = 0.81.
6	<b>Calf survival to 9 months</b>	2006 = 0.39	0.36 = 13 year average	Good, we like to see at least 0.30. Missing 2005, 2007 – 2009 due to overlap with other herds.
7	<b>Peak of calving</b>	29 May 08	1 June	Earliest on record but still OK
<b>Harvest</b>				
8	<b>Total harvest</b>	2008 = 1,500?	4,000?	Somewhat low due to inaccessibility of caribou. Missing 4 User Groups
9	<b>% females in harvest</b>	?	?	Few this year. Over the long term as high as 50%?
10	<b>Hunters' needs met?</b>	Borderlands 2007/08: probably only Arctic Village met their needs	N/A	Fall migration was early, low snow but caribou far away.
<b>Body condition</b>				
11	<b>Average backfat (Nov-Mar)</b>	XXXX	XXXX	
12	<b>Hunter assessment</b>	Body condition hunters: Borderlands 2007/08: half said good, half said fair to lean	N/A	Condition likely average Most reports come from fall
13	<b>Health</b>	Borderlands 2007/08: no reports of abnormalities		No concerns

	Indicator	Value	5 year average	Notes
<b>Habitat and other considerations</b>				
14	<b>Snow conditions (Dempster)</b>	Mar08 = XX cm	XX cm	Shallower than average, no ice layers noted. 18 year average = XX
15	<b>Snow conditions (range wide)</b>	Borderlands 2007/08 says _____	N/A	Low snow year, lots of overflow. Snow and weather affected hunters' ability to travel, not so much condition of caribou.
16	<b>Major fires</b>	XXXX Km2 in 2008		Proportion of range burned in last 50 years = XXXX. Good information only back to 60s
17	<b>Weather events</b>	Borderlands 2007/08 says _____		Freeze up was slow with lots of overflow, warm Dec (some report above 0 for few days) then bitterly cold
18	<b>Timing of Green-up</b>			USGS NDVI

# **Porcupine Caribou Herd Harvest Management Plan Signatories**

(Signature Page 1)

(Signature Page 2)