SUMMARY OF THE:

SAHTÚ HARVEST STUDY FINAL REPORT

Study Background

The Sahtú Harvest Study was a survey of Sahtú Dene and Métis hunters, trappers, and fishers that took place in all communities of the Sahtú Settlement Area between 1998 and 2005. It was a requirement of the Sahtú Dene and Métis Comprehensive Land Claim Agreement, undertaken by the ʔehdzo Got'ı̨nę Gots'ę́ Nákedı (Sahtú Renewable Resources Board). The objective was 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 to protect harvesting traditions.

The results from the study were intended to have a direct impact on determining how many animals should be allocated to Sahtú Dene and Métis in the event that a harvest had to be limited in the future. The process to be followed when limiting harvests is outlined in the Land Claim as the Total Allowable Harvest – this represents the total number of a given species that can be harvested by all parties in the region or in a particular area/community. The Board is responsible for allocating a portion of all available animals to Sahtú Dene and Métis; this is called the Sahtú Needs Level.

Various things are considered when setting or adjusting the Sahtú Needs Level, such as:

- Historical use / harvesting patterns
- Personal needs of Sahtú Dene and Métis for food, clothing, culture, dog food
- Trade needs
- Availability of animals to meet these needs based on scientific studies
- The Sahtú Minimum Needs Level calculated from harvest study counts.

The Sahtú Minimum Needs Level represents the lowest level at which a Sahtú Needs Level can be set.

Study Methods and Implementation

Similar to other studies done across the north around the same time, the Sahtú Harvest Study was a census-type survey that attempted to interview all harvesters in the region, once a month, to record their harvest numbers and locations. The information reported by individual harvesters was then used to estimate total harvests for the whole community, district or region, using a method called 'proportional projection'.

The Sahtú study was designed and piloted with guidance from local harvesters and implemented by the Board in conjunction with the local ʔehdzo Got'ı̨nę (Renewable Resources Councils). Local interviewers were hired in each community and a study coordinator was based in Tulít'a. A number of steps were in place to make sure that there was good communication and good information coming in throughout the duration of the study. An independent assessment of the work done after the survey was finished found that while the Sahtú study did suffer some of the same challenges or sources of error as other harvest studies, overall, it was done carefully, there were very few errors in the data, and there had been good participation in most communities. As a result, it was concluded that the Sahtú Harvest Study should produce results at least as strong as any other northern harvest study of that type.

Statistical Analysis

The numerical results (count data) were sent to an independent contractor to perform a statistical or mathematical analysis in 2014. The analysis concluded that the survey produced five years of data suitable for calculating total estimated harvests and Minimum Needs Levels for each of the five Sahtú communities; it therefore met the requirements of the Land Claim at the level of individual communities.

Because the survey started nine months later in Délı̨nę than in the other communities, a different approach had to be taken to be able to make comparisons among communities, or to compile results for the Sahtú Settlement Area as a whole. In order to have five years of comparable information (*i.e.*, the same months and years in each community), it was necessary to 'impute' or estimate nine months of data for Délı̨nę – this was done by calculating estimates based on Délı̨nę's other years of data.

The statistical analysis also concluded that even though the survey took place over seven years, not all years of data are considered reliable. This is due to the fact that while the study was only intended to last five years, it was continued for an additional two years, but the list of harvesters was reduced in most of the communities and the interview schedule was changed from monthly to quarterly interviews. This resulted in lower participation levels and higher instances of 'recall failure' (people had a harder time remembering what they harvested) in some communities. This means that information recorded in 2004/05 in Tulít'a, Rádelı̨hkǫ́ (Fort Good Hope), and Délı̨nę did not meet the necessary tests for reliability and should not be used in the calculation of total estimated harvests or Minimum Needs Levels; data for Colville and Norman Wells for 2004/05 are considered reliable enough for use.

Statistical Analysis Main Messages and Recommendations:

The statistical analysis made the following recommendations regarding use of the harvest study data:

- The data that are presented in monthly tables that summarize information by individual community have higher reliability and should be used if necessary to calculate Minimum Needs Levels or to make important management decisions.
- If it is necessary to calculate Sahtú Needs Levels at a regional or Settlement Area-wide level, or make comparisons across communities, the first five years of data should be used.
- The 'maximum harvest year' used in Minimum Needs Level calculations should not be the year with imputed (estimated) data.
- Because it is not possible to quantify the level of error associated with the imputed data, the total estimated harvests and estimated variances presented in the data tables for the Sahtú as a whole should be used with caution, keeping in mind that the bias due to assumptions not being met could be sizeable.

Additional sources of error uncovered during the study review and statistical analysis include the following:

- There were several harvesters that consistently declined to take part in the study throughout its duration. Some of these individuals were described as 'intense' or 'super-harvesters'. Their omission would likely result in estimates that are lower than actual harvest levels, but it is difficult to know how big the influence is on the results.

- In some cases there were individuals on the interview list who didn't hunt regularly and likely should not have been included. Inclusion of these individuals would result in a bias in response rate calculations and estimates that are higher than actual harvest levels.
- Very few women took part in the study. This could result in some underestimation of total harvests, especially if these individuals were active or intensive harvesters.
- In 2004/05, when the survey changed to quarterly interviews and harvesters had a harder time remembering their activities, this could result in an increase in the amount of error in the data through recall failure and lower estimated than actual harvest levels.
- Also in 2004/05, because eligibility lists do not appear to have been kept, accurate response rates could not be calculated. Instead, that data was also imputed (estimated) for those years, based on information from previous years.

Some of these errors are common to many harvest surveys while others are unique to the Sahtú experience; none have been explored in a way that provides an understanding about the size or scale of their impact on the reliability of the study results. It is difficult if not impossible to measure the magnitude of their influence on the resulting data set using only statistical methods.

Community Analysis

Considering the study weaknesses outlined above, the potential consequences of using the results in important management decisions, plus an evolving socio-political landscape that is redefining appropriate ways of working with Indigenous Peoples and their information, a decision was made to bring the Sahtú Harvest Study to completion in a collaborative manner with the participating harvesters and local governance organizations. A series of validation workshops was done in the communities between 2015 and 2019. The objective of the community work was to have knowledgeable harvesters provide feedback on and a context for the Sahtú Harvest Study data that could go beyond the interpretation provided by the statistical analysis. The over-arching goal was to provide further information regarding the validity of the survey responses and how well they measure the true picture of harvesting in the Sahtú.

Over 70 Sahtú Dene and Métis community members were engaged in multi-day focus group sessions to identify any factors that could have influenced the harvest study data set, to identify and quantify possible errors, and to provide a local interpretation of the results. In each focus group session, summaries of representative numerical data as well as mapped harvest locations were presented for review and interpretation. In all cases, participants were able to provide very detailed and thoughtful feedback regarding how well the total estimated harvests and the spatial information represented their knowledge and experience of harvesting. They were able to point out instances where the data seemed problematic or inaccurate, and to make suggestions about the factors that could have influenced the data and/or data collection. They provided insights into the context of the study at that time period, such as specific socio-economic, regulatory, or ecological conditions that may have affected harvesting activities. They confirmed that some of the challenges that commonly plague this type of survey were present in the Sahtú study (*e.g.*, interview fatigue, recall failure, problems with the participant list, mistrust, lack of participation of super-harvesters, *etc.*), as well as other Sahtú- and time-specific challenges to data reliability.

In Colville, harvesters observed a pattern across the data for most species – that is, harvest estimates tended to be much higher for the first year or two of the study and then dropped off sharply in the following years. Harvest studies are known to go through something called a 'honeymoon' phase at their

initiation (*i.e*., at the start of the study, when there is a lot of study promotion and education going on, participants are keen to take part; after this point, there is often a 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 a problem in the Colville survey.

Important additional socio-economic factors were identified to be at work in Colville during the years of the study that may have made this trend worse. Some participants in the focus group suggested that people were becoming suspicious of the study and feared that the results might be used against them. Perhaps more importantly, they identified a boom in the resource economy that strongly influenced day to day life in Colville starting after the year 2000. Harvesters said that during the time of the harvest study fewer people were hunting, trapping, and fishing because they were busy with the new wage economy. They felt there were widespread inaccuracies in the harvest study data – this includes data for large and small mammals, fish, and birds alike. There was consensus that the resulting annual average harvest estimates were too low to be representative of Colville's actual harvesting needs.

In Délı̨nę a similar trend to that found in Colville was observed in most species' data – that is, harvest levels in Years 1 and 2 appeared much higher than those in the following years. In fact, in several cases, people felt that the harvest levels in Year 1 were too high and overestimated actual harvesting. This could indicate a possible problem with the initial participant list. Again, harvesters suggested that the high level of study promotion in the early stages influenced peoples' involvement and interest in reporting their harvests, and that by Year 3, participants were starting to experience interview fatigue and becoming less likely to report their harvests. In addition, they felt that harvest levels may have dropped over the time of the survey due to factors such as the introduction of new traps, increases in wage labour in the oil and mining sectors, and a change in the levels of income support and/or financial support for trapping. A former Community Interviewer in Délı̨nę identified several additional potential causes of error, each of which could have resulted in harvest estimates being lower than actual.

Overall, the community analysis indicated that the study results are mixed for Délı̨nę – that is, data accuracy seems to vary greatly between species and species groupings, with some estimates appearing much too high, some much too low, and others reasonably accurate. In one interesting example, Délı̨nę harvesters noted that barren-ground caribou harvests were unexpectedly high in the first year of the survey, and explained that during that time period, Bluenose-East caribou were very near their community – for five or six years in a row hunters didn't have to travel very far to harvest. It was suggested that because the harvest study collected data at a time when the caribou were unusually accessible, the total estimated harvests could be an over-estimate of actual harvesting levels, if averaged over a longer period of time.

In Rádelı̨hkǫ́ (Fort Good Hope), harvesters named industrial activity, road construction, wage employment, and unusual environmental or weather events as possible influences on the study data reliability and accuracy. Nonetheless, 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 actual harvesting patterns at that time. Harvesters were able to identify two cases in which specific harvest estimates did not appear reasonable; these included some bird and small mammal harvests. It was felt that hunters may not have reported their harvests at a species level due to recall failure, and as a result, the data should not be considered at that level. Very few other problems were identified. It is likely that the overall success of the harvest study, and the possibly higher level of reliability in the data for this community, is due in part to the commitment and continuity of the Community Interviewer to the

project over its seven year duration. Nonetheless, some harvesters noted that the patterns recorded by the study are likely no longer relevant and not a good reflection of more recent harvesting patterns.

Focus group participants in Norman Wells also concluded that many of the total estimated harvests were a reasonably accurate representation of their harvesting activities during the time period of the study. They felt that overall, the annual average harvest estimates looked good for many types of large mammals, furbearers, birds, and even fish. Some observations regarding specific possible inaccuracies were noted for barren-ground caribou, woodland caribou, lake whitefish, ptarmigan, and grouse; in some cases participants felt the harvest estimates seemed too high, and in other cases too low. There was a strong message in the Norman Wells session that the harvesting patterns recorded by the study for the 1998-2005 period are not representative of peoples' current harvesting activities.

In Tulít'a, the annual harvest estimates were assessed to be a good accounting of the community's harvesting for most large mammal species with some isolated exceptions (*e.g.*, woodland caribou), but results were felt to be less accurate for some species of birds, fish, and small mammals. Some of the external socio-economic factors identified that may have influenced harvesting patterns during the time of the harvest study included road construction / operation, wage employment, and unusual environmental or weather events that changed animal movements and behaviour. There were also several situations identified where differences in English species names and Dene terminology may have resulted in incorrect reporting, such as for some fish, birds, and small mammal species.

Community Analysis Main Messages and Recommendations:

The community analysis of the numerical or count data indicated that the reliability and accuracy of the harvest estimates resulting from the Sahtú Harvest Study vary by year, by species, and by community. While some common sources of error were found to influence the data set (*e.g.*, interview fatigue, recall failure, *etc.*), additional local and / or regional factors likely also had at least as strong an influence on the data and are important to consider in any interpretation of the results. Recommendations for use of the data based on the findings of the community review and analysis include:

Colville

- It is unlikely that the data resulting from the harvest survey in Colville represent a true and accurate picture of the actual average annual harvest needs or activities for that community. The author recommends that the total estimated harvests of the Sahtú Harvest Study for Colville should not be used as a basis for important management decisions or Needs Level calculations.
- Caution should also be exercised when using the spatial data documented by the study, as those results likely also under-represent actual harvesting levels and patterns for Colville.

Délı̨nę

- The author of this report advises that caution be exercised if the total estimated harvests for Délı̨nę should ever be used as a basis for important management decisions or Minimum Needs Level calculations. Because the community analysis indicates high variability in study data accuracy and reliability, it is important that the results be assessed on a species by species basis, and it is essential that the interpretation provided by the community is considered along with any use of the study results.
- Caution should also be exercised in any use of the spatial data – some harvest locations were questioned for barren-ground caribou, marten, and fish.

Rádelıhkǫ́ (Fort Good Hope)

- It is likely that the total estimated harvests could be used as a basis for important management decisions or Minimum Needs Level calculations for Rádelıhkǫ́ (Fort Good Hope) if necessary, and with an understanding of the recognized general limitations of this type of data collection plus the specific weaknesses of this data set.
- For some species of birds and small mammals, the information may be less accurate at the species level.
- Overall, spatial data representing harvest locations recorded for Rádelıhkǫ́ (Fort Good Hope) also appear to be reliable and accurate, with the exception of some questionable fish and duck harvest locations.

Norman Wells

- The total estimated harvests for Norman Wells seem to be a reasonable reflection of the harvesting that was taking place between 1998 and 2005 in that community, with the exception of some fish, some birds, and two species of large mammals. The information could be used as a basis for important management decisions or Minimum Needs Level calculations for some species as necessary and with an understanding of the limitations of this data set.
- The spatial data showing harvest locations for Norman Wells appear to be reliable and accurate in most cases.
- Overall, the results are not a good reflection of more recent harvesting patterns in the community, and should not be used to represent current harvesting activities.

Tulít'a

- For many fish, bird, small mammal, and some large mammal species, the total estimated harvests resulting from the study in Tulít'a 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 Tulít'a are ever needed to be a basis for important management decisions or Minimum Needs Level calculations.
- Because the community analysis indicates high variability in study data accuracy and reliability, it is important that the results be assessed on a species by species basis, and it is essential that the interpretation provided by the community is considered along with the data.
- The spatial data showing harvest locations for Tulít'a appear to be generally reliable and accurate, with the exception of some isolated instances of questionable harvest locations for caribou, marten and fish.

Discussion: Lessons Learned and Moving Forward

While the statistical analysis of the Sahtú Harvest Study data concluded that the requirements of the Land Claim agreement were fulfilled and the results are reliable enough for use, the community analysis revealed that in many cases, the total estimated harvests resulting from the study may *not* represent a true and accurate picture of Sahtú Dene and Métis harvesting activities during 1998-2005, nor are they necessarily representative of current harvesting needs.

Key Lessons Learned

The community focus group sessions were the first opportunity for harvesters to review and comment on data they had contributed to the Sahtú Harvest Study between 1998 and 2005. Participants were able to provide extremely valuable feedback not only about the accuracy and reliability of the numerical

data, but also important ecological, social, economic, political, and regulatory factors that may have influenced the results. In addition, the validation process itself turned out to be a very positive experience in each community – harvesters enjoyed having a chance to discuss the data with their peers and take some ownership over the study results. Several other key insights that resulted from the community review and analysis are outlined below.

1. **Methods Matter: Study Design, Principles, and Parameters are Key** – Participation levels are directly affected by study design and survey tools; these factors in turn affect the reliability and accuracy of the results. Collective experience and cultural understandings can also strongly influence the success of a study. Appropriate cultural frameworks and methodologies, as well as standards for the ownership and protection of harvester information, are important.
2. **Context is Critical** – Harvesters' activities are adaptive, responding to changes in environment, regulations, species abundances, access, employment opportunities, *etc*. The 'snapshot in time' provided by short-term harvest surveys fails to reflect this fuller picture and may not capture typical years of harvesting, meaning results can greatly over or under-estimate actual harvests. These factors can have such a strong influence on the study results that it is questionable whether it is realistic or valid to extrapolate the results to other years.
3. **Numbers aren't Enough: Why Count-based Surveys are Inadequate to Define Indigenous Harvest Monitoring and Regulation Systems** – Count data vary in reliability and should be considered on a species by species basis with local interpretation before it is determined if they make a good basis for defining a harvest regulation system, determining Needs Levels, or making other important management decisions. Harvest studies done with a more Indigenous research methodology and framework would likely account for more factors than 'kill data' and function with a more adaptive cycle of constant evaluation, feedback, and adjustments.
4. **There is Diversity and Resilience in Sahtú Dene and Métis Harvesting** – The study documented an extraordinary amount of information about the diversity of Sahtú Dene and Métis food systems that can help shape local / regional management priorities, decision-making, and planning.

Beyond Total Estimated Harvests and Needs Levels

The large quantity of information gathered by census-type harvest surveys are seldom used for any purpose other than using count data to calculate total estimated harvests and inform regulatory mechanisms such as the Total Allowable Harvest. Quantitative or statistical analyses of the other types of information recorded by these studies are seldom done, and there are few to no published studies showing results compiled in alternate ways. There are countless other ways that harvest study data could be used to answer research questions; some potential topics could include: harvester demographics / characteristics, household needs, trends in effort, assessments by region / specific area, *etc*. among many other possibilities.

In both the assessment of the study and the community analysis of the Sahtú harvest study data, the results that were reviewed included mapped information. Time was also spent in the focus group sessions considering data compiled and presented in novel ways, such as charts of harvest composition and graphs of seasonal trends in harvesting. Harvesters consistently found that the seasonal results (presented in graphs showing monthly harvests as well as 'seasonal rounds' or circular calendars) represent an accurate reflection of their community's harvesting patterns. The results indicated some differences between communities, and could be useful in management planning and education.

The spatial or mapped information recorded by the study was also found to be very strong, and in most cases represents an accurate reflection of communities' harvesting patterns. The spatial data has been found to be especially valuable in planning, such as in development applications. Further use of the information could include the identification of ecological or cultural 'hotspots' – mapping the information using a coloured density gradient to help identify areas that tend to be consistently important to a species and / or the people who harvest there. Local organizations can use the mapped results to demonstrate broader land use patterns, and provide evidence of and plan for areas that are important for Sahtú Dene and Métis land use and harvesting.

Numerical data from the harvest study were also presented showing the composition of the harvest or relative proportions of species harvested in each community. These data could be compiled by harvester, community, district, or the entire Settlement Area; they also be compiled by season. The resulting charts can be informative in community discussions and planning decisions.

Implications for Future Harvest Monitoring: Where do we go from Here?

The Total Allowable Harvest is a controversial regulatory tool in the Sahtú region. Opposition has been so strong in some areas that this territorial monitoring system has at times been ineffectual. The findings of recent public hearings suggest that regulatory mechanisms such as the Total Allowable Harvest may present a significant infringement of the Aboriginal rights of Sahtú beneficiaries, calling into question the appropriateness and the premise of the past harvest study.

The community review and analysis of the Sahtú Harvest Study data indicates that many of the numerical results do not represent a true and accurate picture of Sahtú Dene and Métis harvesting and are likely not reliable enough to use as a basis to inform important management decisions and regulatory systems such as the Total Allowable Harvest. It is also clear that the study methods, objectives, and cultural framework are no longer appropriate. As a result, future harvest monitoring and harvest regulation will not look like past models.

Since 2016 the Sahtú Renewable Resources Board has supported and promoted 'self-regulation' as a more appropriate mechanism for conservation in Sahtú Dene and Métis communities, suggesting it has greater potential of successfully achieving conservation outcomes than other available options. The approach recommended by the Board is the development of 'Community Conservation Plans'. In contrast to territorial systems, community-driven plans are based in traditional Dene laws, principles, and the agreements that guide Dene relationships with other beings. They may include traditional stories, language, and concepts as a cultural foundation, and use a much broader approach to conservation, with program areas for hunting, habitat, governance, and knowledge.

Harvest monitoring and regulation will be an important component of future community conservation planning, and the past harvest study can help in two main ways: first, by providing data and information compilations that can improve understandings of Sahtú Dene and Métis food systems; and secondly, by providing key insights into the principles and practices that will ensure that future, locally-controlled harvest monitoring programs produce reliable, accurate results.

The lessons learned from the harvest study indicate that the following ideas will be important in setting up a future harvest monitoring programs for success:

- Good community buy-in is essential for successful harvest research and monitoring.
- Programs need to be focused on local interests, priorities, and objectives.
- Community interests need to be protected through formal principles and standards regarding local ownership, control, access, and possession of information.
- Diverse Indigenous food systems and adaptive harvest strategies are best captured through long-term monitoring programs.
- Ecological, regulatory, and socio-economic factors need to be documented and locally interpreted for their influence on customary harvesting activities and patterns.
- A monitoring program that includes indicators of ecosystem health, trends in disease, species other than fish / birds / mammals, etc. may better approximate an Indigenous research methodology and framework as well as help account for changes in harvesting over time.
- An iterative, community-controlled harvesting monitoring program, able to adapt to changing needs and interests can accommodate different conservation priorities.
- Because harvest composition and other factors can differ from community to community, management priorities will also likely need to differ.

Conclusion

While the statistical analysis determined that the Sahtú Harvest Study met the objectives laid out in the Land Claim – that is, the survey resulted in five years of data that could be used to calculate total estimated harvests – the community analysis had very different conclusions. Instead, the numerical data were found to vary widely in reliability by species, by year, and by community, and much of the information was not seen to be a good representation of local harvesting patterns and needs. As a result, in no case should the numerical data alone be used to inform such important management actions as calculating Minimum Needs Levels or determining Total Allowable Harvests.

This is not to say that there is no value in the results of the Sahtú Harvest Study. 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 data that are consistently accurate and reliable, such as the seasonal harvesting patterns documented by the study. It is expected that novel ways of compiling and looking at the information that go beyond tables of total estimated harvests can be a useful tool for gaining insights into each community's complex harvesting system, and help support and inform local decision-making.

As Community Conservation Plans take shape across the region, and local programs for harvest monitoring and regulation are developed, the lessons learned from this past harvest study and its completion can be applied to the design of new approaches that better accommodate Sahtú Dene and Métis priorities and perspectives. In fact, the insights provided during the community analysis demonstrate that Sahtú Dene and Métis are already closely monitoring and regulating their harvesting activities – meaning this is likely to be less about designing something new than returning to a more traditional process and cultural framework, in which communities can meaningfully direct the process of inquiry, own the information, and affect decision-making on their own terms.