



Overview of results and reporting for the:

Sahtú Harvest Study

1998-2005

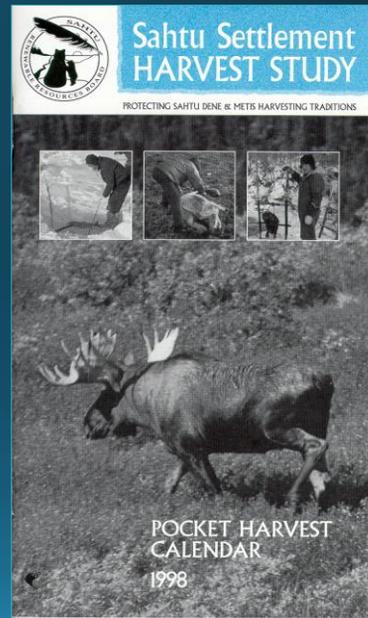
Presentation by Janet Winbourne

In 2012, I was contracted by the SRRB to review the harvest study that was done in the Sahtu from 1998 to 2005. We learned at that time that the study had not been finalized, so we've been working to do that.

I am a technical advisor on this project, working to help bring it to completion. I'm an ethnobiologist or Indigenous and Local Knowledge research expert

Topics we will cover:

- Overview of the study, what's been done.
- Review of findings from a statistical analysis and community analysis of the results.
- Conclusions and recommendations for application of results in harvest monitoring and management.



- Overview the study methods, implementation, results and final products
- Explain what we learned about the data from quantitative and qualitative assessments
- Consider implications for using Harvest Study results in harvest monitoring and management.

First several slides are review, so I will move very quickly and you can talk to me later if you have questions.

Glossary

- Qualitative – based on stories
- Quantitative – based on numbers
- Statistics – analyzing numbers (using math)
- Imputed data – filling a gap in knowledge using numbers and math to make a prediction, like a weather forecast
- Total Allowable Harvest (TAH) – harvest limit
- Minimum Needs Level – basic Dene/Métis harvest needs to be protected (based on Harvest Study results and math)
- Reliable – consistently good in quality, able to be trusted
- Accurate – correct in all details, exact.

MNL is specified in the land claim

What has been done to date?



- 1998-2005: Sahtú Harvest Study survey.
- 2013: Assessment of study methods and results; funding found to finish the work.
- 2014/15: Data checked, prepared for analysis and analyzed by Statistics Canada.
- 2016: Methods Report prepared.
- 2015-2019: Community reviews and analyses of results.
- 2019/20: Final reports prepared.

The community work provided important further interpretations and insights into study reliability and accuracy.

Background: Why was the Study done?



- The Study was a Land Claim requirement.
- Objective: to estimate the total number of animals, fish, and birds harvested by Sahtú Dene and Métis for a period of five years, to provide information for fish and wildlife management and protect harvesting traditions.

13.5.6 A Settlement Area Harvest Study shall be conducted in order to provide necessary information for the Board and government to effectively manage wildlife. The terms of reference for the harvest study are set out in schedule I to this chapter.

The Study was a requirement of the land claim, and was done by the SRRB with cooperation from the RRCs.

It was done 15-20 years ago, from 1998 to 2005.

Similar studies were done in the Inuvialuit Settlement Region, the Gwich'in Settlement Area, and Nunavut around the same time period. It was the model at the time.

How was it done?

- Interviewer in each community.
- Door-to-door survey with all Sahtú Dene and Métis over the age of 16 who were willing to participate.
- RRCs helped build list of harvesters and reviewed the information.
- 802 harvesters took part.



The Study started in Colville Lake, Fort Good Hope, Norman Wells, and Tulit'a in April 1998. Deline joined the Study 9 months later in January 1999.

The Study took place for 5 years (as required by the land claim) and was then continued on a reduced interview schedule with a reduced list of participants for another two years, wrapping up in 2005.

802 people took part in the study

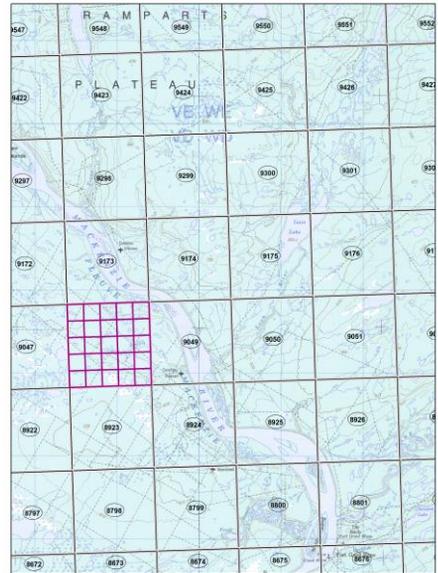
What are the results?

1. Mapped harvest locations

- 2 x 2 km grids for fish
- 10 x 10 km grids for other species

2. Total estimated harvests

- Tables of total estimated harvests by species, number of participating harvesters, recall periods, etc.



Harvest locations were recorded on a grid overlay, using 10 x 10 km squares and a place name for all birds and animals, and a 2 x 2 km grid and place name for fish.

This way, resource managers can still know which areas are important for harvesting, but exact locations are protected.

There are many different ways of using or looking at the data.

Today we'll mostly focus on #2 – the numbers or harvest estimates.

Total estimated harvests: Large mammals, all Sahtú

	YEAR 1 (98-99)	YEAR 2 (99-00)	YEAR 3 (00-01)	YEAR 4 (01-02)	YEAR 5 (02-03)	MEAN
Barren-Ground Caribou	2681	3049	3141	2184	1774	2566
Moose	233	276	207	218	270	241
Woodland Caribou	71	185	102	50	69	95
Dall's Sheep	10	7	16	7	22	12
Black Bear	6	15	17	2	16	12
Muskox		1		1	4	1
Grizzly Bear			1			0

This is the other type of data – the harvest totals or counts.

You can look at the harvest study numbers in many different ways.

- By month, year, season, or all years combined
- By region or specific areas
- By individual harvester, by community, or for the Sahtú Settlement Area as a whole
- By individual species (e.g., marten) or a group of species (e.g., furbearers)

This example shows annual harvests of large mammals, by community, for all years of the study.

This is the kind of data that the harvest studies were intended produce – estimated total harvests to inform things such as Total Allowable Harvests and Minimum Needs Levels.

You can see the Year 1 numbers are a different colour – we'll come back to that in a bit.

Need to keep trying to remember this is 1998-2005 and there were particular things that happened in those years that we talked about in the community analysis of the data, especially for barren-ground caribou numbers.

How can the numbers be used?

Study objective: "... *to provide necessary information for the Board and government to effectively manage wildlife.*"

(SDMCLCA 1993).

- Can they help us better understand harvesting patterns, levels and needs?
- Can they help us determine **Total Allowable Harvests** and **Minimum Needs Levels**?

$$\left[\frac{h_1 \cdot h_2 \cdot h_3 \cdot h_4 \cdot h_5}{5} \cdot h_{\max} \right] \times 1/2$$

h_1	= harvest in year 1
h_2	= harvest in year 2
h_3	= harvest in year 3
h_4	= harvest in year 4
h_5	= harvest in year 5
h_{\max}	= greatest amount taken in years 1-5

As mentioned at the beginning, the harvest study results were intended to be used to protect harvesting rights and inform management decisions. The calculation of Minimum Needs Levels is one of the main reasons the study was done, and that was intended to protect harvesting needs and traditions, but also could be used in calculating Total Allowable Harvests. (all written into the land claim)

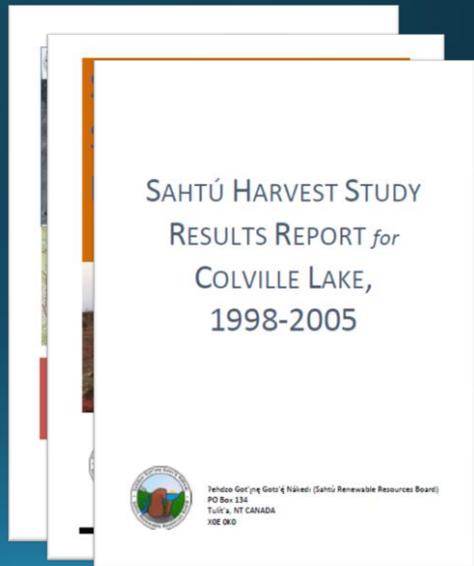
Those are important end uses of the information. So we felt it was very important to assess how good the results were to have the confidence to use them.

What did we do to assess the results?

1. Learn about harvest studies in general, and how the Sahtú study was done.
2. Statistical / quantitative analysis of Sahtú results.
3. Community / qualitative analysis of Sahtú results.

What have we learned?

- 2013 Assessment Report.
- 2016 Methods Report.
- 2020 Results Reports.



[Animated slide]

Our findings are written up into 3 separate reports:

1. Because the study had been effectively dormant for 7 years, we spent some time checking data sheets, talking to former staff, etc. The **2013 report** includes the results of that, and recommendations for finalizing the study – as we quickly realized it hadn't been written up. It also includes information we found about new ways of doing harvest studies and harvest monitoring, plus interviews with former harvest study staff and other experts.
2. The **2016 report** includes very detailed information on how the study was done and Results and Recommendations from the Statistical Analysis.
3. The 2020 reports present data tables of results **by community**, including Results and Recommendations from the Community Analyses.

1) The 2013 assessment:

How reliable are harvest studies in general?

- Only record “kill” data.
- Don’t record “rich” data.
- Difficult to know how accurate they are.
- Just a “snapshot in time”
- Require good participation levels.

As part of our work we did some background research and expert interviews about different harvest study methods and their strengths and weaknesses.

Only record “kill” data – number of animals struck and retrieved, no idea of wounding loss.

Don’t record “rich” data such as traditional knowledge, ecological observations, or socio-economic information.

Difficult to know how accurate they are – may not capture everyone’s harvesting.

Just a “snapshot in time” – may not represent other years very well.

Over-all, they strongly rely on good participation levels.

Native harvest surveys came into common use in the 1970s as a result of the James Bay and Northern Quebec land claims settlement. The settlement provided the basis for establishing ‘guaranteed levels of harvesting’ for Inuit and Cree. There was a lot of this type of work in the 1980s and 1990s that established somewhat standardized methods for harvest data collection in the north.

Similar studies were done in Nunavut, the Inuvialuit and Gwich’in Settlement Areas.

All had similar challenges.

Harvest studies are generally better and produce more accurate information the longer they are done. ***But they require good participation throughout.***

Strengths of the Sahtú study:

- The study was done carefully, and is comparable to other northern harvest studies done at the time.
- There was generally good participation and communication.
- It resulted in lots of information for planning and useful in understanding harvesting patterns and needs – over 10,000 harvest records about over 80 species in the database.



Overall, the study was done well. The coordinators worked closely with the RRCs in each community. Good communication and a strong incentive for good study results helped ensure participation. Harvest study staff regularly visited the communities to make presentations and report on the study results and progress. There was also good communication directly between staff and harvesters that also helped to ensure reliable information.

Also benefited from really good community interviewers.

Huge amount of information resulted – 10,000 records on over 80 species.

Weaknesses of the Sahtú study:

- Missed several main harvesters in each community.
- Women and foods traditionally harvested by women were not well-represented.
- People got tired of the survey – participation declined over time.
- People had trouble remembering harvests sometimes, especially for things like fish and birds.



THIS IS NORMAL – THESE ARE KNOWN WEAKNESSES COMMON TO ALL HARVEST STUDIES.

Past study coordinators said the results are fairly representative of the harvesting that was taking place in the Sahtú at that point, but said that 1 or 2 of the ‘big’ harvesters in each community didn’t take part.

Women were not very well-represented in the harvester list; usually men reported a household’s total harvest, including harvesting done by women. But there was no emphasis on foods traditionally harvested by women (| e.g. berries and plants).

So some problems, across communities, same as other studies: missed some super-harvesters, irregular job of accounting for community harvests, better at large mammals, worse at fish and waterfowl, very few observations/ TK/comments on health, etc. mostly just numbers and locations.

2) The statistical / quantitative analysis:

How *reliable* are the Sahtú study results?

- There was strong participation for 5 years in all the communities, but the *timing* differed.
- The study continued for an extra two years, but participation dropped and remembering harvests became a bigger problem.

The statistical or quantitative analysis looked at *reliability* of the numbers.

Remember, the land claim specifies information is needed for 5 years.

Data are less reliable for 2004-5 because the participant list was reduced and interviews were only done every 3 months, so people had a harder time remembering their harvests, and some of the data are considered “unreliable”.

Also, there were no eligibility lists kept for 2004/05, meaning we had to base the lists on the previous years’ lists, creating another potential source of error that we cannot estimate the magnitude of. (see methods report)

Sahtú Harvest Study *timing*:

	Surveys done: Colville, Fort Good Hope, Tulít'a, Norman Wells	Surveys done: Délįnę	Data used in annual comparisons and mean calculations
Year 1	Apr 1998 – Mar 1999	Jan – Dec 1999	<i>Apr 1998 – Mar 1999</i>
Year 2	Apr 1999 – Mar 2000	Jan – Dec 2000	Apr 1999 – Mar 2000
Year 3	Apr 2000 – Mar 2001	Jan – Dec 2001	Apr 2000 – Mar 2001
Year 4	Apr 2001 – Mar 2002	Jan – Dec 2002	Apr 2001 – Mar 2002
Year 5	Apr 2002 – Mar 2003	Jan – Dec 2003	Apr 2002 – Mar 2003
Year 6	<i>Jan 2004 – Dec 2004</i>	<i>Jan – Dec 2004</i>	<i>LOW RESPONSE RATES – FGH/DEL/TUL</i>
Year 7	<i>Jan 2005 – Dec 2005</i>	<i>Jan – Dec 2005</i>	<i>LOW RESPONSE RATES – FGH/DEL/TUL</i>

Now we're coming back to those blue numbers in Year 1 – let's look at what happened there.

We'll also talk about what happened during those last two years.

- The survey didn't start until 1999 in Délįnę, so no data were collected there for nine months of Year 1.
- The survey was stopped in the other communities for nine months in 2003, to give Deline a chance to "catch up".
- The study was continued for an additional two years (2004/05) but on a reduced list of harvesters, and doing interviews every 3 months instead of every month.
- This changed the methods enough that the statistical assumptions could no longer be met for some years/some communities.
- Of the 2004/05 data, only Colville Lake and Norman Wells meet statistical tests for reliability; data for Délįnę, Fort Good Hope and Tulít'a are ***considered unreliable and should not be used.***
- To meet Land Claim requirements it is necessary to have five years of data; if calculated on an individual basis, each community in the Sahtú has a complete five year dataset that could be used for total estimated harvests. However, to compare

annual totals across communities or for the Sahtú as a whole, it is desirable to have **comparable** years of data (i.e., to compare the same years and/or months for each community).

- **Because the timing of the survey waves differed by nine months, and because the last two years of data are considered unreliable for three out of five communities, there are not five comparable years of data for all the communities and the results can't be used as specified in the land claim (specifically, to calculate Minimum Needs Levels).**
- So to be able to make comparisons (to compare apples to apples, not different years/months) among communities, nine months of data were **imputed** for Délı̄ne – shown in blue font. That means we took the other years of data, calculated means, and called that the 1998 data.

2) Main points from statistical analysis:

- 2004/05 data for Fort Good Hope, Délı̄ne and Tulı́'a are unreliable, and should not be used in important calculations such as Minimum Needs Levels.
- There are five good years of data for each community individually, but not across the same time period for the whole Sahtú.
- To have five years of comparable data for all communities, nine months of 1998 data had to be *imputed* for Délı̄ne.

IT'S OKAY TO BE CONFUSED!

2) Recommendations:

- The five first years of data in the table should be used if it is necessary to calculate Sahtú Needs Levels at a regional or Sahtú Settlement Area-wide level.
- If Minimum Needs Levels are calculated by community, data that is summarized for communities individually should be used instead.
- The “maximum harvest year” used in Minimum Needs Level calculations should not be the year with imputed data.

This is all clearly laid out in the 2016 Methods Report. Plus the info is presented accordingly in the final reports.

This affected how we included data in the final results reports.

Monthly and annual data are presented in tables summarizing information for each community according to the actual survey waves – that is, for Colville Lake, Fort Good Hope, Tulít’a and Norman Wells, data are displayed from April 1998 to March 2003; for Délı̄ne, data are displayed according to the calendar year, from January 1999 to December 2003.

Results of statistical analysis?



- It's a yes, but it's a qualified yes.
- Statistics Canada said we're good to go.
- Most studies stop here and produce a final report.
- We didn't stop.

What can't a statistical analysis tell us?



- Who was missed? What were their harvest levels like?
- Was anything unusual going on at the time of the study?
- Are the results representative or a true reflection of actual harvesting needs and patterns?
- How well do they represent current harvesting?

Here's what we need to consider:

The information is valuable and useful for planning but not perfect. We know there are problems, and some of them, we don't really know how big they are.

So, the statistical analysis is an estimation of the **reliability** of the data, and the amount of error in the harvest estimates. Good to know, but very limited in what it can tell us about the information otherwise. It can't tell us things like:

- Who was missed? What were their harvest levels like?
- Was anything unusual going on at the time of the Study?
- Are those five years representative of those years? What about other years? What is happening now? Are they even relevant?

The ultimate questions we're asking of the Harvest Study data are: how reliable and accurate are the harvest estimates? Are they an accurate record of the harvesting levels and patterns of Sahtu Dene and Metis over the study period?

So we took those questions to the communities next.

3) The community / qualitative analysis:

- How **accurate** are the harvest study results?
- Are they a good representation of actual harvesting?



Statistical analysis measured the **reliability**, but it can't tell us much about **accuracy**.

The Land Claim suggests that consultation is appropriate in considering Needs Levels – not just the numbers, but providing a context for the numbers could be helpful.

So we went to the communities to uncover any other factors that could influence reliability and accuracy, any possible errors missed by the statistical analysis, and to provide a context or interpretation of the results.

[Photo from work looking at spatial data in Fort Good Hope.]

What did we look at?

Harvesters:

- Do the results look reasonable to you for that species, at that time?
- If not, in what way do they not seem right?
- What factors could have influenced harvesting or harvest data collection then?

Community Interviewers:

- What errors might be in the data based on your knowledge?
- Were there any main or 'super' harvesters that didn't take part?
- Did you have any problems doing the monthly survey that could affect the results?

We did small group reviews of representative data in each community, with roughly 12 harvesters each time, and including former interviewers as much as possible – so roughly 60 people helped out on this part of the project by reviewing and analyzing the numbers. I think a lot of people in this room probably took part. Workshops lasted 1-3 days depending on community availability and interest, etc.

We looked at four categories of species data (large mammals, furbearers, fish, and birds), with a more in-depth look at one or two representative species within each category. Data were presented in tables, graphs and on maps.

This is not what most of the other harvest studies did. Nunavut did a little bit of this, but none of the others did.

With over 80 species and 10,000 records in the database, we weren't able to look at all the data, so tried to zoom in on key species, 1 or 2 from each category.

Results of community analysis?

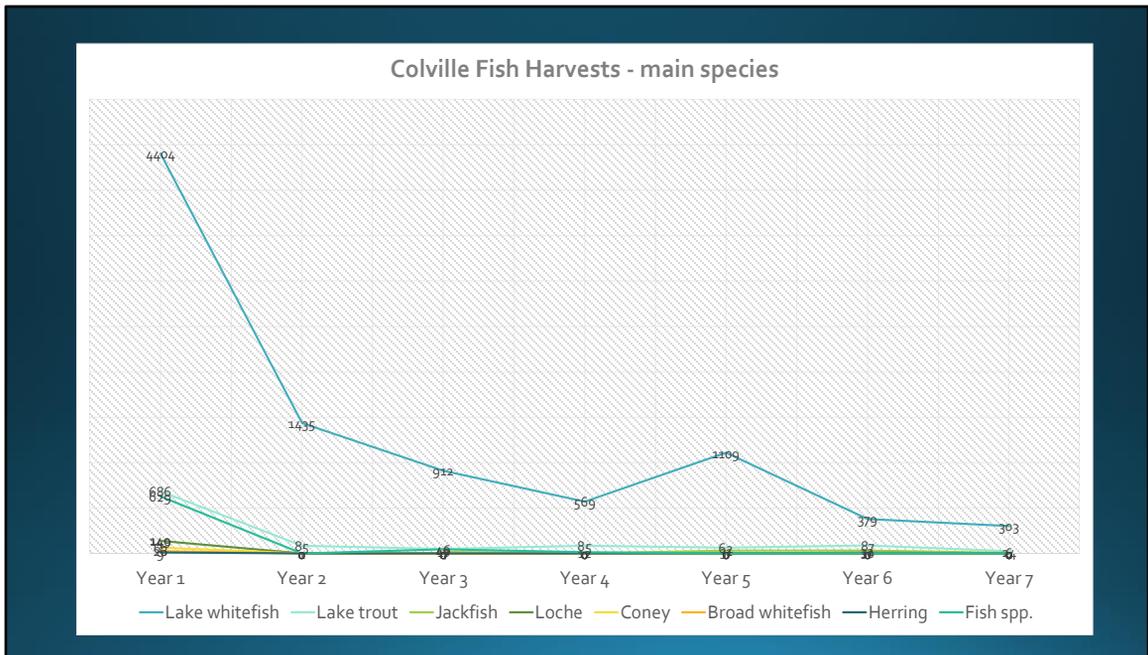
Colville:

- Most harvest estimates were much higher for the first two years, then dropped off sharply.
- Community experienced major change during the years of the study – winter road construction (2001), increased exploration and drilling (2002-2005), introduction of furnaces, running water, etc. People were busy with the wage economy.
- Increasing suspicion around the study and how data would be used.

Colville:

Harvest studies often go through something called a “honeymoon” phase when they start. This is the time when there is a lot of study promotion and education going on, and participants are keen to take part. After this point, there is often a progressive drop in participation over the years as interview fatigue sets in and people become less likely to report their harvests. This was confirmed by the Community Interviewer as an increasing problem in the survey; this problem is not unique to Colville.

But the economic picture in Colville likely had a significant influence on the study results.



This example shows fish harvests for Colville over the course of the study. This general pattern is seen across most species – a very high harvest in year 1, then many zeros or extremely low harvests over the next years.

E.g. we heard this for moose, marten, muskrat, fish, ptarmigan, grouse among other species.

3) Recommendations: Colville

- It seems unlikely that the time period in which the harvest survey was conducted in Colville is representative of the actual average annual harvest needs or activities for that community.
- For most species, the total estimated harvests of the Sahtú Harvest Study for Colville Lake should not be used as a basis for important management decisions or Minimum Needs Level calculations.

Note that these are MY recommendations to the board based on what I've learned from all 3 assessment processes (2013 work, stats, plus communities).

I've got examples like this from each community, but will move very quickly – I just want to give you an overview of the things we learned.

Results of community analysis?

Déjine:

- Harvest estimates are much higher for Years 1 & 2, then decline.
- Possible factors: some lost data, refusal to participate of 5-10 main harvesters, suspicion about study, could result in harvest estimates being lower than actual.
- Data for barren-ground caribou, muskox and black bear seem accurate. Boreal caribou and moose numbers are too high. Furbearer numbers are too low. Some fish okay. Birds not good.

Deline's data showed a similar pattern to Colville's.

Factors:

Some data sheets were lost in Year 1 or 2 of the survey.

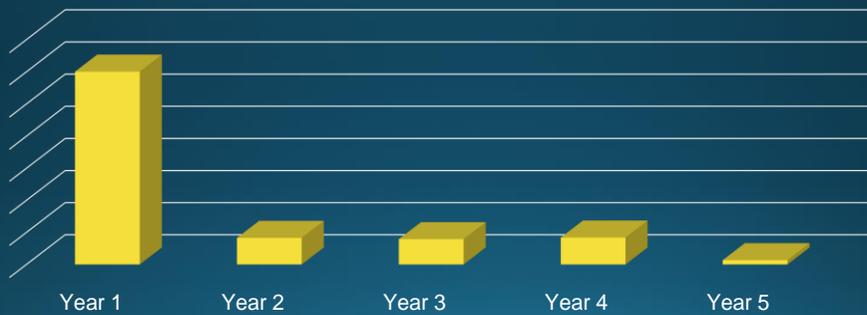
Five to ten main harvesters refused to take part in the survey.

Some people did not participate due to concerns about how the information could be used.

Each of these factors could result in harvest estimates being lower than actual harvests.

[Example of black ducks next slide.]

Total estimated harvest of black ducks, Déljñę, 1999-2003



*Includes : Surf Scoter, White-winged Scoter, and Black Duck species.

Example results for black ducks. So similar pattern to Colville's results.

3) Recommendations: Déljñę

- Data must be considered with the information provided by harvesters and assessed on a species by species basis.
- For many fish, birds, small mammals, and some large mammals, the total estimated harvests are likely not representative of the actual average annual harvest needs or activities for that community.
- Caution should be used if the total estimated harvests for Déljñę are ever needed as a basis for important management decisions or Minimum Needs Level calculations.

IMO, some of the data are okay, but need to be assessed carefully, by species.

Results of community analysis?

Fort Good Hope:

- Most of the average annual harvest estimates seem to be a good accounting of the community's harvesting with two exceptions:
 - Some bird harvest estimates – possible confusion with bird terminology, and in accuracies at the species level.
 - Rabbits – should lump two species with “species” category for a total harvest.

Some of the factors identified included industrial activity, road construction, wage employment, and unusual environmental or weather events.

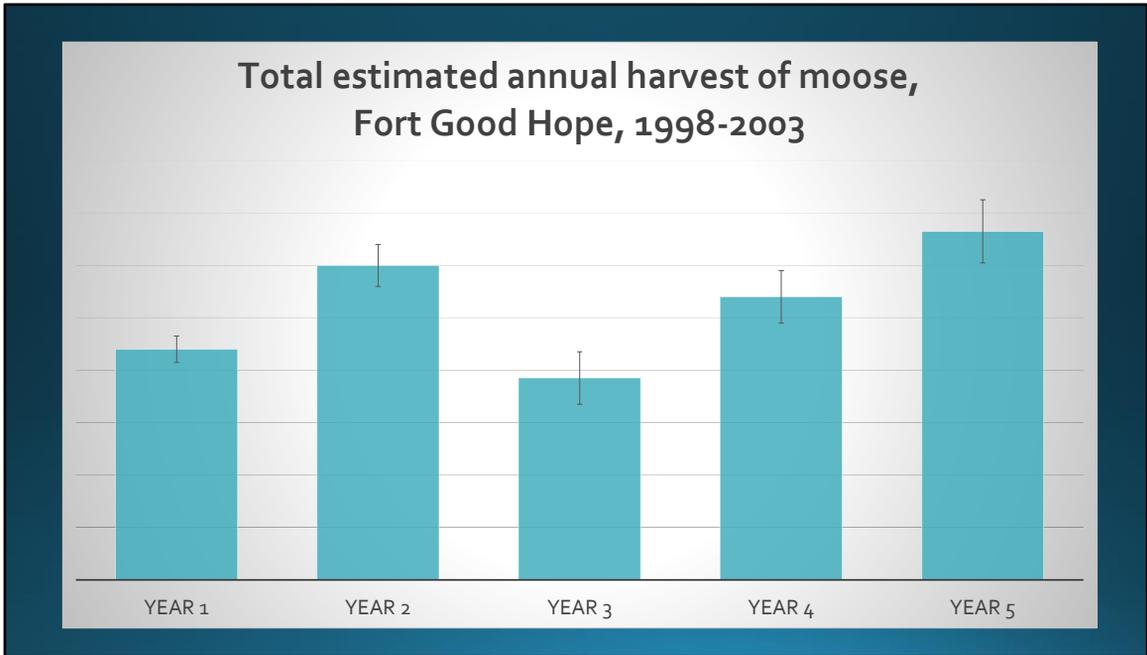
The consensus of the group was that generally, most of the average annual harvest estimates seemed to be a good accounting of the community's harvesting. They also concluded that most of the spatial data accurately represented their harvesting patterns. The harvesters were able to identify two cases in which specific harvest estimates did not appear reasonable. These include:

Some bird harvests: for several types of birds, it is likely that hunters did not report their harvests at the species level due to recall failure following extended periods of time out on the land. Instead, they often reported their harvest as ‘ducks’, ‘geese’ or ‘grouse’. As a result, we would caution that the species-level harvest estimates should not be used without consideration of the larger ‘Goose Species’, ‘Duck Species’ or ‘Grouse Species’ category totals. It is also likely that due to differences in terminology between English and K’áhsho Got’ı̨nę some types of black ducks were mis-recorded.

Hare/Snowshoe Hare: because there is only one species of hare in the Fort Good

Hope area, all harvests recorded as 'Hare (Rabbit) Species' are likely snowshoe hare. We recommend that for more accurate representation of the total snowshoe hare harvest, estimates for Snowshoe Hare and 'Hare (Rabbit) Species' should be added.

We would conclude that in all other cases, the total estimated harvests and average annual harvests should be a reasonable reflection of the harvesting that was taking place between 1998 and 2003 in Fort Good Hope.



Example of moose – large mammal results for Fort Good Hope are thought to be representative and reasonably accurate.

3) Recommendations: Fort Good Hope

- Overall, total estimated harvests and average annual harvests for Fort Good Hope seem to be a reasonable reflection of harvesting that was taking place 1998-2003.
- It is likely that these results represent a true and accurate representation of the actual average annual harvest needs or activities for that community, during that time period.
- Results could be used as a basis for important management decisions or Minimum Needs Level calculations, however, for some species of birds and small mammals, the information may be less accurate at the species level.

Likely strongly influenced by continuity of community interviewer – Michel Lafferty – worked for all the years of the study.

Results of community analysis?

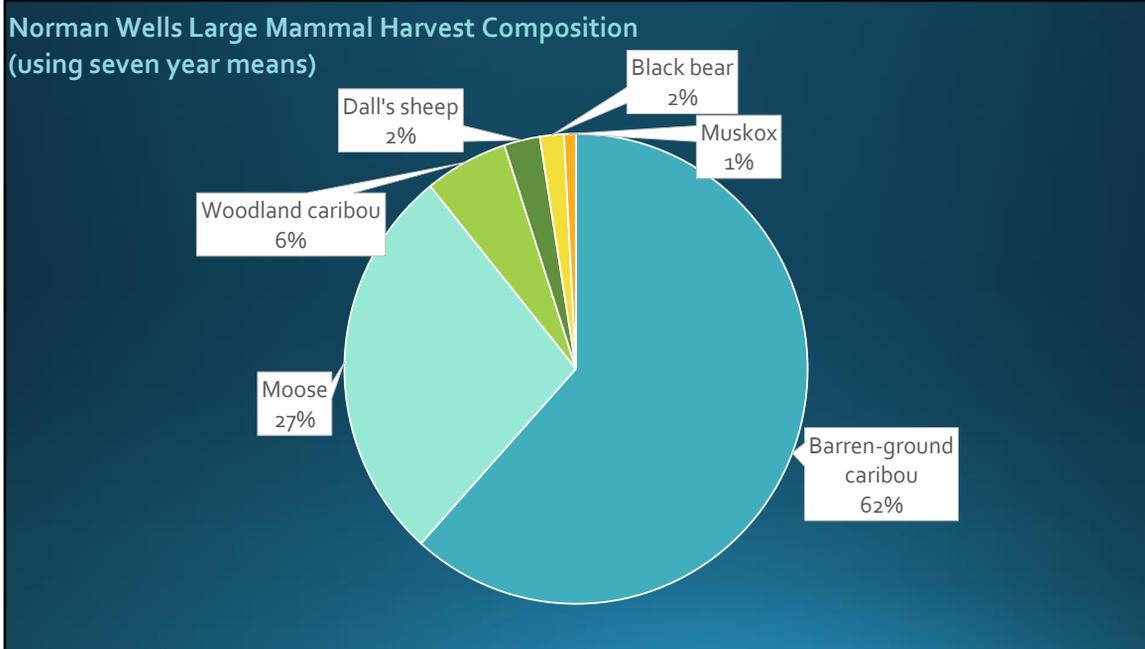
Norman Wells:

- Many of the average annual harvest estimates seem to be a good accounting of the community's harvesting with some exceptions:
 - Barren-ground caribou harvest estimates seem too high.
 - Estimates for woodland caribou should be higher.
 - Estimated annual harvest of lake whitefish seems too low.
 - Most of the ptarmigan and grouse harvest estimates seem too high.
- Results are not at all representative of today's harvesting.

The study seems to have accurately documented seasonal harvesting patterns in Norman Wells, and many of the total estimated harvests were thought to be reasonably accurate. People mentioned that overall, annual average harvest estimates look good for many types of large mammals, furbearers, birds and even fish.

Focus group participants remarked on how the results are not a good reflection of more recent harvesting patterns in the community, as ***harvesting patterns are very different today, especially for large mammals.***

[LOOK AT THAT ON NEXT SLIDE]



This shows the harvest study results, 1998-2005.

Now people say they get a lot more woodland caribou and moose than barren-ground caribou. So while it was relevant and accurate at the time, it isn't any more.

Note that this is a different way of using the results that harvest studies don't usually do, but I think it's interesting and another way of looking at harvesting needs and interests.

These look quite different in the different communities by the way.

3) Recommendations: Norman Wells

- The total estimated harvests and average annual harvests for Norman Wells seem to be a reasonable reflection of 1998-2005 harvesting, with the exception of some fish, some birds, and two types of large mammals.
- Noting those exceptions, it is likely the results for Norman Wells otherwise represent a true and accurate picture of the actual annual harvest needs or activities for that community during that time period. The results could be used as a basis for important management decisions or Minimum Needs Level calculations.
- However, the results are not a good reflection of more recent harvesting patterns in the community, and should not be used to represent or estimate current harvesting activities.

It is important to emphasize that for the last two years of the study, no harvester eligibility lists were available, so lists for 2004 and 2005 were approximated based on the previous years. As a result, the last two years of data are likely less reliable than the first five, and should not be used to inform important management decisions or calculate Minimum Needs Levels.

This is important for Norman Wells and Colville, as the other 3 communities' data can't be used for those years.

Results of community analysis?

Tulít'a:

- The harvest estimates seem to be a good accounting of the community's harvesting for most large mammal species with the exception of woodland caribou (t̥q̥dzi and shúhta ɔep̥é). Those estimates are too low.
- Harvest estimates for ptarmigan and many types of ducks and geese seem too low; mallards too high.
- Fish harvest estimates are too low for most species.

The data identified by harvesters that do not appear reasonable or accurate include:

Bird harvest estimates: for many species, it is likely that recall failure affected the accuracy of harvest reporting. Tulít'a hunters spend long periods of time out on the land for duck and goose hunting, and may not accurately recall their harvesting by the time they are interviewed. This problem was clearly identified by the Community Interviewer/Study Coordinator. In addition, focus group participants observed that some younger harvesters may not know some duck and goose species, and will therefore often report harvests not at the species level, but simply as 'ducks', 'geese' or 'chicken' (grouse). As a result, we would caution that the species-level harvest estimates should not be used without consideration of the larger 'Goose Species', 'Duck Species' or 'Grouse Species' category totals. There was consensus that ptarmigan harvest estimates overall seem much too low, as well as many types of ducks and geese. The one exception noted was mallards; for mallards the estimates were felt to be much too high.

Fish harvest estimates: focus group participants felt that the average annual harvest estimates were too low for most types of fish. As in the case with waterfowl harvesting, the Community Interviewer/Study Coordinator noted that during the fall

fish runs, people are often out on the land for extended periods of time and may not remember their harvests accurately if interviewed at a later date. Participants noted an unusual pattern in the data for lake whitefish, lake trout and herring; for all three species the harvest estimates in Years 3 and 5 are very low. The consensus is that the supply of fish is consistent from year to year, with a possible exception in that herring numbers can fluctuate. However, all types of fish data display high variability in annual totals.

Furbearers: participants observed that some of the annual harvest estimates seem too low – with the exception of the data for hare, beaver and wolverine, which seem reasonable. This is likely due to sensitivities around reporting both harvest numbers and locations for certain types of furbearers.

There were also several places identified where some differences in English species names and Dene terminology may have resulted in incorrect reporting, such as:

Whitefish: people didn't usually differentiate between lake whitefish and broad whitefish when reporting their harvests, so the information should maybe be compiled for these two categories.

Ptarmigan: all ptarmigan harvests may be of one species if in the Tulit'a area

Ducks and Geese: harvest data should be compared to current species distribution maps to confirm records (e.g., Brant goose harvests were reported, but participants said they are not in the area).

Hare/Snowshoe Hare: because there is only one species of hare in the Tulit'a area, all harvests recorded as 'Hare (Rabbit) Species' are likely snowshoe hare. We recommend that for more accurate representation of the total snowshoe hare harvest, estimates for Snowshoe Hare and 'Hare (Rabbit) Species' should be added

Total estimated harvests of main birds, Tulít'a, 1998-2003*

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	AVERAGE
Spruce Grouse	155	22	33	20	224	91
Grouse (Chicken) Species	366	395	50	13		165
Mallard	85	705	406	449	338	396
Northern Pintail		134	99	278	195	141
Surf Scoter			32	400	303	147
Scoter (Black Duck) Species	11	93	263	2	30	80
Duck Species	163	402				113
Canada Goose	5	24	382	875	470	351
Snow Goose (Grey Goose)		248	108	288	35	136
Goose Species	95	978	249			264

*Other species with ≤ 50 harvest per year: Ruffed & sharp-tailed grouse, rock & willow ptarmigan, ptarmigan species, American widgeon, bufflehead, ring-necked duck, Northern shoveler, long-tailed duck, lesser scaup, black scoter, brant goose, greater white-fronted goose, trumpeter swan, tundra swan, arctic loon, loon species..³⁷

-23 species all together

-just included 10 species or categories with highest harvest levels

-groups include: grouse and ptarmigan, ducks, geese and swans, others (e.g., loon)

Indicates that data for smaller animals like birds and fish should not be used to inform management decisions at the level of *species*.

So how meaningful are those averages provided by the statistical analysis? I'm not sure... Can they be used in important management decisions if you are not sure which birds you are talking about?

3) Recommendations: Tulit'a

- Total estimated harvests for Tulit'a vary in accuracy by species/species groupings, and should be considered along with information provided by harvesters, and assessed on a species by species basis.
- For many fish, birds, small mammals, and some large mammals, the total estimated harvests are likely not a true and accurate picture of the actual average annual harvest needs or activities for that community. Caution should be used if the total estimated harvests for Tulit'a are ever needed as a basis for important management decisions or Minimum Needs Level calculations.

So this is the type of information in the reports that have been prepared, just a lot more detail, with the clearest recommendations I can give, recognizing that StatsCan thinks everything is fine...

And realizing that each of the other harvest studies ever done in the north, that were written up and published, in all likelihood have similar factors impacted the accuracy of their data, but no one really looked into it.

How well were Land Claim objectives met?

1. Can the information be used to better understand Sahtú harvesting patterns, levels and needs?



2. Can the data help in determining **Total Allowable Harvests** and **Minimum Needs Levels**?



1. Yes. And we can still learn more here likely.
2. Yes and No. It depends on what species and what communities you need the information for. Land Claim isn't clear (IMO) as to whether MNLs are calculated at the community or SSA level, and the community interpretation provided a lot of food for thought so I'd give this a maybe.

I just showed you a smattering of what we found; it's likely that the errors that were uncovered in each community also occur in the other communities to some degree.

Based on what we heard in the communities, as well as current principles of OCAP, in which First Nations are recognized as the rightful owners of their own information, the results have been organized into 5 separate reports for the community organizations to be able to share / not share as they see fit.

Four components of OCAP: Ownership, Control, Access and Possession. Ownership refers to the relationship of First Nations to their cultural knowledge, data, and information.

What have we learned?

- The process was positive – harvesters like to talk about harvesting!
- We gained a fuller context for the numbers – ideas about accuracy and representativeness that go beyond the statistical analysis.
- Issues with methods affect participation – this tells us what conditions will be necessary for successful harvest monitoring.
- There is diversity and strength in peoples' food systems, they are already monitoring and regulating through harvesting activities.
- Count-based surveys may not be a great basis for defining harvest regulation systems, determining Needs Levels, or defining a TAH.

The process didn't stray too far from some traditional harvest monitoring – meeting in a group to talk about the harvest, PLUS the bigger picture – the environment, what people are doing, etc.)

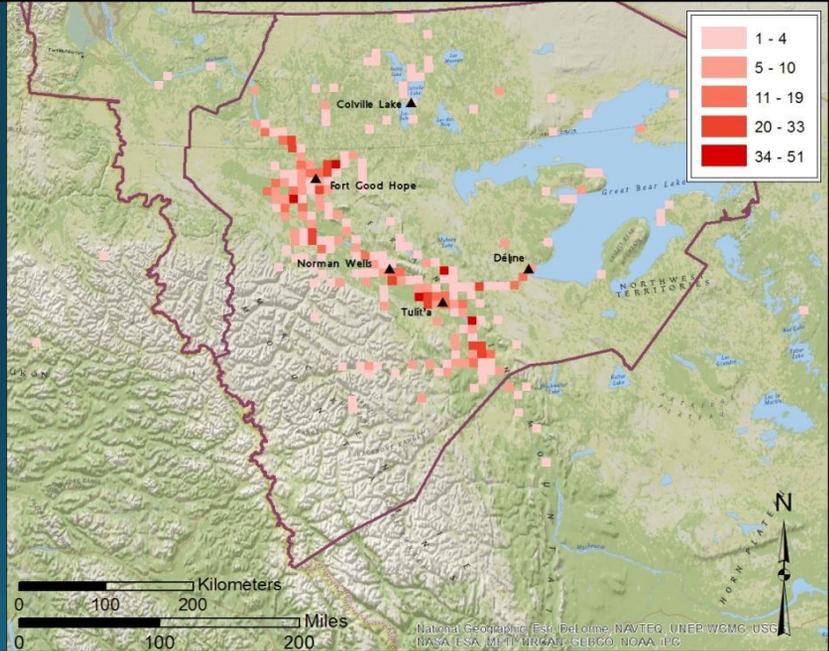
What else can we get out of the data?

- There is interest and value in the broad, relative trends.
- The results provide another way to consider long-term ecological, environmental and social change.
- Planners and biologists have used and continue to use the spatial information – most of the mapped data are reliable and accurate.
- Seasonal harvesting data/patterns are reliable and accurate.
- Database can be queried on many different research questions, and data can be summarized in many other ways.

We've had some indications of what you can do with the data along the way. Just want to show you some other uses of the data quickly now.

Example
mapped
results:

Moose



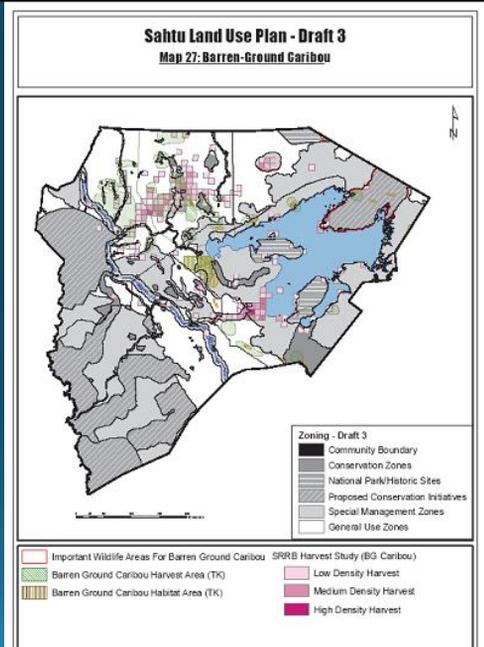
Moose data with what's known as an intensity gradient to show relative harvest levels. Data are for all communities, all years of the study.

Because the Study didn't record exact harvest locations but used the 10 x 10 km grids, the harvests show up as squares.

Biologists and planners usually find this to be a useful tool for finding areas that are important to animals and to harvesters.

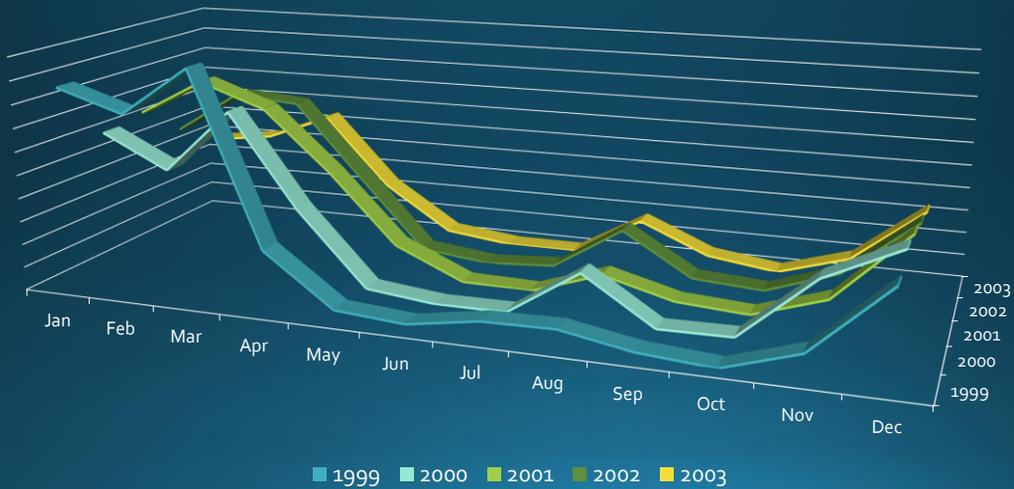
How can the mapped results be used?

- Land use planning – have already been used by the SLUPB and ENR.
- Understanding harvest patterns and needs in the landscape.



Harvest information has been used in land use planning. This map has information for all species lumped together, for the whole Sahtu, and shows different land use zoning.

Total estimated harvests of barren-ground caribou by season, Déljñę.

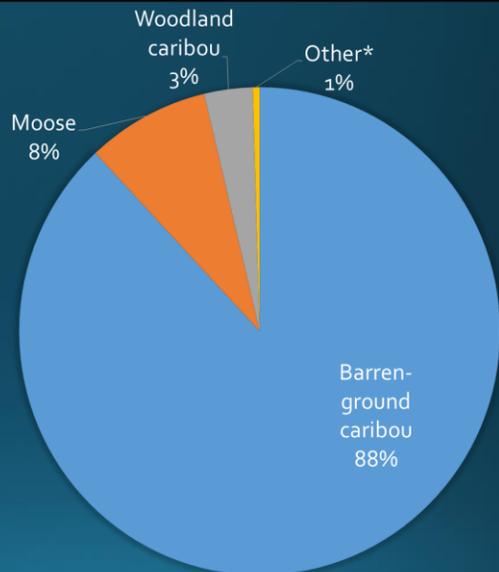


We consistently heard that the seasonal patterns of harvesting are accurate.

This graph shows seasonal caribou harvesting in Deline over the five years of the study.

Understanding harvesting patterns

- Information on over 80 different types of animals.
- Can be summarized by individual harvester, by community, or by region.
- Can look at data by species, dates, months, seasons, years.



* Other species include: Dall's sheep, muskox, black bear, grizzly bear

There are lots of other things you can learn from the data now that it has been finalized. This pie chart shows the proportion of large mammals harvested, 1998-2003, based on 5-year means for the whole sahtu.

These pie charts look quite different for each community – indicating different harvesting patterns and species of importance.

In contrast, Deline's graph shows over 98% of the large mammal harvest was barren-ground caribou, as the study happened to be done in the years that they caribou were very close to the community.

Understanding harvesting patterns:

Seasonal 'round' or harvesting calendar

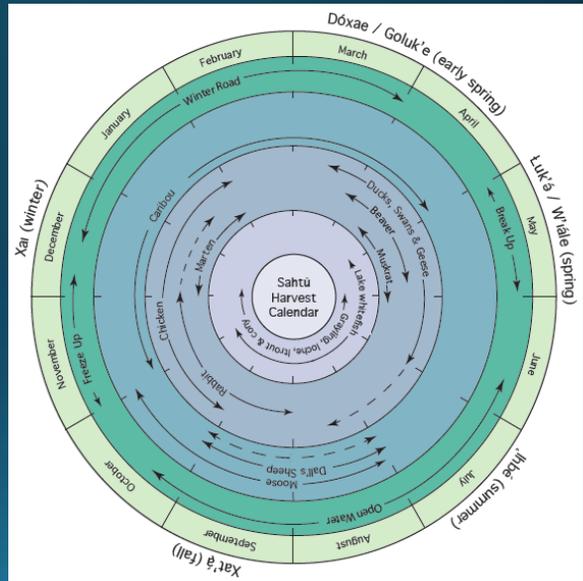


Image created from the SHS results as a starting point for discussion in each community about the seasonal 'round' or harvesting calendar.

Again, this is for the whole Sahtu, but similar calendars can be created for each community based on the harvest study results

Conclusions:

- Harvest studies can be a source of information and insights into harvesting that have not been fully explored, IMO.
- A narrowly-focussed survey of only count data may not present a very accurate or representative picture of a community's harvesting activities or needs over time.
- Data from harvest studies should not be isolated and used without looking at other factors / community interpretations.
- Study methods and monitoring programs with full community support will produce the best results.

Hearings are looking at: "What is the most effective way to conserve caribou?"
The Colville 2020 session is focused on the central question: *"What is the most effective way to regulate the harvest of caribou?"*

There is really a wealth of information there. We plan on collaborating more with the communities to see if there are things we can do with the data that help to support their information needs.

Other data resulting from the study have proven very useful in planning work to date, such as the spatial or mapped data. The community analysis also pointed to other aspects of the harvest data that are consistently accurate and reliable, such as the seasonal harvesting patterns documented by the study. The community validation workshops also gave rise to preliminary indications that the results of the harvest study can be valuable as a collaborative learning tool for gaining insights into the community's complex harvesting system. However, since this was not the main focus of the workshops, the potential value of the harvest study in this respect has yet to be fully understood

Mahsi to the
RRCs, harvesters,
and past staff of
the Sahtú Harvest
Study for making
this all possible!

Questions?

