

GRRB Porcupine Caribou Harvest Report:

June 1, 2011 - May 31, 2012

Gwich'in Harvests reported by Community Interviews and Check Station reports



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Executive Summary

The Gwich'in Renewable Resources Board (GRRB) has a responsibility within the Implementation Plan of the Porcupine Caribou Harvest Management Plan (PCHMP) to collect harvest data from Gwich'in harvesters and provide relevant data to the Porcupine Caribou Management Board (PCMB).

Gwich'in Porcupine caribou harvest data from June 1, 2011 to May 31, 2012 was obtained by community interviews of participating Gwich'in harvesters and additional records were obtained through voluntary reporting of harvests from August 15 to October 16, 2011 at a check station run at the Dempster Highway Peel River ferry crossing. Interview data was analysed to calculate community and overall reported and estimated harvest amounts. Check station data supplied to the GRRB was compared with interview data from the overlapping data collection period (Aug - Oct 2011) for Gwich'in harvesters and station usage by all groups was examined.

The number of Porcupine caribou harvested by Gwich'in participants who reported through interviews was 575 animals for the 12 month period and the harvest was bull dominated (545 males: 25 females: 5 unknown sex). Caribou were generally reported to be in good to excellent condition. Using harvester response rates and reported harvest, the estimated Gwich'in harvest was calculated to be 939.3 caribou (888.6 males and 50.7 females/unknown sex).

A total of 275 caribou harvests were reported at the check station (231 by Gwich'in, 37 by Inuvialuit and 7 by other harvesters). The reported harvest was bull dominated (96 % bulls). Gwich'in harvesters represented 76% of users reporting at the check station. We used information from the Inuvialuit harvest study to make a comparison which suggested that Inuvialuit harvesters reported at the check station in smaller numbers than might be otherwise expected while Gwich'in harvesters reported in larger numbers than expected. Further study by the relevant parties is needed to investigate if resident harvesters and harvesters from other claim groups who reported at the check station did so in proportion to the number of active harvesters in those groups and as estimated in this report.

More Gwich'in harvesters reported by only interview than those who reported only by check station or by both methods. Gwich'in participants from Fort McPherson were more likely to report at the check station than harvesters from other communities and also had higher interview participation rates than other communities. Harvesters from Aklavik did not use the check station at all. By comparing Gwich'in harvest data from both interview and check station records and accounting for discrepancies and double reporting, the total reported harvest for this three month period was calculated to be a minimum of 506 and a maximum of 558 animals, adding 97 to 149 harvests reported at the check station to the 409 reported by interview for the months of reporting source overlap.

Both harvest data collection methods assisted in providing a better understanding of Gwich'in harvests that occurred during the August to October harvest period. Only the interview method however, permitted calculation of a harvest estimate and collection of data representing 12 months of harvesting. Consistency in information required and reported by both methods is necessary to facilitate such comparisons in future.

Introduction:

The Gwich'in Renewable Resources Board (GRRB) has a responsibility within the Implementation Plan of the Porcupine Caribou Harvest Management Plan (PCHMP) to collect harvest data from harvesters and provide relevant data to the Porcupine Caribou Management Board (PCMB) via their technical committee. The PCMB determined that rigorous and verifiable harvest monitoring is an important component of herd management; the process of conducting community interviews undertaken through the GRRB and Renewable Resources Councils (RRCs) is necessary for a more comprehensive understanding of harvest levels of this herd. From June 1, 2011 to May 31, 2012 Gwich'in harvesters were invited to provide information on their harvests of Porcupine caribou to a community interviewer. Community RRCs oversaw this process locally during two reporting periods and supplied the information to the GRRB for data entry, storage, analysis and reporting, with coordination by the GRRB. One purpose of this report is to present the harvest data provided for this period.

The PCMB also requested a comparison of harvest data collected by interviews to those collected from the Dempster Highway check station at the Peel River in order to assist in evaluating the efficacy of both data collection methods in collecting comprehensive harvest data for the GSA communities. The second purpose of this report is therefore to examine usage of the Dempster Highway Peel River check station and the harvest data reported there. In our analysis we compared Gwich'in harvests reported at the check station with Gwich'in harvests reported from harvest interviews. Harvest information collected at the check station for non-Gwich'in harvesters was summarized but no comparative analysis was done with any other reporting methods for those groups. We also examined whether those groups who reported at the check station did so in proportion to rates that might be expected in order to assist in evaluating usage of the Peel River check station.

Methods:

A. Harvest Interview Data

Data Collection

Participating harvesters in the four Gwich'in communities voluntarily shared harvest data through interviews conducted by a community member in November 2011 to record their harvests made between June 1 and October 31, 2011. Interviews were conducted again in June 2012 for harvests made between November 1, 2011 and May 31, 2012. Detailed methods for this harvest study are described in the Implementation Plan for the Porcupine Caribou Harvest Management Plan.

Data collected included the number of animals harvested according to sex and age class, harvest location, condition of animals harvested and general observations on weather and environmental conditions at the time of harvest. The interview form (See Appendix 1) included a section where harvesters could report whether they had hunted as part of a larger party and could volunteer the other names in their hunting party. This data was requested in order to facilitate the comparison of both data collection methods, to ensure the list of potential persons to interview was complete, and to better calculate the overall estimated harvest based on number of known harvesters. Harvester names were kept confidential for privacy purposes.

The GRRB's Renewable Resources Manager worked with RRC Coordinators to update each community's active harvester list prior to each interview round. Interviewers made changes to the list as needed to update contact information, add new harvesters, and add comments.

Data Analysis

Harvests reported from harvesters in each community were summarized by the sex of the caribou harvested, by harvester community and by reporting period for this report.

Response rates were calculated by dividing the number of caribou harvesters interviewed by the number of caribou harvesters on the harvester list provided by the RRC for that survey round. Occasionally, caribou harvesters not on the list were contacted by an interviewer and provided harvest information. They were included in the response rate calculation, their harvests included in the analyses, and their names were added to the community list for future survey rounds. In a few instances persons not on a community list were contacted and reported that they had not hunted or harvested caribou. These persons' names were not added to the community list and were not included in the response rate calculation as we did not consider them active harvesters.

The estimated harvest was calculated by estimating the number of caribou taken by active harvesters who were not interviewed and adding that estimated amount to the harvest reported by participating active harvesters. Harvest estimates were calculated for bulls and cows/unknown caribou separately. The portion of the estimated calculation for non-interviewed Gwich'in harvesters was done according to this formula: (number of active harvesters – number of harvesters interviewed) * (average number of caribou harvested by interviewed harvesters). Participation rates were calculated by determining the percentage of hunters interviewed compared to the number of active harvesters. Participation rates and harvest estimates were calculated for each community and reporting period. These values were summed to obtain the overall annual reported and estimated Gwich'in Porcupine caribou harvest.

B. Check Station Data & Comparison to Interview Data

Data Collection

The Environment and Natural Resources (ENR) check station run at the Peel River ferry crossing was operated by the Gwich'in Tribal Council (GTC) under a contribution agreement with ENR in 2011. The GTC delegated staffing and data collection responsibility to the Tetlit RRC. The check station data used in this report are those that were supplied by the GTC to the GRRB. Further information from these parties will help to describe the data collection methods used at the check station (E.g. Days and hours open, procedures etc...).

Data Analysis

Check station data supplied to the GRRB was compared with Gwich'in interview data from an overlapping harvest period (Aug - Oct 2011). Interview data from outside this time frame was excluded from analysis. In order to determine the total reported harvest and account for instances of double reporting we compared harvester names, community of residence and harvest information from each source, and divided the data into four categories as in Table 1 below: Data obtained by Interview Only; Data obtained by the Check Station Only; Matching Harvests (identical data that was reported at both the check station and by interview); Discrepancies. In the case of the Discrepancies category, these are harvests reported by interview and at the

check station by the same harvesters that were not clearly the same harvest and so could not be added to the Matched category, but were similar enough that they could not be definitively considered different harvests. In order to calculate an overall number of reported harvests by Gwich'in harvesters during the period of overlap, this category was used to calculate a minimum to maximum range of possible harvests, as could best be determined using the available data. For these calculations, we assumed that if discrepancies did not match and represented entirely different harvests, the maximum must sum the harvest from both sources (i.e. every harvest counted). However, if discrepancies represented the same harvest, the minimum amount of harvest that occurred must be determined by only counting the lowest value chosen from both reports made by the harvester in question and all minimums were summed together (to get community minimum totals and overall minimums, in turn). Discrepancy community totals were summed with the confirmed values from the other data source categories (i.e. harvests from the Interview Only, Check Station Only and Matching categories) to get the final minimum calculation. These calculations are described by formulas in Table 1 and were done for male, female and overall reported harvests.

Table 1. Summarized Interview & Check station Harvest Data Template and Calculations

Harvest Data Source												
Unique Records						Reported at Both Interview and Check Station						
Interview only		Check station only		Matching harvests*		Discrepancies**						
						Male		Female				
Community		Male	Female	Male	Female	Male	Female	Interview	Check station	Interview	Check station	
								k_i^d	l_i^d	m_i^d	n_i^d	
$Community_{Com}$		I_M	I_F	S_M	S_F	M_M	M_F	$MinM_{Com} = \sum_{i=1}^d (\text{lowest value of } k_i \text{ or } l_i)$		$MinF_{Com} = \sum_{i=1}^d (\text{lowest value of } m_i \text{ or } n_i)$		
								$MaxM_{Com} = \sum_{i=1}^d (\text{highest value of } k_i \text{ or } l_i)$		$MaxF_{Com} = \sum_{i=1}^d (\text{highest value of } m_i \text{ or } n_i)$		
Formula key:												
TOTAL		$A = \sum_{i=1}^4 I_M$	$B = \sum_{i=1}^4 I_F$	$C = \sum_{i=1}^4 S_M$	$D = \sum_{i=1}^4 S_F$	$E = \sum_{i=1}^4 M_M$	$F = \sum_{i=1}^4 M_F$	Com= for each of 4 communities		$\sum x = \text{sum of all } x \text{ values}$ k & l = discrepancy pair by source	d=number of discrepancies reported in Community Com	
Min. Male		$= A+C+E + \sum_{i=1}^4 MinM_{Com}$					Max. Male harvest		$= A+C+E + \sum_{i=1}^4 MaxM_{Com}$			
Min. Female		$= B+D+F + \sum_{i=1}^4 MinF_{Com}$					Max. Female Harvest		$= B+D+F + \sum_{i=1}^4 MaxF_{Com}$			
Minimum Reported Harvests		$= \text{Min. Male} + \text{Min. Female}$					Maximum Reported Harvests		$= \text{Max. Male} + \text{Max. Female}$			

*Matching harvests are identical harvests that were reported by both methods

**Discrepancy harvests are possible matching records reported by both methods

Results:

A. Harvest Interview Data

A total of 232 harvesters were identified as being active harvesters in the GSA but not all participated in the interview-based study. Across all communities for the entire year, the participation rate was only 53% of active harvesters and varied between communities (Table 2). In all communities, there was greater participation during the first survey wave than during the second survey wave. Fort McPherson had the highest response rates in both waves out of the four communities.

Table 2. Gwich'in Active Harvester numbers and Participation Rates

Entire Year June 2011-May 2012	All communities	Aklavik	Fort McPherson	Inuvik	Tsiigehtchic
# hunters on list	464	68	256	94	46
# hunters interviewed	246	29	156	44	17
Participation rate	53%	43%	61%	47%	37%
Survey Wave 1: Jun-Oct 2011					
# harvesters on list	232	34	128	47	23
# harvesters interviewed	147	18	87	28	14
Participation rate	63%	53%	68%	60%	61%
Survey Wave 2: Nov 2011-May 2012					
# hunters on list	232	34	128	47	23
# hunters interviewed	99	11	69	16	3
Participation rate	43%	n/a	54%	34%	13%

Harvest data reported from each community and the estimated harvest values for male and female caribou are presented below in Table 3 for the entire year. Calculations and individual harvest records (with harvester names removed) are available as an Excel spreadsheet in Appendix 2 to this report for the PCTC. These complete records also present location information and more detailed descriptions of each harvest as it was reported. The total caribou reported harvested by participating Gwich'in harvesters for the entire year was 575 animals and the reported harvest was bull dominated (95% bulls), ranging from 80%-98% bulls between communities.

Table 3. Entire Year Jun 2011-May 2012: Reported and Estimated Harvest by Community and Caribou Sex

MALES	All communities	Aklavik	Fort McPherson	Inuvik	Tsiigehtchic
Reported Harvests	545	32	366	86	61
Variance of interviewed	80.01	15.0	13.3	23.0	28.6
TOTAL ESTIMATED	888.6	67.8	553.2	155.6	112.0
n strata	8	2	2	2	2
90% Confidence Interval	5.20	4.51	4.25	5.58	6.23
FEMALES/UNKNOWN					
Reported Harvests	30	1	7	21	1
Variance of interviewed	3.10	0.1	0.2	2.7	0.1
TOTAL ESTIMATED	50.7	1.9	10.4	36.8	1.6
n strata	8	2	2	2	2
90% Confidence Interval	1.02	0.27	0.57	1.92	0.31

After reviewing check station data (See part B), 11 Gwich'in harvesters were identified that were not on community harvester lists as active harvesters (6 Fort McPherson, 2 Inuvik, 3 Tsiigehtchic harvesters). To ensure estimate calculations were as accurate as possible, these harvesters were added to the number of active harvesters and this number was used to calculate harvester participation rates and estimated harvest for both periods. The harvests they reported at the check station were not included in this calculation as it was based solely on data supplied through interviews; response rate and estimate calculations accounted for harvesters who did not participate by interview, providing the number of active harvesters was accurate. By summing all estimated harvests from each community and survey round, the overall Gwich'in harvest for the entire year was estimated to be 888.6 bulls and 50.7 cows & caribou of unreported sex (Table 3). The annual estimated harvest was divided between communities with 8% of the annual harvest from Aklavik, 60% from Fort McPherson, 21% from Inuvik and 13% from Tsiigehtchic.

Table 4a. Survey wave 1, Jun-Oct 2011: Reported and Estimated harvest by Community and Caribou Sex

MALES	All communities	Aklavik	Fort McPherson	Inuvik	Tsiigehtchic
Reported Harvests	385	19	246	64	56
Avg of interviewed		1.1	2.8	2.3	4.0
Variance of interviewed	45.65	2.1	8.3	15.0	20.3
Estim for uninterviewed		16.9	115.9	43.4	36.0
TOTAL ESTIMATED	597.2	35.9	361.9	107.4	92.0
n strata	4	1	1	1	1
90% Confidence Interval	5.56	2.36	4.73	6.38	7.41
FEMALES/UNKNOWN					
Reported Harvests	26	1	6	18	1
Avg of interviewed		0.1	0.1	0.6	0.1
Variance of interviewed	2.52	0.1	0.2	2.2	0.1
Estim for uninterviewed		0.9	2.8	12.2	0.6
TOTAL ESTIMATED	42.6	1.9	8.8	30.2	1.6
n strata	4	1	1	1	1
90% Confidence Interval	1.31	0.39	0.79	2.42	0.44

Table 4b. Survey wave 2, Nov '11-May '12: Reported & Estimated harvest by Community and Caribou Sex

MALES	All communities	Aklavik	Fort McPherson	Inuvik	Tsiigehtchic
Reported Harvests	160	13	120	22	5
Avg of interviewed		1.2	1.7	1.4	1.7
Variance of interviewed	34.36	13.0	5.1	8.0	8.3
Estim for uninterviewed		18.9	71.3	26.1	15.0
TOTAL ESTIMATED	291.3	31.9	191.3	48.1	20.0
n strata	4	1	1	1	1
90% Confidence Interval	4.82	5.92	3.71	4.65	4.75
FEMALES/UNKNOWN					
Reported Harvests	4	0	1	3	0
Avg of interviewed		0	0.0	0.2	0
Variance of interviewed	0.58	0	0.0	0.6	0
Estim for uninterviewed		0.0	0.6	3.6	0.0
TOTAL ESTIMATED	8.2	0.0	1.6	6.6	0.0
n strata	4	1	1	1	1
90% Confidence Interval	0.62	0.00	0.20	1.23	0.00

Seventy-one percent of the year's reported harvest took place between June 1 and October 31, 2011 and harvest in all communities was higher in this period than from November 2011 to May 2012 (Tables 4a and 4b above). Harvests of female caribou and caribou of unreported sex were also higher in the summer-fall period than during winter-spring. Most of this earlier summer-fall harvest of 411 animals occurred along or near the Dempster Highway (Figure 1). Along the highway, the NWT-YT border and the Arctic Circle were identified as the sites of 44% of the harvest in the summer-fall period and were also locations of 31% of the total annual reported harvest. The summer-fall harvest also tended to be at more northerly locations than the harvests reported during the winter-spring survey period, with all summer-fall harvests at or north of the Horseshoe bend on the Dempster highway and 66% of winter-spring harvests south of this location and none further south than Red Creek, past Engineer Creek. Further information on harvest location is found in Appendix 2.

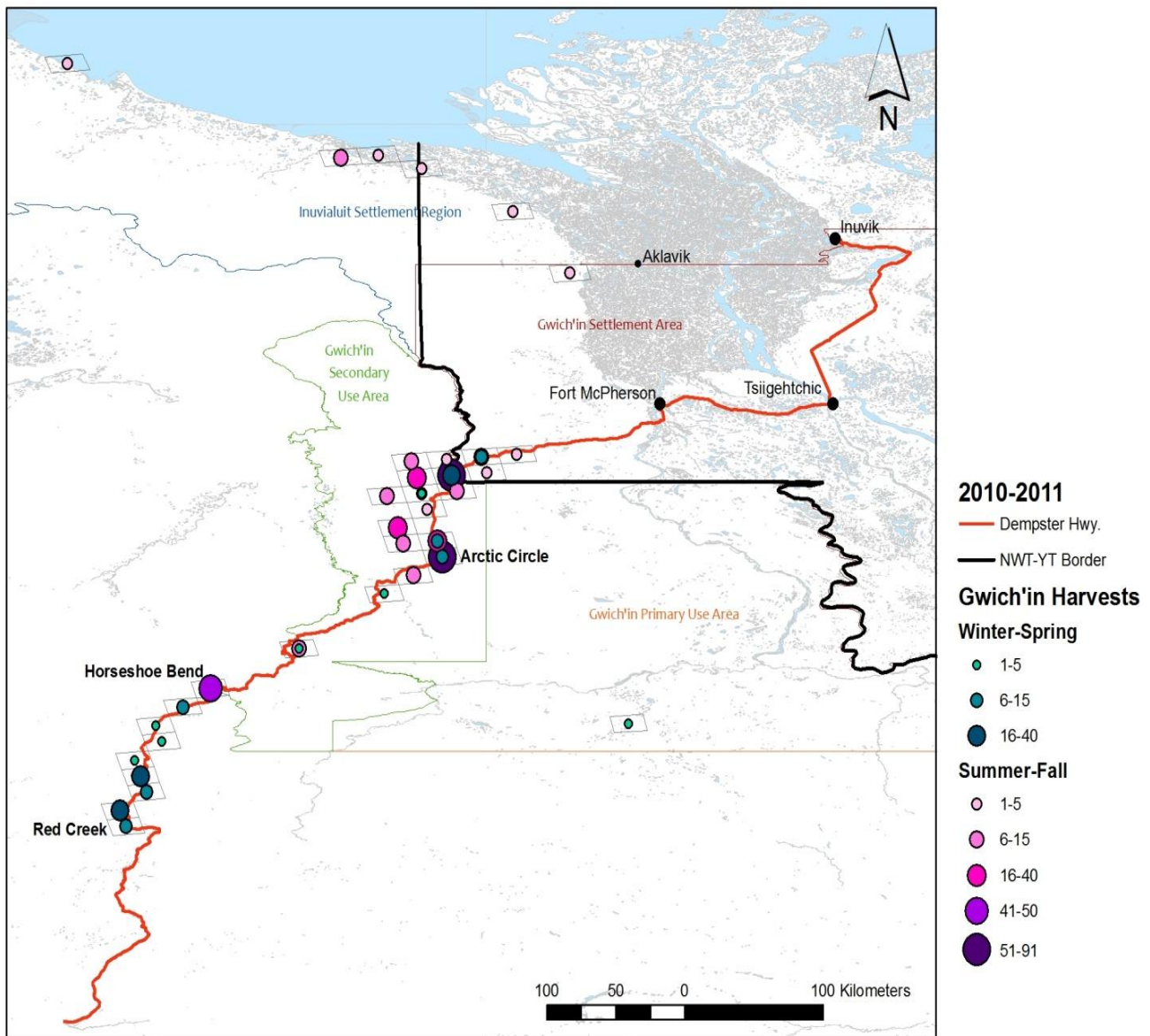


Figure 1. June 2011-May 2012 Gwich'in reported harvests by location and season

Of 135 harvesters who responded to a survey question about the condition of caribou they harvested, 77% reported that caribou were in excellent or good condition across both survey rounds (Figure 2). A greater proportion of harvesters ranked body condition high in the winter and spring of 2012 than in the summer and fall of 2011 (87% versus 72%, respectively). In comparison, of 120 harvesters interviewed through the Arctic Borderlands Ecological Knowledge Coop interviews for the summer and fall of 2011, 83% ranked the body condition of caribou they observed as excellent or good (ABEKC 2011). In the GRRB survey however, harvesters were not asked about all caribou observed, but only those they harvested. Several harvesters commented that during the winter, they saw where caribou shins had been scraped or cut by traveling through ice.

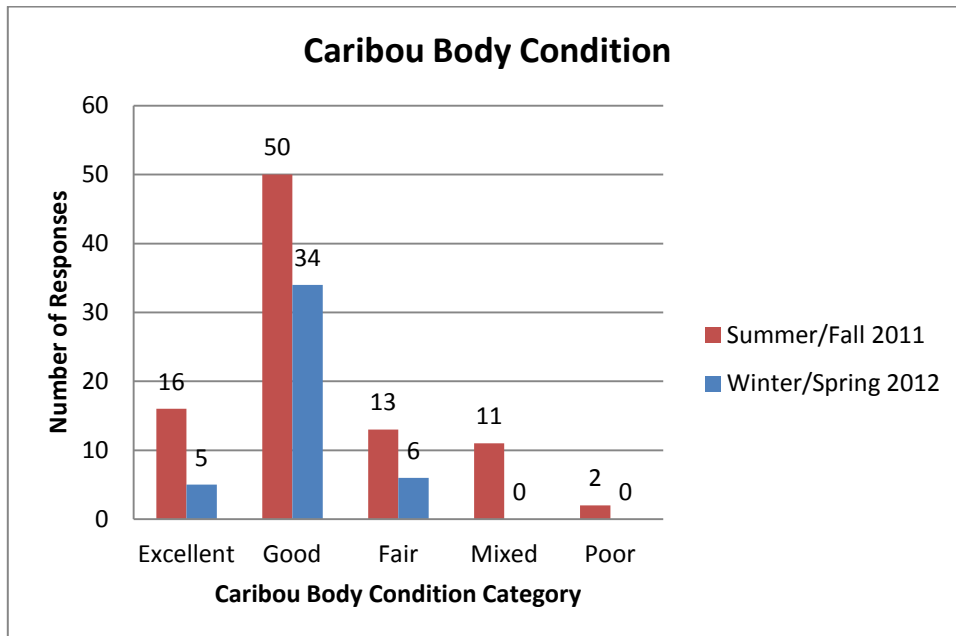


Figure 2. Caribou condition as reported by Gwich'in harvesters during harvest interviews. Respondents were asked about the overall condition of Porcupine caribou that they harvested.

Many harvesters interviewed also reported on the amount of caribou they had seen throughout the year. Caribou were generally reported to be more available in the summer and fall than they were in the winter and spring, as across all communities 50% reported they saw less caribou than usual in the summer-fall and 75% that they had seen less than usual in the winter-spring of 2012 (Figure 3). No one reported seeing more caribou than usual in the winter-spring.

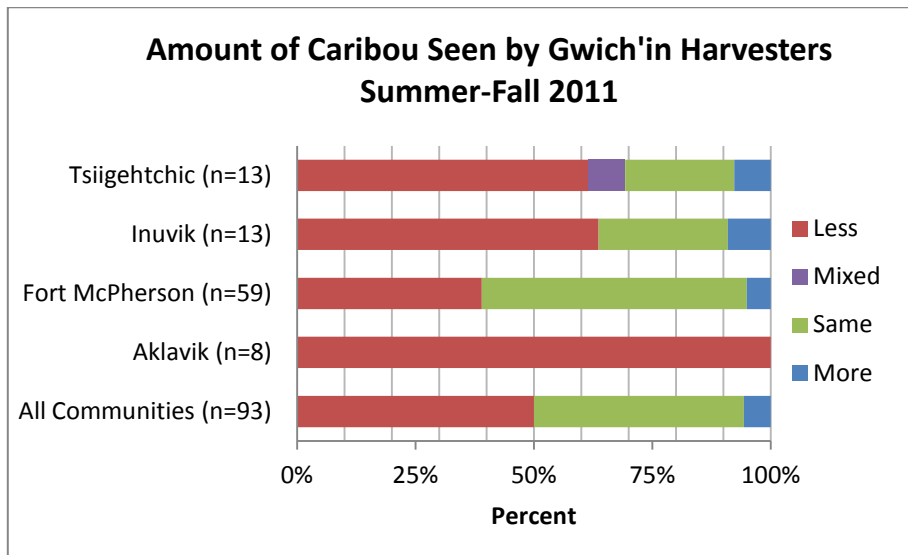


Figure 3a. Amount of caribou seen by Gwich'in harvesters in summer-fall of 2011.

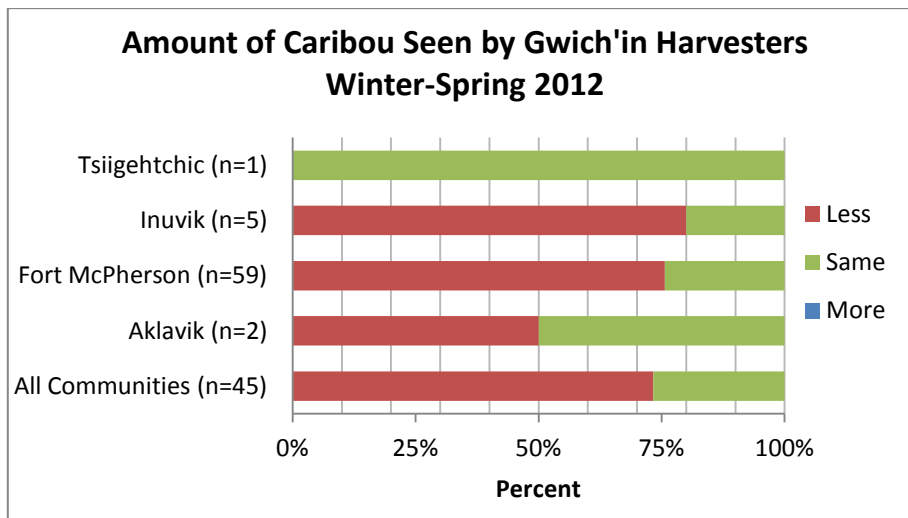


Figure 3b. Amount of caribou seen by Gwich'in harvesters in winter-spring 2012. Number of respondents per community are noted with community name.

Despite seeing fewer caribou than usual, in general for both survey periods, about 70-75% of respondents reported they had met their needs for caribou (Figure 4).

Of 21 respondents those who reported that they did not meet their needs for caribou during the summer-fall of 2011, 43% indicated that this was because of availability (caribou were too far away) while 5% said it was too expensive to go hunting and 14% cited conditions (such as lack of time to hunt or weather conditions) as reasons why they did not meet their needs. Over the winter harvesting season from November to May, 89% of nine harvesters who reported that they did not meet their needs said that this was because caribou were not available and 22% of respondents said it was because of the cost.

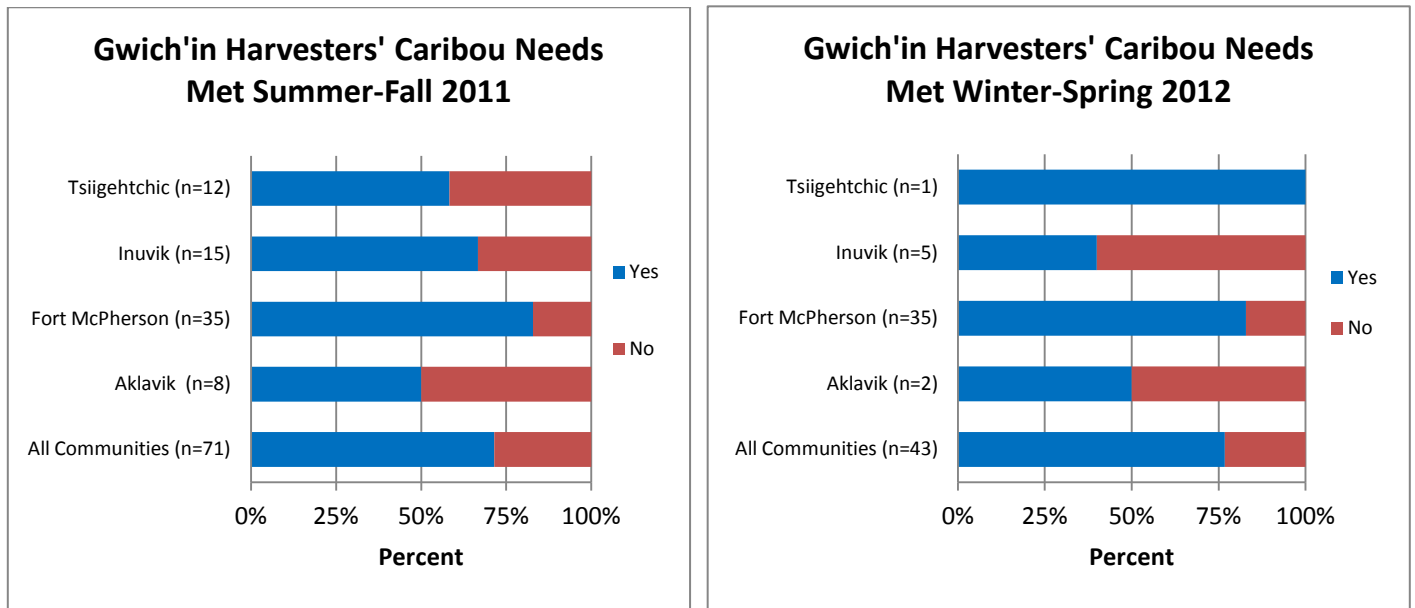


Figure 4. Gwich'in harvesters' indications of whether they had met their needs for caribou by season and by community. Number of respondents in each community is indicated by (n=#).

During the November interview round 63% of 84 harvesters reported that weather conditions in the summer and fall were about normal while 35% of them thought that it was more warm or mild than other years. During the June interview round 56% of 39 harvesters reported that weather conditions over the winter and spring had been about normal while 21% thought it was warmer and 5% considered it colder than usual, although responses varied somewhat by community.

Finally, in the November interview round, harvesters were asked if they had heard about the status of the herd as being in the “Green Zone” during the summer-fall 2011 period, which was the ranking set by the PCMB and Parties to the Harvest Management Plan and which determined management actions, including harvesting levels and potential limits on harvest. Of 147 persons interviewed across all communities 75% of 99 harvesters who answered the question said that they had heard of the Green Zone, but this varied by community and was driven mainly by the positive response of harvesters from Fort McPherson (Figure 5).

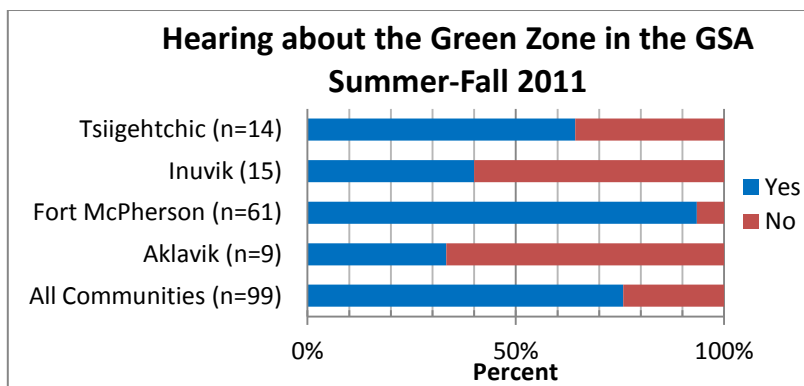


Figure 5. Gwich'in harvesters response by community regarding whether they had heard of the Green Zone status ranking of the Porcupine Caribou herd.

In Inuvik and Aklavik more than half of respondents had not heard of the green status ranking. Those who reported that they had heard of the green zone indicated that they had done so by a variety of methods and these methods cited differed by community (Figure 6). Hearing about this by radio was most important in Fort McPherson, while it was less important for other communities.

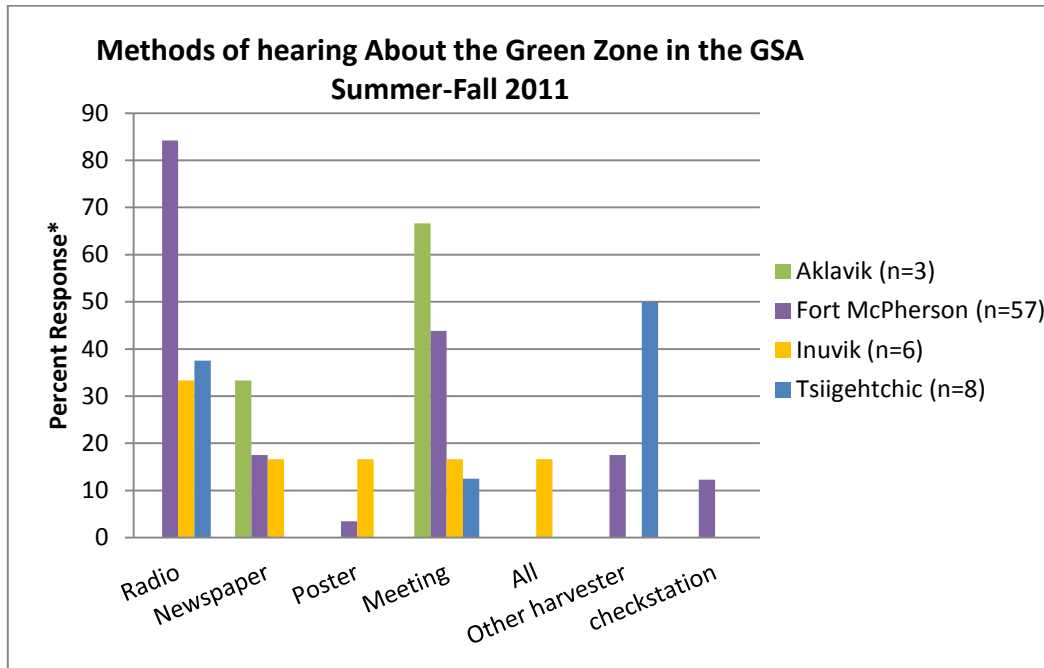


Figure 6. Communication Methods for hearing about the Green Zone in summer-fall of 2011 by Gwich'in interview participants. *Some harvesters reported hearing by more than one method.

B. Check Station Data & Comparison to Interview Data

Check Station

The Dempster Highway check station at the Peel River collected harvest information over a two month period from August 15 - to October 16, 2011. Harvester community and claim group were not always recorded at the check station and this information had to be looked up by GRRB staff in order to complete the comparison of data from both reporting sources. A template of the reporting form used is attached in Appendix 3 and the check station records (with names removed) are in Appendix 4.

During the period the check station was open 66 harvesters reported harvests at the check station, 17% of them doing so more than once (Table 5). Of 275 caribou reported harvested, 96% were bulls.

We did not have access to the station's hours of operations or operating procedures between the dates that it was open from August 15 to October 16 to help evaluate usage of the check station. Some harvesters reported by interview that they did not report their harvest at the check station because it was not open when they passed its location.

Table 5. Check station Reported Harvests from Aug 15-Oct 16, 2011

Claim Group	Community	Harvesters Reporting	Harvesters reporting>1	Harvest		
				Male	Female	Total
Gwich'in	Fort McPherson	38	6	171	9	180
	Inuvik	6	1	25	0	25
	Tsiigehtchic	6	2	26	0	26
Inuvialuit	Fort McPherson	1	0	2	0	2
	Inuvik	9	2	31	3	34
	Unknown	1	0	1	0	1
Unknown	Inuvik	2	0	2	0	2
	Unknown	3	0	5	0	5
TOTAL		66	-	263	12	275

We did not have access to the number of Inuvialuit Porcupine caribou harvesters or resident and non-resident harvesters with tags in 2011 in order to compare to the proportions of those groups who reported at the check station. However, the Inuvialuit Harvest Study (Joint Secretariat 2003) reported that on average from 1988-1997 there were 65 caribou harvesters from Aklavik and 58 from Inuvik. If all of them harvested Porcupine caribou and were also considered to be active harvesters from this herd in 2011, these numbers can be compared to the number who reported at the check station. For this analysis, we also assumed that of all Inuvialuit caribou harvesters only those from Aklavik and Inuvik may have harvested from the Porcupine caribou herd. We know that in 2011 there were 232 active Gwich'in harvesters (see Table 2) and possibly 123 Inuvialuit caribou harvesters, as described above. Discounting harvesters from unknown groups (as we did not have information to estimate this number), this means that there could be 355 harvesters reporting at the check station in an expected ratio of approximately 65.3% Gwich'in and 34.6% Inuvialuit. In comparison, the actual ratios of those who reported at the check station were approximately 76% Gwich'in, 17% Inuvialuit and 8% were other harvesters. This means that Gwich'in harvesters reported more often than might be expected at the check station while Inuvialuit harvesters reported less often than expected, if these assumptions about the number of Inuvialuit Porcupine caribou harvesters are correct.

We also examined the differences in reporting at the check station between communities within Inuvialuit and Gwich'in claimant groups: Of 123 possible Inuvialuit harvesters and of the 11 who did report, those from Inuvik were more likely to report at the check station than may have been expected (81.8% of 11 versus 47.1% of 123). No Inuvialuit harvesters reported from Aklavik while 52.8% may have been expected based on the breakdown of harvesters' communities in the Inuvialuit Harvest Study. Among Gwich'in communities, harvesters from Fort McPherson were much more likely to report at the check station than expected based on the number of active Gwich'in harvesters in each community. Of 50 Gwich'in harvesters who reported at the check station, 76% of them were from Fort McPherson compared to the proportion expected from that community (Fort McPherson active harvesters made up 55.2% of 232 Gwich'in harvesters in 2011-2012). Gwich'in harvesters from Tsiigehtchic reported at the check station slightly more than expected (12% versus 9.9%) while harvesters from Inuvik and Aklavik reported less than expected at the check station (12% and 0% versus 20.2% and 14.7%, respectively).

Comparison of Gwich'in Check Station to Interview Data

During the harvest study interviews few harvesters recalled the exact date of their harvest to the interviewer but did remember the month of harvest. As a result, all interview data from August 1st to October 31st was included in this comparison, potentially adding four weeks of harvest data from the interview method (two weeks at start and two weeks at end) in addition to the data from the true period of overlap.

Table 6. Number of Gwich'in Harvesters by Reporting Method for Aug-Oct, 2011 Harvests

Community	Total*	Interview only*	Check station only	Both*
Aklavik	8	8	0	0
Fort McPherson	77	39	16	22
Inuvik	18	12	3	3
Tsiigehtchic	14	8	3	3
TOTAL	117	67	22	28

*This figure represents the number of harvesters who reported successful hunts. Others were interviewed who may not have had successful hunts.

Gwich'in participants volunteering harvest information took advantage of the opportunity to choose their reporting method (Table 6) although they favoured doing so by interview. Of 117 Gwich'in harvesters who reported successful harvests from this period by at least one of these methods, 57% did so only by interview, 19% only by check station and 24% by both methods. Aklavik harvesters did not report at the check station. Sixty-six percent of Gwich'in harvesters reporting harvests for this period were from Fort McPherson.

Almost twice as many fall caribou harvests made by Gwich'in harvesters were later reported by interview than were reported at the check station (409 versus 231) and some of these harvests were reported at both locations (Table 6). Of those harvesters who reported at both locations, 22 reports (11 pairs, one from each source) and more than half of their reported harvests could not be easily matched and were categorized as discrepancies.

Table 7. Gwich'in Reported Harvests from Aug- Oct, 2011

Community	Interview only		Check station only		Matching harvests		Discrepancies**			
	Male	Female	Male	Female	Male	Female	Male		Female	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Aklavik	17	1	0	0	0	0	0	0	0	0
Fort McPherson	176	6	87	4	32	0	28	62	0	5
Inuvik	58	16*	13	0	3	0	3	9	0	2
Tsiigehtchic	35	1	10	0	12	0	4	9	0	0
TOTAL	286	24	110	4	47	0	35	80	0	7
Min Male	478		Max Male		523					
Min. Female	28		Max Female		35					
Minimum Reported Harvests	506		Maximum Reported Harvests		558					

*One caribou of unknown sex reported by interview-only in Inuvik was added to the total females.

The number of harvests reported by Gwich'in harvesters between Aug – Oct, 2011, after compiling interview and check station sources and accounting for double reporting and discrepancies, was calculated to be at least 506 and a maximum of 558 animals (Table 7). This adds 97 to 149 harvests reported from the check station to those reported by interview (409) for the months of overlap.

Discussion

A. Harvest Interview Data

The annual reported harvest of 575 caribou from this study is less than half of the average annual reported harvest during the Gwich'in Harvest Study (GHS) run between the years 1995-2001 (average =1,364 caribou, GRRB harvest study database). The estimated annual harvest of 1,016 caribou from this study is also less than the average estimated harvest of 1,558 caribou from the GHS (GRRB, 2009). This difference may be a result of differences in the availability of caribou to harvesters in 2011-2012 and in harvest effort, among other possible variables, when compared to years of survey during the GHS. Some harvesters remarked that they had not met their needs for caribou meat in 2011-2012 and many respondents indicated that they had observed fewer caribou than usual, suggesting that availability of caribou may have affected the amount of harvest taken.

Fort McPherson's higher response rates than other Gwich'in communities both by interview and at the check station may have been a result of increased harvester awareness of the harvest study in that community. For example, the TRRC coordinator regularly used radio announcements to discuss the importance of harvest reporting and to announce when harvest interviews were occurring. A significant factor may also be the long time participation of the Fort McPherson community interviewer who was familiar with the harvest study interview methods and who was known to the community in this role. The other communities experienced turnover of interviewers during the interview periods in November 2011 and June 2012. Some of the new interviewers did not use the harvester list provided and may have missed interviewing identified active and key harvesters. Interviewers may have found it difficult to contact harvesters to be interviewed and so did not complete the interviews or harvesters may have been reluctant to speak with someone they did not know.

Response rates in all communities were also lower during the second interview round than the first and more of the harvest took place during the first half of the year rather than during the winter and spring. Some harvesters commented that they had not met their needs during this year. We speculate that the availability of caribou could have affected harvesters' willingness to participate in the harvest study: if harvesters were not successful or had not hunted because caribou were known to be unavailable, they may not have thought it worthwhile to participate in interviews.

The responses of harvesters to the question of whether they had heard about the Green Zone or not suggests that there is room for improvement to be made regarding communications about herd management in all communities and that methods could be tailored to individual communities based on responses observed. The radio messaging by the Tetlit RRC was helpful to residents of Fort McPherson and less so to other communities, who did not have regular announcements to our knowledge, but this may be helpful to these communities in future.

B. Check Station Data & Comparison to Interview Data

Check Station

If assumptions about numbers of Inuvialuit Porcupine caribou harvesters were correct, then during the time the check station was open, Gwich'in harvesters reported more often than expected at the check station while Inuvialuit harvesters reported less often than expected. Fort McPherson harvesters were also much more likely to report at the check station than expected while Gwich'in from Aklavik and Inuvik were less likely to report at the check station than expected. Of Inuvialuit who did report, those from Inuvik were more likely to report than expected compared to their proportion of possible harvesters from their community in the Inuvialuit harvest study.

Further information and study is required regarding the reasons why harvesters did or did not make use of the check station. It would be helpful if in addition to the range of dates the check station was open, daily hours of operation were recorded and operating procedures undertaken by check station staff were available for review.

For future study, parties may wish to consider hypothetical reasons why harvesters may have used or not used the check station: It is possible that Fort McPherson harvesters may have felt more comfortable or encouraged to report at the check station, as it was staffed by Gwich'in participants from that community and Gwich'in from other communities or persons from other claim groups or harvester groups may not have had the same familiarity with the staff. We know that the TRRC regularly used radio announcements in this period to encourage harvest reporting but to our knowledge, this was not done in other communities. If the check station was not open when a harvester was ready to report, Fort McPherson users would have had easier access to return to make a report because of that community's proximity to the station. It is also possible that the operation of the check station by Gwich'in participants may have discouraged non-Gwich'in users from reporting there if they did not view it as a public reporting forum although this hypothesis does not explain why Gwich'in from other communities also generally reported less than expected. In this regard, it is encouraging that non-Gwich'in users did make use of the check station, as it provides an easy reporting method and is intended to be used by the public when it is available. That there were no harvesters from Aklavik of any group reporting at the check station suggests also that harvesters from this community were probably more likely to harvest caribou in other locations and so the check station was not a convenient method or location for reporting. We did not present the harvest locations based on community from interviews with Gwich'in participants but suggest that the locations furthest north and close to the coast were most likely reported by Aklavik harvesters.

Comparison of Gwich'in Check Station Data to Interview Data

Interestingly, although the Gwich'in harvest study has been ongoing for many years to varying degrees and has been advertised in Gwich'in communities by different methods and likely discussed by word-of-mouth within communities, almost one fifth of harvesters chose to report their harvest only through the check station. A small number of active harvesters were also identified through their use of the check station that were not known to be active harvesters for the interview based harvest study. Obviously, the check station is valued by these harvesters as a helpful way to share their harvest information and their data is useful in calculating total reported harvests for their community and claimant group, for the season and year's total harvests, and to help examine harvest location patterns and collect observations and samples made while

harvesting. If the check station and interview methods had collected data over exactly the same period of time, and these harvesters were known to have reported all of their harvest information to the check station, their reported harvests could also be added to an estimate calculation, but because of these differences their information could not be further used to calculate a harvest estimate along with the interview sourced data.

Another one fifth of harvesters reported both at the check station and by interview, indicating that both of these methods are acceptable ways for them to share their harvest information and that reporting their harvest is highly valued, so they ensured that they did so by both methods available. A greater proportion may also have done so if the check station was open when they were ready to report as some harvesters reported by interview that the station was closed when they passed its location.

Among those who reported their harvests at both the check station and by interview, there were several discrepancies between harvests reported by both methods by the same harvesters which made it more difficult to rule out double reporting and count only unique harvests. There are a few possible reasons why harvest numbers might have been different for the same harvester based on the reporting method used: if a harvester got caribou more than once during the same reporting period but the check station was not open every time, that harvester's interview report would be expected to be greater than that by the check station; if a harvester was interviewed several months later they may not have remembered harvest details that may have been captured when their memories were fresh at the check station and could have forgotten a harvest that was recorded at the check station. The last reason is one that was an obvious issue for some of the discrepancies and this occurred when harvesters hunted as part of a larger party: they may have reported only their harvest or their share by interview while they or someone else may have reported the entire party's harvest at the check station or may not have done so at all. The discrepancies observed during comparison meant that in these cases, in order to calculate a maximum harvest, we had to assume both sources were independent records when it was more likely that a portion of them represented the same harvests. This likely biased the maximum reported harvest summed from both sources for this period higher than it actually was.

Analysis and comparison of the check station data to the interview data was sometimes hindered by incomplete or missing information. In future, inclusion of harvester claimant group and community of residence in data collected at the check station will facilitate faster data input and analysis. At the check station, if reporting harvesters had hunted together, including group member names and their individual portion of the harvest will assist in comparison of data with interview data to help rule out double reporting and better calculate overall reported harvest. For harvesters who report by interview, it will be helpful if participants also describe when they were part of a group and what portion (if any) of the group hunt they report during their interviews. Although the interview form asks harvesters if they hunted as part of a group and to volunteer group names, the form also instructs harvesters not to report community hunts but does not collect community hunt information otherwise. It will be important to follow up with RRCs and bands to ensure all harvest from these methods are reported. Collecting harvest data on a monthly basis is sufficient for the needs of the interview based harvest study but the absence of the exact day of harvest created difficulty when comparing to the check station data.

By collating the results of both methods of harvest reporting, more complete harvest information was collected for the overlap period. It is encouraging that by including all known active harvesters in an interview

based estimate calculation for this period that the estimate was larger than the maximum reported harvest calculated by combining check station and interview data. Were it not, this would indicate that harvester lists did not include a majority of harvesters and/or that harvester participation in the interview process was too low to be meaningful. However, that a small number of active harvesters were identified only by their participation at the check station indicates that it is possible that other harvesters have not been identified as active harvesters and are not reporting by either method. Additionally, response rates were low in some communities which could also have biased the estimate. More work needs to be done in future to ensure community harvester lists are complete, regardless of whether or not harvesters wish to participate in harvest studies, to ensure that harvest estimates are as accurate as possible. If harvest limits or allocations need to be made in future, only the best available data is used to help calculate needs levels and to set allocations. If harvester lists are in face missing active harvesters but no other estimates are available and all available data indicates harvester lists are complete, calculated needs levels may be smaller than they should be otherwise in these cases.

Conclusions

The interview method of reporting harvest permitted calculation of an overall harvest estimate for each Gwich'in community and for all Gwich'in communities combined and provided useful data on location of harvest, weather and environmental conditions at the time of harvest as well as harvesters' general observations about changes over time. The interviews collected data from a year rather than from a specific point in time and so help provide a more complete picture of harvester activity than check station reports alone. Effects of high interviewer turnover and low participation may decrease the amount or quality of data collected. This program would benefit by having increased focus on interviewer training and retention, complete harvester lists and additional communication about the value of harvest reporting.

The Peel River check station was a useful source of additional information about the Porcupine caribou harvest that took place in the fall of 2011 by Gwich'in harvesters and by those who did not participate in the interview study and provided another means by which harvesters could report their harvest. The check station records were also useful for obtaining additional names to add to the harvester lists as potential future participants in interview-based harvest studies. This method was predominantly used by Gwich'in harvesters from Fort McPherson and was not well used by other groups although it was intended for public use. Further examination of usage rates and reporting rationale among other factors would be helpful in explaining the usage patterns observed and to developing ways to increase reporting by groups under-represented at the check station. Complete information about check station hours of operations will also help facilitate this comparison.

Acknowledgements

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Appendix 1. Harvest Interview Form

Round 2 Survey Form. Round 1 identical, other than dates (June 1-Oct 31,2011)



Tetlit Harvest Data Collection

Harvest Dates: 01 Nov 2011 to 31 May 2012

Date Entered: _____

Checked: _____

Initials _____

(office use only)

Harvester ID: _____

User Group:
Gwich'in Inuvialuit
Other _____

Community: Fort
McPherson

Interview Date: _____

Interviewer Name: _____

Decline to Participate:

Did you attempt to hunt in this period? Yes No Why? _____
 If yes were you successful? Yes No If no why not? _____
 Did you get meat from others? Yes No If no why? _____
 Involved in a community hunt? Yes No If yes from who? _____
 If yes do not include in data below.

Complete Table: Ensure Map code is entered. Use Age and Sex codes in bottom corner. If the harvester hunted with others only report the animals he/she shot.

Date	Place Name	Map Code	Species	How Many / Age / Sex	Hunting Party Names	Have you reported this elsewhere? Where?
31 Aug	James Creek	28101	Caribou Porcupine	2 / A / M 1 / / F	George Clooney George Jones	Yes, check station

Species	Age Codes	Sex Codes
Caribou – Porcupine	A - Adult	M - Male
Caribou – Bluenose-West	J - Juvenile	F - Female
Caribou – Woodland	C - Calf	U - Unknown
	U - Unknown	

Species	Age Codes	Sex Codes
Moose	A - Adult	M - Male
Dall's Sheep	J - Juvenile	F - Female
Muskox	C - Calf	U - Unknown
	U - Unknown	

Continue to record harvest information using codes on previous page.					
Date	Place Name	Map Code	Species	How Many / Age / Sex	Hunting Party Names
Final Questions: Circle harvester choice or N/A if not applicable. Questions are for harvester observations during Nov 01, 2011 and May 31, 2012					
Questions about caribou					
1. What was the condition of the harvested caribou? Poor Fair Mixed Good Excellent					
2. Based on your observations this harvest period how many caribou did you see compared to normal? Less Same More					
3. Did you meet your needs for caribou this harvest period? Yes No					
4. If no what prevent your caribou needs from being met? Abundance Availability (too far away) No means to hunt Other? _____					
5. If you hunted less caribou, what did you hunt instead or did you buy food to replace the caribou? Less Same More					
Questions about muskrat, beaver and otter					
6. Based on your observations this harvest period how many muskrats have you seen compared to normal? Less Same More					
7. Based on your observations this harvest period how many beaver have you seen compared to normal? Less Same More					
8. Based on your observations this harvest period how many otter have you seen compared to normal? Less Same More					
9. Why do you think that is? Circle the species to which this applies: muskrat beaver otter all					
Questions about weather and environment					
10. Please describe any unusual, extreme or rare weather event that you observed during this harvest period and what month(s) this occurred.					
11. Did you notice anything unusual? (e.g. predators, fire, insects, erosion) Where?					
Thank you for participating in this survey. Please sign here: _____ My signature indicates that this information is accurate and was given by me. _____ Interviewer Initials (as witness of signature): _____					

Continue to record harvest information using codes on previous page.

Date	Place Name	Map Code	Species	How Many / Age / Sex	Hunting Party Names	Have you reported this elsewhere? Where?

Final Questions: Circle harvester choice or N/A if not applicable. Questions are for harvester observations during Jun 01, 2012 and Oct 31, 2012

Questions about caribou

1. What was the condition of the harvested caribou?

- Poor Fair Mixed Good Excellent

2. Based on your observations this harvest period how many caribou did you see compared to normal?

- Less Same More

3. Did you meet your needs for caribou this harvest period?

- Yes No

4. If no what prevent your caribou needs from being met?

Abundance Availability (too far away) No means to hunt

Other? _____

5. If you hunted less caribou, what did you hunt instead or did you buy food to replace the caribou?

Questions about muskrat, beaver and otter

6. Based on your observations this harvest period how many muskrats have you seen compared to normal?

- Less Same More

7. Based on your observations this harvest period how many beaver have you seen compared to normal?

- Less Same More

8. Based on your observations this harvest period how many otter have you seen compared to normal?

- Less Same More

9. Why do you think that is? Circle the species to which this applies:

- muskrat beaver otter all

Questions about weather and environment

10. Please describe any unusual, extreme or rare weather event that you observed during this harvest period and what month(s) this occurred.

11. Did you notice anything unusual? (e.g. predators, fire, insects, erosion) Where?

Thank you for participating in this survey. **Please sign here:**

My signature indicates that this information is accurate and was given by me.

Interviewer Initials (as witness of signature): _____

Appendix 2. Interview Harvest Data & Calculations

Full harvest records (map zone, location, harvest breakdown by caribou age, etc.) and calculations are available as an [Excel spreadsheet](#). This has been supplied to the PCMB via the PCTC by request, with harvester names removed. Other interested parties may request the data from the GRRB.

Appendix 3. Check Station Reporting Form

Name	Date	Place Name	Species	How Many/Age/Sex

Tetlit Gwich'in RRC and Gwich'in Tribal Council Data Collection
Fort McPherson, NT
August-October 2011

Appendix 4. Check Station Harvest Data

These records are available as an Excel spreadsheet which has been supplied to the PCMB via the PCTC by request with harvester names removed. Other interested parties should request the data from ENR, who had ultimate responsibility for the check station data collection.