# Yukon First Nation Wildlife Harvest Data Collection and Management: Lessons Learned and Future Steps

Contextual analysis of the wildlife harvest workshop held November 5-6, 2009, Lake Laberge, Yukon

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"We're better than we were, but we're not there yet" (panelist)

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YUKON FIRST NATION

WILDLIFE HARVEST DATA

COLLECTION AND MANAGEMENT:

LESSONS LEARNED AND

FUTURE STEPS

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EXECUTIVE SUMMARY

Harvested species have ecological and cultural importance. The decline of these species can impact the environment and the people that rely upon the species. Ta'an Kwäch'än Council, Teslin Tlingit Council, and Carcross Tagish First Nation organized a survey and workshop to address the role of First Nation wildlife harvest data in the co-management decision-making process. This workshop was to explore wildlife harvest data collection, data storage, uses for the data, and data's importance during Total Allowable Harvest and Basic Needs Allocation negotiations. Ta'an Kwäch'än Council hosted the workshop at The Deep Creek Centre, Lake Laberge, Yukon to allow participants, representing 10 Yukon First Nations, the opportunity to discuss wildlife harvest data collection and management.

A brief historical context is required to understand the current situation. In 1973 the Yukon Native Brotherhood (YNB) wrote *Together Today for Our Children Tomorrow* stating grievances and potential solutions to ensure Yukon First Nations become equal with Euro-Canadians. This letter initiated negotiations with the Government of Canada, resulting in the Yukon Umbrella Final Agreement (UFA) in 1993. Since 1993, ten Yukon First Nations have signed individual Final Agreements and are self-governing nations.

Yukon wildlife has been managed by two different systems. The first is based upon western philosophy and is often expressed as scientific management. Scientific managers often view themselves as separate from the environment and believe they are able to impartially manage ecosystems for a fixed goal, such as maximum yield. The second system present in the Yukon is traditional management. This system recognizes that humans are a part of the environment and that governing human activity, through cultural expectations, can maintain the environment's ability to support future generations. Chapter 16 of the Final Agreements requires

First Nation Governments and the Yukon Government to co-manage wildlife within boundaries of First Nation Traditional Territories. The two management systems have parallel perspectives and have converged in co-management. Co-management requires a foundation of mutual trust and respect to succeed. Managers from both systems have common goals and can use these goals to initiate discussions that will build trust and respect. First Nation Governments are in varying stages of collecting wildlife harvest data from their citizens. The collection of First Nation wildlife harvest data can be used to negotiate harvest allocation between First Nations and sport-hunters and, if required, negotiate Total Allowable Harvest or Basic Needs Allocation.

The organizing First Nations developed an electronic survey to determine interest in the workshop, to collect preliminary data, and to determine discussion topics of interest. The survey was sent to each Yukon First Nation and ten responses were received. 88% of respondents currently collect wildlife harvest data and respondents believe most hunters are willing to share certain aspects of their harvest data. 62% of respondents employ Game Guardians to collect data and 50% of respondent First Nations conduct face-to-face interviews. Collected data is currently stored using a range of methods and little analysis is being conducted. Data is used to support recommendations made to leadership and the data is not shared except with the Government of Canada when required.

The workshop started with a discussion of the Coordinated Harvest Management Program (CHMP). The CHMP was an attempt to collect wildlife harvest data but First Nations were not prepared to participate in the program. Several First Nations were negotiating individual Final Agreements or were in the process of implementing their individual Final Agreement. These First Nations did not have the resources required to participate in the CHMP

since resources were allocated to other priorities. The CHMP was deemed a failure and terminated due to poor participation.

One large barrier to harvest data collection barrier is a perceived lack of trust between citizens and governments and fear about the intended use of harvest data. Communicating with and building relationships with citizens may foster trust, increasing a hunter's willingness to share data. Explaining to hunters the intended use for the data can alleviate fears that the data would be used to infringe on subsistence rights. Intended uses for collected data could include: balancing subsistence rights with management responsibilities, negotiating Total Allowable Harvest or Basic Needs Allocation, or determining access permit allocation. An appropriate management model needs to incorporate a First Nation's traditional knowledge, culture, and identity with contemporary knowledge.

Collaboration amongst First Nation Governments was explored and participants are considering developing a standard harvest data form and developing a database that could be used individually by each First Nation. The database would provide a standardized storage system that could be customized by each First Nation. The participants were clear that collaboration does not mean access to each other's data. This view reflects the position that protecting hunter confidentiality is essential for this initiative to succeed.

Two enforcement models were discussed. The first is associated with scientific management and a central authority is responsible for enforcing regulations. The second model encourages First Nation hunters to self-regulate and social sanctions are used for non-compliance. Participants discussed challenges encountered during the collection of data. Some challenges include citizen status and rights, providing for Elders, granting access permits, hunting under subsistence rights and territorial license, and determining appropriate enforcement

methods. Although several challenges were identified, participants discussed opportunities to overcome these barriers. Several First Nation Governments are collecting data providing an opportunity to learn from other's efforts, hunters' awareness is increasing which may increase willingness to share data, collaboration and developing a network can increase efficiency.

Other northern aboriginal governments are collecting wildlife harvest data and appear to be using similar methods and forms. These governments start the process with an education program. A local citizen is selected to collect the data, which is entered into a central database system. Hunters' identity is protected through the use of a personal identification number. Data is not shared unless required for management decisions and hunters are allowed to access their personal data.

A Google Group (http://groups.google.ca/), an Internet working group, was launched. The Group is to allow participants to discuss topics started at the workshop and new concerns. The Group has low participation but this may be caused by the need to learn a new system. Other methods can be used to continue the discussions and participants can select their preferred methods. Participants raised several questions but there was not sufficient time to address these questions. Some questions are associated with the Federal Government's involvement for signed-unsigned rights, others with recording additional sources of wildlife mortality, potential harvesting loopholes, and jurisdiction for species-of-concern.

Participants identified some steps that may be taken to achieve the long-term goal of collecting wildlife harvest data, achieving provisions contained within Chapter 16 of a Final Agreement. The short-term goal is to continue discussion and building relationship amongst workshop participants. Medium-term goals focus on collaborating to develop standardized

harvest data forms and databases, coordinate efforts with other Governments to maximize limited resources, and identify required resources.

Achieving Chapter 16 provisions will be a long journey with several challenges but each challenge has an opportunity that will strengthen First Nation Governments. Workshop participants view collaboration as essential to addressing larger challenges since the burden can be shared by several individuals. Building relationships, education, gaining citizens' trust, and protecting confidentiality is essential for this initiative to succeed. First Nation Governments need to find a system that is acceptable for their citizens. This cyclical learning process can develop an adaptive co-management system that accommodates changing resource abundance, cultures, and needs.

ACKNOWLEDGEMENTS

1.0 INTRODUCTION

1.1 Survey and Workshop Rationale

Yukon First Nation Governments have the authority to co-manage wildlife found within their respective Traditional Territories. The capacity of these Governments is increasing and workshop participants are recognizing the importance of accurate wildlife harvest data. Co-management organizations may require this data to equitably allocate wildlife to First Nation subsistence hunters and to sport-hunters governed by the Yukon Government (YG). Accurate data is also important since Chapter 16 of the Umbrella Final Agreement (UFA; Government of Canada 1993) has provisions ensuring First Nations have priority access to wildlife where a concern about harvest level exists. The Total Allowable Harvest (TAH) and Basic Needs Allocation (BNA) are based upon historical harvest rates and a lack of accurate data could compromise a First Nation's ability to receive an allocation that fulfills the community's needs.

Northern mountain caribou (*Rangifer tarandus caribou*) are used by several First Nations and have been listed as a species-of-special-concern, by the Committee on the Status of Endangered Wildlife in Canada (Kerr 2009). Knowing accurate caribou harvest rates is essential to understand the population dynamic response to harvesting; this information is required to effectively manage this species and prevent further decline (Kerr 2009). First Nation Governments are in various stages of collecting accurate harvest data. The workshop was organized in order to provide delegates the opportunity to discuss challenges and to gain insight to overcome obstacles with culturally appropriate harvest reporting (Kerr 2009).

Workshop participants discussed seven, interconnected topics: 1) current and past harvest data collection methods, 2) challenges encountered during the collection of harvest data, 3) solutions to the challenges identified, 4) a systematic method for compiling and analyzing collected data, 5) data sharing amongst governments for collaborative management approach, 6) benchmarks that indicate improving data quality and quantity, and 7) the role of TAH and BNA in management planning. A summary of Yukon's history and parallel summary of scientific and First Nation worldviews will provide the context required to introduce the complexity of wildlife management in the Yukon.

1.2 Historical Context

Yukon First Nations never signed a numbered Treaty with the Government of Canada and their rights remained uncertain for decades during which a series of southern encroachments occurred starting with the Klondike Gold Rush (McCandless 1985). The Yukon Native Brotherhood (YNB) endeavored to improve the future of their people and drafted a statement of grievances and proposed remedies, and requested that the Government of Canada settle with Yukon First Nations (YNB 1973). The authors of *Together Today for Our Children Tomorrow* (1973) described their history to provide a cultural and historical context for the grievances described later in the document. The primary themes addressed government dependency, enfranchisement, the imposition of legal title to land, and the Government of Canada's legal obligation to negotiate a treaty with Yukon First Nations. The authors believed that the failure to address these concerns through a modern treaty would slowly erode First Nation culture and enforce inequality with Euro-Canadians. The Yukon Native Brotherhood demanded social and economic

equality with Euro-Canadians to regain control over their future. To achieve equality, the authors proposed a settlement plan that would divide responsibility between First Nation Governments and the Government of Canada. This division of power would allow both parties to oversee their respective futures without significant imposition on the other. The Government of Canada entered into negotiations with the YNB initiating the first comprehensive land claim in Canada's history.

Twenty years after *Together Today for Our Children Tomorrow* was written, four First Nations ratified the Yukon Umbrella Final Agreement in 1993.

The UFA provides a model for each First Nation to use while developing individual Agreements (CYFN 2009). Individual Agreements are modified to be culturally appropriate and to address local concerns regarding the implementation of the UFA. Chapter 24 of the UFA (Government of Canada 1993) grants First Nations the ability to self-govern, allowing each First Nation the ability to guide their future. Chapter 16 allocates hunting rights to signatory First Nations throughout their settlement land. First Nations have the right to hunt on Crown land but this right has been separated from other rights and uses of the land. Nadasdy (2002) is concerned that this separation would allow the Crown to sell or develop the land resulting in a slow erosion of a First Nation's cultural identity and connection with the land.

First Nations have been granted priority to wildlife species when the population is of concern. When the population reaches a threshold, First Nations receive a TAH quota or a BNA. The TAH and BNA are mathematical averages of the historical harvest that met the community's needs (Government of Canada 1993).

The UFA created and established Renewable Resource Councils (RRC) and the Yukon Fish and Wildlife Management Board (YFWMB) as the primary instruments for wildlife co-management within Traditional Territories and in the Yukon respectively (16.6.0, 16.7.0 UFA, Government of Canada 1993). RRCs and YFWMB have an equal number of First Nation and YG appointed members to negotiate and recommend management strategies to the appropriate governments. Equal representation allows local and Territorial management systems to be recognized and combined if participants are willing to view the other system as complimentary and valid (Berkes and others 1991).

Management of complex ecosystems is best addressed with collaborative processes and by using multiple types of knowledge during problem solving (Armitage et al. 2009). Scientific and traditional systems have different cultural roots that influence the management process and data used during the decision-making process. Scientific management often uses population survey data to estimate species abundance while traditional management uses hunter effort data as an indicator of relative species abundance (Thoms 1999, Usher 1986). Although both systems collect data, exploring each system's worldview will clarify the cultural foundation that guides data generation and interpretation.

1.3 Scientific Management

Scientific management is firmly grounded in western philosophy regarding humanity's position within nature; humans are superior to and disconnected from nature (Parlee and others 2005). Scientific research is reductionist; managers focus on specific objectives and may not account for other needs, and a central authority implements decisions through a bureaucratic chain-of-command (Brunner and Steelman 2005).

Limiting acceptable knowledge to hard science and centralized decision-making may be an attempt to improve management efficiency. Scientific management has been unable to effectively address social factors that influence the decision-making process and policy implementation (Ludwig 2001). The involvement of numerous stakeholders creates a situation with multiple appropriate solutions; each solution is closely associated with a particular stakeholder and may be unacceptable for the other stakeholders. Pinkerton (1999) believes this widespread failure can be related to science's disconnect not only from nature but also a failure to understand the social context that surrounds management decisions.

Scientific protocol and property rights tend to form the foundation for state-level management of wildlife resources. Scientific objectivity and the reliance upon empirical data are perceived as the sources of reliable information to inform decisions (Moller and others 2004). Governments rooted in western philosophy assign property rights as a method to control access and use of a resource but when this system is imposed on societies unfamiliar with such a form of property rights, governments appear incapable of addressing the perceived loss of rights and loss of use (Wiener 1995, Ostrom 1990). The Government creates multiple departments and numerous experts to address the individual components of state-controlled resources but there is often a lack of inter-departmental cooperation amongst departments managing the same system (Berkes 1995, Osherenko 1988).

The top-down structure creates specialization but managers and scientists are distanced from the system being managed. This is an attempt to collect unbiased empirical data through mechanistic processes that remove human interference (Berkes

2008). The scientific process generates empirical data that can be statistically analyzed or entered into ecosystem models to aid management decisions. Synchronic data, a series of snapshots over time, is the most common wildlife data due to the difficulty of constant population monitoring. Synchronic data is used to estimate trends, develop models, determine the potential outcome of management decisions, and allocate surplus production (Usher 1986). Collected data may not cover multi-generational cycles, may not record changes in the system, and miss unusual events that can affect the accuracy of the model and resulting management (Cobb and others 2005, Osherenko 1988).

Although wildlife managers focus on the long-term sustainability of wildlife populations, this objective is tempered by resource-extracting industries pressuring governments to develop natural areas. Stakeholders can influence the implementation of wildlife management plans, often weakening the policy to allow development to proceed with minor obstacles. Depending on the socio-political climate, development may receive a greater priority than wildlife conservation and resulting decisions are driven by economics rather than biology (Collings 1997). Even though socio-political forces can drive wildlife management decisions, the mechanistic data generation and analysis does offer several strengths.

The main strength of scientific management is the consistent manner in which data is collected during studies. Research projects often follow the same sampling protocol, which allows comparison of each data set and the development of trends. Even separate research projects may follow different sampling procedure and frequency but the similarities may allow the data sets to be complementary. Research sites can be dispersed across a wide geographic area and the data is linked to each location. Sampling design

can include areas that have not been included in previous projects but these areas may be excluded due to high access costs (Moller and others 2004). With sufficient training, experience, and evaluation of observers, managers might be capable of correcting measurement error and standardize the results (Bart and Notz 1996).

Scientific management is limited through the lack of financial resources, the lack of long-term data, and the lack of appropriate research by the science community (Strickland and others 1996, Berkes 1995). The models and predictions developed based on known data are designed for general application but the simulations may not be suitable for use at small scales due to differences amongst populations (Cobb and others 2005). Models can be refined for local application but this may require the active involvement of local experts, which can create conflict in an expert-knows-best management structure. Management goals can appear shortsighted and implemented regulations may not be culturally appropriate. Although species conservation, preservation, or sustainable harvest is the objective, culturally unacceptable regulations may hinder the management process unless managers are able to enforce regulations (Sandlos 2008).

1.4 Traditional Management

Traditional ecological knowledge (TEK) can be described using the six-part framework (Fig. 1) proposed by Houde (2007). 1) Observations made by active hunters are interpreted against historical observations to detect changes in the system and management systems are adjusted accordingly (Cobb and others 2005, Wiener 1995). 2)

Elders govern wildlife management[1] and harvest patterns are often associated with community needs and seasonal abundance of each species (Lyver and others 2005, Thoms 1999). 3) Historical practices explain the appropriate harvest of species and conservation arises from a desire to avoid needless harvest (Turner and Berkes 2006). 4) Ethics and values center on respect, guide hunters' relationship with the land and interactions with other species (Berkes 2008, Houde 2007). 5) Social and cultural identity is closely associated with use of the land and wildlife (Cobb and others 2005, Parlee and others 2005, Wiener 1995) and the loss of a species may have a profound impact on a First Nation's cultural identity. 6) Cosmology is the final dimension that anchors the other components together. First Nation cosmology believes that humans are a part of nature, that we occupy one niche that is interconnected with the other components of the environment. Humans are to act responsibly to avoid unnecessary harm to the other components since all have a right to life (Parlee and others 2005, Salmon 2000).
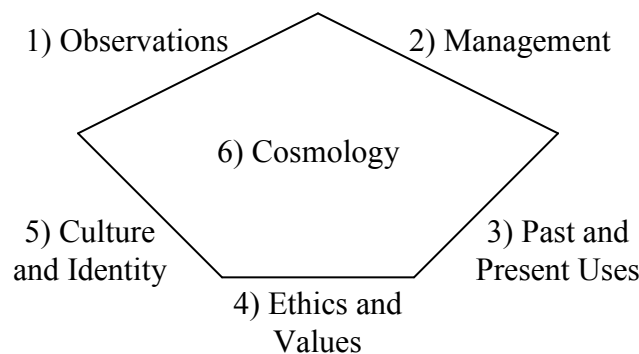
Figure 1. The six components that form the foundation of traditional ecological knowledge (Houde 2007).

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[1] Management systems implies human superiority, which may be inconsistent with First Nation beliefs (Stevenson 2006) but this term has been selected to describe a component of TEK since western audiences are familiar with this concept.

Management paradigms are culturally and spiritually based and can lose significance if separated from the social context (Usher 2000). Human interaction with the land and wildlife is to be respectful. Humility provides respect's foundation and requires members to have a concern for future generations' needs, their community's needs, and remain connected with the land (Berkes 2008). Tlingit and Athabaskan cosmology believe that animals are cognizant of how they are being treated; disrespectful behavior has consequences including failed hunts (Ratner and Holen 2007, Berkes and Turner 2006, Nadasdy 2003). Wildlife harvesting is guided by respect, the Elders' collective knowledge, and long-term experience with the land is passed through generations (Cobb and others 2005). First Nation communities often do not have formal regulations, but social norms and sanctions do exist for failing to comply with Elders' guidance or the community's expectations (Berkes 1995). European property rights are controversial since the land provides life and should not be owned by any individual but, land is allocated to support families and communities (Nadasdy 2002, Pinkerton 1999). Traditional management systems are loosely based around a western concept of property rights (Ostrom 1990). The allocation of land to individual communities allows for small-scale management that responds rapidly to changes and addresses local needs that general laws of application miss but local level governance may lose effectiveness when multiple stakeholders are involved (Berkes 2009).

Diachronic data, long-term information, accumulates due to the active participation of individuals in data collection for specific locations frequented by hunters (Osherenko 1988). New observations are added to the collective knowledge and interpreted based upon historical trends that could span several generations for the species being observed

(Parlee and others 2006). The accumulated knowledge allows local users to compare unusual observations with historical trends to determine what is occurring within the ecosystem and to determine the potential effects on other species of interest (Olsson and others 2004). Although relative abundance and long-term cycle of each species is known, quantitatively assessing changes in population size to determine if over-harvest is occurring; although experienced hunters may be capable of assessing population size changes based upon harvest effort (Nadasdy 2005).

Ostrom (1990) found that wildlife management and politics are closely related topics for most indigenous communities since wildlife abundance could facilitate or hinder a community's activities. Communities followed the seasonal availability of food and decisions were based upon food abundance (Sieferle 2001, Thoms 1999). Community governance controls hunters' effort by ensuring physical needs are met and that social norms are followed. With northern First Nations, Elders advised hunters and ensured the hunt proceeded in a culturally acceptable manner (Lyver and Łutsël K'é Dene First Nation 2005). "Family groups figured out how to share" (workshop participant) and granted family members access to the land. Berkes (2008) and Pinkerton (1999) observed young hunters receiving ethical, social, and practical instruction from senior hunters. Hunters develop an intimate connection with the land and this intimate connection allows management to address local concerns (Pinkerton 1999).

Flexible wildlife management is a significant advantage of traditional systems since local communities are capable of accommodating to changing environmental conditions. First Nations have a holistic view of ecosystems and have been able to describe the population cycles of several species found within their territory (Nadasdy

2003, Berkes 1988) and offer alternative hypothesis for declining wildlife populations (Collings 1997). Harvesting balances community needs, efficiency, and the wildlife population size and health (Gadgil and others 1993, Usher 1986). Animal health indicators vary between communities and can be accurate indicators of the animal's health. Experienced hunters are able to use these indicators – chest fat thickness and color, flesh color, behavior, etc – and estimate the health of the population, most of these indicators are overlooked by science but provide a quick analysis of body condition (Lyver and Łutsël K'é Dene First Nation 2005, Olsson and others 2004). Traditional management systems are very effective at local scales but can lose effectiveness when applied in a rapidly changing world or over large geographic areas (Berkes 2009).

Globalization is increasing wildlife management complexity. The increased number of stakeholders has changed the dynamics of resource management since there may be several conflicting interests. Resolving this complexity is often beyond the ability of local-scale managers and numerous professionals may be required to navigate the problem. Traditional knowledge can have limited applicability in co-management since the hunters often understand the population dynamics but do not know the specific population densities or minimum viable populations (Osherenko 1988). Wildlife populations can maintain normal cycles but have declining densities. Some traditional users do not view declining populations as a concern since the animals are a divine gift to the people and are an unlimited resource that replenish at the beginning of each season (Flores 1991, Osherenko 1988).

1.5 Co-management

Co-management is perceived as a power-sharing arrangement between state and local resource users with the objective of balancing scientific systems with traditional systems (Wyatt 2008). Scientific and traditional worldviews provide alternative methods of approaching problems. Each system has inherent strengths and weaknesses, each can provide partial explanations for problems, each can propose culturally appropriate solutions, and a combination of both systems may strengthen the decision-making process by incorporating several perspectives. The risk of co-management is either system can lose effectiveness and significance if removed from the cultural context that generated the knowledge (Berkes 2008, Nadasdy 2007, Moller and others 2004, Usher 2000). Traditional knowledge can humanize the management process by providing a cultural dimension by adding ethics, values, equity, and social justice; considerations that may be lacking from scientific management decisions (Moller and others 2004). Several authors have raised concerns that co-management is the government extending power to local institutions by allowing local users to participate in the management process but decisions are made based on scientific data or TEK stripped of cultural context (Stevenson 2006, Feit 2005, Nadasdy 2005, Spaeder and Feit 2005, Ellis 2005, Nadasdy 1999).

Co-management implementation requires a series of nested legislation that ensures a minimum amount of government regulation while maximizing local management (Pinkerton 1999). Territorial Government regulation should address regional concerns and transfer partial legislative authority to local managers allowing the managers to develop culturally appropriate regulations (Rusnak 1997). The co-management

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arrangement will be tested when the resource becomes scarce and all participants vie to have their needs met (Usher 1995); participants will be required to identify and agree upon the problem prior to identifying culturally appropriate solutions (Rusnak 1997).

Although the primary focus of co-management is natural resources, the management of human relationships is critical to ensure trust and mutual understanding is developed prior to crisis. Trust or the lack of trust often determines the co-management organization's success and ability to address resource access, allocation, and conservation (Goetze 2005, Osherenko 1988). Mutual trust is required for co-management to succeed and participants often have common concerns: 1) managing people's use of a resource, 2) assessing resources, 3) governing use of the resource, 4) acceptable harvesting technology, and 5) all participants have culturally influenced values that affect problem identification (Ratner and Holen 2007). These common concerns could be used to initiate discussions and build relationships between participants before more contentious issues are brought to the organization for discussion. Enforcement can be a contentious issue since western management favors regulations and armed enforcement officers while traditionally, First Nations self-enforced (workshop participant).

The structure of co-management organizations can vary widely depending on the context but all successful organizations harmonize traditional and scientific management systems and focus on the benefits of co-management (Kofinas 2005, Rusnak 1997). Co-management organizations may have fewer problems when participants focus on mutual objectives: vision for the ecosystem, conflict resolution, and accessible knowledge (Armitage and others 2009, Pinkerton 2008). Focusing on outcomes can drive the co-management process forwards while focusing on problems can hinder the process.

Although establishing trust, respect, and mutual objectives are essential for co-management organizations to succeed, evaluating progress and incorporating the feedback will strengthen the organization.

Successful co-management may be achieving objectives but some participants may perceive their needs were not met. So, although the goal was met, the process failed. Moller and others (2004) and Goetze (2005) propose success as fulfilling the needs of all resource users. Pinkerton (1999) suggests successful organizations allow harvesters the ability to develop regulations that ensure harvesters are accountable, and sanctions are enforced. Although Goetze's, Moller's, and Pinkerton's suggestions are useable, Kofinas (2005) recommends evaluating the perceived legitimacy of the process. The stakeholders represented by the co-management organization need to perceive the institution as legitimate, accept the methods used to produce knowledge, and delegates must remain connected to their community. Communities are willing to participate in co-management once they perceive that the organization is legitimate and will accurately represent their interests (Carlsson and Berkes 2005, Natcher and others 2005). Although co-management is a new model to incorporate the desires of multiple stakeholders, Kofinas (2005) raised concerns about co-management's potential to become a social engineering exercise that results in the dominance of the science paradigm and loss of traditional cultures and associated knowledge.

2.0 METHODS

2.1 Survey

The organizing First Nations developed an online survey, using Zoomerang (http://www.zoomerang.com), to provide preliminary data, determine interest in potential

topics, and to determine participants' level of interest in the topic and proposed forum (Brown 2009). A series of 29 questions solicited information regarding: the collection of, the use of, and the management of wildlife harvest data; challenges encountered while collecting data; concerns and future steps. The survey was launched October 4, 2009 and access instructions were sent to workshop participants October 15, 2009 (Brown 2010). Final results were compiled November 4, 2009 and were reviewed by the moderator prior to the workshop. Draft copies of the preliminary results were distributed to participants for discussion during the workshop.

2.2 Workshop

An invitation was sent to all 14 Yukon First Nations mid-October, 2009 and a follow-up letter was sent to anticipated participants October 30, 2009 (Brown 2010). Ta'an Kwäch'än Council hosted the workshop at The Deep Creek Centre, Lake Laberge, Yukon on November 5 and 6, 2009. The goal of the workshop was to foster dialogue and collaboration amongst First Nation wildlife officers. The workshop's main objectives were to:

1) understand the importance of First Nation harvest data and how the data will be used during management decisions,

2) discuss methods used to collect harvest data and the potential for a unified approach,

3) discuss the storage and management of collected harvest data that protects confidentiality while allowing for effective management, and

4) produce a document that can be used to implement or improve harvest data collection (Kerr 2009).

Dr. Douglas Clark, School of Environment and Sustainability, University of Saskatchewan, facilitated the workshop, with the author attending the workshop as a student/observer. Workshop discussions were audio-recorded and a "what worked" flip-chart page summarized successful methods used to collect harvest data.

The workshop began with introductions to become familiar with the other delegates and to help the delegates understand the purpose of the graduate student. The first day consisted of semi-structured discussion that addressed the main workshop topics. The discussion was facilitated to ensure topics were addressed and to ensure discussion did not excessively deviate from the topics. The second day opened with a plenary session with panel members representing the Government of Canada, the YG, and First Nations. Panelists were requested to offer a management definition, advice on data collection, and perceived differences between First Nation and Euro-Canadian Government management systems. The afternoon's discussion addressed future needs that would improve the collection and management of wildlife data, unaddressed issues, and topics to be emphasized in the final report.

This research project received a waiver from the University of Saskatchewan's Behavioral Research Ethics Board, and the organizing First Nations have retained ownership of all original data.

3.0 RESULTS AND DISCUSSION

The survey provided workshop participants the opportunity to answer questions related to the workshop's topics. The survey results allow for basic analysis of patterns occurring across participating First Nations. Ten out of 14 First Nations were represented at the workshop. The First Nations represented vary in age with some having signed individual

Agreements in the early 1990s: First Nation of Na-Cho Nyak Dun, Vuntut Gwitch'in First Nation, Champagne and Aishihik First Nation, and Teslin Tlingit Council; the late 1990s: Tr'ondek Hwëch'in; and the early 2000s: Kluane First Nation, Ta'an Kwäch'än Council, and Carcross Tagish First Nation (CYFN 2009). White River First Nation has not signed an Agreement. Some First Nation Governments have passed Wildlife Acts (TTC 1998, NNDFN n.d.). The discussions encourage participants to pursue the collection and the management of wildlife harvest data.

3.1 Survey

A hyperlink was sent to all 14 First Nation workshop participants and requested their participation. Completed surveys were received from eight individuals and a partial survey from one respondent. The information acquired from the survey is useful for indicating trends, preferences, and the diversity of methods used by First Nations to address the collection, analysis, and use of wildlife harvest data. First Nations starting on the data collection journey may be able to learn from the other First Nations. Survey respondents were enthusiastic about the participating in the workshop, building capacity for their First Nation, and having the opportunity to discuss concerns with other workshop participants.

Five First Nations believe their harvest data to have fair to excellent completeness and all respondents describe the data's accuracy as fair to excellent. Most First Nations are collecting harvest data (Fig. 2) and five Governments have implemented mandatory reporting (Fig. 3) with incentives to ensure compliance. The main incentive for compliance is preventing citizens from reapplying for consents or funding the following year to pursue traditional activities. Reporting is now mandatory for caribou in one region

due to declining populations but enforcement is the responsibility of the YG. Citizens

tend to view data collection with suspicion since their rights may be affected and may not

understand that data can be used to protect their rights in times of crisis.
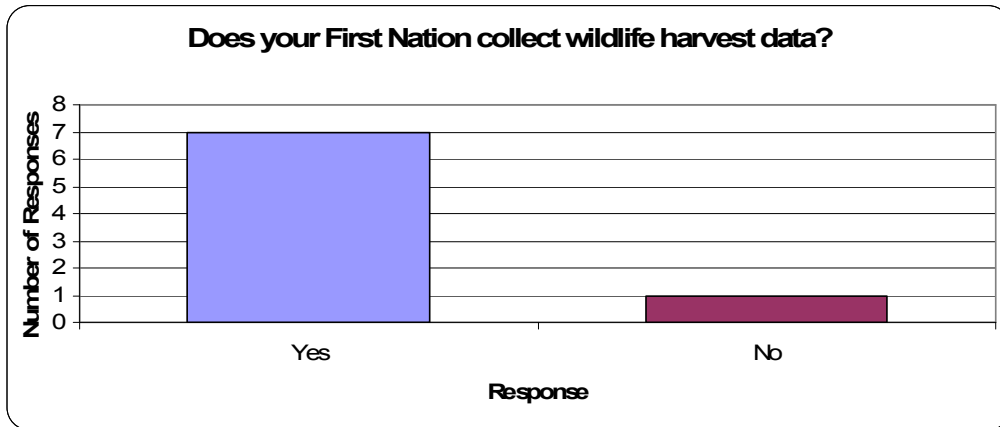
Figure 2. Number of First Nation Governments that actively collect wildlife harvest data from their citizens.
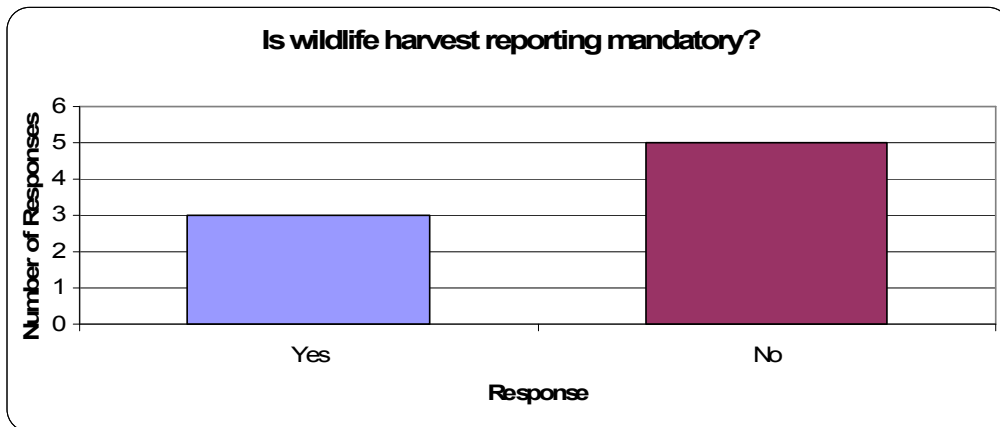
Figure 3. Number of First Nation Governments that chose to have mandatory wildlife harvest data reporting in comparison to voluntary harvest reporting.

5/8 of responding First Nations collect data from their citizens. Four respondents

actively collect data from all citizens and three respondents target First Nation hunters

and three indicate that data will be collected from anyone who voluntarily provides data.

This is a total of ten responses but eight First Nations completed the survey. This appears to indicate multiple groups may be approached for data (Fig. 4) and multiple methods may be used to obtain the required data (Fig. 5). The variety of groups approached and the multiple methods could indicate that workshop participants are attempting to determine which group will provide reliable data, refine collection methods, and determine a method accepted and trusted by their citizens. The dependency upon individuals, whom volunteer data, rather than hunters, may indicate that citizens and hunters do not trust the Government or fear that rights will be affected if the data is provided. Two wildlife officers collect data from hunters that have been granted consents; mandatory reporting of harvest data is a condition of being granted future consents. Methodology varies from face-to-face interviews to email surveys. The most common method of data collection is through face-to-face interviews but one respondent stated data is collected by "any and all ways possible". Half of the survey respondents indicate unwillingness to share harvest data as a challenge, three others are concerned about the data's accuracy.
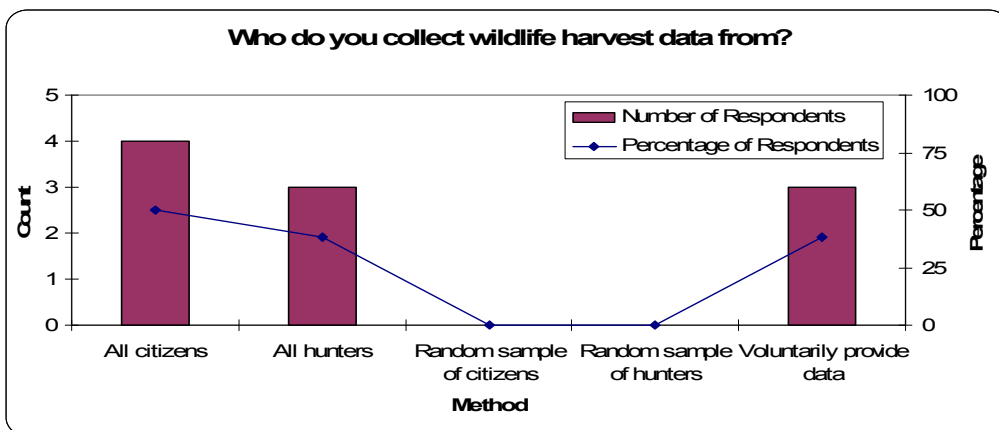
Figure 4. Groups sampled during the collection of wildlife harvest data.
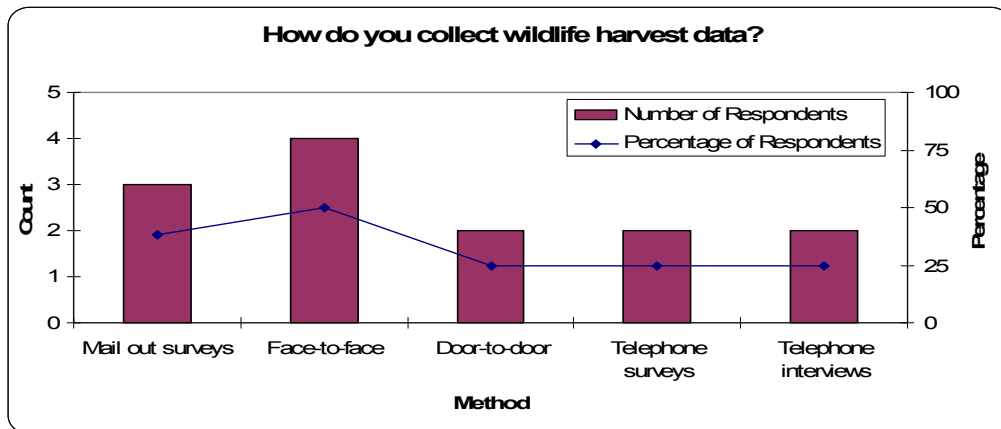
Figure 5. Methods used to collect wildlife harvest data.

One survey question requested respondents to identify methods used to keep track of hunters. The Game Guardian is a common method used to identify hunters and to build relationships with the hunters. Some First Nations do not track their hunters, others rely upon local knowledge to identify hunters, and one has a list of hunters. Tracking hunters and developing relationships may be required to gain the hunter's trust and increase the harvest data reporting success.

Hiring a Game Guardian is a common method to track active hunters and this individual is responsible for collecting harvest data for 62% of responding First Nations (Fig. 6). Three First Nations delegated responsibility to a contractor to collect the data, wildlife officers or managers collected the data for the remaining respondents. Eleven responses were submitted for this question but eight individuals completed the survey. The additional responses indicate that some First Nations are collecting data through different individuals and possibly different methods. These different individuals may be selected depending on available resources and relationship with their citizens.
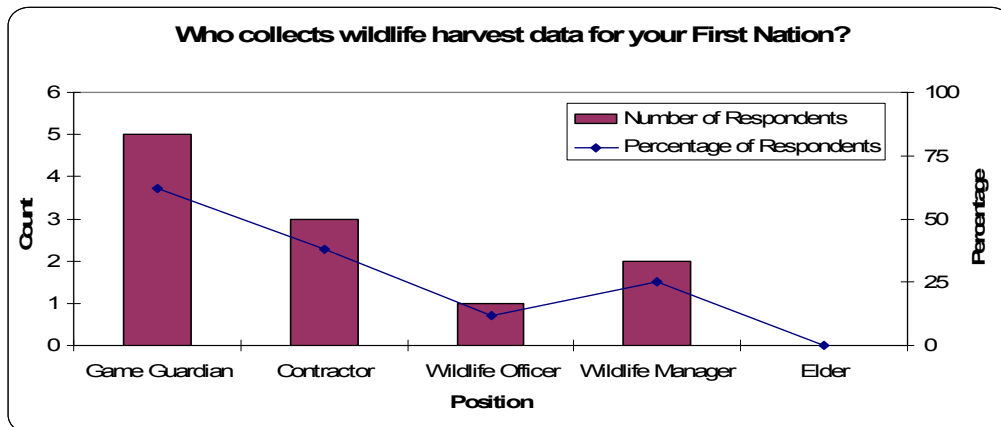
Figure 6. Position responsible for collecting wildlife harvest data.

One survey question requested information regarding data storage and analysis of collected harvest data. The most frequent database system employed by First Nations is Microsoft Excel. This is a good system for storing basic information but is unable to store large volumes of data and has a limited query function, which impedes the management use of data. Some workshop participants are in the process of developing a Microsoft Access database and will transfer the data from Excel to the new database. Three First Nations have the data and are in the process of developing a database using a program of choice, one First Nation harvest database has been linked to the First Nation Government's internal database. Other managers are storing harvest data on paper forms in filing cabinets. This variety of data storage seems to indicate a progression of experience with newer Governments collecting hard copies and the more experienced Governments attempting to develop databases. Associated with the collection of data is the analysis and use of data during management decisions.

Responses to the questions regarding analysis and use of harvest data follows a similar pattern with experienced First Nations analyzing data collected and other First

27

Nations storing but not analyzing the data. Several respondents commented that the inability to analyze data is an obstacle. One manager is conducting extensive data analysis to support recommendations to leadership regarding wildlife harvest. The remaining respondents have conducted preliminary data exploration but most have not yet analyzed the data. These managers have accumulated data and are beginning to decide how to use the data to support management decisions and to collaborate with other Governments during the management of species of concern.

Data management is delegated to the wildlife officer, manager, or coordinator – indicated as Other – for 75% of respondents (Fig. 7). The wildlife assistant is responsible for data management in one Government; the other respondent was not clear as to the position of the individual responsible for data management. Allowing managers to access and analyze data can provide the information required to support recommendations to leadership but there is a risk of misinterpreting the results.
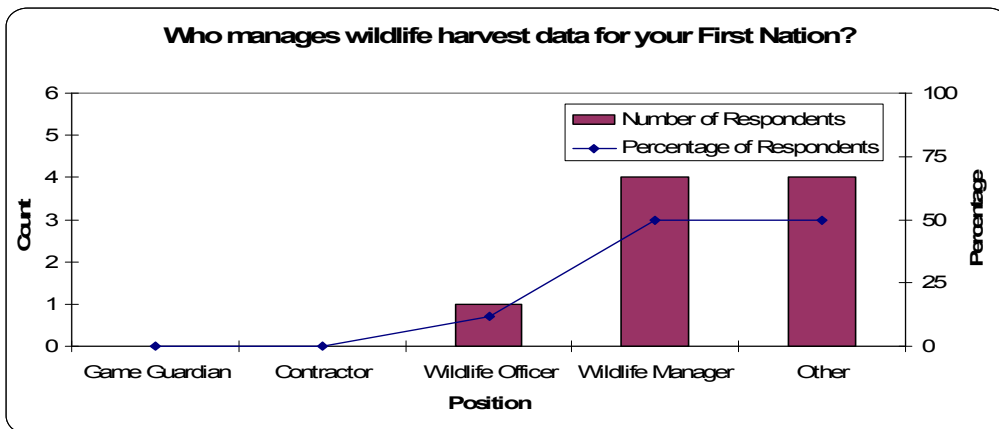
Figure 7. Position responsible for the management of wildlife harvest data.

67% of respondents do not share the data with the YG. Those that share are required to provide data for species of special concern or as a funding condition. One Government shares data to provide and receive a complete picture of harvesting activities within their

Traditional Territory. A significant concern associated with sharing data is protecting the identity of individual hunters.

All First Nations except for one respondent, who releases salmon fishery information, protect confidentiality of hunter's identity. Two managers protect confidentiality by aggregating survey responses and eliminating individual hunter identity from the database, one assigns a hunter ID number to further separate the individual's identity from the data. The remaining managers do not release data unless required but do not indicate measures used to protect confidentiality.

Since harvest data is collected to manage wildlife populations and to protect their rights, managers are required to communicate with their citizens. Most managers communicate through newsletters, brochures, and notices. Other methods include personal visits, newspaper ads, and community meetings. The diversity in methods used by each respondent seems to indicate that the importance of the communication will determine which method is selected.

Workshop participants have observed that harvest data questions appear to be on a sensitivity gradient. Questions placed at one end of the gradient are comfortable, while questions at the other end are more sensitive. Respondents believe their hunters are willing to share the animal's quality and the number of people who shared the meat. All respondents believe their hunters are willing to very willing to share the species but are less willing to share the sex. Very sensitive topics address the location of a kill and the number of animals killed. These topics may be especially sensitive due to lack of trust and the perception that the data may infringe on their rights.

Negative perceptions underlie all of the reasons hunters are unwilling to share harvest data. Hunters do not trust the Governments involved in wildlife management and fear the data will be used to infringe on their rights. Hunters are concerned about what the data will be used for and may not understand that contributing data can protect their rights when faced with negotiating a TAH or BNA. Community perception and values may reduce a hunter's willingness to return harvest reports.

3.2 Workshop

The workshop was organized by three First Nations who wanted to document methods and techniques used by other First Nations in the collection of harvest data, to foster community building and collaboration, and to strengthen relationships between First Nation workshop participants. An invitation was sent to the 14 First Nations but not all were able to attend the workshop. Workshop delegates represented the following First Nations: Carcross Tagish First Nation, Ta'an Kwäch'än Council, First Nation of Na-Cho Nyak Dun, Tr'ondëk Hwëch'in, White River First Nation, Champagne and Aishihik First Nations, Kluane First Nation, Teslin Tlingit Council, Kwanlin Dün First Nation, and Vuntut Gwitchin First Nation. Additional participants, for specific discussions, included representatives from the YG, First Nation Elders, and the Yukon Fish and Wildlife Management Board. The workshop and panel discussions addressed several interconnected issues, the following subsections start with the prior harvest data collection program, addresses social aspects, and ends with challenges and opportunities associated with this initiative.

3.2.1 Coordinated Harvest Monitoring Program

In 1998, the Yukon Fish and Wildlife Management Board (YFWMB) oversaw the Coordinated Harvest Monitoring Program. This program was requested by First Nations, funded by the YG, and administered by a contractor. First Nations were not adequately prepared for the Program and eventually the Program was terminated due to poor performance (workshop participant). An underlying cause for the failure was that the "YFWMB has trust issues with Government and First Nation Governments have trust issues with the Yukon Government" (workshop participant).

3.2.2 Fear-Trust Dichotomy

The fear-trust dichotomy surfaced during the workshop and panel discussions. Hunters fear that if data is shared, their rights will be infringed upon. This fear is borne from a history of animosity between First Nations and Government but concerns regarding the intentions of Governments, First Nation and Euro-Canadian alike (Nadasdy 2003). First Nations have invested decades of time and invested millions of dollars to negotiate Final Agreements to have their right to traditional lifestyle recognized by the Territorial and Federal Governments. One panelist perceives a right infringement when tourists arrive in Whitehorse and are allowed to hunt in the Traditional Territory without consent. First Nation hunters may fear changing public perception. The public has concepts, often Western philosophy founded, regarding appropriate wildlife management. Sharing harvest data can change public perception and increase tensions between the various stakeholders. One workshop participant voiced First Nation hunters' concern

"[will] outfitters get higher quotas if they know what First Nations are harvesting?" Gaining trust and developing relationships are crucial to reducing tension and alleviating fear.

First Nation citizens fear that providing data will infringe on their subsistence rights and First Nation Governments need to gain trust to improve their perceived credibility. Several participants iterated that "it takes time to gain trust" and that an individual "[can] undercut trust faster than [he] can build trust". Building trust is a large, time-intensive process and several participants believe that having a full-time Game Guardian is effective. The ideal Game Guardian is on the land year-round, is in contact with hunters, knows traditional place-names, and the people. The individual is able to relate to the hunters and is capable of explaining the why, what, and how questions associated with data collection and use. "Relationships matter" (workshop participant), hunters are more comfortable sharing harvest information "as we establish trust". Trust is fundamental for an institution to be perceived as credible and personal relationships are required "since a smile can break defenses" (workshop participant).

3.2.3 Relationships and Education

Relationships take time to build and "relationships change when there is turnover" (workshop participant). Most relationships need to be rebuilt with staff-turnover since the new individual needs to gain the trust of coworkers, the trust of Government counterparts, and the citizens' trust. This process consumes large amounts of time and energy that could be directed towards other endeavors. Education can be demonstrated through several forms but there is a unifying

objective: to gain the hunters' trust so that they are willing to provide data that can be used to effectively manage wildlife and protect First Nation subsistence harvesting rights. Having people on the land is essential to build relationships between the Government and hunters but to also "bring reality back to the office" (workshop participant). A strong relationship between managers and hunters ensures managers are making decisions that reflect the current concerns expressed by citizens.

Citizens must understand why the data needs to be collected and that their identity will remain confidential. One educational approach was to inform hunters that accurate harvest data would be used during TAH or BNA negotiations and that without their data "we have no harvest so why negotiate" (workshop participant). Another approach was to explain that without data, it is hard for managers to determine if some areas need to rest by restricting the hunt. This is becoming a concern since isolated family hunting grounds are not as common and areas with easy access are being over-hunted compared to isolated regions. Customary laws are slowly disappearing and one participant has distributed pamphlets explaining the proper procedure to request permission to hunt on another First Nation's Traditional Territory. One panelist encouraged teaching youth customary laws and how to respect the land because "without animals, we will not exist". Education does not only need to be directed towards First Nation citizens. Participants and panelists raised concerns that people "forget what is in the Agreements and go back to their old ways" and that people should be willing to respect a different management system while on settlement land.

3.2.4 Data and Models

Western management and the models being developed by First Nation Governments rely upon data to inform and support the decision process. A crucial first step is to understand data. A panel discussion participant proposed that data is "harvest information from our citizens and the purpose is within the context of our Agreement". Understanding data is essential to guide question development since poorly phrased questions will produce inaccurate or unusable data.

Data collection can be based on two different yet complementary models. The first model underlies western management systems and is a hierarchical system of needs that may achieve a determined objective. The second model is based on the medicine-wheel in which managers solve patterns to restore balance (panelist). This model is a holistic approach that examines interconnected components to determine which areas will have the greatest influence on the final outcome. The panelist encouraged workshop participants to examine both models and develop models that work for First Nations. A workshop participant echoed this sentiment and thought, "we were too reliant on the YG's system of data collection". Some First Nations have clan systems that can be used to oversee data collection within each clan (panelist). This system is accepted by citizens and may increase willingness to provide harvest data (workshop participant). There is a need to build models that work since existing models have not incorporated changing situations yet First Nation models may not handle the complexity facing managers. The challenge is to build working models that incorporate traditional

knowledge, fundamental respect and reciprocity, contemporary knowledge, and determine the data required to make these models work.

3.2.5 Harvest Surveys

Harvest surveys, that collect the required data, can be developed once an appropriate model has been selected. One panel discussion participant justified collecting harvest data since "unless we know what's out there, we can't manage it"; another panel participant's reason

> *Collaborate and develop a standard harvest data reporting form.*

was to "conserve wildlife into perpetuity." Current harvest data collection assumes that every First Nation wants to collect data and to pursue data collection based on categories developed by the YG. Several participants have noted that hunters associate their activities with the land's traditional names. Accommodating this intimate connection may recognize cultural components, moving wildlife management from an activity to preserving traditions, cultures, and identities. First Nations prefer personal interactions and several participants have recognized that face-to-face interviews are effective, build trust, and increase reporting rates. One workshop participant observed that after a few years of face-to-face, hunters are willing to fill out a form as long as the form looks the same.

The standardized form would ensure all First Nations are collecting the same information, which will allow aggregation of data and comparison of data amongst Traditional Territories. Collected data is to inform management decisions that conserve wildlife species and protect subsistence rights.

3.2.6 Management

Management is not clearly defined in the Final Agreement since "the Agreements set out some limitations and the management decisions will reflect the situation" (panelist). Panelists and workshop participants proposed management definitions that range from a western perspective "a series of decisions made in order to meet objectives" and "the art of producing more wildlife on the land" to a traditional perspective "looking after the wildlife in our Traditional Territory", "controlling ourselves", and answering "how do we make stuff last?" The following workshop discussion agreed that management should strive towards a long-term vision and should include intermediate standards to determine program effectiveness. Although a wide diversity of definitions was proposed during the discussion, most workshop and panelists agreed that current management models might not adequately reflect First Nation values and objectives.

First Nation Governments are working towards achieving Provision 16.5 of the Final Agreement (Government of Canada 1993). One panelist expressed concern that "management is currently an experiment … and that we [need to] sit down with the people who are directly impacted by what we do." First Nation employees have several competing demands and "need to define why harvest monitoring is important" (workshop participant) to receive the senior leadership's support. Other workshop participants believe that the YG is not effectively managing wildlife and that "someone has to fight for the animals, someone has to speak for the animals, someone has to protect them" (panelist). This sentiment

reinforces the position that as the resource users with the longest connection to the land, First Nations should have the most influence in resource management (Usher 1986). Managers are keen to use harvest data to inform Ministerial decisions and support management decisions, especially decisions relating to negotiating TAH or BNA with the YG. Several participants indicated that a TAH has not yet been negotiated but wildlife species are continuing to decline, which may require TAH negotiations at some point in the future. Such negotiations will require an accurate representation of First Nation harvest and managers will need to efficiently retrieve and present data supporting a position during negotiations.

3.2.7 Database

Workshop participants expressed an interest in developing a database to store, manage, query, and present data. Increasing capacity will allow managers to efficiently participate in species-specific discussions and the resulting management plans. Participants support the initiative to develop and distribute a standardized database that contains the same data categories but has sufficient flexibility to customize other portions of the database by adding additional categories to manage data for topics of interest, in particular, number of allowances granted.

> *Collaborate and develop a standard yet customizable database.*

There appeared to be consensus that housing the database and data administrator occur in a neutral, centralized location. the Council for Yukon First Nation's (CYFN) office or Yukon College was suggested as potential locations that would meet this criterion.

The ability to spatially reference the database would allow Geographic Information System (GIS) technicians the ability to produce habitat maps, visualize hunting pressure distribution, or other topics of interest. Spatial data would allow workshop participants the ability to collaborate with other departments during the review of proposed developments. Most participants would like the database to be simple and cost-effective. A simple system would reduce training time required, and trouble-shooting can occur via telephone or video-conferencing.

Database development options were explored but will require further consideration. Microsoft Access has some supporters since the program is easily accessible, modifiable, easily taught, inexpensive, but labor intensive to develop the database. Hiring a consultant to develop a custom database received some support but concerns were raised about training, trouble-shooting, and the ability to customize. One participant suggested looking at custom database software that provides more flexibility than Microsoft Access but at a lower cost than a custom database. Another participant suggested increasing community capacity by training a citizen with data management skills. This individual would later design an in-house database, provide training, and technical support. Another possibility is to approach Yukon College since they are "another institution that is at arms length from the YG and [individual] First Nations … they may be able to fulfill some of the needs presented here." The ability to efficiently store and retrieve data "will simplify things" and improving the regulatory component of wildlife management.

3.2.8 Enforcement

Two enforcement models are present in the Yukon. The western model gives power to the authority's representatives and the traditional model gives power to hunters to self-police. Euro-Canadians can be prosecuted for poaching but First Nations have an entrenched right to hunt and controlling over-harvest is a challenge. A workshop participant is concerned with public perception since "white men poach but First Nations over-harvest."

First Nations with individual Final Agreements have the ability to regulate their citizens' harvest throughout the Traditional Territory (Government of Canada 1993). Enforcement can be challenging since demands and orders are not received well by hunters since most experienced residential schools; however, these hunters are often willing to consider suggestions. Traditional Territories cover a large geographic area and can overlap with other First Nations' settlement lands, which can create a unique enforcement opportunity. Collaboration amongst First Nations and possibly the YG could create a joint game guardianship to share enforcement costs and resources. One participant suggested allowing hunters to enforce social norms "since we would rather be charged than shamed." The enforcement model implemented will vary between First Nations but there are opportunities and challenges ahead.

3.2.9 Challenges

Workshop participants discussed several management challenges. One challenge was encouraging hunters to harvest respectfully and to reduce excessive harvest. Another challenge arises from hunting practices. Some hunters will

engage in subsistence hunting – as legally defined in the UFA and Final Agreements – others hunt under laws of general application, and others hunt under both systems. There is concern that First Nations hunting under laws of general application report their harvest to the YG but First Nation Governments may not know that this harvest has occurred. This situation may cause problems during TAH or BNA negotiations since First Nation Governments may not be able to accurately calculate their needs. A YG representative told participants "information regarding licensed First Nation harvest is available, just need to ask for the information."

Other workshop participants are concerned that the animal has been reported to both systems. Two representatives asked, "Has this animal been reported to another agency?" to avoid double reporting. A concern associated with the existence of both systems is "double-dipping". This concern was discussed through various scenarios: 1) A hunter is granted subsistence consent but also holds a general application license. "Does this individual assume the ability to harvest two moose?" Is there a way to identify dual-system hunters? 2) An individual is a member of one First Nation and a beneficiary of a second. The lack of clarity for membership definitions, rights associated with each definition, and general lack of understanding may allow a hunter to harvest in multiple First Nation lands, 3) A consent is granted to the adult but their child harvests the animal. Could the adult harvest an animal, with an access permit, and have the child harvest another animal without a permit? This question sparked a debate about methods of issuing and tracking consents.

Currently, consents are granted to individuals but with First Nations "a lot comes up per family, per household, per unit" (workshop participant). This participant proposed granting consents to family units since under existing regulations a family of four could harvest four moose but only requires one moose. Another workshop participant successfully uses the definition for nuclear family to allocate program funding and believes this definition could be used for subsistence consents. While discussing consents, a workshop participant wondered "if there is something in the policy that allows a hunter to harvest for an Elder?" Hunters abuse the system and claim to hunt for an Elder but there currently is not a way to track Elders' hunters. Another workshop participant suggested a card that indicates a hunter is designated Elder's hunter. Other participants wondered if a non-First Nation could be a designated Elder's hunter or if this designation is restricted to First Nations.

Granting subsistence consents and outfitter access was briefly explored. Individuals debated if fees should be charged for the consent. First Nations that charge for the consent direct the money into the Game Guardian program but a workshop participant noted that citizens might perceive "we are persuaded by money and lose focus on protecting the land." Although the workshop delegates recognize that there are several concerns that need to be addressed, the ability to talk openly with other managers inspired hope and ways to address challenges.

3.2.10 Opportunities

First Nation workshop participants are geographically separated and often work in isolation from their counterparts in the other Governments. This isolation

has lead to frustration and duplication of methods and effort. Unanimous support was received for developing a wildlife manager network. Calling the group a network improves credibility and does not threaten senior administration. A proposed objective for the network is to dialogue about the direction of wildlife management.

Participants discussed methods that the network would interact and a spectrum of options was presented. The least formal was to develop a Google Group (http://groups.google.ca/). The Group would allow discussion to occur without requiring

> *"Start a dialogue and start a communication about where people want to go and do"*
> (workshop participant)

additional resources but these discussions may not have the same efficiency as direct interaction. Meetings are the most formal method for the network to discuss issues. Although the meetings are efficient, they are expensive and remove attention from other responsibilities. Video-conferencing was proposed as a method to allow for direct interaction without the high cost of formal meetings. All of the participants have access to video-conferencing equipment through Yukon College or through their Government's office. Participants favored a combination of discussed methods. The Google Group, once learned, would be ideal for general discussion regarding a topic and to refine the main points for future deliberation. Video-conferencing could be used to efficiently discuss those specific points identified through the online discussion and meetings may be appropriate for contentious issues.

Participants recognized that "collaboration is huge" and that collective effort

can achieve objectives faster than through individual efforts. Workshop

participants and Government representatives are enthusiastic about the potential

to collaborate on various issues. The main issues for

collaboration are harvest data collection and

database development. One panelist stated

> *"Collaboration is huge"*
> (workshop participant)

"governments have limited resources and we need to come together as

governments and work together." Participants are willing to collaborate on

developing harvest data collection methods and forms to ensure data is

compatible. Others would like to see collaboration in developing other forms –

consents, permits – so that this information can be tracked and reduce incidences

of 'double-dipping'. Collaboration during the development of the database can

include discussing structure, content, intended uses, and resource sharing. Having

compatible databases keeps information confidential

but compatible during meetings that discuss regional

wildlife concerns and trans-boundary issues. A

> *Collaboration is sharing methods and products not sharing data.*

standard database would help First Nations that are

starting to collect data since the management tool has been developed, tested, and

refined. Other potential areas for collaboration were briefly discussed: 1) joint

Game Guardian program, 2) First Nation collecting data for the YG or

Government of Canada, 3) regional biologists, 4) other First Nation Government

departments, 5) purchase of helicopter or drone to conduct surveys, and 6) present

stronger opinions to Minister. For collaboration to work, participants "need a common understanding and reason."

4.0 COMPARISON WITH OTHER JURISDICTIONS

One survey question inquired about topics that respondents would like more information about. Four respondents requested additional information about Aboriginal harvest management in other jurisdictions. In light of the above discussion, a brief introduction to other northern jurisdictions will be provided. Other Aboriginal groups across northern Canada are collecting wildlife harvest data and have recently published harvest reports. Many of these reports have attempted to accommodate concerns raised by consultants.

Parlee and others (2005) had problems quantifying harvest since some individuals do not count numbers but as having enough to meet needs. Surveys that incorporate traditional knowledge can create data management problems since context and interpretation are critical and databases are unable to accurately record and interpret TEK (Kendrick and Manseau 2008). Usher and Wenzel (1987) raised concerns that biologists rather than social scientists developed some harvest estimate methods. This method could include direct observation of hunters and extrapolating the results, relying upon administrative records, or academic studies for data. These authors were concerned that biologists, who did not understand the required methods, were trying to conduct social science surveys. Many of the concerns raised by Usher and Wenzel (1987) have been addressed by additional research and the results have been incorporated in newer surveys.

Usher and Brooke (2001) developed a working document for the Government of Nunavut to guide the collection of statistical data. The authors discuss the importance of using a behavioral or social survey since recalling memories involves methods foreign to most

biologists. Harvest surveys may require different questions to evaluate the harvest of different species. Subsistence hunters may harvest large numbers of an individual species at the peak of the annual cycle (ie. salmon spawning or migrating birds) and may have difficulty remembering the number of animals harvested due to volume or low importance accorded to the species. Other harvested species may be easier to recall (ie. moose, caribou) because of lower harvest rates and the importance accorded to the particular species. The authors later describe methods to reduce recall error, improve accuracy, gain public support, and securely manage data. The recommendations made by Usher and Brooke (2001) are beyond the scope of this paper.

Usher and Wenzel's (1987) recommendations and the results of further research have been incorporated in recent harvest survey methods. The harvest study reports evaluated by the author tend to use similar methods that have been modified to increase cultural acceptance. The reports reveal that collecting harvest data is an intensive process that begins with community consultation, education, and promotional campaigns to gain the citizens' support and to address concerns (GRRB 2009, Stephenson 2004, Priest and Usher 2004, ISR 2003, JBNQ 1988). The project manager, overseeing the Inuvialuit Settlement Region (ISR) study (2003), guaranteed hunter information will never be disclosed and that the data will not be used for enforcement. Hunters are consistently defined, in all reports, as an individual who expects to hunt, trap, or fish within the next 12 months. The ISR report (2003) allows female hunters to report data, and the James Bay and Northern Québec survey (JBNQ 1988) does not allow female or males under the age of 18 to report data.

All jurisdictions requested a nomination from each local co-management bodies (ie. RRC). The nominee is supposed to be an individual that knows the language, knows the land,

and knows harvesting practices. The local wildlife officer trains the interviewer regarding: the project's history and use for data, interview methods, protocol, and acceptable prompts. The interviewer compiles a list of known hunters in the community. In small communities, the interviewer attempts to contact all hunters, in large communities the interviewer contacts a random sample of hunters.

Assigning a unique code to the hunter protects the identity of each hunter and the master list is accessible by the interviewer and by the wildlife or project manager. Interviews begin at the start of each month and ask the hunter to recall the harvest for the previous month. Harvest is restricted to animals killed and retrieved since killed or wounded and lost are very sensitive subjects. Harvest data includes species, number harvested, gender, age, location, and any comments from the hunter. The Gwich'in Renewable Resources Board (GRRB) survey (2009) allows hunters to backfill three months of data and the JBNQ survey (1988) permits hunters to backfill up to 12 months of data if accurate records are provided. The ability to backfill data accommodates hunters who want to participate but are on the land while interviews are being conducted. Backfilling is an attempt to balance the need for data and concerns about recall accuracy. All jurisdictions allow hunters to access their personal harvest history.

Data integrity is a concern expressed in all jurisdictions' reports. A thorough data entry process has been developed to minimize entry error. Harvest data is entered into the database by the interviewer, verified by another employee, and then reviewed by a manager. If discrepancies are found, the interviewer or the hunter will be contacted to provide missing data or to clarify the entry. GRRB initially developed a database using File Maker Pro (Macintosh system) but switched to Microsoft Access for unspecified reasons (2009).

Stephenson (2004) discusses a similar procedure for collecting fish harvest data. The questions asked and the forms have been modified to account for fishing and some participants may give the same name to similar species.

The brief description of the methods used in other Aboriginal jurisdictions is a list of system similarities, not the promotion of a particular template. Each jurisdiction has modified the methods to develop a socially appropriate survey that helps the participant understand the connection between hunting and the data requested. The methods and forms are simple to reduce training time, to reduce interview time, and to reduce interviewee burden. Questions address information that the hunter would notice and the questions avoid sensitive topics. Interviewers are recruited from the community and response rates are high since participants know the interviewer. Data integrity is of high importance as is hunter confidentiality. Samples of ISR and GRRB survey forms are attached at the end of this report for additional information regarding the structure of the survey forms and questions posed in the other jurisdictions.

5.0 WORKSHOP OUTCOMES

The survey and workshop were complimentary approaches to explore the current efforts to collect wildlife harvest data and the future of this endeavor. Scientific management tends to view data collection as separate from cultural influences; discussion revealed that collecting and using harvest data extends beyond wildlife management into governance, reviving culture and traditions, and capacity building. A workshop participant commented that there is a "need to structure this effort" to improve efficiency and to reach the intermediate and long-term objectives. Several themes occurred during the panel discussion and roundtable discussions that should be highlighted.

5.1 Google Group

The delegates were required to travel long distances to attend the workshop. Since the delegates concurred that future collaboration would be beneficial, forming a Google Group was proposed as a method to remain in contact without the expense of traveling or telephone. Some delegates supported the formation of the online discussion forum but others were skeptical of the forum's acceptance. The Google Group was launched shortly after the workshop. The research proposal was posted to solicit review and comments from workshop delegates but the organizers replied to the outline using email rather than the Group. The group has been re-launched and a tutorial video was attached to the invitation to help members navigate the group. To date, the majority of First Nation delegates have not joined the group. The Group may require a champion to encourage participation. If the Group does not succeed, collaboration may continue using more familiar technology. Group emails are one option for participants to discuss. This method is effective but may become cumbersome with the number of replies and the apparent lack of order to the discussion. Another possibility would be using teleconferencing using telephone lines or Voice Over Internet Protocol (VOIP). Teleconferences would allow participants to have structured discussions but cost may become a concern. The low acceptance may be caused by the technological hurdles to be conquered but time will determine the success of the online forum.

5.2 Highlights

88% of respondents collect harvest data

Data storage ranges from filing cabinets to databases

50% of respondents conduct face-to-face interviews

Collected data has limited analysis

SURVEY

Most hunters are willing to share data

Game Guardians collect data for 62% of respondents

Data is being used to support recommendations to leadership

Data is not shared except with Federal Government

38% of respondents have mandatory reporting

Several challenges were identified regarding:

Citizen status and associated rights

Hunting with YG license and subsistence

Access permits and administrative fees

Elders' hunters: who and identification?

Should management change from individuals to family units?

Balancing subsistence rights with management responsibilities

Identify a culturally acceptable and efficient enforcement model.

Need to protect confidentiality

Roundtable

Need to build trust and relationships

Several opportunities to overcome challenges were identified:

Several Governments are currently collecting data; able to learn from other's experiences

Collaborate during development of harvest survey and database

Standardized harvest forms

Database development

With other departments and Governments to maximize use of limited resources

Collaboration **DOES NOT** mean access to others' data

Develop network to maintain relationships and communication

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                    │  intended use for   │
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│  Canada              │       │       │  desires and         │
│  representatives     │       │       │  interests           │
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5.3 Unanswered Questions

Several questions were raised and remain unanswered. These questions may need to be discussed at a future date to further clarify the complexity of managing wildlife in the Yukon.

1) Questions associated with Federal involvement

   - How does the Indian Act apply for signed and unsigned First Nations while harvesting in each other's Traditional Territory?

   - Is there a management and consultation gap? Who manages or is responsible for managing wildlife?

   - Who is responsible for collecting wildlife data in unsigned territories?

        i. Jurisdiction, Funding, Oversee process, Data management

   - Why are the YG and the Government of Canada concerned about data collection after First Nations sign?

2) Is data for additional mortality (ex. road kill) collected and incorporated in management decisions?

3) How does the YG perceive 'double-dipping'?

4) The final agreements supply a number of tools (TAH, BNA) to respond to conservation concerns and there are numerous bodies involved (RRCs, Governments, YFWMB). Who is responsible for managing harvest for populations of concern? Who designates a population 'of concern'?

5.4 Next Steps

1) Short-term goals

- Launch and learn Google Group discussion forum.

- Continue group momentum.

- Produce report that will capture workshop discussion and provide a tool to improve wildlife harvest data collection and use.

2) Medium-term goals

- Collaborate

  o Develop uniform harvest report form.

  o Develop database template that can be customized.

- Potential institutions that may provide resources (ie. financial, expertise) during implementation of future steps.

  o Yukon College

  o University of Saskatchewan

  o Department of Fisheries and Oceans

- Use data to support management recommendations.

- Develop job shadowing or exchange program to keep invested resources within the community.

- Standardize some regulatory aspects.

  o Species of special concern

  o Consents (How many, Fees, etc.)

  o Outfitters (How many consents, Fees – how much?, etc.)

- Coordinate efforts

  o Enforcement with other First Nations and with Yukon Government.

- Get out on land together.

3) Long-term goals

- Achieve Provision 16.5

6.0 CONCLUSION

Workshop participants spent two days discussing the challenges and opportunities associated with the collection of wildlife harvest data from First Nation citizens. Discussion revolved around harvest data collection but social factors were explored. These factors influence the success of a harvest data collection program since First Nation hunters need to feel confident that data will be used to protect their rights. Gaining support can be a slow process since building and maintaining relationships can be difficult, especially when dealing with a high rate of staff turnover. Workshop participants found that with a Game Guardian on the land they were able to develop relationships with hunters. Some First Nations employ Game Guardians on a seasonal basis and the interruption in employment may hinder progress. Communication with citizens directly through a Game Guardian program, and indirectly through pamphlets and other forms of written communication can help hunters better understand the need for and use of harvest data.

Data can be qualitative and quantitative information that describes an observed event. Harvest survey data is a collection of information that can be used to trace harvest rates across time, establish harvest levels for TAH or BNA negotiations, or for other needs identified by First Nation administrators or RRCs. Collaboration amongst First Nations in the development of a harvest survey was discussed and received support. A standardized form would allow each First Nation to collect harvest data using the same methods as other Yukon First Nations resulting in data compatibility, if required. The survey needs to collect data appropriate for the implemented models (Usher and Brooke 2001). Some expressed concern that the YG's models are not efficiently managing wildlife and may not be compatible with First Nation culture. Database design should consider how data will be sorted, queried,

analyzed, and how it will be used (White and Clark 1996). Workshop participants expressed interest in contributing collectively to the development of a database template but cautioned the need to retain the ability to customize the database to meet their individual needs. Collaboration during the database's development does not mean shared access to harvest data; each First Nation's data has restricted access unless disclosure is required.

Participants of signed First Nations discussed steps that will lead to achieving Provision 16.5 of their respective Final Agreements. The future steps were divided into short, medium, and long-term objectives. The short-term objective is to continue the momentum generated by the workshop. The Google Group is in place to facilitate discussion within the network and this report can guide future discussion. Medium-term goals involve implementing ideas generated during the workshop. Resources may limit some initiatives but there is strong support for collaboration. Participants can share costs and resources and group effort can reduce strain felt by individual managers. Future discussion can include coordinating efforts with the YG, standardizing some regulatory aspects, and developing a citizen-training program. The long-term goal is to achieve Provision 16.5 of the Final Agreements and help other First Nations towards this goal.

There appears to be two parallel, complementary initiatives. The first addresses the socio-cultural aspect. This initiative would build community support for harvest reporting, increase hunters' willingness to share harvest data, and would incorporate existing traditional systems into wildlife decision-making. The second initiative focuses on collecting, managing, and using First Nation wildlife harvest data to move First Nation Governments towards co-management and Provision 16.5 of the UFA.

The delegates present at the workshop are building these relationships and are learning to trust one another. As these relationships mature, effort needs to be directed towards each First Nation's citizens to develop relationships, nurture trust, and gain legitimacy. The initiative to collect harvest data may be more successful once citizens perceive First Nation Governments as legitimate and not an extension of Euro-Canadian Government. Hunters are currently willing to part with some information but are less likely to part with sensitive information. Unfortunately, some of the sensitive information is required to understand land-use patterns and to identify areas of special concern. Hunters may trust and voluntarily participate in the program if: collected data remains confidential, rights are not infringed upon, is not used for enforcement, and is used to protect their interests in the land. Voluntary participation allows First Nation Governments to develop appropriate management regimes without needing to resort to the YG model with mandatory participation. Building this foundation is a slow, tedious process that will increase the reliability of data collected from hunters.

Data is a collection of observations that can be analyzed to support management decisions or to support a position during meetings. Most First Nations are collecting data and are experimenting with different methods. Additional research has shown that other Aboriginal jurisdictions have adopted hunter recall surveys to accommodate time on the land and to provide monthly harvest changes. Collecting accurate data using recall interviews is the next step to take in the journey. It is possible to conduct recall interviews with hunters but data volunteered may not be an accurate depiction of all harvest occurring across the Traditional Territory. The hunter may not perceive the Government as legitimate or may fear misuse of the data provided. These perceptions can result in deliberate harvest

misrepresentation. Other hunters may not yet perceive the Government as legitimate but trust the people collecting, managing, analyzing, and using the data provided. This scenario can result in data of questionable quality that may need verification from experienced hunters or Elders to determine if a reported harvest is reasonable under existing conditions.

Moving data from paper forms to a database system is a logical endeavor. An electronic data management system increases a manager's ability to sort, analyze, and use the data to support management recommendations. Collaboration amongst First Nation Governments or departments is an effective way to understand the fundamentals of database design. Other possibilities could involve training a First Nation citizen to become the future data administrator, partnering with an arms-length organization, or hiring a consultant. All options will produce similar databases but with different costs and different advantages. These databases will need to produce queries in a form that is easily understood and useable by management.

Wildlife managers will need to decide which models or combination of models will be used to manage the land. One model involves centralized decision-making and designated authorities to enforce regulations. The second model is based on local decision-making that encourages self-policing. The ideal model may be one, or the other, or both but the selected model needs to be appropriate for the culture to be effective. Several participants mentioned declining wildlife populations might require TAH negotiations in the future. Accurate harvest data from their citizens is crucial to negotiate the appropriate harvest allocation. This data can also be used to recommend resting areas of the land due to excessive human use. The uses for harvest data are fairly narrow but the ripples will be felt in all aspects of an individual's identity.

Legally recognized First Nation Governments are relatively young compared to the YG, provincial, and Federal Governments. These Governments have had decades to develop wildlife management models. These models have not accounted for technological and societal changes; these models are failing. First Nations do not have the luxury of testing multiple models since wildlife populations are in decline while human impacts on the land are increasing. Other jurisdictions have been developing harvest surveys, databases, and supplementing their traditional knowledge with collected data. Collaboration and learning does not need to be contained within Traditional Territory borders or even the Yukon's borders. Other First Nations have been on the same journey and may be willing to provide guidance to fellow travelers.

The journey to achieving the management powers described by Provision 16.5 will be a long process filled with opportunity and obstacles. Most of the obstacles have an associated opportunity that will strengthen First Nation communities and their Governments. Workshop participants are currently facing a multitude of challenges but have the ability to collaborate and overcome these obstacles as a united group. Collaboration – with a solid foundation of trust, legitimacy, and sound relationships – will involve sharing the small victories along the journey but will also involve sharing the struggles. Fortunately, the burden can be distributed amongst several individuals that are working towards the same objectives. These individuals can overcome obstacles and learn lessons when collective resources and will is mobilized. This cyclical process will allow Governments to engage in adaptive co-management by having sufficient flexibility to accommodate changing environments, cultures, and demands.

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APPENDIX A – SURVEY QUESTIONS

1. Does your first nation collect wildlife harvest data?

2. Who do you collect wildlife harvest data from?

3. How do you collect wildlife harvest data?

4. Is wildlife harvest reporting mandatory?

5. How do you keep track of hunters?

6. How do you store and manage wildlife harvest data?

7. How do you analyze wildlife harvest data?

8. How do you use harvest data in wildlife management?

9. Who collects wildlife harvest data for your first nation?

10. Who manages wildlife harvest data for your first nation?

11. How do you communicate information about wildlife harvesting (e.g. regulations, management goals) to your citizens?

12. Do you employ the same methods in collecting salmon and wildlife harvest data?

13. Do you share your wildlife harvest data with anyone?

14. How do you protect confidentiality of the wildlife harvest data you collect?

15. What are the top 3 challenges to collecting wildlife harvest data in your area?

16. Has your first nation tried other methods than those you currently use?

17. In general, are citizens of your first nation willing to discuss their harvest data?

18. On a scale of 1 to 5, with 1 being "not at all willing" and 5 "very willing", what information of the following types are citizens of your first nation willing and not willing to discuss?

19. In your experience, what concerns or deters people from sharing their harvest data with first nation governments?

20. On the scale below, how would you describe the completeness of the harvest data collected by your first nation?

21. On the scale below, how would you describe the accuracy of the harvest data collected by your first nation?

22. Can you think of any resources or tools that would make harvest data collection, storage, and management easier and/or more reliable?

23. Workshop goals: We want to generate discussion and strengthen relationships between First Nation staff who are working on this issue, and provide them with the tools for developing their harvest data collection and management system in the form of a Best Practices document that is based on the cumulative experience of all Yukon First Nations. Please comment on any additional goals you have for this workshop.

24. Were you and/or any of your current staff involved in the YFWMB discussions that culminated in the Coordinate Harvest Monitoring Program presented in January 2000?

25. Please check any of the following that you would like to have information presented on:

- Intent of Chapter 16 of the UFA

- Basic Needs and Total Allowable Harvest

- YTG Harvest Data Management

- YFWMB Harvest Monitoring Working Group/Coordinated Harvest Monitoring Program

- Harvest Management in other jurisdictions by other First Nations or other Aboriginal organizations

- Harvest database models

26. Please identify any speakers you would especially like to see. Note that these speakers would

provide information only, and would not be a part of the discussions outside of a brief Q&A.

27. Please identify any speakers you would NOT like to see. Note that these speakers would

provide information only, and would not be part of the discussion outside of a brief Q&A.

28. Please check any of the following that you would like to have a focused discussion on:

- Methods to collect harvest data (past/current, successful/not)

- Challenges to collecting harvest data

- Potential/desire for a unified approach

- Storing/managing/analyzing harvest data

- Sharing data

- Confidentiality

- Utility of harvest data for different management

- Strategies such as TAH

29. Is there any other area of focus that you would like to see discussed, or any additional

information that you think would inform our discussions through a presentation?

Did you **hunt, fish** or **trap** last month?

Hunter Code: ☐ ☐ ☐ ☐   Interviewer: _____

For month of: Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Activity Code:
(1) harvested
(3) did not hunt
(5) moved
(7) remove: does not hunt

(2) hunted but did not get anything
(4) could not contact
(6) remove: does not want to participate
(8) other

1996

Interview Date: _____

Ask age and sex information for: **moose, Dall's sheep, caribou and bears.**

What animal did you harvest?	Where did you harvest these animals?		How Many?	Age				Sex		
	Place Name	Map Code		Adu	Juv	Calf	Unk	M	F	U

Comments:

APPENDIX C – INUVIALUIT HARVEST FORM (ISR 2003)

INUVIALUIT HARVEST STUDY HUNTER RECORD

HUNTER NUMBER: ☐ ☐ ☐ ☐   Page: _____ of _____

COMMUNITY: _____

INTERVIEW DATE: _____ _____ _____

MONTH INFORMATION IS FOR: FROM _____ _____ _____ TO _____ _____ _____
         DAY   MONTH   YEAR   DAY   MONTH   YEAR

HUNTING CODE: ☐   INTERVIEWED HUNTER and: 1) Hunted, 2) Hunted but no catch, 3) Did not hunt
       DID NOT INTERVIEW because (also comment on): 4) Out hunting, 5) Out of town, 6) Could not contact,
                                    7) Did not want to be interviewed, 8) Moved, 9) Other

ANIMAL NAME	NUMBER HARVESTED								HARVEST LOCATION			DATE OF HARVEST	
	TOTAL NUMBER	SEX			MATURITY				NAME	MAP AREA		Month	
		Unknown	Male	Female	Unknown	Adult	Immature	Calf—Cub				First Day	Last Day

COMMENTS
How does this season compare with past years?
Were you able to get what you needed (if not why not)?
Did you notice anything interesting or unusual while hunting?
Any other comments?

Days I spent on the land hunting: ☒

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

APPENDIX D – LIST OF ACRONYMS

BNA – Basic Needs Allocation

CHMP – Coordinated Harvest Management Program

CYFN – Council of Yukon First Nations

GIS – Geographic Information System

GRRB – Gwich'in Renewable Resources Board

ISR – Inuvialuit Settlement Region

JBNQ – James Bay and Northern Québec

NNDFN – First Nation of Na-Cho Nyak Dun

RRC – Renewable Resources Council

TAH – Total Allowable Harvest

TEK – Traditional Ecological Knowledge

TTC – Teslin Tlingit Council

UFA – Umbrella Final Agreement

YG – Yukon Government

YFWMB – Yukon Fish and Wildlife Management Board

YNB – Yukon Native Brotherhood