CanNorth
Canada North Environmental Services Limited Partnership
A First Nation Environmental Services Company

NOKIIWIN TRIBAL COUNCIL
COUNTRY FOODS STUDY

Revised Final Report

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EXECUTIVE SUMMARY

In 2015/2016, the Nokiwiin Tribal Council (NTC) secured funding from the National First Nations Contaminants Program to conduct a country foods study. The first part of the study obtained information regarding the quantity, type, and harvest location of country foods consumed by community members in four NTC communities: Animbiigoo Zaagi'igan Anishinaabek (AZA), Bingwi Neyaashi Anishinaabek (BNA), Biinjitiwaabik Zaaging Anishinaabek (BZA), and Kiashke Zaaging Anishinaabek (KZA). A NTC specific Food Frequency Questionnaire (FFQ) was developed and band members were hired and trained to conduct interviews with community residents. The results of the survey are based on responses from a total of 95 people from the four NTC communities.

Traditional meat that was predominantly harvested included moose, snowshoe hare, and deer. Fish were the most utilized country food type and the most common fish species consumed was walleye, followed by lake whitefish and lake trout. The most frequently consumed birds were spruce and ruffed grouse, followed by Canada goose and mallard duck. The most common berry types were blueberry, wild strawberry, and wild raspberry. The consumption frequency and quantities reported vaired between the communities, but were within the range of other First Nations surveyed in Ontario and across Canada. Traditional foods have a number of health benefits; thus, the regular consumption of locally collected fish, meat, and vegetation is recommended to residents.

The second part of the study involved collecting and chemically analyzing water and country food samples (fish, blueberry, birds, snowshoe hare, moose, etc.) from locations near the study communities and traditional hunting and gathering areas. The water samples contained chemical concentrations that were below guidelines and do not pose a risk to environmental or human health.

Metal concentrations measured in the NTC country food samples were mainly similar to, or lower than, Health Canada's total dietary study values and regional data. The mean mercury levels in five northern pike in Postagoni Lake and five lake trout from Pipestone Point in Lake Nipigon were above a consumption guideline of 0.5 mg/kg, which means that fish should be eaten in limited amounts (especially pregnant women and children). High lead concentrations in some of the moose and upland bird (partridge and grouse) samples illustrate that lead shot should not be used when hunting as it can contaminate the meat and cause health concerns. The three moose liver and kidney samples tested as

part of this study did not contain overly high cadmium concentrations when compared to national data; however, further testing would be needed to evaluate if consumption restrictions are warranted, particularly for high risk populations such as smokers.

The results of the NTC country food study demonstrate that country foods are frequently gathered and hunted near the study communities and are important to the diet of the NTC communities. Harvesting and consuming traditional foods are integral components of good health among Aboriginal people, influencing both physical health and social well-being. For several food types the sample sizes were limited; however, this study provides preliminary data and can act as a baseline for future developments.

1.0 INTRODUCTION

The First Nations Environmental Contaminants Program (FNECP) provided funding to the Nokiiwin Tribal Council (NTC) in partnership with Canada North Environmental Services (CanNorth) to undertake a country foods study in the Lake Nipigon area. The project involved conducting a community based research program with four First Nations that are part of the NTC. Of primary concern to local First Nations is that no developments past or present negatively impact the ability of individuals and commercial fishermen to sustain their way of life, affect their consumption of country foods, or prevent Aboriginal and Treaty Rights from being exercised. Country foods can be defined as "traditional native foods that are obtained from the land, such as wild game, birds, fish, and berries by local residents during subsistence hunting and gathering" (Peace Athabasca Delta Group Project 1972). Generally speaking, country foods provide a cheaper and lower fat protein diet when compared to store-bought meats and also provide socio-cultural benefits to community members including mental health, cultural identity, and morale (AFN 2007).

1.1 Study Design

The study team carried out research to obtain information on the quantity, type, and capture location of country food items consumed by community members through an interview process. The results of the interviews were then utilized to establish a sampling program whereby water and country foods (e.g., fish, berries, wildlife) were collected and chemically analyzed from select locations. The chemistry data provided information on current chemical levels in the water and country foods harvested by each community and may potentially act as baseline data for future resource developments in the region for the communities.

The program relied heavily on traditional knowledge to identify what and where to sample and complete involvement of the communities is a major priority of the project. Research results were communicated with community members through a variety of sources including this final report, newsletters, presentations, and community websites. The research team had the input, support, and guidance of the NTC, Chiefs and Councils, and respected community members for each of the four communities. It was through their support and ideas that the funding application was pursued by the research team. Community involvement is outlined further in Section 2.0.

1.2 Study Area

Lake Nipigon is the largest lake in Ontario that is entirely within the boundaries of the province and is located approximately 120 km northeast of Thunder Bay, Ontario (Figure 1.2-1). The study area for the project includes parts of Lake Nipigon and the surrounding region where the four First Nations included in this study have reserve lands they utilize for fishing, hunting, and gathering (Figure 1.2-2). Provided below are brief summaries discussing each of the four communities who participated in the study.

1.2.1 Animbiigoo Zaagi'igan Anishinaabek First Nation (AZA – Lake Nipigon)

The Ojibwa people of Animbiigoo Zaagi'igan Anishinaabek (AZA) used to live in the Ombabika and Auden area on the northeast side of Lake Nipigon and were known as Lake Nipigon Ojibway First Nation but officially changed their name to Animbiigoo Zaagi'igan Anishinaabek in 2001. Through negotiations with Canada and Ontario, the AZA people received a land base back in 2008 through the Robinson-Superior Treaty. The new reserve lands are located along Highway 11 within the Greenstone area along the south shores of Partridge Lake (Figure 1.2-2). The Reserve is 12.7 square km of undeveloped land. The new land base for AZA has allowed the leadership to work on building a community that will be a place and home for their members (AZA 2016). There are approximately 476 AZA members, the majority of who currently live off the reserve land (AANDC 2016a). Today community members continue to trap, fish, hunt, and gather medicines and plants on their traditional lands of Auden and Ombabika, their new reserve lands of Partridge Lake, and on the various islands and tributaries of Lake Nipigon.

1.2.2 Bingwi Neyaashi Anishinaabek First Nation (BNA - Sand Point)

Bingwi Neyaashi Anishinaabek (BNA) is an Ojibwa First Nation with a registered population of approximately 250 people (AANDC 2016b). The First Nation is led by a Chief and is known to be one of the most progressive communities in Canada. The traditional lands for the people of BNA have always been on the southeast shore of Lake Nipigon. After approximately 20 years of negotiation, BNA received a reserve land base in 2010, totalling approximately 10,000 hectares located west of Highway 11 on the east shore of Pijtiwabik Bay of Lake Nipigon. The land that was established as Sand Point First Nation Reserve on April 22nd, 2010 by the government of Canada abuts the north

end of BZA reserve (Figure 1.2-2). Since BNA is a relatively new reserve, there is no housing or infrastructure in place at the present time. The proposed community site that is being considered for residential developments has the potential to be developed as a green community with an emphasis on renewable energy options. In 2012, the First Nation announced it was one of two First Nations in Ontario to enter into a Framework Agreement on First Nations Land Management. The Framework Agreement will give BNA the authority to create its own Land Code and land laws in the development of its reserve lands, natural resources, and revenues from its reserve land base (BNA 2016).

1.2.3 Biinjitiwaabik Zaaging Anishinaabek First Nation (BZA – Rocky Bay)

Biinjitiwaabik Zaaging Anishinaabek (BZA) is an Ojibway First Nation located on the southeast shoreline of Lake Nipigon (Rocky Bay 1 Reserve) near MacDiarmid, Ontario approximately 160 km from Thunder Bay (Figure 1.2-2). The population of 338 (on reserve) is governed by an elected Chief and five elected councillors who serve 4-year terms and are part of the Robinson-Superior Treaty of 1850 (AANDC 2016c). Historically, the ancestors of the BZA living on the shores of Lake Nipigon engaged in hunting, fishing, and trapping for sustenance. The BZA members continue to traditionally hunt and gather on Lake Nipigon and its islands as well other smaller lakes and river systems in the area. Today, BZA is involved in the Rocky Bay Fisheries Unit, which is designed to "help First Nations people increase their understanding and control of and authority and responsibility for the waters which in turn will give them an economic basis for development and self-sufficiency" (BZA 2016). The people of BZA continue to practice many of the Ojibway cultural traditions, including the annual pow-wow hosted by the community every summer.

1.2.4 Kiashke Zaaging Anishinaabek First Nation (KZA – Gull Bay)

Kiashke Zaaging Anishinaabek (KZA) is an Ojibwa community located on the western shore of Lake Nipigon, approximately 200 km north of Thunder Bay up Highway 527 (Figure 1.2-2). It has a membership of approximately 1,350 members, with 375 members living on reserve, and the remaining population living in Thunder Bay and across the region (AANDC 2016d). KZA is a signatory to the Robinson-Superior Treaty of 1850. KZA has a long, rich history, and continues to practice many of its cultural traditions to this day. The members of KZA have a strong connection to the land and practice traditional Anishinaabek culture. The members exercise their Aboriginal and treaty rights

by hunting, fishing, and gathering medicines and berries throughout Lake Nipigon and the islands and tributaries.

1.3 Potential Contaminant Concerns in the Region

While the Lake Nipigon area does not contain large quantities of current resource developments, there are future and historic developments that have resulted in potential environmental contaminant concerns from First Nations communities in the region. Although some environmental testing has occurred on Lake Nipigon and surrounding areas, there has not been a program that specifically tests contaminant levels in foods routinely consumed by community members. Provided below is a brief summary of the current, historical, and potential future developments in the Lake Nipigon region.

1.3.1 Current Mining Operations

The Lac des Iles Mine is located approximately 90 km northwest of Thunder Bay, Ontario (Figure 1.2-2). The Lac des Iles deposit contains one of the largest bulk mineable palladium reserves in the world. The mine commenced production as an open pit in 1993 and expanded underground in 2006.

1.3.2 Advanced Exploration Operations

Many past-producing mine sites in the area are undergoing a renaissance today and significant efforts in exploration and potential extraction have been growing. A number of companies in the area are currently in the advanced exploration and prefeasibility stages and future operations may directly affect the First Nations' traditional hunting and gathering territories. Three such projects include: Greenstone Gold Mines – Trans Canada Project (Gold), Laurion Mineral Exploration Inc. – Sturgeon River Mine (Gold), and Rock Tech Lithium Inc. – Georgia Lake (Lithium and Rare Metals). In addition, a number of smaller exploration activities are currently underway in the area.

1.3.3 Abandoned Mines in the Region

There are a number of abandoned mines that contain waste rock piles, tailings, shafts, trenches, and adits in the Beardmore-Geraldton Gold Belt area (Figure 1.2-2). Several mines that had ceased operations before 1991 were not closed out in accordance with

current legislation and standards. This has left abandoned mine hazards on the land that could now potentially pose risks to public health, safety, and the environment. In 2013, the Ontario Ministry of Natural Resources (MNR) stated that there are tailings ponds associated with abandoned mines that are currently leaching into the ground and water systems in the region (MNR, November 14th, 2013, pers. comm.).

All known existing mine sites have been classified as abandoned mines by the Ministry of Northern Development and Mines (MNDM) through the Abandoned Mines Information System (AMIS; MNDM 2015). The database currently contains information on over 5,600 abandoned mine sites across Ontario that contain over 15,000 mine hazards known to the Ministry (OAGO 2015). The purpose of AMIS is to capture data about all known abandoned mine sites and their associated hazards so that the ministry can prioritize these sites for future rehabilitation and track any work activities undertaken on these sites (site assessment work, changes to the known hazards, etc.).

The known abandoned mines in the NTC country foods project study area that contained tailings and may pose a potential environmental risk were reviewed. In total seven sites with unconfined tailings were identified and are presented in Figure 1.3-1. The water quality results from several of the sites indicate that arsenic was well above provincial and federal guideline levels for protection of aquatic life as well the federal drinking water quality guidelines (MNDM 2016).

1.3.4 Hydroelectric Projects in the Area

There are two proposed hydroelectric projects in the Lake Nipigon study area: the Little Jackfish River Hydroelectric Project and the Namewaminikan Waterpower Project (Figure 1.2-2).

Ontario Power Generation Inc. (OPG) is proposing to construct a generating station on Little Jackfish River, which drains into Lake Nipigon that will contribute approximately 78 megawatts of power to the provincial grid annually. The proposed generating station will consist of a dam, the construction of an approximately 200 km long 230 kilovolt transmission line that will connect the generating station to the provincial grid east of the town of Nipigon, and a 25 kilovolt transmission line that will connect the generating station to Summit Control Dam.

Environmental studies were conducted between 2008 and 2012 and the most significant environmental effect found was a predicted increase in mercury concentrations in the reservoir and Zigzag Lake located upstream of the proposed dam. Mitigation measures were proposed to reduce mercury loading and long-term monitoring is planned once the project commences. Local First Nations on Lake Nipigon have significant concerns regarding potential mercury contamination especially in fish and some, such as the BZA, are opposing the project as it is currently proposed (due to the potential increase in mercury levels in fish of the proposed development as well as worries regarding the Lake Nipigon fishery). The project is currently on hold as it was determined by OPG that the energy generated by the Little Jackfish River Hydroelectric Project is not needed in the near-term.

Namewaminikan Hydro Inc. (a partnership between the Axor Group and AZA, BNA, and BZA) are currently developing two run-of-river hydroelectrical generating stations and an associated 34.5 kV power line on the Namewaminikan (Sturgeon) River, located 15 km north of Beardmore. The run-of-river project will be produced with little or no storage of water upstream of the dam. A number of concerns were identified and were documented during the environmental screening process prior to construction. One of the primary concerns from the First Nation communities in the area was the potential increase in mercury concentrations in sport fish due to the project.

The Ministry of Environment (MOE) has current restrictions on the consumption of a number sport fish in the Namewaminikan River system (MOECC 2016) including walleye and northern pike attributed to logging activity in the 1970's and the High Falls reservoir that was built in the 1990's (Namewaminikan Hydro 2016). Environmental studies completed most recently for the run-of-river project determined that based on a worst case scenario, mercury content in walleye in the river could potentially increase by 0.002 µg/g to 0.02 µg/g during the life of the project and rigorous monitoring will be conducted to confirm this evaluation. The results of the environmental studies indicate that there are no significant negative effects and Namewaminikan Hydro intends to proceed with the project (Namewaminikan Hydro 2016).

1.3.5 Herbicide Spraying

A number of NTC community members identified herbicide spraying as a major concern with respect to impacts on country foods in their area. As a part of the Ministry of Natural

Resources and Forestry (MNRF) efforts to manage and protect Ontario's forests against competing vegetation, aerial spraying of herbicides is used on selected stands on the Lake Nipigon Forest. This will continue to be used on Ontario's forests moving forward as a forest vegetation management tool.

More specifically, the 2014/2015 campaign involved the aerial application of Vision Max (Registration Number 27736 - glyphosate active ingredient) herbicide to competing plant species such as poplar, white birch, alder, raspberry, and grass. The timing of aerial application upset a number of community members as the aerial spraying took place during the summer months when berry picking is viewed by many to be at its best. In addition, the MNRF chose to spray the Shadow Mountain forest block (105-107) which is an important hunting and gathering location for the community of BZA a week before their annual cultural camp in the area.

1.3.6 Mercury in Fish

Across Canada, natural deposits associated with lead, zinc, copper, silver, gold, and hydro-electric reservoir developments are often associated with higher levels of mercury in fish of some lakes (HC 2004). Since people are generally exposed to mercury through their diet, mercury levels in fish in Lake Nipigon and the surrounding area continue to be a major concern for community members. Previous developments in the region including the Ogoki Diversion Project completed in 1943 to divert the flow from the Ogoki River to the Little Jackfish River and the Great Lakes system have resulted in changes to the landscape. The flooding of the land and creation of large reservoirs are believed to increase the level of mercury in some fish within the river system upstream of Lake Nipigon. Today in Canada, the majority of provinces and/or territories have developed their own mercury fish consumption guidelines for waterbodies that are consistent across the country. Ontario has published these guidelines for waterbodies in "Guide to Eating Ontario Fish 2015-2016" (also found online at www.ontario.ca/fishguide) that are based on tolerable daily intake guidelines provided by the Food Directorate of Health Canada (MOECC 2016).

1.4 Study Objectives

The primary study objectives of the project were to:

- Identify Contaminants of Potential Concern (COPC) that may affect traditionally harvested country foods in the study area.
- Provide training and employ community members to conduct interviews in order to map country foods' harvesting locations and document the quantities and types of foods consumed.
- Conduct a sampling program that targets country food types and harvesting locations identified to be of the most importance to the communities.
- Assess contaminant concentrations in water and identified country foods (fish, berries, wildlife) collected from selected locations.
- Communicate the results to community members through a variety of media such as newsletters, website, meetings, and/or oral presentations.

2.0 COMMUNITY INVOLVEMENT

2.1.1 Community Engagement and Consultation

Before the study began, several meetings were held between Mr. Kevin Sherlock, the Project Lead for the NTC, and the four communities participating in the study. Discussions involved the selection of potential COPC, species consumed regionally, community concerns, interview questionnaire design, sample collection methods, and how the results of the study would be communicated to community members. These discussions and community consultations were integral in the finalization of the study design for the program.

The first step towards attaining community approval and interest in the project was to hold community meetings with four First Nation communities and its members. Consultation within the communities started early on for the program. Community consultations were conducted in November and December of 2014 within several of the NTC communities. During consultation with several traditional land-users (including elders and youth) regarding new resource developments in the area, a growing concern regarding the safety of collection and consumption of certain traditional foods and medicines became apparent.

More detailed presentations on program funding were delivered by Kevin Sherlock to each of the four Chiefs and Councils in the following months. The purpose of the meetings was to describe the project objectives, discuss potential harvested foods, explain the interview process and questionnaire form, and to answer any questions from Chief and Council regarding the funding application. One month after the presentation, a Band Council Resolution (BCR) was obtained from each Chief and Council in support of the research proposal (Appendix A). Lastly, an update was provided to each of the four NTC communities that the application had been accepted for funding and that the process would be moving forward.

Updates on the NTC country foods study were delivered throughout the duration of the project through the NTC lead, Mr. Kevin Sherlock, as well as through the selected community liaisons. Updates included briefings at Chief and Council meetings, educational posters, outreach, and articles that were printed in the local First Nations newsletters (Appendix B).

A final update on the progress of the project, including the general results of the interviews, the chemistry program, and the final report was delivered to the NTC in June of 2016. In the following months, the NTC will present the results to the Chief and Council of each of the four First Nations. Following the meetings, Chief and Council will work with the NTC project lead to present the results to its members at upcoming events, in newsletters, on websites, etc. In addition, each of the four First Nations will be provided with a copy of the final report.

2.1.2 Community Participation

Community members had significant input into the study design and questionnaire and were included at several stages of the program. It was recognized that a key facet of a successful community monitoring program is that the project is completed by local residents and is independent of government and industry environmental monitoring programs. The monitoring program was designed to enable community members to select and sample the components of the environment and the locations that were of most concern to them. The following list outlines community training and traditional/local/indigenous knowledge that were utilized during this project.

- Community interviewers/liaisons from each of the four First Nations were involved in the study and assisted in several aspects of the program including disseminating information, completing interviews, and sample submission.
- NTC community summer student was hired and trained in interview techniques, data entry, sample collection, and sample submission for the project.
- Community expertise was utilized to locate people to interview, identify local areas of potential contaminant concern, and to refine the sampling program.
- Data collected during the interviews was utilized to establish the final study design of the sampling program. This information helped to determine what and where to sample based on the traditional/local/indigenous knowledge gathered.
- Community members were essential in the sample collections. This provided temporary employment and training on sampling techniques.
- Community members will be thoroughly informed about the results of the program, thus providing training on environmental contaminants in their local area and country foods.

3.0 COMMUNITY INTERVIEW METHODS

The intent of the country foods questionnaire was to examine the country food consumption patterns of the residents within four NTC communities. The goal was to identify which regional specific harvested foods were consumed by each community, as well as the approximate amount, frequency, and locations they were harvested. In addition, individuals were also asked if they would be willing to provide a sample(s) of regionally gathered country foods for chemical analyses.

Specific information obtained through the interview process included:

- the general type (species), frequency (portions), and amount (grams) of country foods in local diets;
- the general hunting and harvest locations where country foods are collected by local community residents; and,
- the level of concern of community residents regarding country foods contamination, disease, etc.

3.1 Food Frequency Questionnaire

A Food Frequency Questionnaire (FFQ) is one of the most commonly used dietary assessment methods that measure an individual's usual food intake. A FFQ consists of a list of food items for which average frequency consumption is determined with reference to a specified period of time (i.e., last month, last 6 months) (Zulkifi and Yu 1992). The food list aims to incorporate foods that are commonly consumed by individuals in the population. The respondents to the questionnaire also provide information about portion sizes usually consumed, which enables the interviewer to quantify the information obtained. The data collected about portion size and frequency of consumption allow for estimations of the amounts of country food consumed in different food categories (e.g., meat, fish, and berries). Such data should not be considered absolute; rather they should be considered as respondents' estimates.

The major limitation of the FFQ method, as well as the majority of other retrospective methods used in dietary assessments, is the ability of the respondent to accurately recall frequency and amounts of foods consumed (Briefel et al. 1992). Since respondents may have difficulty estimating frequency and portion size over a long period, they tend to

overestimate consumption and report their routine or typical diet rather than the specifics of what they ate over the period in question (INAC 2003). While the FFQ tends to overestimate food consumption, it does provide general information on how frequently foods are consumed over a specific period.

The NTC FFQ was customized and designed with the help of community members to gather information on the country foods consumption patterns of the residents of four communities of the NTC. The questionnaire was based on a methodology used by CanNorth for the Hatchet Lake Dietary Survey (CanNorth 1999) and the Uranium City Country Foods Program (CanNorth 2011, 2014) as well as the First Nations Food, Nutrition, and Environment Study (Chan et al. 2014). It was modified with the input of elders and NTC members to include only the detailed country food information for Lake Nipigon and surrounding area. The FFQ used in this study is presented in Appendix C.

3.2 Community Interviewers

Interview employment opportunities were posted in May 2015 by the NTC in each of the four communities. The most qualified local residents from each community were selected based on their communication skills, work experience, and relationships with residents in their respective communities. Originally, four community interviewers were selected and hired for the project (one for each of the four communities). However, it was decided to train additional community members in case interviewers were offered other permanent full-time summer job employment and turned down the NTC employment opportunity at a later date.

3.3 Interviewer Training

Following the interviewer selection, two days of interview training were scheduled with the NTC in Thunder Bay in May and June 2015. Employing individuals from the communities for the study was beneficial because they were familiar with the cultural specific food habits such as the country foods usually eaten, preparation methods, and portion sizes. By employing a local familiar with the residents of their own community, interviews could be arranged to best suit the interviewees. Furthermore, residents were more willing to trust and develop a rapport with a local rather than an individual from outside the community. In total the NTC trained eight individuals to complete the community interviews. The training session included familiarizing community

interviewers with the purpose of the study, interviewing techniques, quality control, mapping, and confidentiality. Portion sizes were discussed to familiarize the interviewer with the categories developed in order to help the interviewees communicate how much was eaten.

To familiarize the interviewer with the questionnaire, a number of practice interview sessions between the NTC trainer and the interviewers took place until the interviewer felt comfortable with the interviewing techniques and the questionnaire. The interviewers and the NTC trainer were provided with laptops in order to enter their interview results electronically.

Large paper maps of the surrounding area were provided to the interviewers so that residents could convey information about where their harvesting/gathering areas or trap lines were located. The interviewer was also provided with sample containers and labels and instructed to ask local residents if they had samples they would like to submit for chemical analysis. The interviewer was instructed on proper sample collection procedures, such as collection of key information (i.e., date and location of sample collected) and storage procedures.

3.3.1 Selection of Interviewees

Selection of interviewees was conducted with help of the community liaisons, community interviewers, and Chief and Council. It was based on criteria such as known community hunters, trappers, fishers, or elders with traditional knowledge of the local area. Preferably, the interviewed candidates had intimate knowledge of a family trap-line, including knowledge of the plants and animals that were important sources of food or medicine for their family or community.

To promote community involvement, the NTC community interviewers placed brochures throughout the communities (band offices, post office, and health centers) so that residents were aware of the upcoming study. The brochures identified the importance of the project, time, and date for community interviews and contact information for those wishing to sign up. The residents who did not sign up for interviews were encouraged to contact (by telephone) the community interviewers, who then explained the details regarding the survey and arranged a suitable interview time.

3.3.2 Interview Process

At the beginning of each interview, each individual was asked for his or her name, age range, gender, address and community, number of years lived in community, if he or she had an active trap line, and number of people in their household that consume from the trap line. The interviewer assured community residents that confidentiality for those who participated was an important part of the survey and that any personal information gathered would not be shared without further consent (see Section 3.4.4 for more information on confidentiality). A $50 honorarium was given to those who participated to encourage residents to participate.

Individuals were then asked to check off the foods typically eaten in a normal year from the final list of country foods included in the survey (Appendix C). A box labelled "other" was also provided for each type of food in case individuals felt limited by the country foods list. The NTC country foods survey questionnaire was then divided into five different sets of questions based on the types of foods each individual consumed (land and aquatic mammals, birds, fish, vegetation (edible), and vegetation (medicinal)). For each section, the estimated frequency of consumption of country foods was reported either by day, week, or month, and season depending on the type of food and/or the preference of the individual being asked. The frequency of each type of wild food used was then calculated as the number of portions or occasions consumed per person per year. Portion sizes were provided and were divided into small, medium, and large to allow for estimations of the total quantities each individual consumed. For vegetation (berries), portion sizes were divided into ½ cup, 1 cup, and 1½ cups. In addition, detailed maps of their traditional hunting and gathering areas were used to illustrate the approximate location the foods were harvested.

Finally, the interviewee was asked if he or she was willing to donate a sample at the time of the interview or at a later date. Only samples that had been legally harvested through traditional harvesting rights or licensed hunting activities were accepted for the study.

3.3.3 Guidelines for Ethical Aboriginal Research

The Canadian Institute of Health Research (CIHR), in conjunction with its Institute of Aboriginal Peoples' Health, have recently released the Guidelines for Health Research Involving Aboriginal People. These guidelines were produced to assist researchers and

institutions in carrying out ethical and culturally competent research involving Aboriginal people. The intent is to promote health through research that is in keeping with Aboriginal values and traditions. This project gained written approval from Health Canada's Research Ethics Board (REB) (Appendix D).

The ethical considerations for the NTC Country foods study included assurance of privacy and respectful treatment of all participants. Questionnaires were reviewed with all participants before the interview was started and the project description, including how the information collected during the interview would be used, was clearly explained to all participants.

3.3.4 Confidentiality

In order to protect the interviewer/interviewees and participants, the following steps were taken before and during the interview process.

1. Consent form: participant was informed of research objectives and provided free consent to participate in the research and interview process (Appendix E).
2. Protection of participant identity: participants were assigned an identification number and information they provided that might be used to discern their identity was omitted from the results. No names will ever be publicly displayed or published in any reports to protect participant identity.
3. Oath of Confidentiality: as interviewers were entrusted with potentially sensitive information they provided an oath of confidentially prior to conducting the interviews (Appendix F). Interviewers do not claim the knowledge that was revealed through an interview. The interviewers did not discuss the results or information, outside of our research objectives, reporting process, and communications with the Chief and Council or the research team.

3.4 Data Entry and QA/QC

The quality of the survey data is extremely important and was dependent on the quality of each individual interview. After each interview was completed, the interviewer was responsible for reviewing each survey to ensure that it was completed accurately. All completed survey forms were to be reviewed twice, to assure quality before the forms were sent to the NTC in Thunder Bay. The hardcopy forms were first reviewed by the

interviewer at the participant's home and again at the end of the day before the forms were filed as completed.

The purpose of these checks was to identify and correct any errors or omissions before the forms leave the home or area in which the participant lives. Errors identified by the interviewer or later by the NTC that could not be corrected by the interviewer were noted, and where necessary, the interviewer phoned the respondent to obtain or clarify the outstanding information. In this way, confidentiality was assured and only one telephone call to the interview participant was required. Once the hardcopy interviews were complete they were entered into excel by the interviewer.

Before sending the final country foods datasheets back to CanNorth in Saskatoon, a final tally of the completed interviews was conducted. The completed electronic copies were then delivered by the NTC to CanNorth in Saskatoon and a final tally of the received interviews was then completed by CanNorth staff. The data for each community was saved into a master database that was password protected. All of the original questionnaires (hardcopies) were filed in a locked cabinet at the NTC in Thunder Bay for confidentiality.

The database was double checked to ensure that the data entered corresponded with what is known about the area (i.e., what lakes have certain fish species in them). Survey results that seemed out of the ordinary were flagged for further review, and any obvious errors were further investigated and corrected/omitted.

3.5 Data Analyses

3.5.1 General Use

The general use of country foods was calculated by summing the total number of people interviewed in each community who stated that they consumed each country food type in the last year (summer 2014 to summer 2015).

3.5.2 Frequency

For each type of country food, residents were asked to provide detailed information on the number of times they consumed each species in each of the four categories (mammals, fish, birds, and berries). Estimated frequency of use was calculated by

summing the total number of portions consumed of each wild food type by each resident interviewed in each community. Using the frequency information reported by each community member for their country foods type in each category, the average number of portions per person per year (por/pp/yr) was calculated per community.

3.5.3 Amount

To estimate the amount of country foods consumed in grams (g), residents were asked to estimate portions or serving sizes of the species they consumed in each of the four categories (mammals, fish, birds, and berries). Portion sizes for meat and fish were divided into ounces (oz), either small (3 oz = 85 g), medium (6 oz = 170 g), or large (9 oz = 255 g). Each portion size (3 oz, 6 oz, or 9 oz) was then multiplied by the frequency of use to determine the amount. For berries, interviewers asked community members for their average serving size in cups (½ cup, 1 cup, and 1½ cups) and were converted to grams individually based on berry and plant weights available.

The total amount consumed of each individual country food type was summed together to get the total weight in grams (g) consumed per community. Using the information calculated for each community member for the amount of each country food type consumed in each category, the average was calculated to estimate the yearly amount consumed per person (grams per person per year [g/pp/yr]).

3.5.4 Level of Concern

Like many First Nations communities across Canada, the NTC membership has expressed concerns about the quality of their country foods. For each country food type consumed, individuals were asked if they had any concerns regarding potential chemical contaminants and impacts of these on the plants and wildlife health or human consumption. The findings will help to provide a better understanding of the perception of NTC residents, which are essential to planning effective and culturally appropriate delivery of public health messages about the safe consumption of country foods.

A ranking system was created within the questionnaire in order to determine the level of concern that NTC communities may have. Individuals were asked whether they were extremely concerned (5), very concerned (4), moderately concerned (3), slightly

concerned (2), or had no concerns (1) about chemical contaminants in a particular type of country food.

3.6 Mapping of Country Foods

Detailed maps of Lake Nipigon and the surrounding area were used to identify the approximate locations the country foods and medicinal plants were harvested and are presented in Figures 3.6-1 to 3.6-6. It is important to note that the data used to create the maps was compiled from the best sources available and represents the general hunting and gathering locations of community members.

The approximate locations where NTC residents harvested country foods for the four communities were identified and were drawn onto a map during participant interviews. During the interview process participants were provided a 92 cm by 106 cm map of the study area, which was sectioned by a 5 km by 5 km grid. Once the general hunting and gathering area was located, participants provided traditional knowledge by marking and labelling specific points, linear tracts, and geometric shapes where country foods were harvested. Post interview, the maps were scanned to a JPEG format image and spatially georeferenced to known Universal Transverse Mercator (Zone 16) coordinate graticule marks printed on the maps. This realigned the 5 km by 5 km grid printed on the map with the original digital, spatial data grid. The traditional knowledge presented by the participants was associated with its corresponding grid cells' identification numbers and entered in a Microsoft Excel spreadsheet. Thus, in the resulting database, the location is represented by a spatially referenced grid cell identification number, and the country foods information included a code identifying the participant survey number, a code identifying the community the participant represented, and a note identifying the food species.

In order to document the participants' information in the database as accurately as possible, the mapped data was supplemented with the questionnaire responses and interview notes. The resulting database was analyzed to identify grids of concentrated harvesting. Cartographic presentations were prepared to provide visual summaries of the analysis. The country foods mapping instructions provided to interviewers is presented to in Appendix G.

4.0 COMMUNITY INTERVIEW RESULTS

4.1 General Results

Community interviews took place from approximately June 15th to October 15th, 2015. The results of the survey are based on the responses of 95 people interviewed from four NTC communities. The goal of the study was to interview approximately 35 to 40 individuals from each of the four communities. Unfortunately, due to several different circumstances (interviewee turnover in two of the communities, busy summer schedules, etc.) these numbers were not reached in all four of the communities. It should be noted that while the results cannot be deemed representative of the frequency, amount, and location of country foods consumed by each member of the communities surveyed, several strong trends emerged from the study. The general locations of country food harvesting areas are presented in Figures 3.6-1 to 3.6-6.

The breakdown among the four communities surveyed was as follows: 38 in AZA, 15 in BNA, 30 in BZA, and 12 in KZA. Candidates were selected with preference given to a matriarch and/or patriarch if possible and were asked about household consumption where possible. Of the 95 people surveyed, 49 (51.5%) were male and 46 (48.5%) were female. Individuals between the age of 31 and 50 made up approximately 38% of those surveyed. The interviews were conducted by trained interviewers at the home of either the resident or the interviewer and lasted approximately one hour.

Breakdown of community members interviewed for the NTC Country foods study.

Community	AZA	BNA	BZA	KZA	Total
Female	20	7	14	5	**46**
18-30	3	-	5	3	11
31-50	6	5	6	1	18
51-70	8	2	2	1	13
Unknown	3	-	1	-	4
Male	18	8	16	7	**49**
18-30	-	3	6	3	12
31-50	7	2	7	2	18
51-70	2	2	3	2	9
70+	2	-	-	-	2
Unknown	7	1	-	-	8
Total	**38**	**15**	**30**	**12**	**95**

4.2 Land and Aquatic Mammals

4.2.1 General Use

The most common land or aquatic mammal utilized by the NTC communities surveyed was moose, the flesh of which was consumed by 91.6% of the residents interviewed in the past year, followed by snowshoe hare with 56.8%. Moose kidney and liver were the third (31.6%) and fourth (27.4%) most common meat consumed across the four communities (Table 4.2-1).

Other mammals that were consumed less frequently but are still an important part of the traditional diet included white-tailed/mule deer (20.0%) and beaver (15.8%). However, it should be noted that there were differences in consumption patterns of these animals between communities. For example, 30.0% of the population interviewed in BZA responded that they had consumed beaver within the last year compared to 7% to 10% of the population in the other three communities, while deer do not appear to be as important to the residents of KZA (Table 4.2-1).

Other mammal species consumed less frequently by members of the NTC communities surveyed included black bear (6.3%) and woodland caribou (6.3%), as well as porcupine (4.2%) and muskrat (3.2%) (Table 4.2-1).

4.2.2 Frequency/Portions

Information on the frequency and number of portions of land and aquatic mammals consumed is presented in various formats in Tables 4.2-2 to 4.2-7. In total, 4,526 mammal portions were consumed by those interviewed in the four communities throughout the year, resulting in an annual average of 47.6 por/pp/yr and accounting for roughly 23.3% of the total country food consumption. Among all of the communities surveyed, mammal consumption was highest during the fall, followed by the winter, with spring and summer months being very comparable (Table 4.2-2).

The mammal species most frequently consumed (tied for the top country food) by residents of all four communities was moose meat, with a total of 2,706 portions consumed for an average of 28.5 por/pp/yr (Table 4.2-3). The second most frequently consumed mammal species overall was snowshoe hare, followed by moose kidney and

moose liver. Moose is an extremely important country food for all four communities and accounted for over 75% of all mammal portions consumed throughout the year.

Mammal species that were consumed by NTC communities on a less frequent basis included beaver, deer, and, to a lesser extent, muskrat. Woodland caribou consumption was reported within the last year in small amounts by the residents interviewed in one of the four communities. Other mammals including bear and porcupine were consumed in small quantities by two of the four communities (Tables 4.2-4 to 4.2-7).

4.2.3 Amount

The average daily intake of country foods by type, season, and/or community is presented in various formats in Tables 4.2-8 to 4.2-11. In total, residents of the four communities consumed an average of 27.6 grams of meat per day on an annual basis, which is second only to fish (Table 4.2-8). This equates to approximately 22 pounds of wild meat consumed per person per year across all four communities. When looking at only the total amount of mammals consumed, over 21 grams (78.1%) consisted of moose meat and/or organs, followed by rabbit (13.7%), and beaver (3.1%). The remaining 5% included deer, muskrat, and woodland caribou (Tables 4.2-8 and 4.2-10).

Moose meat was ranked the number one country food eaten, accounting for 16.1% of the total average daily intake of country foods across all four communities (Table 4.2-9). When combined with liver and kidney, moose accounted for 20.5% of the total intake of the country foods consumed by community members. Rabbit was the only other mammal that ranked within the top ten country foods consumed overall, accounting for approximately 3.6% of total consumption (Table 4.2-9).

The amount of mammals consumed on a seasonal basis was highest during the fall (42.7 g/pp/dy), followed by the winter (36.5 g/pp/dy), with spring (15.7 g/pp/dy) and summer (15.4 g/pp/dy) months being very comparable (Table 4.2-8). Overall, KZA members had the highest intake of mammals, consuming an average of 55.6 g/pp/dy, while BNA residents had the lowest consumption with 17.2 g/pp/dy. Members of BZA reported values similar to the NTC average with 30.1 g/pp/dy, while residents of AZA reported intakes slightly below the average with 21.6 g/pp/dy (Tables 4.2-9 and 4.2-11).

4.2.4 Level of Concern

NTC members had some concerns regarding chemical contaminants in the land, as well as in mammals that they consume on a regular basis. Predictably, the top mammal country food consumed (moose) had the highest level of concern of all mammal food types, with approximately 68% of those interviewed expressing some level of concern. Overall, half of the respondents were slightly (2) to moderately (3) concerned regarding moose consumption, while approximately 40% of those interviewed were very (4) to extremely concerned (5) about the moose meat they were harvesting and consuming (Table 4.2-12).

A large percentage of the concerns regarding the consumption of moose meat and organs involved the spraying of herbicides in the forests where community members hunt and the possible uptake of these herbicides and other chemicals into the moose (Table 4.2-13). Other concerns mentioned by community members included spots and lumps on moose organs, overhunting, and disease. Community members had no concerns regarding the consumption of other mammals such as rabbit, deer, and beaver (Table 4.2-13).

4.3 Fish

4.3.1 General Use

Fish are an essential part of the diet of all four NTC communities and were found to be the most utilized country food type during the survey. The most common fish species consumed by the community members surveyed was walleye, with 94.7% of those interviewed consuming this species within the last year (Table 4.2-1). Lake whitefish (63.2%) and lake trout (51.6%) were also consumed by a significant portion of the community members surveyed. Other species commonly consumed included rainbow smelt (46.3%), brook trout (42.1%), yellow perch (42.1%), and northern pike (40.0%). Cisco (36.8%), lake sturgeon (25.3%), and rainbow trout (25.3%) were also in the top ten fish species consumed by community members during the past year (Table 4.2-1).

4.3.2 Frequency/Portions

Information on the frequency and number of portions of fish consumed is presented in various formats in Tables 4.2-2 to 4.2-7. Fish accounted for approximately 44% of the amount of country foods consumed across all communities. In total, 8,497 portions of

fish were consumed by those interviewed in the four communities throughout the year for an annual average of 89.4 por/pp/yr (Table 4.2-2). Fish consumption was highest during the summer months and lowest during the winter months in all communities, whereas consumption during the spring and fall was similar (Table 4.2-2)

The species of fish consumed most frequently was walleye, with residents eating an average of 28.5 por/pp/year (Table 4.2-3). This fish species accounted for approximately 14% of the total country food consumption and over 32% of all fish consumed. The second most common fish species consumed was lake whitefish, with 11.7 por/pp/yr. Other fish species included in the top ten country foods included lake trout, brook trout, and northern pike (Table 4.2-3). Other commonly consumed fish species included smelt, yellow perch, and sauger. Cisco (tullibee), sucker species, burbot (mariah), and smallmouth bass were also consumed in smaller quantities by residents from the four communities within the last year. BZA and KZA residents living near Lake Nipigon reported the highest intake of fish by the four communities and also had the highest average consumption frequencies (131.5 por/pp/yr and 110.8 por/pp/yr; Table 4.2-2).

4.3.3 Amount

The average daily intake of country foods by type, season, and/or community is presented in various formats in Tables 4.2-8 to 4.2-11. In total, residents of the four communities consumed an average of 52.4 grams of fish per day on an annual basis (Table 4.2-8). This equates to approximately 42 pounds of fish consumed per person per year across all four communities. When looking at only the total fish consumption, 31.2% of the fish consumed consisted of walleye, followed by lake whitefish (12.7%), and lake trout (9%). Overall, walleye ranked second only to moose meat in terms of the amount consumed, accounting for 15.6% of the average daily intake of country foods across all four communities (Table 4.2-9). Five other fish species, including lake whitefish, lake trout, brook trout, northern pike, and smelt were amongst the top ten country foods in terms of the amount consumed (Table 4.2-9).

On a seasonal basis, the average daily intake of fish was highest during the summer (56.3 g), followed closely by the spring (54.7 g), fall (52.6 g), and finally winter (46.2 g; Table 4.2-8). Of the four communities, BZA members had the highest fish consumption with a total of 86.9 g/pp/dy, followed closely by KZA residents who consumed 71.0 g/pp/dy on average (Table 4.2-11). In comparison, the amount of fish consumed by BNA residents

(38.0 g) was similar to that reported by AZA residents (27.3 g). The higher fish consumption rates reported by BZA and KZA may be due to the location of these communities on Lake Nipigon which allows for easy, year-round access to several different fish species.

4.3.4 Level of Concern

A number of concerns were identified by NTC members regarding chemical contaminants present on the land and the potential for them to end up in the water and affect the fish they consume. As with mammals, a high proportion (65.3%) of the people interviewed were concerned regarding whether walleye were safe to consume. Approximately half of the concerns regarding walleye were slight (2) to moderate (3), while approximately 50% of those interviewed were very (4) to extremely concerned (5) about the walleye they were consuming (Table 4.2-12).

A large percentage of the concerns regarding the consumption of fish included elevated mercury levels, the potential for further mercury contamination as a result of new hydroelectric dams, metals leaching from abandoned mines, and runoff from aerial herbicide spraying into nearby waterbodies (Table 4.2-13). Other concerns cited by community members included overfishing, invasive species, and acid rain. Community members had no concerns regarding the consumption of other less utilized fish species such as lake trout, brook trout, northern pike, and yellow perch (Table 4.2-13).

4.4 Birds

4.4.1 General Use

Both local and migratory bird species are consumed by the residents of all four NTC communities (Table 4.2-1). The most common species consumed included spruce grouse and ruffed grouse which were eaten by 49.5% of those interviewed within the last year, followed by Canada goose (45.3%). Other bird species commonly consumed included mallard duck (38.9%), gray partridge (32.6%), sharp-tailed grouse (13.7%), pheasant (6.3%), and several other species of duck. The eggs of several different bird species were also eaten by approximately 3.2% of those interviewed within the last year (Table 4.2-1).

4.4.2 Frequency/Portions

Information on the frequency and number of portions of birds consumed is presented in various formats in Tables 4.2-2 to 4.2-7. Birds were the least consumed country food type overall and by each community (Table 4.2-2), accounting for roughly 9% of the total country food consumption across all four communities. In total, 1,733 bird portions were consumed by those interviewed in the four communities throughout the year, resulting in an annual average of 18.2 por/pp/yr. Seasonally, consumption of birds was highest during the fall, followed by spring, winter, and summer (Table 4.2-2).

The bird species most frequently consumed by members of all four communities were spruce grouse and ruffed grouse, which accounted for approximately 52% of the total bird consumption and 4.6% of country foods consumption. On average, 4.7 por/pp/yr were consumed across all communities. Other bird species that were determined to be an important part of the diet of NTC residents included migratory birds such as Canada goose (2.7 por/pp/yr) and mallard duck (2.0 por/pp/yr) which are primarily consumed in the spring and fall, as well as the gray partridge (1.9 por/pp/yr), which is a non-migratory species that is primarily consumed during the fall (Table 4.2-3).

4.4.3 Amount

The average daily intake of country foods by type, season, and/or community is presented in various formats in Tables 4.2-8 to 4.2-11. In total, residents of the four communities consumed an average of 8.9 g/pp/dy of birds annually (Table 4.2-8), which equates to approximately 7 pounds of bird meat yearly per person, the lowest of any country food type. When looking at only the total bird consumption, roughly 54% of the birds consumed were spruce or ruffed grouse. Overall, spruce grouse was ranked 11th (2.5 g/pp/dy) and ruffed grouse was ranked 13th (2.3 g/pp/dy) in terms of the amount of country foods consumed across all four communities (Table 4.2-9).

Seasonally, the amount of birds consumed was highest during the fall (19.2 g/pp/dy) followed by spring (10 g/pp/dy), whereas during the summer (2.0 g/pp/dy) and winter (4.2 g/pp/dy) smaller quantities were consumed by community members (Table 4.2-8). Migratory bird species including Canada goose (1.2 g/pp/dy) and mallard duck (1.0 g/pp/dy) and non-migratory species including gray partridge (0.9 g/pp/dy) and sharp-tailed grouse (0.3 g/pp/dy) made up the remainder of the total consumption.

In terms of community differences, KZA members consumed the highest amount of birds with an average of 18.2 g/pp/dy, which is nearly double the average of 8.9 g/pp/dy for all communities. In comparison, the other three communities reported consumption values very similar to the overall consumption, ranging from 5.2 g/pp/dy to 8.6 g/pp/dy (Table 4.2-11).

4.4.4 Level of Concern

Community members had fewer concerns regarding the consumption of birds in comparison to other country food types (Table 4.2-12). Approximately one third of those interviewed were concerned with spruce and ruffed grouse, with approximately half of those people being slightly (2) to moderately (3) concerned, and the other half being very (4) to extremely concerned (5) about the grouse they were consuming (Table 4.2-12).

The majority of concerns related to the consumption of non-migratory bird species such as grouse and partridge were tied to herbicide spraying and other potential local sources of contamination. Community members also cited concerns related to destruction of grouse habitat and changes in the migration patterns of Canada geese (Table 4.2-13).

4.5 Berries and Edible Plants

4.5.1 General Use

A number of different berry species were recognized as an important part of the diet of community residents. The most common berry species utilized by the community members surveyed was blueberry, with 83.2% of those interviewed consuming this fruit within the last year. Other berries utilized in larger quantities included raspberry (64.2%), wild strawberry (40.0%), Saskatoon berry (21.1%), and pin cherry (20.0%). Other berry species consumed in smaller quantities included chokecherry, gooseberry, high bush cranberry, and bog cranberry (Table 4.2-1).

Several different types of edible plants were identified as being consumed by community members during the interviews. The most common edible plant types utilized by the community members surveyed were wild rice (22.1%) and Labrador tea (21.1%). Wild mushrooms, wild mint, and wild carrot root were also consumed by a smaller proportion of the population interviewed (Table 4.2-1).

4.5.2 Frequency/Portions

Information on the frequency and number of portions of berries and other edible plant species consumed is presented in various formats in Tables 4.2-2 to 4.2-7. Consumption of berries and edible plants accounted for approximately 23% of the total country food consumption across all four communities. A total of 4,534 portions were consumed throughout the year by the people interviewed in the four communities, resulting in an annual average of 47.7 por/pp/yr. Seasonally, consumption of berries and edible plants was highest during the summer (2,564 portions), followed by fall (1,050), spring (465), and winter months (455) across all communities (Table 4.2-3).

The berry most frequently consumed by all four communities was blueberry, which was the third ranked country food in terms of consumption behind moose and walleye. Blueberries accounted for approximately 38% of the total berry consumption and made up 8.9% of the total amount of country foods consumed by resident, with an annual average of 18.1 por/pp/yr. Other berry species on the list of the top ten country foods consumed by NTC members included raspberry (11.0 por/pp/yr) and wild strawberry (5.1 por/pp/yr), which are primarily consumed in the summer and fall months (Table 4.2-3). Pin cherry (2.3 por/pp/yr), Saskatoon berry (1.5 por/pp/yr), and gooseberry (1.0 por/pp/yr) were also consumed by residents. Wild rice, wild carrot, Labrador tea, and mushrooms were the most common edible plant species harvested and consumed by community members throughout the year.

4.5.3 Amount

The average daily intake of country foods by type, season, and/or community is presented in various formats in Tables 4.2-8 to 4.2-11. In total, residents of the four communities consumed an average of 15.8 g/pp/dy of edible plants on a yearly basis, equalling roughly 12 pounds of wild berries and edible plants per person per year. Blueberries accounted for approximately 44% (7 g/pp/dy) of the total berry consumption and made up 6.7% of the total country foods consumption. Wild raspberry accounted for approximately 3.7% of all country food consumption with community members eating an average of 3.9 g/pp/dy.

As might be expected, the average daily intake of berries and edible plants was highest during the summer (38.2 g/pp/dy), followed by fall (15 g/pp/dy), whereas consumption was generally lower during the spring (4.8 g/pp/dy) and winter (5.0 g/pp/dy; Table 4.2-8).

Of the four communities, KZA members had the highest consumption of berries, with a total of 26.2 g/pp/dy, followed closely by BZA residents who consumed 19.0 g/pp/dy on average (Table 4.2-11). In comparison, the consumption of berries by members of AZA and BNA was slightly lower than the overall consumption average, with 11.3 g/pp/dy and 13.4 g/pp/dy consumed per person, respectively (Table 4.2-11).

4.5.4 Level of Concern

Community members had a number of concerns regarding consumption of some of the commonly eaten berry species, including blueberry, raspberry, and wild strawberry (Table 4.2-12). Approximately 61% of the people interviewed expressed some level of concern regarding the consumption of blueberries, with just under half of those concerned indicting that they were slightly (2) to moderately (3) concerned, while the other half were very (4) to extremely concerned (5) (Table 4.2-12). The majority of concerns related to the consumption of berries were tied to herbicide spraying and other potential local sources of contamination in areas where locals harvest berries. Other concerns community members mentioned included forestry and contaminants associated with abandoned mines (Table 4.2-13).

4.6 Vegetation (Other/Medicinal)

4.6.1 Traditional Use

In addition to country foods consumption, NTC residents were asked during the interview process whether they harvest or obtain vegetation for traditional or medicinal uses (Table 4.2-1). The most common type of medicinal plant was sweet grass (30.5%), which was used by roughly a third of the NTC residents interviewed. Sweet grass has been used traditionally and as a medicinal remedy in the past. It is often dried and smoked as incense or used in smudging for the blessing of people, food, and ceremonies or meetings (Johnson et al. 1995).

Birch bark and cedar were used by 15.8% of the NTC residents interviewed. Many First Nations, including the Ojibway, consider white birch the most useful of all trees. It has been used for centuries to make baskets, canoes, sleds, snowshoes, and paddles (Johnson et al. 1995). Birch sap was used by approximately 7.4% of the NTC residents interviewed and is boiled down to make birch syrup. Cedar is often used in Ojibway culture to treat stomach problems and headaches, and can be used in a tea to relieve sore throats, coughs,

and colds. Others have reported the cedar species being used as a poultice to treat infections, to cool burns, or to treat cuts, sores, and skin disorders (Johnson et al. 1995).

Spruce gum was used by approximately 12.6% of the NTC residents interviewed. Spruce gum can be picked from the dried pitch of white spruce and boiled with fat to make a salve or cream that can be applied to sores, scratches, cuts, or infections of the skin. Others chewed the gum to relieve coughs and sore throats. Common dandelion was used by 10.5% of the NTC residents (Table 4.2-1). Dandelion leaves are a nutritious food and are sometimes boiled and or eaten raw in salads. The roots and leaves also help to purify the blood and relieve high blood pressure, indigestion, and heartburn (Johnson et al. 1995; Marles et al. 2008).

Other medicinal plants mentioned by NTC residents included St. John's Wort, which is often used as an antiseptic or antibiotic to treat skin conditions. Bearberry is often used medicinally for sore throats and the stems and leaves can also be boiled to make a tea to treat bladder or kidney problems. The berries (and sometimes the leaves) are mixed together with tobacco or other herbs and smoked; this mixture is frequently referred to as kinnikinnick. Balsam bark and juniper were used by a small number of community members (8.4%) and are usually boiled to make teas to treat a variety of different ailments, including coughs, colds, chest congestion, and sore throats (Table 4.2-1).

4.7 Comparison with Other Surveys

The consumption of country foods by members of the four NTC communities as identified through the FFQs was compared between communities and to other similar studies conducted for First Nations across Canada (Table 4.7-1). Although it should be noted that the methods used during these studies may differ and are unique, general comparisons may demonstrate where similarities and differences exist regarding the consumption of country foods between communities and may indicate the importance of these foods overall.

A wide range of consumption amounts were reported in the literature. A study with a sample size similar to the residents of AZA and BZA showed that residents of Old Crow (n=29) and Teslin (n=33) in the Yukon had a much higher average intake of mammals (124 g/pp/day and 104 g/pp/day, respectively) compared to the NTC communities, where consumption ranged from 17.2 g/pp/day to 55.6 g/pp/day, although these amounts were

similar to the amounts consumed by other First Nations communities in the Lake Superior region (31.0 g/pp/dy; Table 4.7-1). It should be noted that mammal and bird consumption reported by several First Nations communities were combined, therefore it is difficult to get an accurate picture of how overall meat consumption varies across Canada.

Fish consumption values for the four NTC communities were generally comparable to other First Nation communities across Canada. The community with the highest fish consumption values was Old Crow, Yukon with an estimated 112 g/pp/day, followed by BZA and KZA residents, who consumed an average of 86.9 g/pp/day and 71.0 g/pp/day, respectively. The consumption of fish by BNA (38 g/pp/yr) and AZA (27.3 g/pp/yr) residents was similar to First Nations interviewed in the Lake Superior region (35.8 g/pp/yr; Table 4.7-1).

In general, NTC residents consumed more berries and edible plants compared to First Nations communities in Alberta, but consumed fewer than those in the Yukon (Table 4.7-1). This may be an indication that the NTC area supports a good variety and/or abundance of berries and that berries are a valuable food source for local residents.

Among the four NTC communities surveyed, the average amount of country foods consumed on a daily basis was the highest in the community of KZA (171.1 g/pp/day), followed by BZA (143.5 g/pp/day), BNA (73.8 g/pp/day), and AZA (68.8 g/pp/day). The variation in consumption amounts may be a result of several factors. For example, fewer interviews (n=12) were conducted in the KZA community, therefore the results may over represent high-end consumers of this community when compared to the other communities in the study. Another important factor in overall country food consumption is access to the land, and therefore, the food that is harvested from the land. AZA and BNA, where consumption was lower compared to the other communities, only recently obtained reserve lands, and their members are spread out in communities over the region, whereas the other two communities (KZA and BZA) have been settled on the lands they occupy for some time. This may also explain the large differences in fish consumption among communities, as both KZA and BZA have community members living on Lake Nipigon, which allows for year-round access to several different fish species.

Overall, the results show that country foods consumption by the four NTC communities surveyed are within the range of studied First Nation communities across Canada.

Several other factors other than study design, interviewer techniques, and sample sizes may play a role in consumption differences between communities, including location, population size, road access, proximity to waterbodies, presence of hunters, trappers or fisherman, age and gender, and costs and availability of market foods (Blanchet et al. 2000).

5.0 SAMPLING PROGRAM METHODS

The majority of the samples were collected or submitted directly by, or with the assistance of, community members during their traditional hunting and gathering activities. All water and some fish samples were obtained primarily during a sampling program, while the majority of the berry, bird, and mammal samples were gifted by community members throughout the summer, fall, and winter of 2015. The sampling program took place from October 12th to 20th, 2015 and was completed by a senior biologist from CanNorth alongside community members. The community members chosen to help with the sample collections in their respective communities were recommended by NTC as being respected community hunters, trappers, and fisherman with traditional knowledge of their local areas.

5.1 Study Areas

The study design of the sampling program included obtaining samples for chemical analyses from each of the four study communities. After the interviews were completed, harvest locations identified by community members were mapped, and this information was utilized to help to determine the potential locations frequented by community members for collections of country foods of the four study communities. All of the detailed samples and their locations are presented in Figures 5.1-1 to 5.1-5 for each media sampled.

5.2 Sampling Components

The program focused on two primary sampling components (water chemistry and country foods chemistry) to characterize the current chemical conditions in the region. The large study area and limited budget restricted the number of samples that could be analyzed for the program. Therefore, some of the most frequently consumed wildlife species that were known to occur in these areas were selected and targeted.

Effort was made to collect a total of ten water samples from the region as well as ten samples of each of the four country food types selected from four study communities. The types of country foods selected were based on their availability during the survey, as well as on the interview results from each of the NTC communities. The following table details the country food types selected for sampling and the final sample sizes obtained.

Summary of samples collected during the NTC Country foods study.

Category	Type of Sample Selected	# of Samples Targeted During Survey	# of Samples Collected
Water	hand grab	n=10	n=10
Mammal	moose/snowshoe hare/moose organs	n=40	n =22
Fish	lake whitefish/walleye/northern pike/other fish	n=40	n=69
Birds	grouse/partridge/ducks	n=40	n=18
Vegetation	blueberry or other berries consumed	n=40	n=4
Total Samples	all	n=130	n=123

5.3 Sample Collection

For each sample collected or submitted, the following information was obtained:

- the type of sample collected (i.e., fish flesh – walleye);
- the location the sample was collected (UTM coordinate and sketched on a map);
- the date the sample was collected;
- name of sample collector; and
- a description of how the sample was collected (i.e., equipment, hand-picked, etc.).

Only samples that had been legally obtained through traditional harvesting rights or licensed hunting activities were accepted for the study. The NTC's Project Lead, Mr. Kevin Sherlock, was selected as the local sample receiver for the study. Mr. Sherlock lives in Thunder Bay and visits the communities often, therefore he was in a position to arrange transport of samples to the NTC office in Thunder Bay where they could further be sorted and categorized before being submitted to the laboratory for chemical analyses. Mr. Sherlock was instructed on the type of information required for collection from individuals that chose to submit samples for analytical testing, including the location the sample was obtained, the date the sample was collected, proper labelling and storing of the samples, and proper chain of custody forms needed for sample submission.

A CanNorth senior staff member accompanied NTC residents when conducting the field sampling program in October of 2015 in order to provide training in scientific sample collections.

5.4 Sampling Methods

5.4.1 Water

In total, ten water samples were collected from areas in the region that were of interest. The station locations were decided upon by CanNorth in consultation with the NTC and community members, and were determined primarily by accessibility, proximity to the communities, and importance of waterbodies within the region.

Prior to field collections, sample bottles and preservatives were obtained from the Australian Laboratory Services (ALS) laboratory in Thunder Bay. Water chemistry samples consisted of a surface grab collected from 15 cm below the surface of the water column. All samples were preserved as required and were kept refrigerated prior to being transported to the ALS laboratory in Thunder Bay for chemical analysis. The table below summarizes the sample number, collection date, and location of the water samples collected during the survey.

Summary of water samples collected during the NTC Country foods study.

Sample #	Date	Water Sampling Locations
1	16-Oct-15	Windigokan Lake
2	15-Oct-15	Postagoni River
3	15-Oct-15	Parks Lake
4	16-Oct-15	Blackwater River
5	16-Oct-15	Namewaminikan (Sturgeon) River
6	17-Oct-15	Rocky Bay (BZA)
7	16-Oct-15	North Wind Lake
8	15-Oct-15	Partridge Lake (AZA)
9	17-Oct-15	Pijitawabik Bay (BNA)
10	16-Oct-15	Onaman River

5.4.2 Fish

At each of the four sampling communities, effort was expended to obtain ten fish samples for chemical analysis. Five different fish species were targeted, including walleye, lake trout, northern pike, lake whitefish, and brook trout. A number of the fish samples were collected by local community members during their routine fishing activities and were gifted to the program. In total, 69 fish samples were collected and submitted for the study,

including 37 walleye, 5 northern pike, 12 lake trout, 5 lake whitefish, 2 brook trout, 4 white sucker, and 4 yellow perch.

All whole fish collected for chemistry by community members with CanNorth staff were frozen and transported to the NTC office in Thunder Bay where they were processed. The primary fish capture methods were short-length single panel gill nets (10 m long and 1.8 m high) with a mesh size (stretched) of 7.6 cm (3") and angling. Fish processing included measuring length (fork length) to the nearest mm, measuring weight to the nearest 20 g, determining the sex of the fish, assessing and recording stomach contents, and conducting a visual health assessment. The whole fish was then frozen and submitted to the ALS laboratory for chemical analysis of the fish flesh. Any fish samples received from the communities (fillets, etc.) were double-bagged (in Ziploc type plastic bags), labelled, frozen, and transported to the ALS laboratory in Thunder Bay for chemical analysis.

5.4.3 Birds

At each of the four sampling communities, effort was expended to obtain ten samples of the targeted bird species, which included grouse, partridge, duck species, and Canada geese. All of the bird samples were collected by community members during their routine hunting activities and were gifted to the program; unfortunately, the target sample sizes were not always achieved from each community. In total, 18 bird samples were collected and submitted by the four communities, including 4 grouse, 6 partridge, 7 ducks, and 1 Canada goose.

All bird samples were identified to species. A sample of the breast meat of the birds (300 g to 500 g) was removed and submitted for chemical analyses. All samples were double-bagged (in Ziploc type plastic bags), labelled, frozen, and transported to the ALS laboratory in Thunder Bay for chemical analysis.

5.4.4 Mammals

At each of four sampling communities, ten mammal samples were targeted for chemical analysis. All of these samples were collected by community members during their routine hunting activities and were gifted to the program. Two species that are commonly consumed by the NTC communities were targeted, including moose and snowshoe hare. In addition, since moose organs (liver, kidney, and heart) were also identified as an

important food source for NTC community members, samples of these organs were also submitted for chemical analyses.

In total, 13 moose tissue samples and 6 moose organ samples (3 livers, 2 kidneys, and 1 heart) were donated by community members for submission to the laboratory. Samples were submitted by members of each of the four participating communities. Only 3 snowshoe hare samples were obtained or submitted by community members of BZA during the study, although attempts were made during the winter of 2015 to obtain additional samples.

All mammal samples (400 g to 800 g) received from the communities were double-bagged (in Ziploc type plastic bags), labelled, frozen, and transported to the ALS laboratory in Thunder Bay for chemical analysis.

5.4.5 Vegetation

At each of the sampling communities, effort was expended to collect ten samples of blueberries or another species known to be abundant and eaten locally. All berry samples were hand-picked by community members independently. Unfortunately, only three blueberry samples and one wild strawberry sample could be collected from the communities. Additional effort was expended to collect additional berry samples; however, this was not possible as several residents indicated that 2015 was a very bad year for berries.

Each sample consisted of approximately 500 g to 600 g of berries. All samples were double-bagged (in Ziploc type plastic bags), labelled, frozen, and transported to the ALS laboratory for chemical analysis.

5.5 Laboratory Methods

All samples were analyzed by the Environmental Division of ALS Laboratories. Chain of custody forms were completed and were transported with each set of samples sent to the laboratory. ALS is certified and accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). Accreditation ensures that procedures, facilities, and methods conform to ISO/IEC 17025, which is an internationally recognized standard. ALS has an extensive Quality Assurance/Quality Control (QA/QC) program to ensure reliable

analytical results. With each set of samples run, ALS tests reference materials, duplicates, and spiked samples. Data results provided by ALS include full QA/QC reports for each sample submission.

5.5.1 Water

The majority of water samples were analyzed directly without any preparation; however, samples containing suspended solids were digested with nitric acid in a block digester, following the Standard Methods for the Examination of Water and Wastewater - Part 3030 (APHA, AWWA, and WEF 1999). The digestion ensured that metals present in any suspended solids were in solution.

Subsequent to digestion, water was analyzed using Inductively Coupled Plasma - Mass Spectrometry (ICP-MS; modified from EPA Method 6020A; US EPA 2007). Cations were determined directly using Inductively Coupled Plasma - Optical Emission Spectroscopy (ICP-OES). Instrumental analysis of mercury in water was by cold vapour atomic fluorescence spectrophotometry as per US EPA Method 245.7 (US EPA 2005). This procedure involved a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride.

5.5.2 Animal Tissue and Berries

All tissue sample preparation methods were adapted from US EPA Method 200.3 "Sample Procedures for Spectrochemical Determination of Total Recoverable Elements in Biological Tissues" (US EPA 1996). Tissue samples were homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide. Moisture in all tissue samples was carried out gravimetrically by drying the samples at 105°C for a minimum of six hours.

For most analytes (metals and trace elements) instrumental analysis was by collision cell inductively coupled plasma - mass spectrometry (ICP-MS) modified from EPA Method 6020A. Mercury in tissues was completed by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7 (US EPA 2005).

5.6 Data Analyses and QA/QC

In addition to the internal QA/QC completed by ALS laboratories, CanNorth conducted QA/QC assessments on the chemistry data to look for aberrant values. If aberrant values were found, the lab was contacted to double check their analyses.

Summary statistics were calculated for the chemistry data from each media type and the values were compared to the criteria discussed in Section 5.7. The concentrations of many metals and trace elements in the sampling media were at levels below the Method Detection Limit (MDL). For values that were below the MDL, it is not possible to determine the actual concentration; therefore, all values were set equal to half the MDL for computing summary statistics. This is a conservative approach as the actual concentrations could be substantially lower than the MDL.

5.6.1 Selection of COPC

For the purposes of this study, COPC were selected based on concerns from a human health perspective, metal mining operations in the region, and potential hydroelectric undertakings in the region. This list contains metals/trace elements that have been identified by regulatory agencies, environmental assessments, and other monitoring programs as chemicals of interest for country foods and human health assessments in First Nations communities as well as in areas with mines and abandoned mines (Gamberg 2000; CanNorth 2011; HC 2011; Chan et al. 2014).

Due to their high degree of toxicity, arsenic, cadmium, lead, and mercury rank among the top priority heavy metals that are of public health significance and were selected as COPC for this study. All four are considered systemic toxicants that are associated with a number of adverse effects on human health (HC 2004). They are classified as human carcinogens (known or probable) based on epidemiological and experimental studies according to the U.S. Environmental Protection Agency, the International Agency for Research on Cancer, and Health Canada (Tchounwou et al. 2012). In addition, these four metals are included under the Convention on Long-range Trans-boundary Air Pollution Protocol on Heavy Metals (1998 to 2012) and are considered "toxic" substances; as such, they are on the List of Toxic Substances (Schedule 1) managed under the Canadian Environmental Protection Act (GC 2016).

Historic mining and future resource developments in the Lake Nipigon region were also considered when selecting COPCs. Historic gold and silver mining operations often used cyanide leaching to dissolve and separate gold from ore. Due to the existence of historical cyanide mills in the area, cyanide was selected as a COPC for this study. Mercury was a key COPC, particularly in fish, because of concern over increased mercury levels caused by hydroelectric developments.

Concentrations of additional metals measured in supermarket foods from across Canada (Total Diet Study [TDS]), including cobalt, molybdenum, selenium, and zinc were included and further examined to ensure that levels of these metals do not present a health concern to the study communities. The TDS results from the most recent study period for trace element analyses (2005 to 2007) have been included herein for comparative purposes and are discussed further in Section 5.7.3 (HC 2011).

5.7 Comparison Criteria

The following comparison criteria were used to put the COPC concentrations measured in the samples collected for the NTC country foods study into context:

- available federal and provincial guidelines (water and mercury in fish);
- available regional data from across Ontario (water, fish, birds, and moose) of four heavy metals (arsenic, cadmium, lead, and mercury);
- chemical concentrations measured in supermarket foods that the general Canadian population is exposed to; and
- to available literature where applicable.

Further information on these comparison criteria are provided below.

5.7.1 Guidelines

Guidelines used for water quality evaluations included those pertinent to the protection of freshwater aquatic life and drinking water quality for community members. Water quality data were compared to the Canadian drinking water quality guidelines (CDWQGs)

maximum acceptable concentrations[1] (MAC; HC 2014) and the Canadian water quality guidelines for the protection of freshwater aquatic life (CWQGs; CCME 2015).

Currently, both provincial and federal consumption guidelines are available for mercury levels in fish. For mercury occurring in commercial fish, Health Canada (HC 2007) and the Commission of the European Communities (CEC 2006) provides a maximum allowable concentration of 0.5 mg/kg (wet weight) for most fish, but allows up to 1.0 mg/kg (wet weight) for specific fish species, including northern pike. It needs to be stressed that these maximum allowable concentrations are specific to commercial fish and not sport fish.

In the case of fish consumed for subsistence purposes, mercury consumption guidelines are available for a number of waterbodies across Ontario (MOECC 2016), which are based on tolerable daily intake guidelines provided by Health Canada. Similar to the Health Canada guidelines, the tolerable daily intake is lower for sensitive populations (pregnant women and women who plan on becoming pregnant, and children under 15) than the general population. It is advised that community members follow the fish consumption advice according to their location and the species and length specific information found in the Ontario consumption advisory tables.

Since recommended provincial fish consumption quantities set to regulate mercury intake are only provided for select waterbodies and vary with waterbody, species, and fish length, concentrations of mercury in fish flesh were flagged for discussion herein if they exceeded 0.5 mg/kg. This value was used as the "guideline" for this report to indicate if mercury concentrations should pose a concern.

5.7.2 First Nations Food, Nutrition, and Environment Study

The First Nations Food, Nutrition, and Environment Study (FNFNES) is being implemented region by region across Canada over a 10-year period. The study hopes to better understand the concerns and the impacts of nutrition, food security, and environmental pollution on the quality and safety of traditionally-harvested foods by First Nations people living south of the 60th parallel. Data collection was completed in 18 First Nations communities in Ontario during the fall of 2011 and 2012. The country foods

[1] If MAC were not available, then aesthetic objectives or operational guidance values were presented.

portion of the program collected and tested a total of 1,241 food samples representing 115 different types of traditional foods for levels of four metals including arsenic, cadmium, lead, and mercury (Chan et al. 2014). Relevant results from the Ontario study period (2011 to 2012) have been included to determine if the NTC country foods are comparable to data collected across Ontario. The NTC country foods chemistry values are compared to the FNFNES arsenic, cadmium, lead, and mercury average and maximum concentrations.

5.7.3 Supermarket Concentrations – Total Diet Study

Health Canada has conducted a Total Diet Study during six separate periods since 1969 as part of their mandate to ensure that chemicals are not present in foods at levels that pose an unacceptable risk to human health. During the TDS study, approximately 210 individual food items were purchased from supermarkets and were then prepared and processed as they would be for consumption by the average household kitchen. The processed foods were then mixed to produce approximately 150 different food composites for chemical analysis, the results of which are available online (HC 2011). The results from the most recent study period for trace element analyses (2005 to 2007) have been included herein for comparative purposes. The NTC country foods are compared to the TDS data as follows:

- NTC fish data are compared to the average supermarket freshwater fish concentrations;
- NTC blueberry data are compared to the average supermarket blueberry concentrations;
- NTC bird data are compared to the average supermarket poultry (chicken and turkey) concentrations; and
- NTC moose data are compared to the average supermarket meat concentrations which consist of a combined average of beef steak, beef roast, beef ground, fresh pork, cured pork, veal, and lamb.

Comparisons of the NTC country foods data to the supermarket foods data need to be interpreted with caution. As described above, supermarket foods consist of different species than those tested. Also, although the supermarket food data provides information on the levels of chemicals the Canadian population is routinely exposed to; this does not mean that concentrations above these levels are harmful to human health. They should

not be interpreted as guidelines; rather, they are used to put the levels measured by this study in perspective. The supermarket values for a number of parameters have not been included due to differences in laboratory detection limits from this study.

6.0 SAMPLING PROGRAM RESULTS

The chemistry portion of the NTC country foods study allowed for the collection of preliminary data that established a baseline for the country foods in the regional study area. Due to the low sample sizes tested by the program, the results need to be interpreted with caution.

The NTC country foods data are presented using both summary tables and figures where applicable. Where applicable, descriptive statistics (the number of samples analyzed, mean, standard deviation, maximum, and the number of values that measured below the MDL) were calculated and reported for each of the selected COPCs for each sample type. Graphical representations of the concentrations of selected COPCs recognized as being of potential concern (cadmium, lead, and mercury) compared to available guidelines and Ontario regional values or literature are also included. Detailed chemistry data are presented in Appendix H, Tables 1 to 7.

6.1 Water Chemistry

The concentrations of a number of metals and trace elements in the ten water samples collected were below the MDLs, meaning that the levels were too low to measure (Table 6.1-1). Parameters that were at measurable levels were almost all lower than the CDWQG (HC 2014) and the CWQG for the protection of freshwater aquatic life (CCME 2015). The only exceedance of the CDWQG was the manganese concentration in the sample collected from Windigokan Lake (0.0738 mg/L), which exceeded the aesthetic objective of 0.05 mg/L. The only exceedance of the CWQG was aluminum in the sample from Postagoni River (0.102 mg/L), which was almost equal to the guideline value of 0.1 mg/L. Overall, the results indicate that water quality in the study areas tested near the communities does not pose a risk to aquatic or human health.

6.2 Fish Chemistry

The fish chemistry results are summarized in Tables 6.2-1 to 6.2-4, while detailed fish chemistry results are presented in Appendix H, Tables 1 to 3. Concentrations of COPCs in the fish flesh samples were low (often below the levels the laboratory can measure), similar between study areas, and near to or lower than supermarket values and Ontario regional levels. Concentrations of mercury in fish flesh samples that were above

guideline levels and/or Ontario regional values are discussed in more detail below and are presented in Figure 6.2-1.

Of the 37 walleye tested, mercury concentrations in one sample from Postagoni Lake (1.36 mg/kg) and two samples from Ombabika River (0.502 mg/kg and 0.611 mg/kg) exceeded the guideline of 0.5 mg/kg (Appendix H, Tables 1 and 2). The mean concentration of mercury in the six walleye samples from Postagoni Lake (0.358 ± 0.493 mg/kg) and the ten walleye samples from Ombabika River (0.40 ± 0.14 mg/kg) were marginally higher than the Ontario regional mean value of 0.32 mg/kg (Chan et al. 2014) but were below the guideline for mercury in fish (Table 6.2-1, Figure 6.2-1).

The mean concentration of mercury in the five northern pike samples collected from Postagoni Lake (0.897 ± 0.325 mg/kg) exceeded the mercury guideline and the Ontario regional mean value of 0.633 mg/kg (Table 6.2-4, Figure 6.2-1). Other predatory fish species that exceeded the mercury guideline included five lake trout from Pipestone Point in Lake Nipigon which had a mean mercury concentration of 0.517 ± 0.226 mg/kg and a maximum value of 0.816 mg/kg (Table 6.2-4, Figure 6.2-1).

All of the other fish samples tested from the Lake Nipigon study area including lake whitefish, brook trout, yellow perch, and white sucker contained mercury concentrations below 0.5 mg/kg and were generally below the Ontario regional values (Figure 6.2-1; Tables 6.2-2 and 6.2-4). The one exception was one white sucker from Parks Lake which had a mercury value of 0.541 mg/kg (Table 6.2-2).

6.3 Bird Chemistry

In total, eight migratory birds (seven waterfowl and one Canada goose) were analyzed during the study. It should be noted that because waterfowl and geese are migratory, parameter concentrations do not necessarily reflect the presence of contaminants in the region, therefore the results should be interpreted with caution.

Concentrations of COPCs in birds showed variability between samples; however, mean concentrations were similar between study areas and were generally comparable to or lower than supermarket concentrations and Ontario regional values available. It should be noted that mean mercury concentrations (0.19 ± 0.35 mg/kg) in the seven duck breast samples were elevated when compared to the Ontario regional value of 0.0393 mg/kg.

For upland game birds, although there was no regional data available for comparison, the majority of the COPCs were near or below the partridge concentrations across Ontario and below the supermarket values. The six partridge tested from the area had mean concentrations of arsenic (0.02 ± 0.02 mg/kg) and cadmium (0.07 ± 0.08 mg/kg) that were above the supermarket poultry concentrations and the Ontario regional values available for partridge (Table 6.3-1).

Concentrations of lead in one spruce grouse from Jean Lake (0.179 mg/kg) and three of the four partridge samples analyzed (0.101 mg/kg, 0.237 mg/kg, and 0.282 mg/kg) exceeded the Commission of the European Communities maximum level for lead of 0.1 mg/kg in meat from bovine animals, sheep, pigs, and poultry (CEC 2006) (Appendix H, Table 4). These elevated levels may be a result of residuals from lead shot; however, it should be noted that these levels were much lower when compared to the mean values (1.204 mg/kg) for partridge from across Ontario (Table 6.3-1; Figure 6.3-1; Appendix H, Table 4).

6.4 Snowshoe Hare Chemistry

Three snowshoe hare (rabbit) samples were collected during the study. The concentration of COPCs in meat showed some variability between samples, but concentrations were similar between study areas (Appendix H, Table 4). The mean concentration of copper (2.12 ± 0.399 mg/kg) for the three hare samples was slightly higher than the supermarket samples tested as part of Health Canada's total diet study (Table 6.4-1). This may be due to species differences since the supermarket values are from meat (composite of beef, pork, veal, and/or lamb) and not snowshoe hare meat. Arsenic, cadmium, mercury, and lead concentrations in snowshoe hare were all below the mean values reported by the FNFNES study conducted in Ontario (Table 6.4-1).

6.5 Moose Tissue Chemistry

In total, 13 moose tissue samples from the study area were submitted for chemistry. Although the concentrations of selected COPCs were variable between samples, the majority were lower than or near to Health Canada's total diet study and regional levels from Ontario (Table 6.5-1; Appendix H, Table 5). There were a few exceptions worth noting, including cadmium and lead concentrations, which are discussed in detail below.

A number of studies have documented cadmium levels in wild game across Canada including moose, deer, and elk (Crete et al. 1987; Crichton and Paquet 2000; Gamberg 2000; Jin and Joseph-Quinn 2004) and Ontario (Glooschenko et al. 1988). Generally speaking, cadmium follows a predictable pattern in mammals with the highest metal concentrations in kidneys, many times less in the liver, and lowest in muscle tissue (Gamberg 2005). In the 13 moose tissue samples analyzed from across the study area, cadmium concentrations ranged from 0.0027 mg/kg to 6.53 mg/kg with a mean of 0.51 ± 1.80 mg/kg (Table 6.5-1, Figure 6.5-1; Appendix H, Table 5).

One moose tissue sample from Candido Road had a cadmium concentration of 6.53 mg/kg, which is considerably higher than the maximum concentration reported in the FNFNES Ontario study (0.279 mg/kg). To further put this value in perspective, it is well beyond the Commission of the European Communities maximum limit for consumption of cadmium in supermarket meat of 0.05 mg/kg (CEC 2006) and well above the mean tissue values for moose from across Canada (Figure 6.5-1). The aberrant value was double checked with the lab and deemed accurate; however, it should be noted that if the value of 6.53 mg/kg is removed, the mean cadmium concentration in the remaining 12 moose tissue samples is 0.009 ± 0.004 mg/kg, which is well below the mean concentration of 0.026 mg/kg reported in the FNFNES Ontario study.

The concentration of lead was considerably higher in two moose tissue samples from animals harvested at Candido Road (19.6 mg/kg) and Humboldt Bay of Lake Nipigon (44.7 mg/kg). It is suspected that these elevated levels of lead are due to lead ammunition that was embedded in the samples submitted for analyses. High lead levels in large game, including moose, have been linked to the use of lead ammunition (ATSDR 2008), which has also been linked to higher blood levels of lead in people who consumed wild game (Iqbal et al. 2009) compared to those who did not consume wild game, including First Nations in Ontario (Tsjuis et al. 2008).

There is currently no single standard for permissible amounts of lead in food in North America. Furthermore, the Food and Drug Administration (FDA) regulatory standards and guidelines for lead in food are complicated by the relatively recent recognition of lead as a probable human carcinogen (ATSDR 2007). The levels of lead in these two moose tissue samples exceeds the Commission of the European Communities maximum food level of 0.1 mg/kg for lead in meat from bovine animals, sheep, pigs, and poultry

(CEC 2006) by over 200 times. These values are unsafe and should not be consumed by adults or children as they may increase the risk of elevated lead levels in blood.

6.6 Moose Organ Chemistry

In total, six moose organ samples (three livers, two kidneys, and one heart) from the study area were submitted for chemistry. COPC concentrations illustrated variability between samples; however, concentrations of cadmium, lead, and mercury were within the range of regional levels from Ontario's FNFNES study (Table 6.5-1; Figure 6.5-1; Appendix H, Table 5). Arsenic concentrations in the two kidney samples tested from the study area (0.025 mg/kg and 0.048 mg/kg) were higher than the mean concentration reported in the FNFNES Ontario study (0.008 mg/kg) and were near to or higher than the maximum concentration (0.028 mg/kg). There was variability in the arsenic concentrations measured in the moose liver samples with the highest concentration measured in the moose from Candido Road (Appendix H, Table 5).

The three moose liver samples analyzed from the study area had a mean cadmium concentration of 1.10 ± 0.447 mg/kg with a maximum concentration of 1.61 mg/kg (Figure 6.5-1, Table 6.5.1). Several studies, including the FNFNES, have shown that the concentration of cadmium in moose livers from across North America is higher than those measured in the NTC study area (Glooschenko et al. 1988; Jin and Joseph-Quinn 2004; Gamberg 2005; Arnold et al. 2006; Chan et al. 2014). In 17 moose livers analyzed from northern British Columbia, the mean cadmium concentration was 2.31 mg/kg (Jin and Joseph-Quinn 2004), while Gamberg reported a mean cadmium value of 5.11 mg/kg in 60 livers sampled in Yukon moose (Arnold et al. 2006). In a study conducted in Ontario, mean cadmium concentrations in moose liver ranged from 2.7 mg/kg in Sudbury to 5.7 mg/kg in Algonquin (Glooschenko et al. 1988).

The moose kidney cadmium concentrations measured in the NTC study area (3.56 mg/kg and 3.8 mg/kg) were considerably lower than mean concentration observed in moose kidney in the FNFNES Ontario study (13.93 mg/kg; Chan et al. 2014), northern British Columbia (7.59 mg/kg; Jin and Joseph-Quinn 2004), the Yukon (26.4 µg/g; Gamberg 2005), and Ontario (51.4 mg/kg; Glooschenko et al. 1988).

6.7 Berry Chemistry

Blueberry samples were collected from the study area near the communities of KZA (one sample), BZA (one sample), and BNA (one sample). In addition, one wild strawberry sample was submitted from BZA. Concentrations of COPCs were similar between study areas and were frequently below the laboratory's detection limits (Table 6.7-1, Appendix H, Table 6). Additionally, COPC concentrations were near to or lower than levels measured in supermarket blueberry samples tested as part of Health Canada's total diet study as well as regional levels from the FNFNES Ontario study (Table 6.7-1).

7.0 SUMMARY

7.1 Interview Results

One of the primary objectives of the NTC country foods study was to complete a semi-quantitative country foods assessment involving the residents of four NTC communities. This included studying the country food types, frequency of consumption, approximate amounts, and harvest locations to gain a better understanding of the utilization of country foods by the NTC membership. A FFQ and interview process conducted by locally hired band members was used to collect this information.

The results of the survey are based on responses from a total of 95 people from four NTC communities. Traditional sources of meat include moose, snowshoe hare, and moose organs. Other mammals, including beaver, deer, and muskrat were also reported to be consumed in smaller quantities. A number of these animals are harvested locally, and hunting areas are normally accessed by nearby roads. Other hunters travel longer distances by road and water to hunt and gather their country foods on traditional trap lines that have been passed down from generation to generation.

Fish were identified as the most frequently consumed dietary component of all four study communities, even more so than meat. The most commonly eaten fish species was walleye, followed by lake whitefish, lake trout, brook trout, and northern pike, which were all consumed in large numbers.

Both local and migratory bird species were consumed by the NTC residents. Upland birds such as grouse (spruce, ruffed, and to a lesser extent, sharp-tailed grouse) and partridge were hunted by a number of residents. The most common migratory bird consumed was Canada goose, followed by duck, particularly mallard. Most of the hunting activity for birds was located close to accessible areas such as roadways, power lines, and nearby ponds and lakes.

Fruit commonly gathered included blueberries, raspberry, wild strawberries, pin cherries, and Saskatoon berries as well as a number of other berries that play a much smaller role in the diet of NTC residents. Berries were predominantly eaten fresh during the summer months; however, a number of people indicated that they also froze berries for use during the winter. Other edible plants (wild rice, mushrooms, wild carrot, and mint) and medicinal plants (sweet grass, spruce gum, dandelion, and several different roots and tree

species including birch, cedar, and tamarack) were frequently used by residents of the NTC and were often dried and stored for later use.

7.2 Chemistry Results

The second objective of the NTC country foods study was to complete a sampling program in order to gain a better understanding of COPC concentrations in the country foods consumed by NTC residents. This part of the study included the collection and chemical analysis of a number of several different types of wild foods, including berries, fish, birds, and mammals from a number of traditional hunting and gathering locations in the Lake Nipigon area. In addition, water samples were collected near the study communities and waterbodies in the study area.

The results of the water sampling program conducted in the Lake Nipigon study area demonstrated that overall, water quality in the study area was good and that water samples contained chemical concentrations that were below guideline levels and do not pose a risk to environmental or human health.

Concentrations of metals in the majority of the fish and berry samples were low (often below the levels the laboratory can measure), similar between study areas, and comparable to regional data. Mercury levels in lake whitefish, yellow perch, and brook trout samples were all below consumption guidelines, meaning that these fish species may be eaten in unlimited amounts. The mean mercury levels in five northern pike in Postagoni Lake and five lake trout from Pipestone Point in Lake Nipigon were above one of the consumption guidelines of 0.5 mg/kg.

In general, samples of duck, grouse, partridge, rabbit, and moose had metal concentrations that were variable but were within the range of regional data and similar to Health Canada's total dietary study concentrations. Exceptions included a high cadmium concentration in one moose tissue sample from Candido Road and high lead concentrations in moose tissue samples from Candido Road and Humboldt Bay of Lake Nipigon.

7.3 Discussion

The results of the country foods study demonstrate that traditional foods are frequently gathered and hunted near the study communities and that these foods are an important part of the diet of NTC residents. The consumption quantities reported varied between the four communities, but fit within the range of other First Nations communities surveyed in Canada.

From a human health perspective, women of child bearing age, teenagers, and children should consider limiting consumption of northern pike from Postagoni Lake to avoid possible higher intakes of mercury. If women of child bearing age and children should choose to continue to consume fish from Postagoni Lake, they should limit their consumption of northern pike to fish of a smaller size, and/or limit their consumption of predatory fish species until more mercury data is obtained for fish from this lake. The Ministry of the Environment (Sport Fish Contaminant Monitoring Program) will be notified of the results obtained in northern pike in Postagoni Lake. For up to date information on fish consumption advisories for other lakes and rivers in Ontario and Lake Nipigon region contact the Sport Fish Contaminant Monitoring Program (1-800-820-2716) or visit them online at www.ontario.ca/fishguide.

Selected results for lead in country foods such as moose and upland birds (partridge and grouse) illustrate that lead shot should not be used when hunting as it can contaminate the meat and cause health concerns. As of September 1999, the possession or use of lead shot for hunting most migratory game birds (waterfowl) was banned in Ontario. However, lead shot remains legal for grouse, partridge, and other upland species and lead ammunition continues to be commonly used for hunting large game in Ontario. Lead is a neurotoxin; however, toxicity depends on the level and frequency of exposure. It is also particularly harmful to young children and pregnant women. Studies have shown that lead gunshot undergoes fragmentation on impact with game birds, resulting in contamination of the meat and, hence, increased exposure to lead of human consumers of game (Pain et al. 2010). Consumption of meat contaminated with lead shot could be a concern to human health if sufficient quantities were eaten. It is recommended that hunters consider ammunition alternatives that are not prone to fragment (non-lead) including steel, copper, bismuth, or other high-weight retention ammunition alternatives.

Health studies conducted in the Northwest Territories (Larter and Nagy 2000) and Yukon (Receveur et al. 1997) have recognized that the highest potential exposure to cadmium from terrestrial mammals is through the ingestion of the liver and kidneys of moose and caribou, and that consumption should often be limited (Arnold et al. 2006). Smokers should be especially careful since they are already exposed to high amounts of cadmium from cigarettes. In the Yukon, Health Canada has recommended limiting consumption of moose kidney and liver to one/person/year (Gamberg 2005). In northern British Columbia, Jin and Joseph (2004) concluded that adults can continue to eat moose kidney and liver occasionally in moderate amounts, but that children and cigarette smokers should not eat these organs at all due to cadmium concentrations. The three moose liver and kidney samples tested as part of this study did not contain overly high cadmium concentrations when compared to national data; however, further testing would be needed to evaluate if consumption restrictions are warranted, particularly for high risk populations such as smokers.

The harvest and consumption of traditional foods are both integral components of good health among Aboriginal people, influencing both physical health and social well-being. Several health benefits of consuming traditional country foods have been documented across northern Canada and thus, the regular consumption of locally collected fish, meat, and vegetation is recommended.

8.0 MAP SOURCES AND DISCLAIMERS

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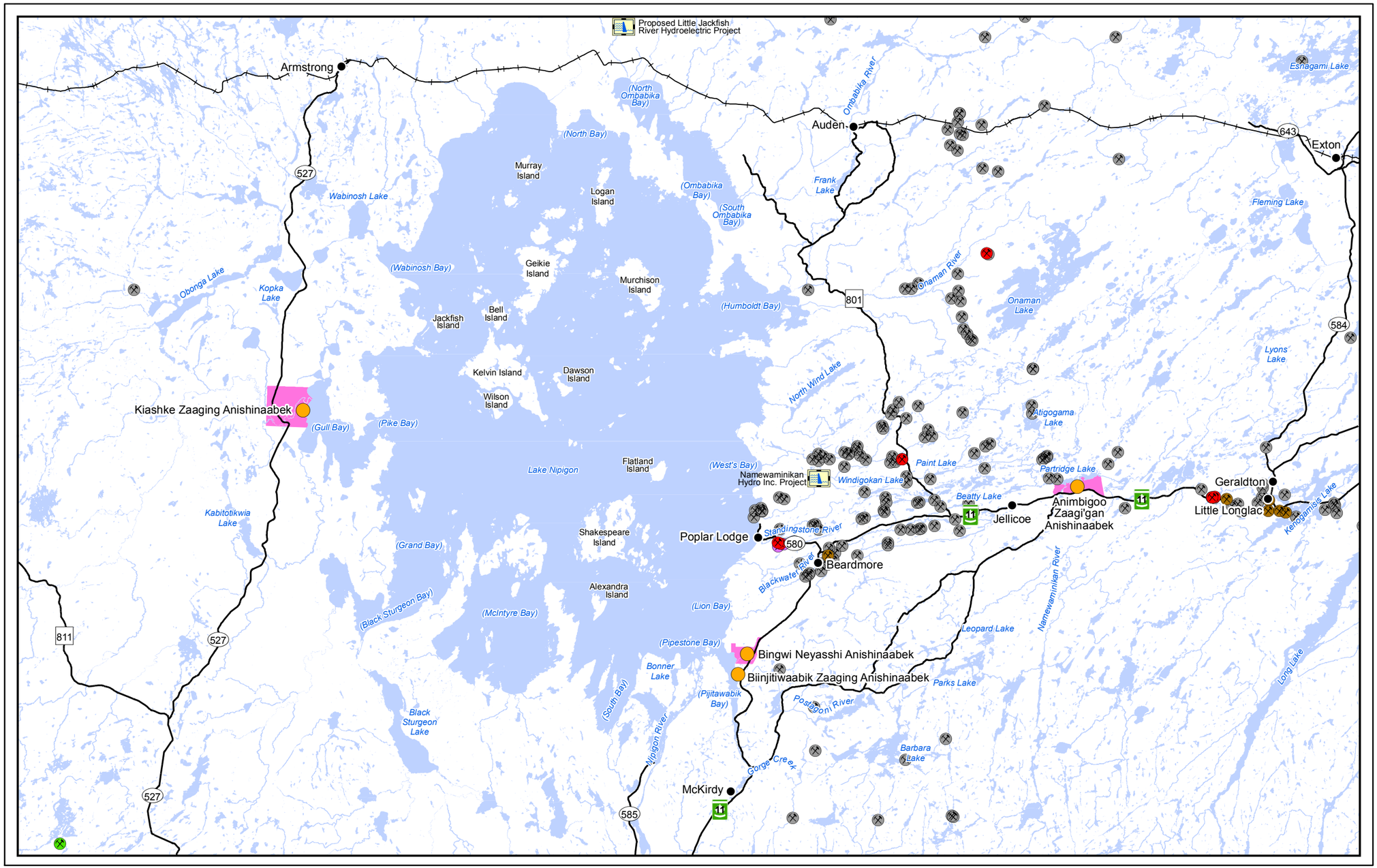
FIGURES

LIST OF FIGURES

Figure 1.2-1. Nokiiwin Tribal Council (NTC) country foods study area.



Base Map

- Study Community
- Community
- First Nation Reserve Lands
- Highway/Roadway
- Railway
- Waterbody
- Abandoned Mine
- Abandoned Mine with Unconfined Tailings
- State of Inactivity Mine
- Advanced Exploration Mine
- Producing Mine
- Hydroelectic Project

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Refer to text for full details & disclaimer.
File: 1807-21 Client: Nokiiwin Tribal Council/Health Canada
17 / Jun / 2016 Geomatics: CC Reviewed by: KW
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Figure: 1.2-2

Figure 1.2-2. Past, current, and future developments in the NTC study area.

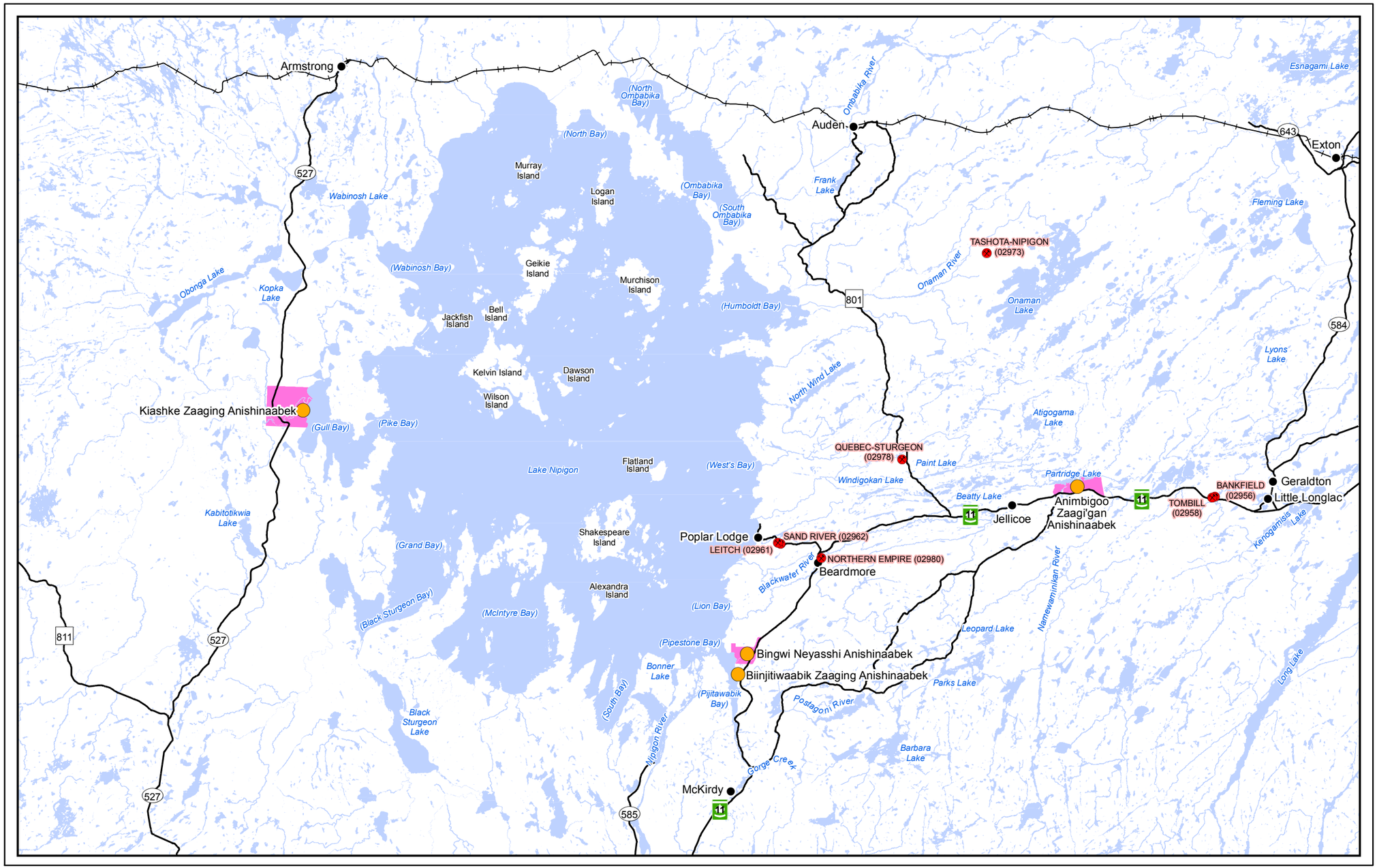


Figure 1.3-1. Community and abandoned mine sites with tailings in the NTC study area.

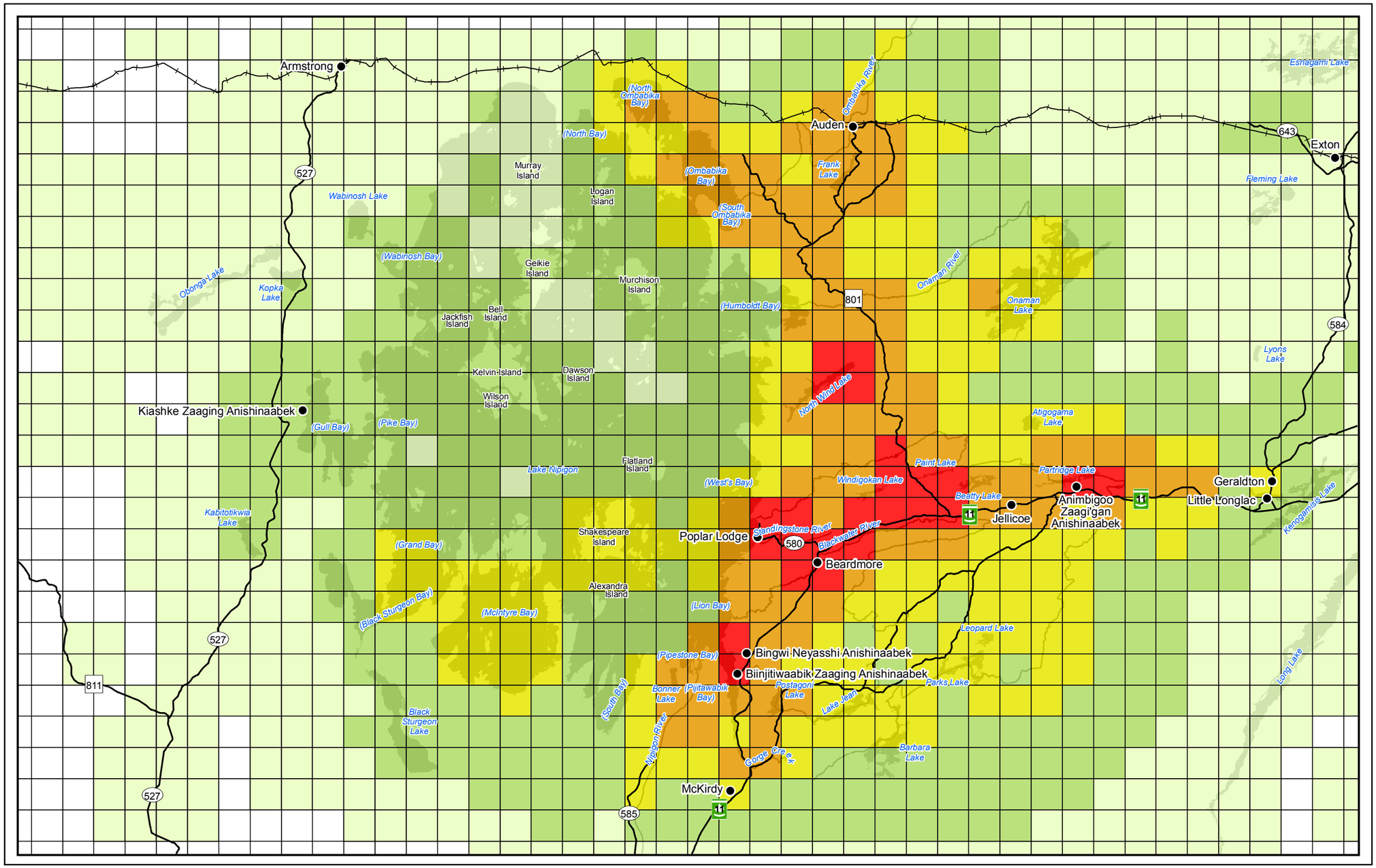
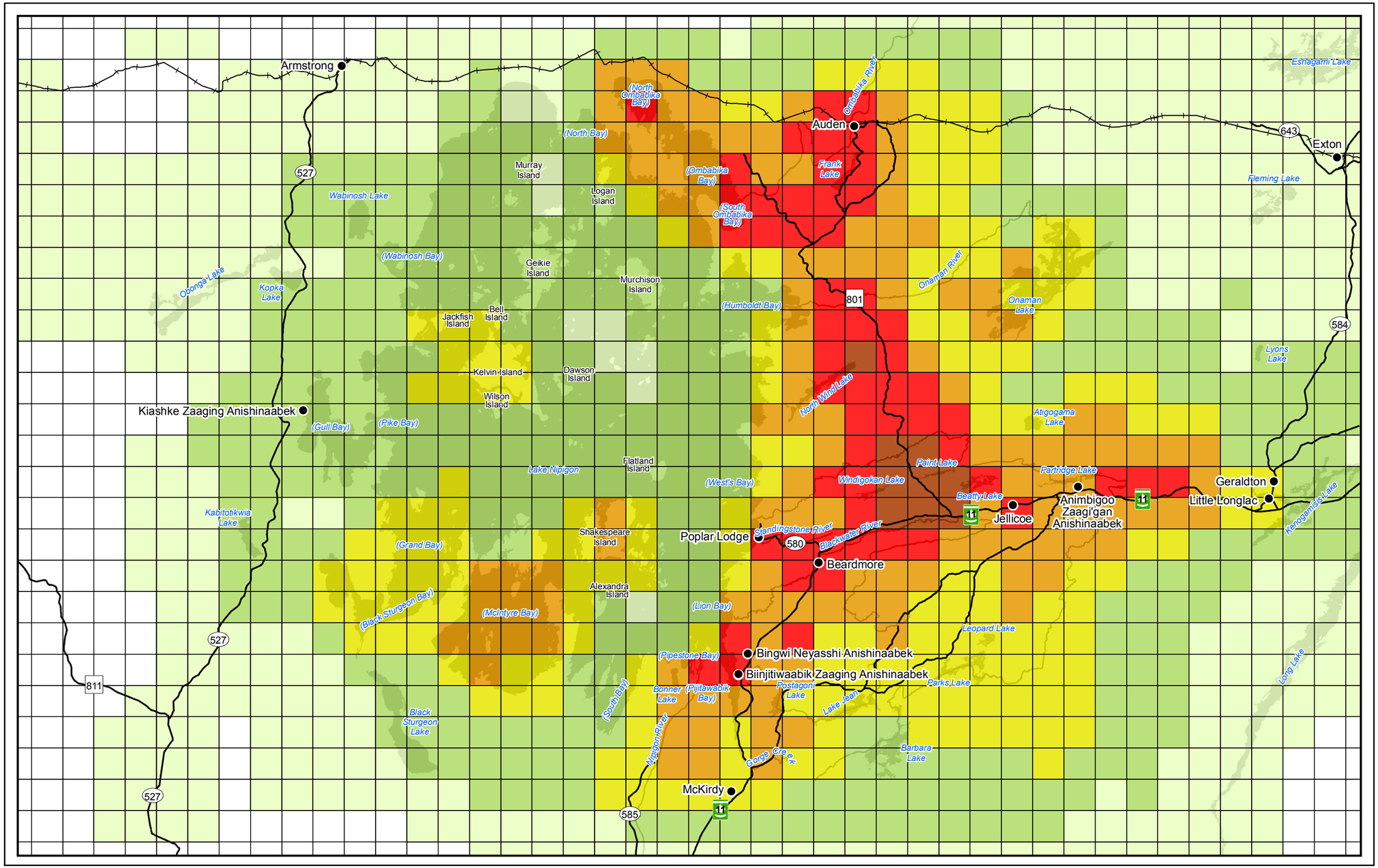


Figure 3.6-1. Approximate hunting and gathering areas of interviewed NTC community members for all country food types.



Percentage of Participants (n=80) Who Identified Grid Area for Mammal Harvesting

35.1% to 40.0% | 28.1% to 35.0% | 21.1% to 28.0% | 14.1% to 21.0% | 7.1% to 14.0% | 1.3% to 7.0%

Base Map

Community | Highway/Roadway | Railway | Waterbody

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18 / Apr / 2016 Geomatics: CC Reviewed by: KW
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CanNorth
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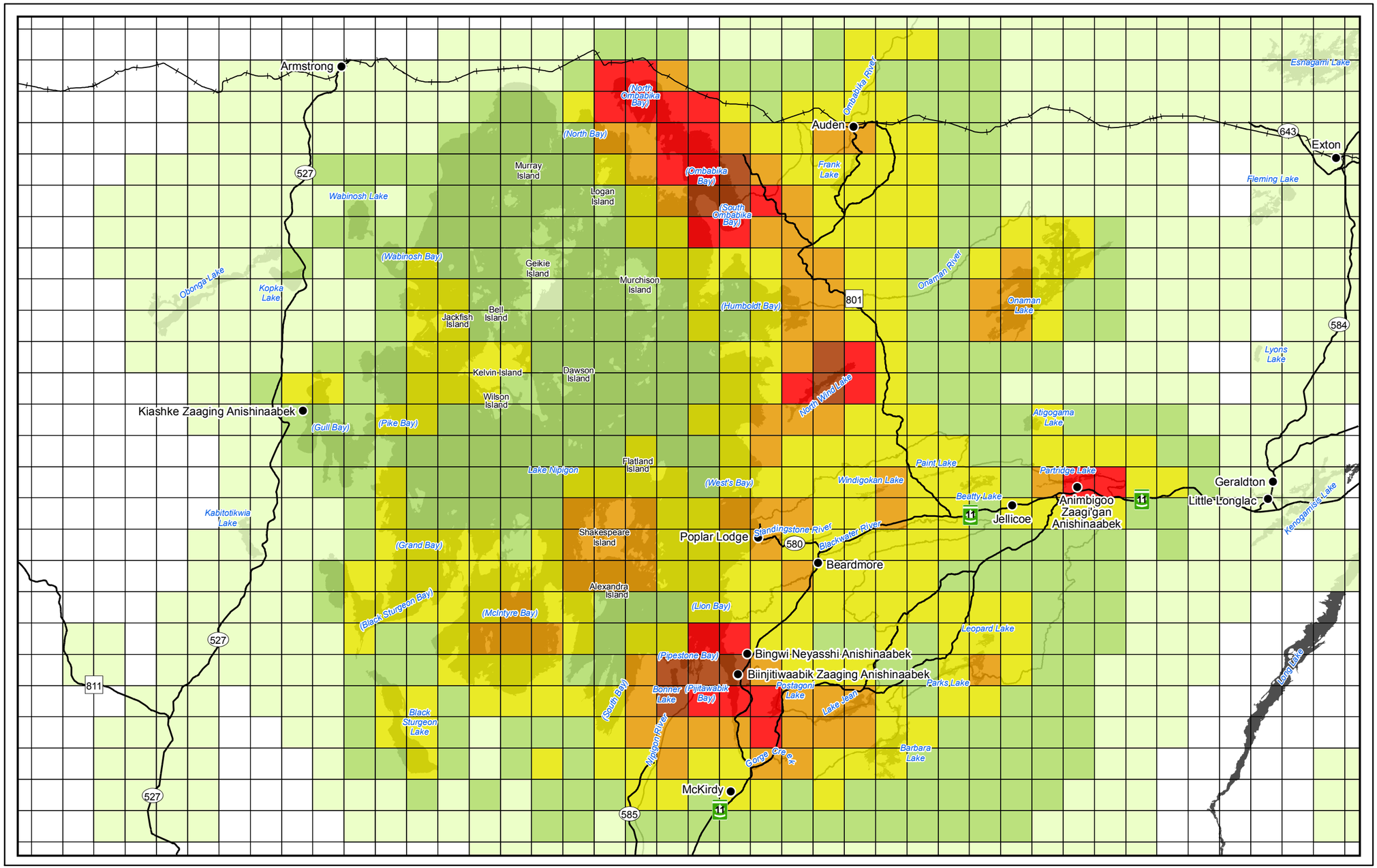
Figure 3.6-2. Approximate mammal hunting areas of interviewed NTC community members.



Percentage of Participants (n=77) Who Identified Grid Area for Fish Harvesting

35.1% to 41.6% | 28.1% to 35.0% | 21.1% to 28.0% | 14.1% to 21.0% | 7.1% to 14.0% | 1.3% to 7.0%

Base Map

Community | Highway/Roadway | Railway | Waterbody

Map Sources: Natural Resources Canada "CanVec+"; Contains information licensed under the Open Government Licence – Ontario.
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File: 1807-25 Client: Nokiiwin Tribal Council/Health Canada
19 / Apr / 2016 Geomatics: CC Reviewed by: KW

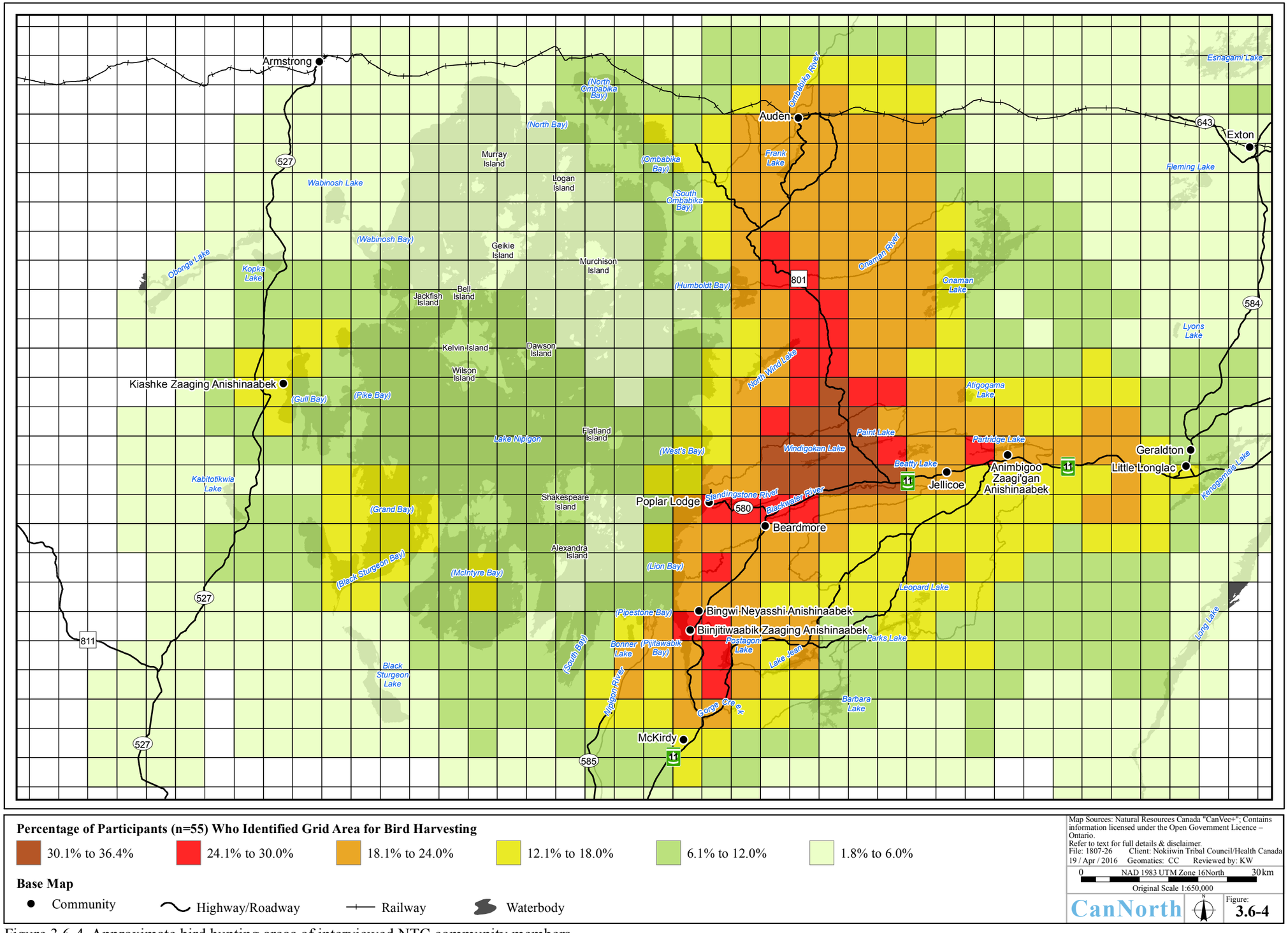
0 NAD 1983 UTM Zone 16North 30 km

Original Scale 1:650,000

CanNorth

Figure: **3.6-3**

Figure 3.6-3. Approximate fishing areas of interviewed NTC community members.



Percentage of Participants (n=55) Who Identified Grid Area for Bird Harvesting

- 30.1% to 36.4%
- 24.1% to 30.0%
- 18.1% to 24.0%
- 12.1% to 18.0%
- 6.1% to 12.0%
- 1.8% to 6.0%

Base Map

- Community
- Highway/Roadway
- Railway
- Waterbody

Map Sources: Natural Resources Canada "CanVec+"; Contains information licensed under the Open Government Licence – Ontario.
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File: 1807-26 Client: Nokiiwin Tribal Council/Health Canada
19 / Apr / 2016 Geomatics: CC Reviewed by: KW
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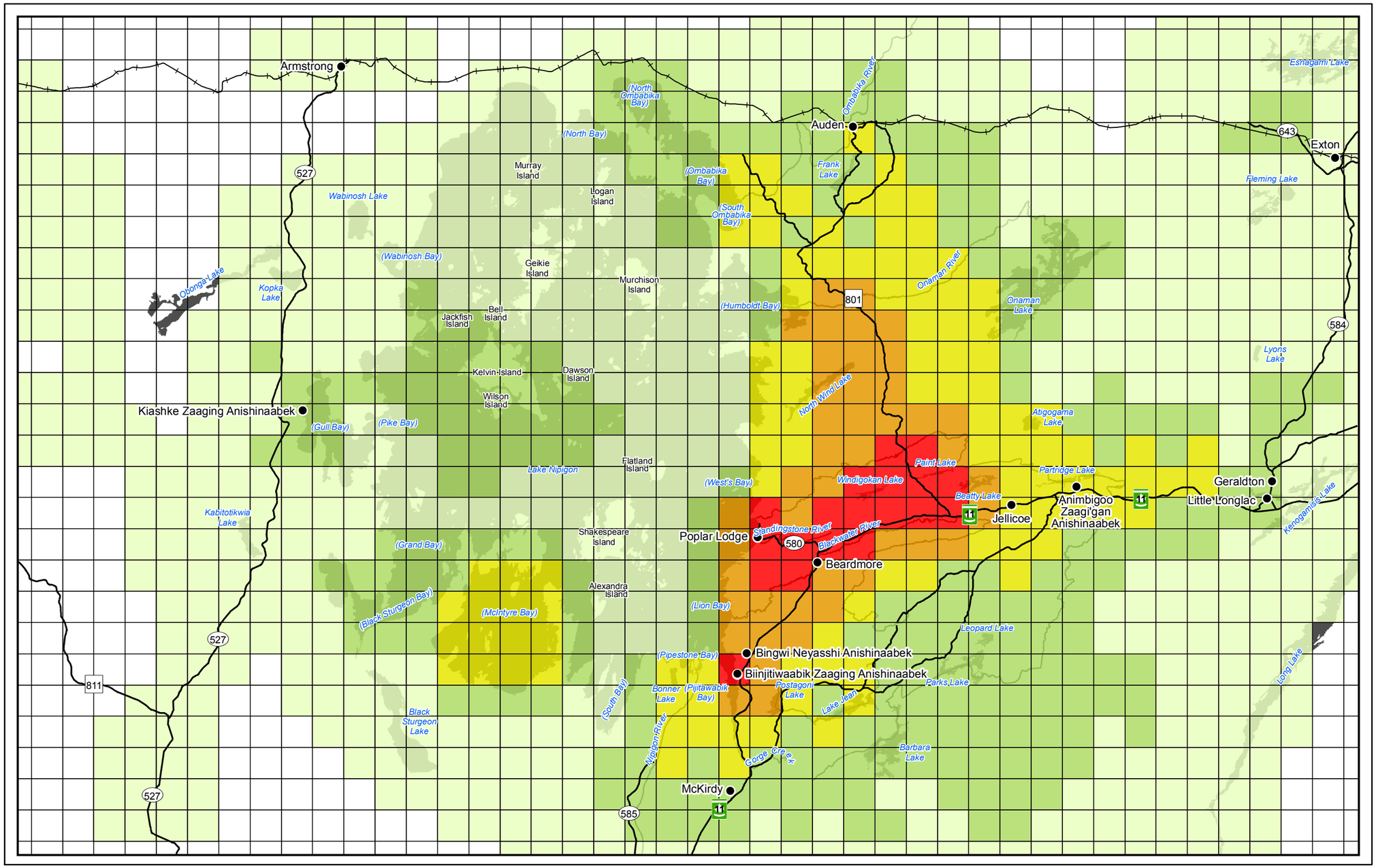
Original Scale 1:650,000
CanNorth
Figure: 3.6-4

Figure 3.6-4. Approximate bird hunting areas of interviewed NTC community members.



Percentage of Participants (n=66) Who Identified Grid Area for Edible Plant Harvesting

- 32.1% to 40.9%
- 24.1% to 32.0%
- 16.1% to 24.0%
- 8.1% to 16.0%
- 1.5% to 8.0%

Base Map

- Community
- Highway/Roadway
- Railway
- Waterbody

Map Sources: Natural Resources Canada "CanVec+"; Contains information licensed under the Open Government Licence – Ontario.
Refer to text for full details & disclaimer.
File: 1807-27 Client: Nokiiwin Tribal Council/Health Canada
19 / Apr / 2016 Geomatics: CC Reviewed by: KW

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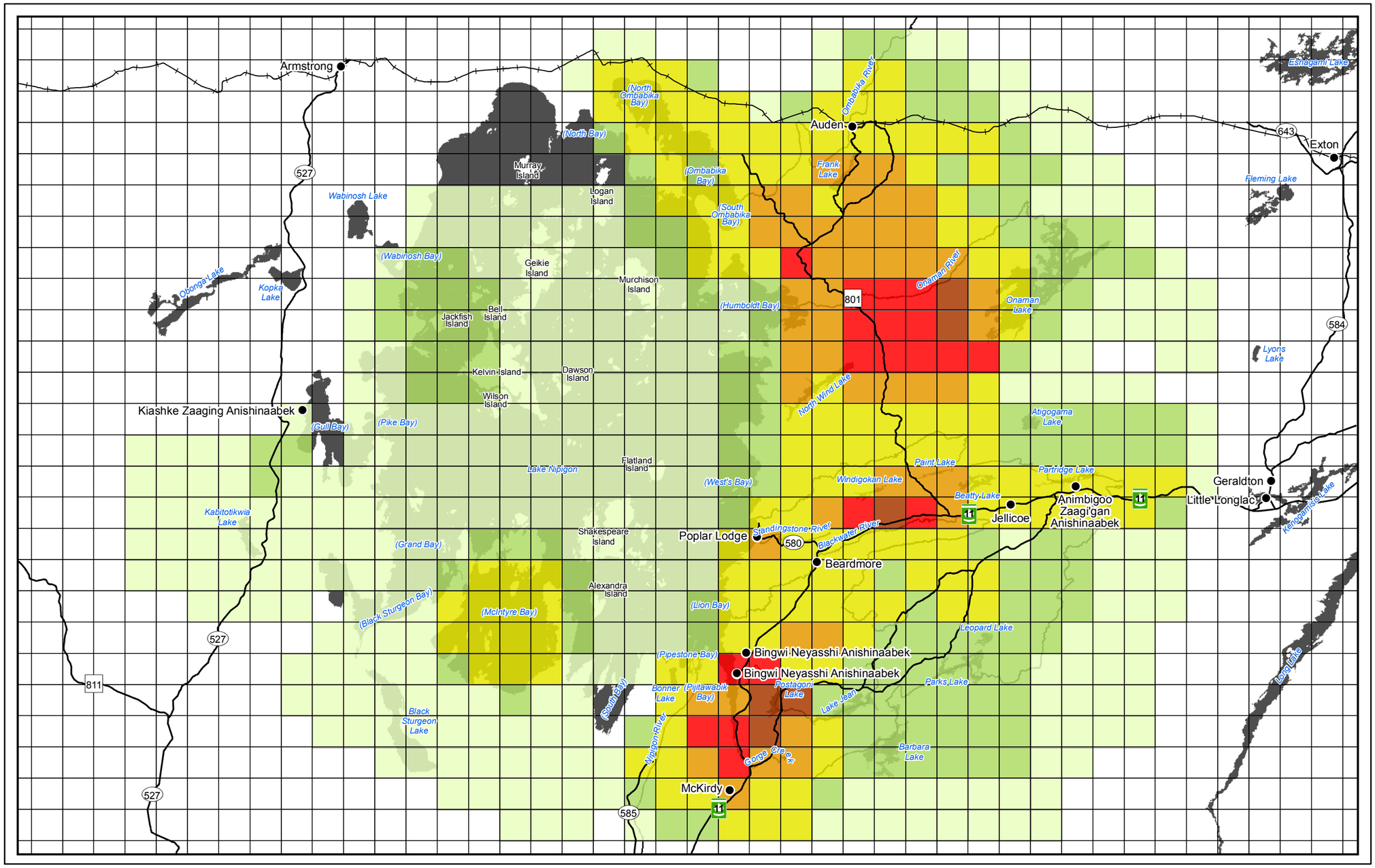
Original Scale 1:650,000

CanNorth

Figure: 3.6-5

Figure 3.6-5. Approximate edible vegetation harvest areas of interviewed NTC community members.



Percentage of Participants (n=17) Who Identified Grid Area for Medicinal Plant Harvesting

- 40.1% to 47.1%
- 32.1% to 40.0%
- 24.1% to 32.0%
- 16.1% to 24.0%
- 8.1% to 16.0%
- 5.9% to 8.0%

Base Map

- Community
- Highway/Roadway
- Railway
- Waterbody

Map Sources: Natural Resources Canada "CanVec+"; Contains information licensed under the Open Government Licence – Ontario.
Refer to text for full details & disclaimer.
File: 1807-28 Client: Nokiiwin Tribal Council/Health Canada
19 / Apr / 2016 Geomatics: CC Reviewed by: KW
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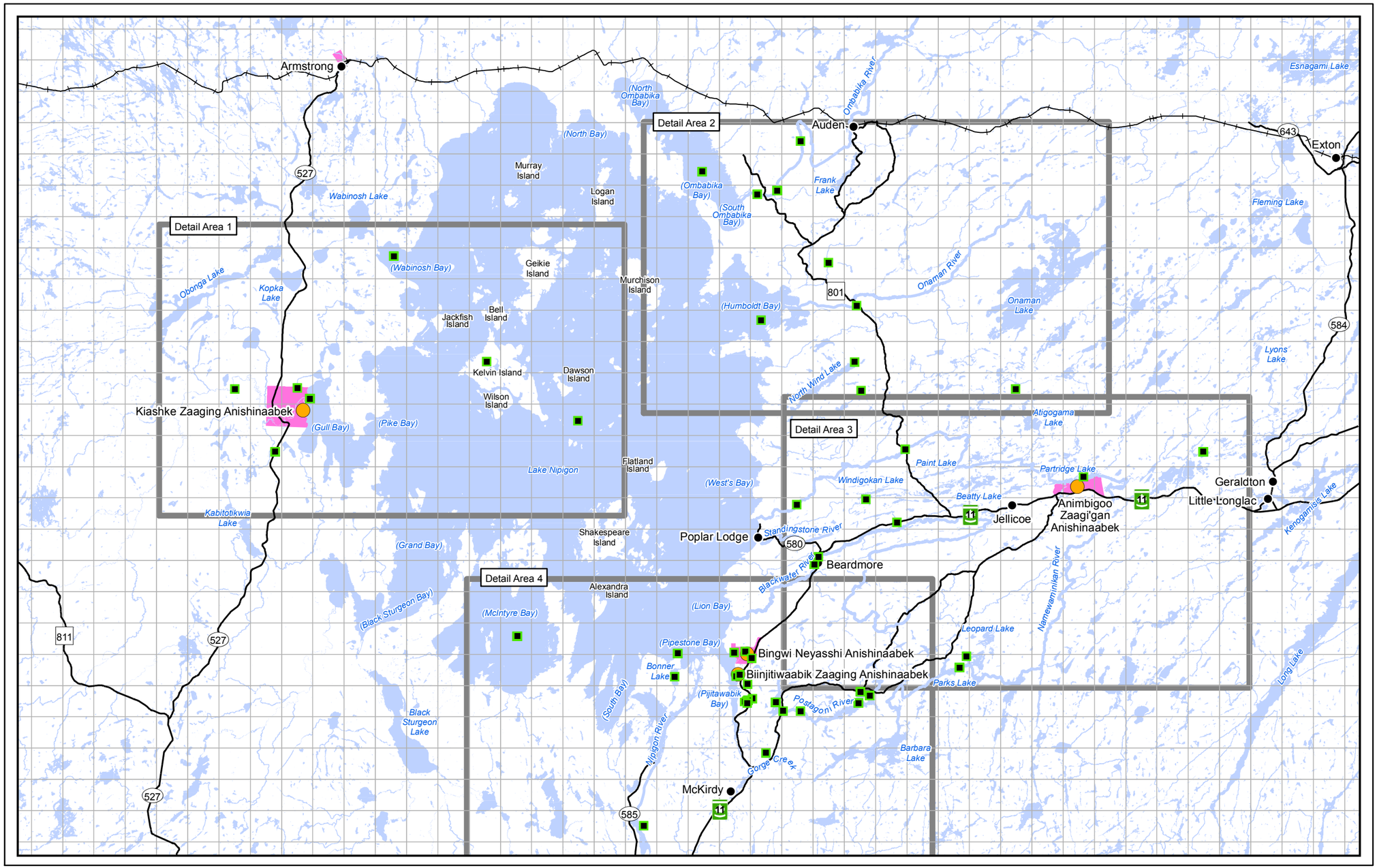
Original Scale 1:650,000
CanNorth
Figure: 3.6-6

Figure 3.6-6. Approximate medicinal vegetation harvest areas of interviewed NTC community members.



Base Map

- Country Food Sample Location
- Study Community
- Community
- First Nation Reserve Lands
- Highway/Roadway
- Railway
- Waterbody

Map Sources: Natural Resources Canada "CanVec+"; Contains information licensed under the Open Government Licence – Ontario.
Refer to text for full details & disclaimer.
File: 1807-29 Client: Nokiiwin Tribal Council/Health Canada
18 / Apr / 2016 Geomatics: CC Reviewed by: KW

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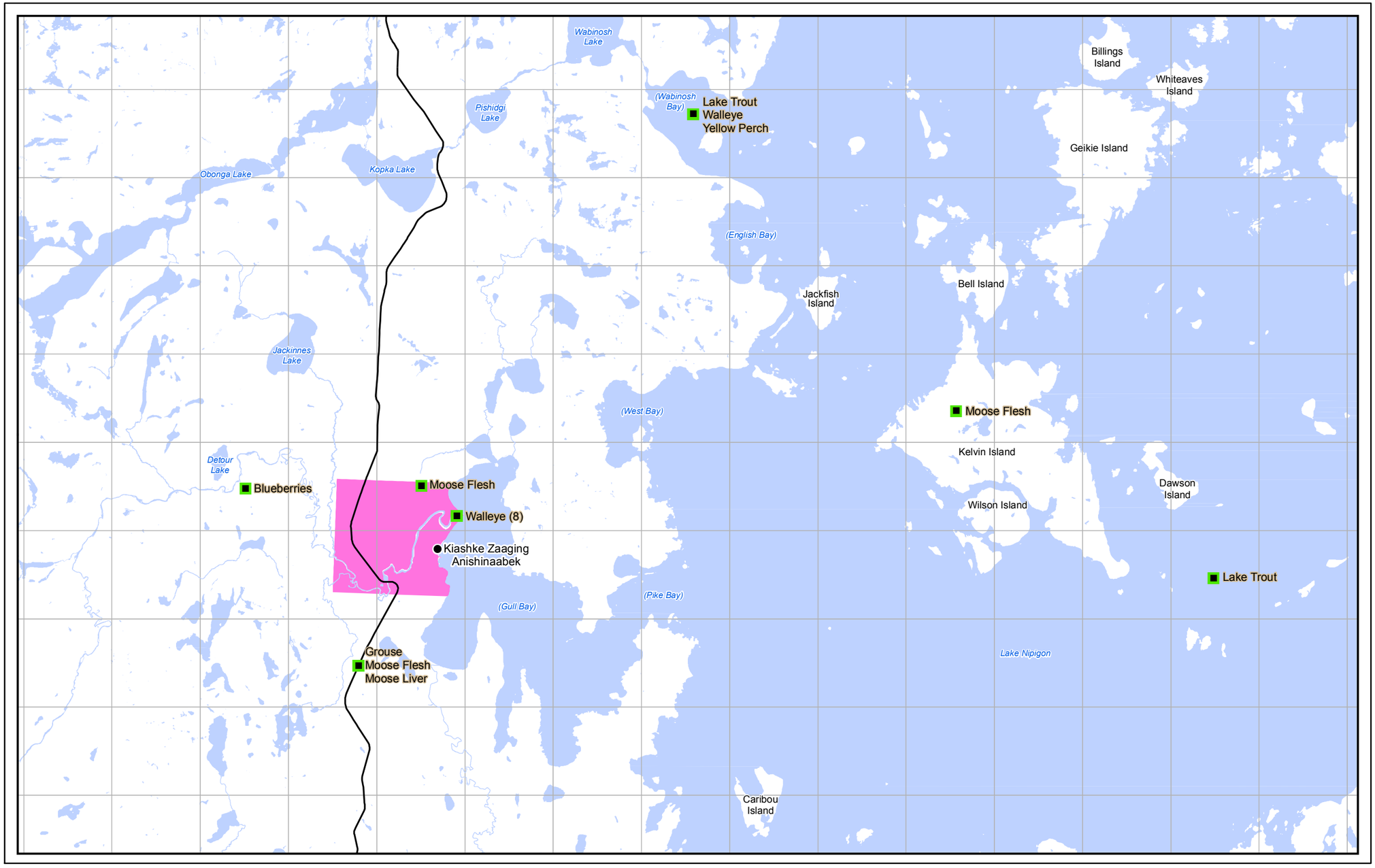
Figure: **5.1-1**

Figure 5.1-1. Overview of the detailed country foods sampling locations in the NTC study area.



Base Map

- Country Food Sample Location
- Community
- First Nation Reserve Land
- Highway/Roadway
- Waterbody

Map Sources: Natural Resources Canada "CanVec+"; Contains information licensed under the Open Government Licence – Ontario.
Refer to text for full details & disclaimer.
File: 1807-30 Client: Nokiiwin Tribal Council/Health Canada
19 / Apr / 2016 Geomatics: CC Reviewed by: KW

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CanNorth

Figure: **5.1-2**

Figure 5.1-2. Detailed country foods sampling locations, map 1 of 4.

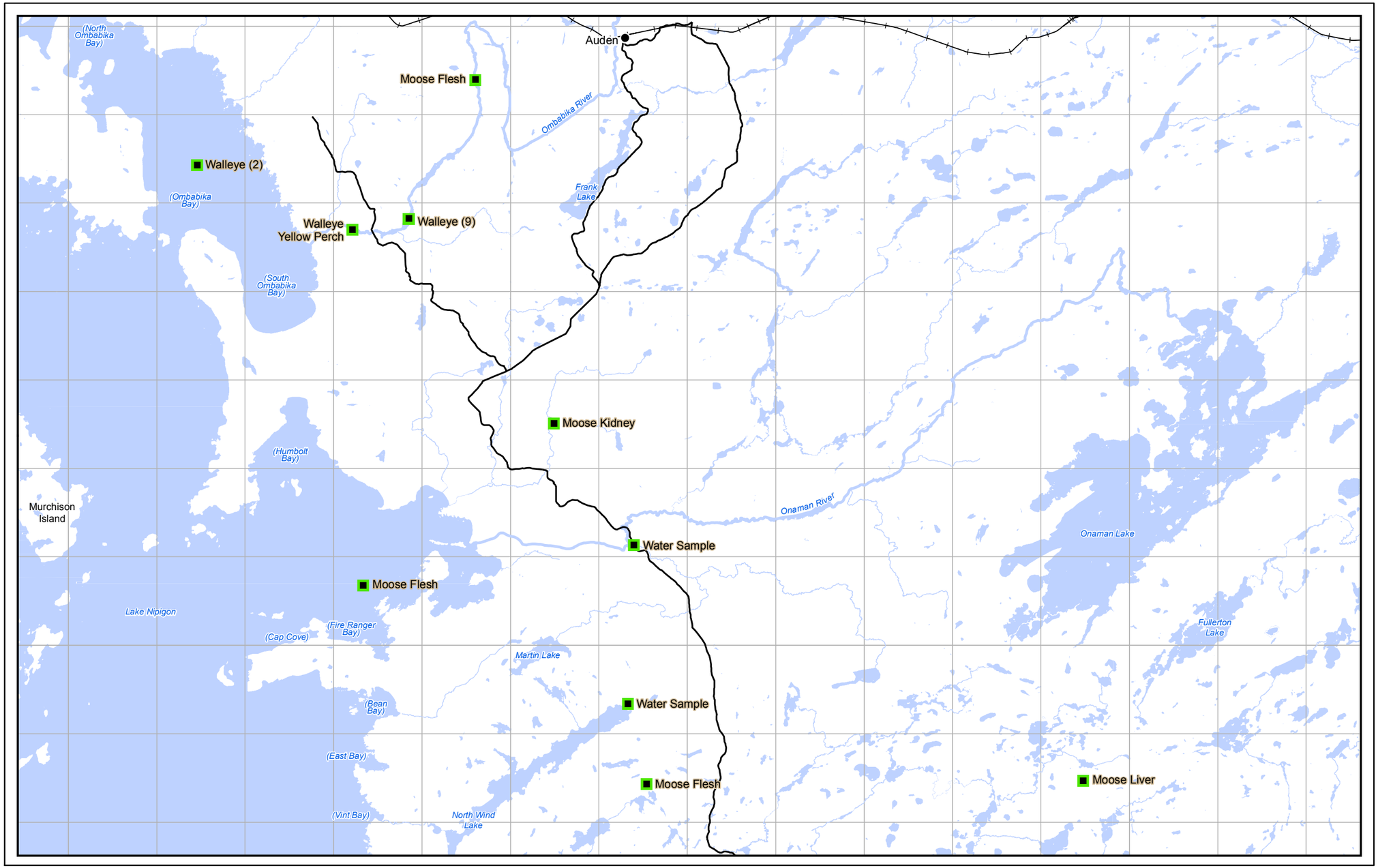


Figure 5.1-3. Detailed country foods sampling locations, map 2 of 4.

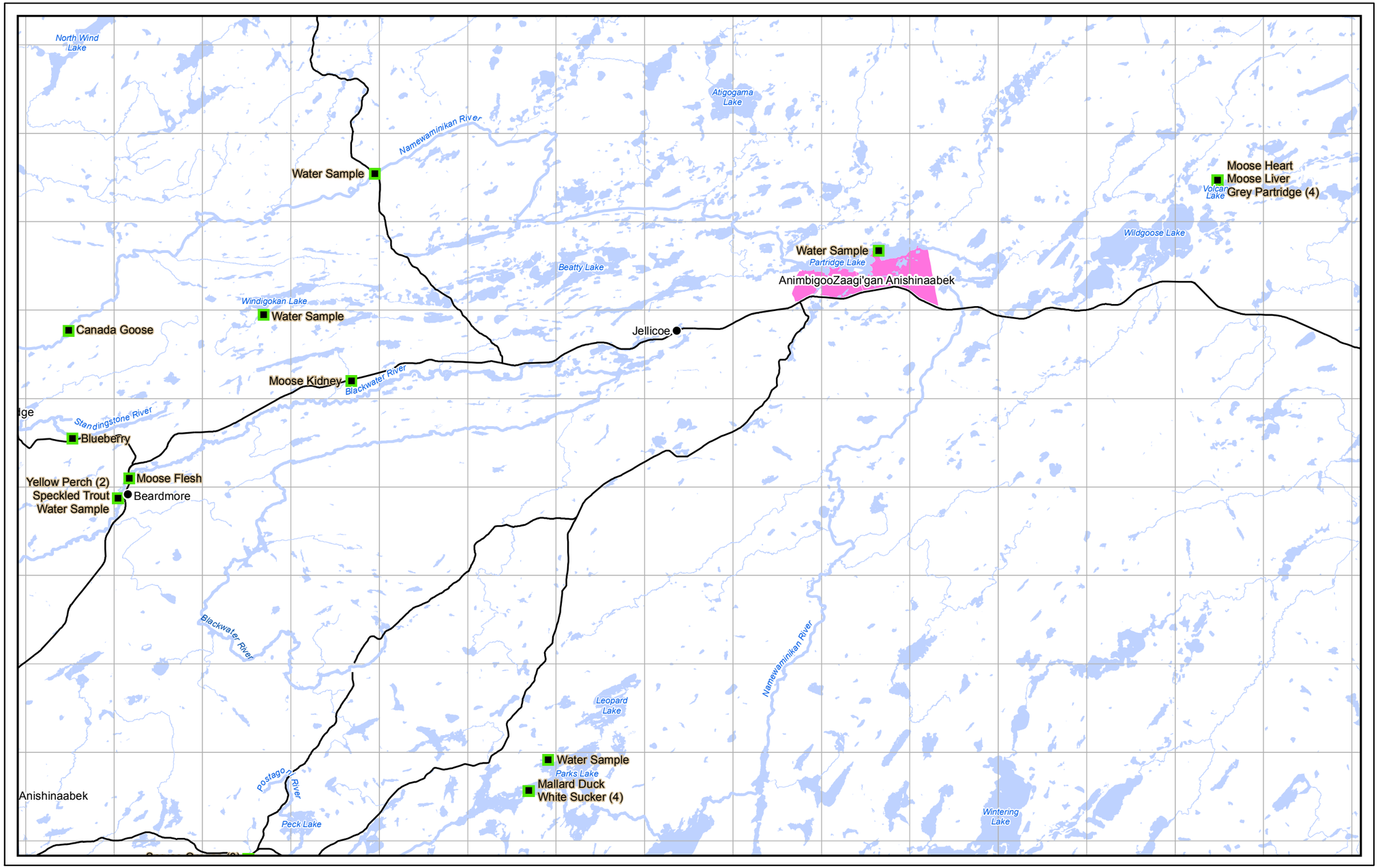
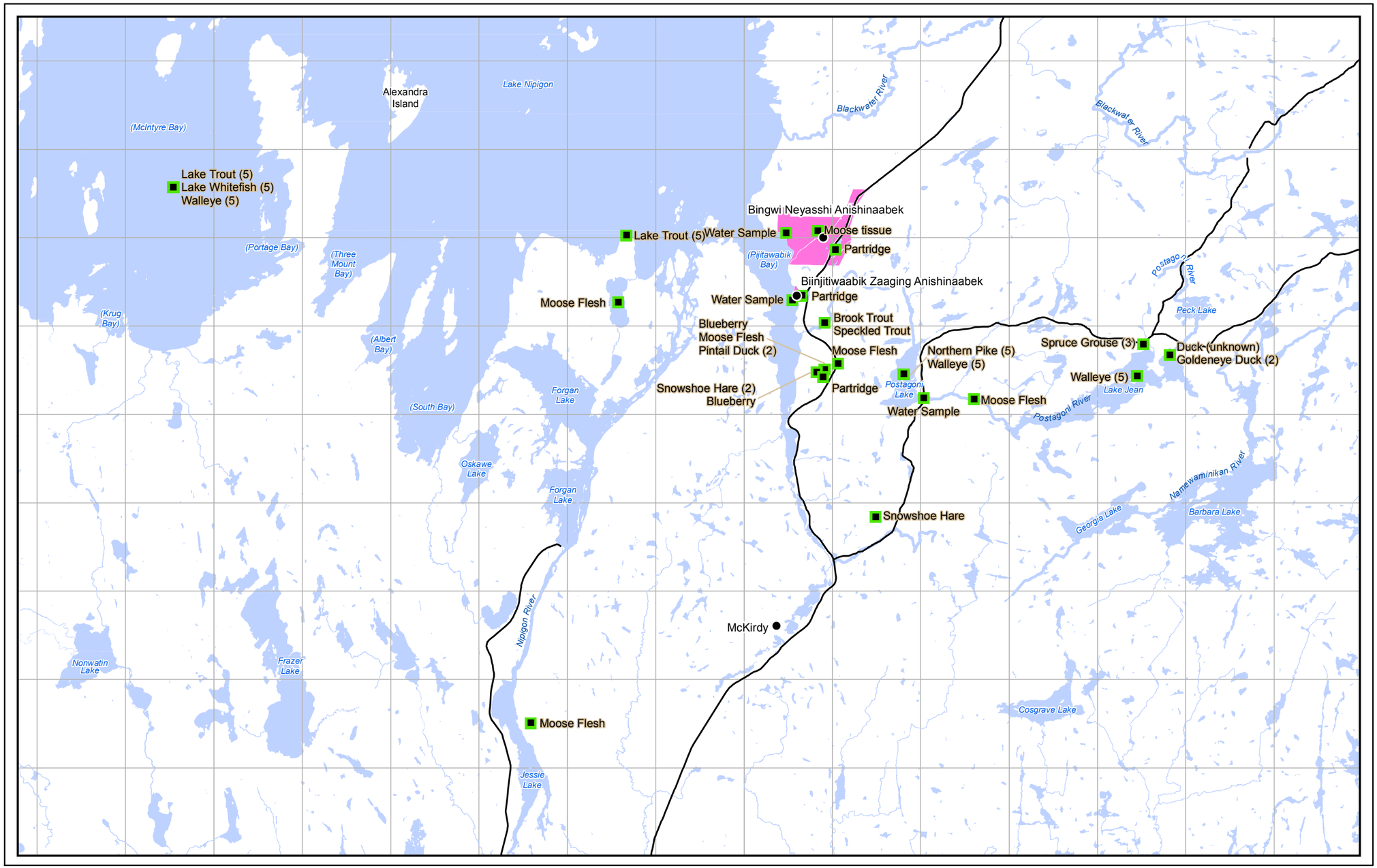


Figure 5.1-4. Detailed country foods sampling locations, map 3 of 4.



Base Map

- Country Food Sample Location
- Community
- First Nation Reserve Land
- Highway/Roadway
- Waterbody

Map Sources: Natural Resources Canada "CanVec+"; Contains information licensed under the Open Government Licence – Ontario.
Refer to text for full details & disclaimer.
File: 1807-30 Client: Nokiiwin Tribal Council/Health Canada
19 / Apr / 2016 Geomatics: CC Reviewed by: KW

0 NAD 1983 UTM Zone 16North 10 km
Original Scale 1:230,000

CanNorth

Figure: **5.1-5**

Figure 5.1-5. Detailed country foods sampling locations, map 4 of 4.

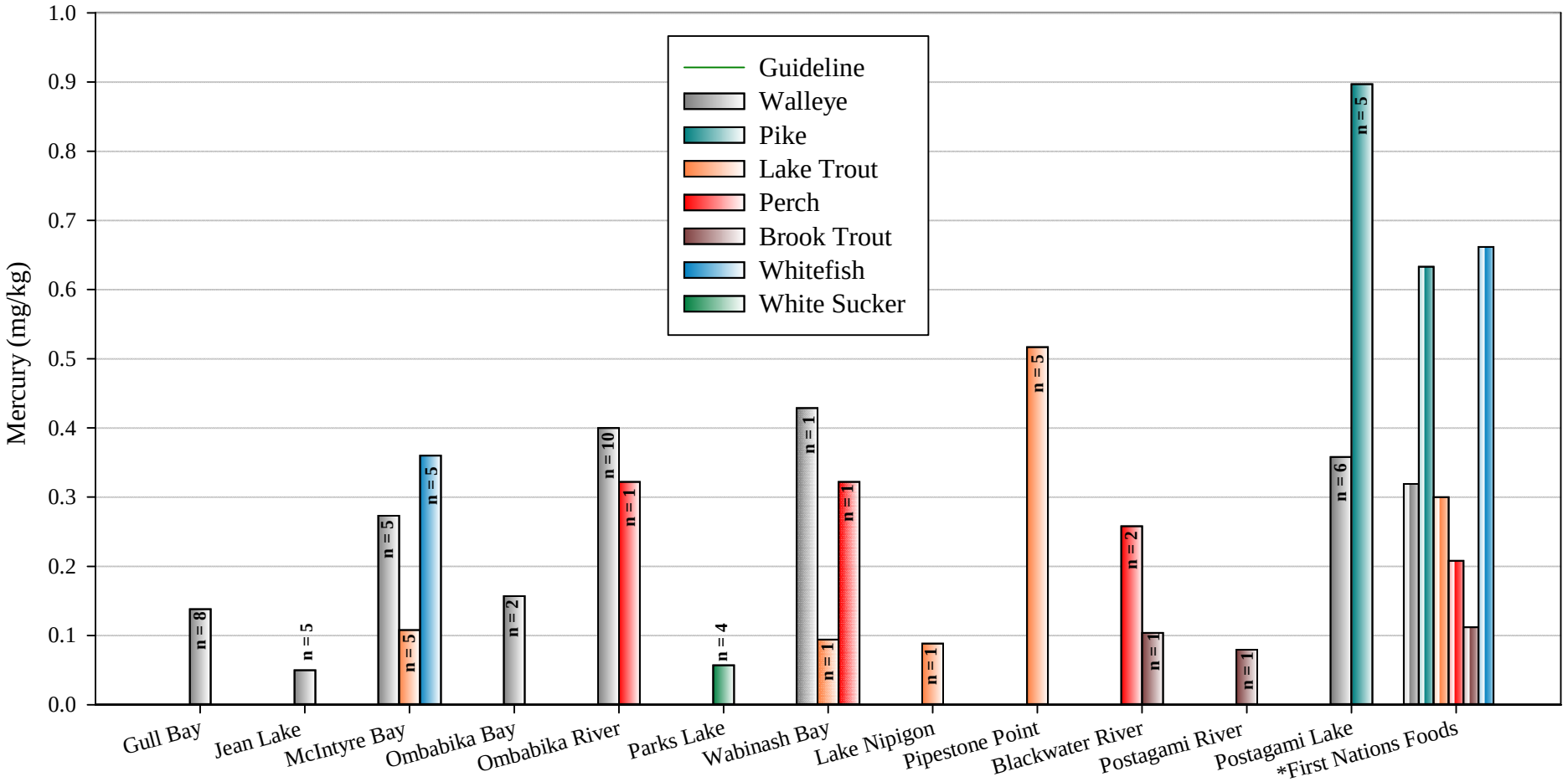


Figure 6.2-1
Mean mercury concentrations in fish tissue samples collected in the NTC study area.
*First Nations Food, Nutrition and Environmental Study, 2011-2012 (Chan et al 2014). Sample size not available.

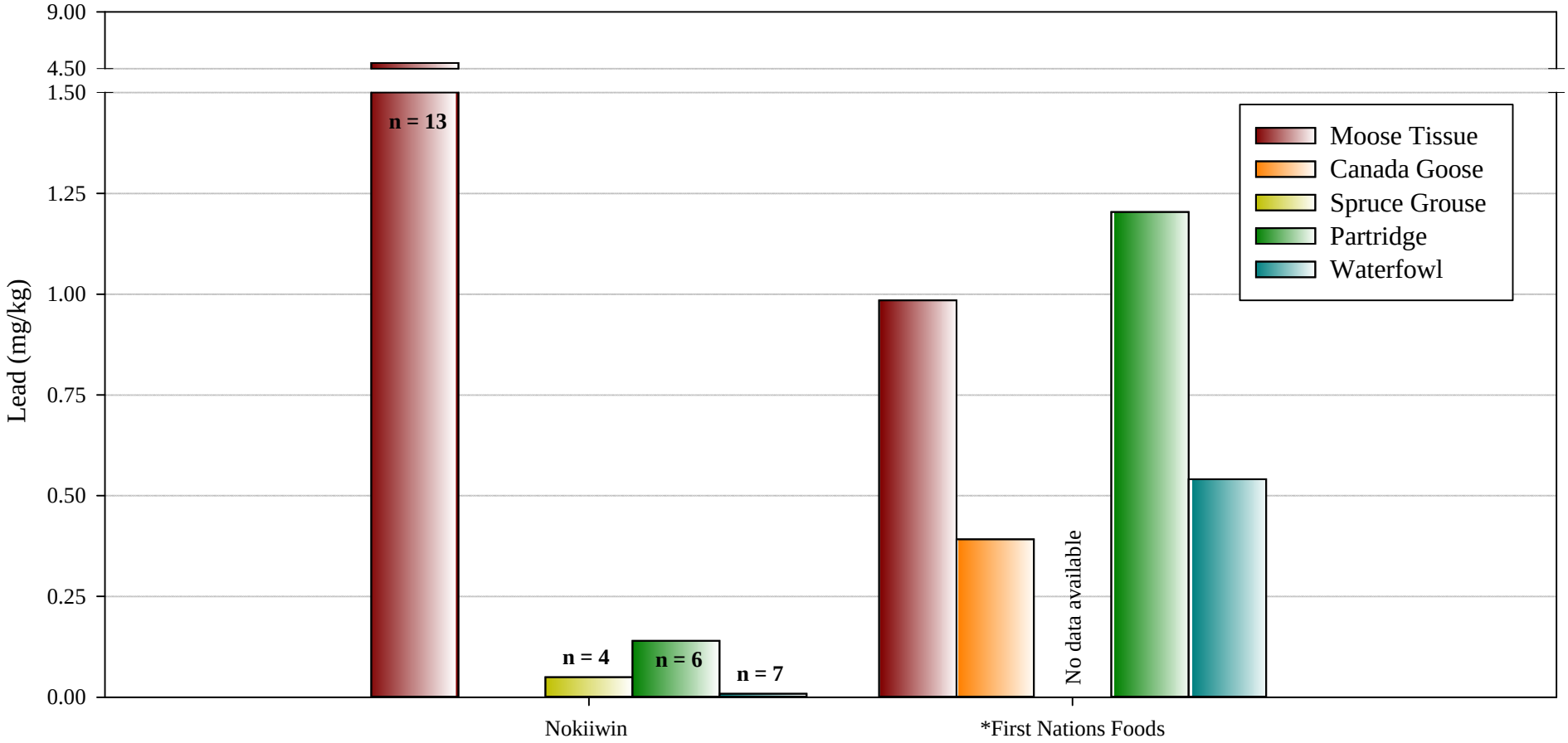


Figure 6.3-1
Mean lead concentrations in moose and bird tissue samples collected in the NTC study area.
*First Nations Food, Nutrition and Environmental Study, Onatrio 2011-2012 (Chan et al. 2014). Sample size not available.

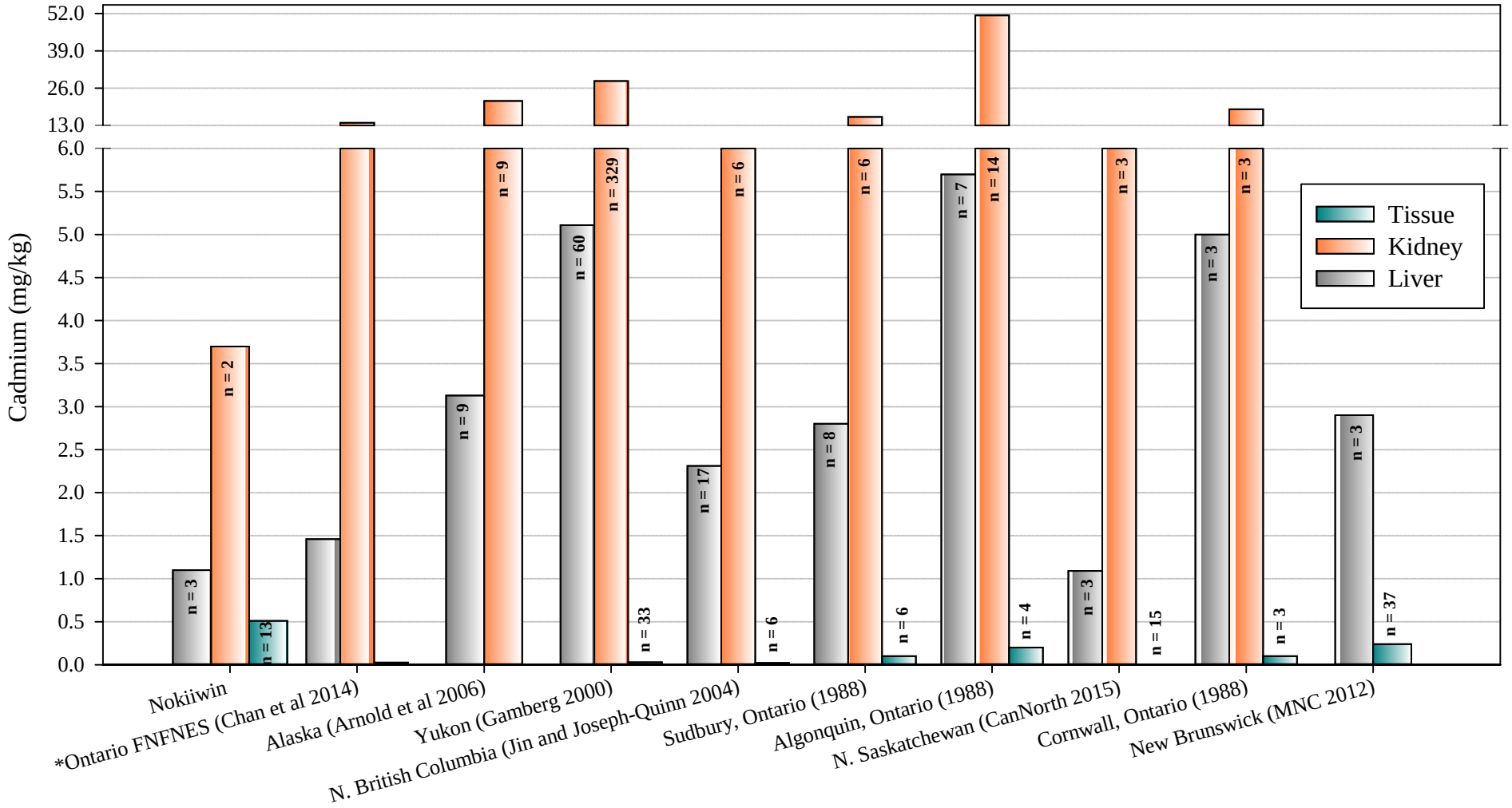


Figure 6.5-1
Mean cadmium concentrations in moose kidney, liver, and tissue samples collected in the NTC study area.

*First Nations Food, Nutrition and Environmental Study, Ontarion 2011-2012 (Chan et al. 2014). Sample size not available.

TABLES

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TABLE 4.2-1

Number and percentage of population who consumed country foods in the last year from four Nokiwiin Tribal Council (NTC) communities.

Common Name	Latin Name	AZA		BNA		BZA		KZA		Total	% of NTC
		(n=38)	%	(n=14)	%	(n=30)	%	(n=12)	%	(n=95)	Interviewed
Land and Aquatic Mammals											
Moose meat	***Alces alces***	**33**	**86.8**	**14**	**100.0**	**29**	**96.7**	**11**	**91.7**	**87**	**91.6**
Snowshoe Hare	***Lepus americanus***	**24**	**63.2**	**7**	**50.0**	**16**	**53.3**	**7**	**58.3**	**54**	**56.8**
Moose Kidney	-	**14**	**36.8**	**2**	**14.3**	**11**	**36.7**	**3**	**25.0**	**30**	**31.6**
Moose Liver	-	9	23.7	2	14.3	11	36.7	4	33.3	26	27.4
White-tailed/ Mule Deer	*Odocoileus virginianus/hemionus*	7	18.4	4	28.6	8	26.7	0	0	19	20.0
Beaver	*Castor canadensis*	4	10.5	1	7.1	9	30.0	1	8.3	15	15.8
Black Bear	*Ursus americanus*	2	5.3	0	0	3	10.0	1	8.3	6	6.3
Woodland Caribou	*Rangifer tarandus caribou*	0	0	0	0	6	20.0	0	0	6	6.3
Porcupine	*Erethizon dorsatum*	0	0	1	7.1	3	10.0	0	0	4	4.2
Moose Heart	-	3	7.9	0	0	0	0.0	0	0	3	3.2
Muskrat	*Ondatra zibethicus*	0	0	0	0	2	6.7	1	8.3	3	3.2
Deer Liver	-	0	0	1	7.1	1	3.3	0	0	2	2.1
Moose Tongue/Nose	-	1	2.6	0	0	0	0.0	0	0	1	1.1
Deer Kidney	-	0	0	0	0	1	3.3	0	0	1	1.1
Woodland Caribou Liver	-	0	0	0	0	1	3.3	0	0	1	1.1
Woodland Caribou Kidney	-	0	0	0	0	1	3.3	0	0	1	1.1
Squirrel	*Tamiasciurus hudsonicus*	0	0	0	0	1	3.3	0	0	1	1.1
Lynx	*Lynx canadensis*	0	0	0	0	1	3.3	0	0	1	1.1
Fish											
Walleye (Pickerel)	***Sander vitreus***	**34**	**89.5**	**14**	**100.0**	**30**	**100.0**	**12**	**100.0**	**90**	**94.7**
Lake Whitefish	***Coregonus clupeaformis***	**23**	**60.5**	**7**	**50.0**	**21**	**70.0**	**9**	**75.0**	**60**	**63.2**
Lake Trout	***Salvelinus namaycush***	**17**	**44.7**	**6**	**42.9**	**20**	**66.7**	**6**	**50.0**	**49**	**51.6**
Rainbow Smelt	*Osmerus mordax*	23	60.5	4	28.6	14	46.7	3	25.0	44	46.3
Brook Trout	*Salvelinus fontinalis*	15	39.5	4	28.6	18	60.0	3	25.0	40	42.1
Yellow Perch	*Perca flavescens*	18	47.4	3	21.4	18	60.0	1	8.3	40	42.1
Northern Pike	*Esox lucius*	18	47.4	4	28.6	12	40.0	4	33.3	38	40.0
Cisco (Tullibee)	*Coregonus artedi*	20	52.6	0	0	14	46.7	1	8.3	35	36.8
Lake Sturgeon	*Acipenser fulvescens*	5	13.2	1	7.1	10	33.3	8	66.7	24	25.3
Rainbow Trout	*Oncorhynchus mykiss*	3	7.9	3	21.4	18	60.0	0	0	24	25.3
Cutthroat Trout	*Oncorhynchus clarkii*	3	7.9	4	28.6	16	53.3	0	0	23	24.2
Salmon Species	*Oncorhynchus sp.*	4	10.5	1	7.1	14	46.7	2	16.7	21	22.1
Sauger	*Sander canadensis*	9	23.7	2	14.3	10	33.3	0	0	21	22.1
Burbot (Mariah, Ling)	*Lota lota*	4	10.5	0	0	12	40.0	3	25.0	19	20.0
Sucker Species	*Catostomus sp.*	4	10.5	1	7.1	9	30.0	1	8.3	15	15.8
Brown Trout	*Salmo trutta*	2	5.3	2	14.3	5	16.7	0	0	9	9.5
Smallmouth Bass	*Micropterus dolomieu*	0	0	0	0	3	10.0	0	0	3	3.2
Birds											
Spruce Grouse	***Falcipennis canadensis***	**21**	**55**	**5**	**36**	**14**	**47**	**7**	**58**	**47**	**49.5**
Ruffed Grouse	***Bonasa umbellus***	**23**	**61**	**3**	**21**	**16**	**53**	**5**	**42**	**47**	**49.5**
Canada Goose	***Branta canadensis parvipes***	**24**	**63.2**	**4**	**28.6**	**10**	**33.3**	**5**	**41.7**	**43**	**45.3**
Mallard Duck	*Anas platyrhynchos*	17	45	5	36	12	40	3	25	37	38.9
Grey Partridge	*Perdix perdix*	4	10.5	6	42.9	16	53.3	5	41.7	31	32.6
Sharp-tailed Grouse	*Tympanuchus phasianellus*	6	16	0	0	5	17	2	17	13	13.7
American Black Duck	*Anas rubripes*	5	13.2	0	0	3	10.0	0	0	8	8.4
Pheasant	-	0	0.0	1	7.1	5	16.7	0	0.0	6	6.3
Canvasback Duck	*Aythya valisineria*	5	13.2	0	0	1	3.3	0	0	6	6.3
Wood Duck	*Aix sponsa*	2	5.3	0	0	1	3.3	0	0	3	3.2
Teal	-	3	7.9	0	0.0	0	0.0	0	0.0	3	3.2
Loon	*Gavia immer*	0	0.0	0	0.0	3	10.0	0	0.0	3	3.2
Snow Goose	*Anser coerulescens*	0	0.0	0	0.0	3	10.0	0	0.0	3	3.2
Misc. Bird Eggs	-	1	2.6	0	0.0	2	6.7	0	0.0	3	3.2
Redhead	*Aythya americana*	0	0.0	0	0.0	1	3.3	0	0.0	1	1.1
Goldeneye	*Bucephala clangula*	1	2.6	0	0.0	0	0.0	0	0.0	1	1.1

TABLE 4.2-1

Number and percentage of population who consumed country foods in the last year from four Nokiwiin Tribal Council (NTC) communities.

Common Name	Latin Name	AZA		BNA		BZA		KZA		Total	% of NTC
		(n=38)	%	(n=14)	%	(n=30)	%	(n=12)	%	(n=95)	Interviewed
Vegetation (berries)											
Blueberry	***Vaccinium myrtilloides***	**31**	**82**	**11**	**79**	**26**	**87**	**11**	**92**	**79**	**83.2**
Raspberry	***Rubus idaeus***	**20**	**53**	**6**	**43**	**27**	**90**	**8**	**67**	**61**	**64.2**
Wild Strawberry	***Fragaria virginiana***	**14**	**37**	**2**	**14**	**19**	**63**	**3**	**25**	**38**	**40.0**
Saskatoon berry	*Amelanchier alnifolia*	5	13	4	29	10	33	1	8	20	21.1
Pincherry	*Prunus pensylvanica*	5	13	3	21	11	37	0	0	19	20.0
Chokecherry	*Prunus virginiana*	2	5	2	14	3	10	0	0	7	7.4
Gooseberry	*Ribes sp.*	3	8	1	7	2	7	0	0	6	6.3
Bog Cranberry	*Vaccinium vitis-idaea*	1	3	0	0	3	10	0	0	4	4.2
Highbush Cranberry	*Viburnum trilobum*	2	5	0	0	2	7	0	0	4	4.2
Rosehips	*Rosa acicularis*	2	5	1	7	0	0	0	0	3	3.2
Cloudberry	*Rubus chamaemorus*	1	3	0	0	0	0	0	0	1	1.1
Currant	*Ribes sp.*	0	0	0	0	1	3	0	0	1	1.1
Vegetation (edible/other)											
Wild Rice	***Zizania palustris***	**7**	**18.4**	**1**	**7.1**	**11**	**36.7**	**2**	**16.7**	**21**	**22.1**
Labrador Tea	***Ledum groenlandicum***	**13**	**34**	**3**	**21**	**3**	**10**	**1**	**8**	**20**	**21.1**
Wild Mushrooms	**-**	**4**	**10.5**	**1**	**7.1**	**6**	**20.0**	**1**	**8.3**	**12**	**12.6**
Wild Mint	*Mentha arvensis*	6	15.8	1	7.1	2	6.7	1	8.3	10	10.5
Wild Carrot Root	*Daucus carota*	0	0.0	0	0.0	7	23.3	0	0.0	7	7.4
Vegetation (medicinal/other)											
Sweet grass	*Hierochloe odorata*	**8**	**21.1**	**3**	**21.4**	**14**	**46.7**	**4**	**33.3**	**29**	**30.5**
Birch bark	**-**	**7**	**18.4**	**3**	**21.4**	**4**	**13.3**	**1**	**8.3**	**15**	**15.8**
Cedar	**-**	**7**	**18.4**	**3**	**21.4**	**4**	**13.3**	**1**	**8.3**	**15**	**15.8**
Spruce Gum	-	8	21.1	1.0	7.1	2	6.7	1	8.3	12	12.6
Common Dandelion	*Taraxacum officinale*	6	15.8	1	7.1	2	6.7	1	8.3	10	10.5
Bearberry	*Arctostaphylos Uva-Ursi*	8	21.1	0	0.0	1	3.3	0	0.0	9	9.5
St. John's Wort	*Hypericum perforatum*	5	13.2	0	0.0	4	13.3	0	0.0	9	9.5
Tamarack	*Larix laricina*	5	13.2	0	0.0	3	10.0	0	0.0	8	8.4
Juniper	*Juniperus communis*	5	13.2	0	0.0	3	10.0	0	0.0	8	8.4
Balsalm Bark	-	5	13.2	0	0.0	3	10.0	0	0.0	8	8.4
Birch Sap	-	5	13.2	1	7.1	1	3.3	0	0.0	7	7.4
Lily Root	-	4	10.5	0	0.0	2	6.7	0	0.0	6	6.3
Rat Root	*Acorus calamus*	6	15.8	0	0.0	0	0.0	0	0.0	6	6.3
Yarrow	*Achilllea millefolium*	5	13.2	0	0.0	0	0.0	0	0.0	5	5.3
Pitcher Plant	*Sarracenia purpurea*	4	10.5	0	0.0	1	3.3	0	0.0	5	5.3
Red Osier Dogwood	*Cornus sericea*	4	10.5	1	7.1	0	0.0	0	0.0	5	5.3
Bunchberry	*Cornus canadensis*	5	13.2	0	0.0	0	0.0	0	0.0	5	5.3
Sweet flag	*Acorus calamus*	4	10.5	0	0.0	0	0.0	0	0.0	4	4.2

AZA = Animbiigoo Zaagi'igan Anishinaabek; BNA = Biinjitiwaabik Zaaging Anishinaabek; BZA = Biinjitiwaabik Zaaging Anishinaabek; KZA = Kiashke Zaaging Anishinaabek.

Bolded entries indicate the top 3 foods types consumed by NTC communities overall.

TABLE 4.2-2

Seasonal and total frequency of use of country food types by NTC community members, based on Food Frequency Questionnaire results, 2015.

Country Food Type	Spring - # of times eaten per season	Summer - # of times eaten per season	Fall - # of times eaten per season	Winter - # of times eaten per season	Yearly Total	Average Portions pp/yr*
Community - AZA (n=38)						
Birds	175	54	438	67	734	19.3
Edible plants	225	665	409	221	1520	40.0
Fish	508	717	522	420	**2167**	57.0
Mammals	317	303	543	487	1650	43.4
Total	1225	1739	**1912**	1195	6071	159.8
Community - BNA (n=15)						
Birds	32	15	79	28	154	10.3
Edible plants	51	202	115	78	446	29.7
Fish	287	298	297	174	**1056**	70.4
Mammals	108	84	129	101	422	28.1
Total	478	599	**620**	381	2078	138.5
Community - BZA (n=30)						
Birds	180	6	258	9	453	15.1
Edible plants	120	1127	450	105	1802	60.1
Fish	945	957	1078	965	**3945**	131.5
Mammals	108	99	689	543	1439	48.0
Total	1353	2189	**2475**	1622	7639	254.6
Community - KZA (n=12)						
Birds	104	30	183	75	392	32.7
Edible plants	69	570	76	51	766	63.8
Fish	457	369	284	219	**1329**	110.8
Mammals	117	132	437	329	1015	84.6
Total	747	**1101**	980	674	3502	291.8
All Communities (n=95)						
Birds	491	105	958	179	1733	18.2
Edible plants	465	2564	1050	455	4534	47.7
Fish	2197	2341	2181	1778	**8497**	89.4
Mammals	650	618	1798	1460	4526	47.6
Total	3803	5639	**5987**	3872	19301	203.2

*pp/yr = per person per year.

Bolded entries indicate the top season for portions and top country food type yearly.

TABLE 4.2-3

Seasonal and total frequency of country food use (by species) by all NTC communities, based on Food Frequency Questionnaire results, 2015.

Country Food Species	Number of Portions Eaten				Total Portions	Average # of Portions pp/yr*
	Spring	Summer	Fall	Winter		
Walleye (Pickerel)	**736**	**872**	**593**	**505**	**2706**	**28.5**
Moose Meat	**403**	**436**	**1053**	**814**	**2706**	**28.5**
Blueberry	**220**	**886**	**391**	**226**	**1723**	**18.1**
Lake Whitefish	**253**	**240**	**406**	**210**	**1109**	**11.7**
Raspberry	**85**	**628**	**247**	**88**	**1048**	**11.0**
Lake Trout	**162**	**229**	**166**	**186**	**743**	**7.8**
Brook Trout	**129**	**152**	**210**	**186**	**677**	**7.1**
Rabbit	**118**	**91**	**186**	**280**	**675**	**7.1**
Northern Pike (Jackfish)	**143**	**123**	**123**	**106**	**495**	**5.2**
Wild Strawberry	**37**	**307**	**121**	**15**	**480**	**5.1**
Ruffed Grouse	52	18	312	74	456	4.8
Smelt	192	84	102	75	453	4.8
Spruce Grouse	46	42	297	56	441	4.6
Yellow Perch	127	124	65	78	394	4.1
Sauger	57	129	120	87	393	4.1
Moose Kidney	43	31	183	131	388	4.1
Moose Liver	25	28	177	111	341	3.6
Rainbow Trout	72	78	111	76	337	3.5
Salmon	61	67	84	64	276	2.9
Canada Goose	154	21	61	19	255	2.7
Pin Cherry	12	171	21	12	216	2.3
Lake Sturgeon	91	72	33	18	214	2.3
Cedar	43	68	49	49	209	2.2
Mallard Duck	101	6	84	3	194	2.0
Gray Partridge	43	3	120	18	184	1.9
Cisco (Tullibee)	39	48	51	36	174	1.8
Wild Rice	6	87	66	9	168	1.8
Suckers	51	36	36	36	159	1.7
Burbot (Mariah)	12	18	45	76	151	1.6
Beaver	32	10	48	55	145	1.5
Smallmouth Bass	36	36	36	36	144	1.5
Saskatoon Berry	3	99	37	0	139	1.5
Deer Meat	6	9	88	33	136	1.4
Wild Carrot	6	60	24	3	93	1.0
Gooseberry	0	89	3	0	92	1.0
Labrador Tea	8	37	22	20	87	0.9
Mushrooms	9	54	15	6	84	0.9
Other	16	16	16	16	64	0.7
Brown Trout	36	18	0	3	57	0.6
Muskrat	20	10	12	14	56	0.6
Sharp-tailed Grouse	4	3	39	9	55	0.6
Bog cranberry	0	32	6	0	38	0.4
Roots	12	9	9	6	36	0.4
Pheasant	18	0	12	0	30	0.3
American Black Duck	18	0	9	0	27	0.3
Teal	6	6	12	0	24	0.3

TABLE 4.2-3

Seasonal and total frequency of country food use (by species) by all NTC communities, based on Food Frequency Questionnaire results, 2015.

Country Food Species	Number of Portions Eaten				Total Portions	Average # of Portions pp/yr*
	Spring	Summer	Fall	Winter		
Other Edible Plants	3	0	6	15	24	0.3
Rosehips	5	5	8	5	23	0.2
Woodland Caribou	0	0	15	7	22	0.2
Bear	0	0	21	0	21	0.2
Chokecherry	0	11	6	0	17	0.2
Canvasback Duck	16	0	0	0	16	0.2
Highbush Cranberry	0	10	6	0	16	0.2
Wood Duck	6	3	6	0	15	0.2
Redhead	12	0	0	0	12	0.1
Brown Trout (spec)	0	12	0	0	12	0.1
Bird Eggs	9	0	0	0	9	0.1
Wild Mint	3	3	3	0	9	0.1
Loon	0	0	6	0	6	0.1
Snow Goose	3	3	0	0	6	0.1
Deer Liver	0	0	6	0	6	0.1
Porcupine	0	3	3	0	6	0.1
Total	**3803**	**5639**	**5987**	**3872**	**19301**	**203.2**

Results are based on the total number of Food Frequency Questionnaires completed (n=95).

*pp/yr = per person per year.

Bolded entries indicate the top ten country foods consumed.

TABLE 4.2-4

Seasonal and total frequency of country food use (by species) by AZA community members, based on Food Frequency Questionnaire results, 2015.

Country Food Species	Number of Portions Eaten				Total Portions	Average # of Portions pp/yr*
	Spring	Summer	Fall	Winter		
Moose Meat	**243**	**246**	**359**	**303**	**1151**	**30.3**
Walleye (Pickerel)	**197**	**341**	**281**	**238**	**1057**	**27.8**
Blueberry	**106**	**242**	**154**	**109**	**611**	**16.1**
Rabbit	**56**	**48**	**61**	**127**	**292**	**7.7**
Raspberry	**25**	**145**	**91**	**31**	**292**	**7.7**
Ruffed Grouse	**21**	**15**	**147**	**29**	**212**	**5.6**
Lake Whitefish	**47**	**57**	**65**	**33**	**202**	**5.3**
Lake Trout	**33**	**76**	**31**	**54**	**194**	**5.1**
Spruce Grouse	**15**	**3**	**129**	**17**	**164**	**4.3**
Sauger	**9**	**81**	**54**	**9**	**153**	**4.0**
Northern Pike (Jackfish)	48	48	36	19	151	4.0
Wild Strawberry	31	65	39	6	141	3.7
Canada Goose	57	21	39	18	135	3.6
Brook Trout	36	37	30	21	124	3.3
Cedar	28	32	31	31	122	3.2
Yellow Perch	43	43	10	15	111	2.9
Smelt	81	3	3	3	90	2.4
Mallard Duck	36	3	48	0	87	2.3
Other	16	16	19	28	79	2.1
Moose Kidney	6	6	32	21	65	1.7
Pin Cherry	0	64	0	0	64	1.7
Gooseberry	0	48	0	0	48	1.3
Labrador Tea	5	5	19	17	46	1.2
Beaver	12	0	15	15	42	1.1
Gray Partridge	0	0	36	0	36	0.9
Deer Meat	0	3	25	6	34	0.9
Moose Liver	0	0	30	3	33	0.9
Saskatoon Berry	3	4	25	0	32	0.8
Sharp-tailed Grouse	3	3	18	3	27	0.7
Burbot (Mariah)	0	0	0	24	24	0.6
Teal	6	6	12	0	24	0.6
Wild Rice	0	12	11	0	23	0.6
Suckers	12	3	3	3	21	0.6
Rosehips	5	5	5	5	20	0.5
Mushrooms	3	9	3	3	18	0.5
Bear	0	0	18	0	18	0.5
Canvasback Duck	16	0	0	0	16	0.4
American Black Duck	9	0	6	0	15	0.4
Highbush Cranberry	0	7	6	0	13	0.3
Roots	3	3	3	3	12	0.3
Brown Trout	0	12	0	0	12	0.3
Salmon	1	4	3	1	9	0.2
Wood Duck	3	3	3	0	9	0.2
Rainbow Trout	0	3	6	0	9	0.2
Lake Sturgeon	1	6	0	0	7	0.2
Bog cranberry	0	0	6	0	6	0.2

TABLE 4.2-4

Seasonal and total frequency of country food use (by species) by AZA community members, based on Food Frequency Questionnaire results, 2015.

Country Food Species	Number of Portions Eaten				Total Portions	Average # of Portions pp/yr*
	Spring	Summer	Fall	Winter		
Bird Eggs	6	0	0	0	6	0.2
Chokecherry	0	5	0	0	5	0.1
Cloudberry	0	3	0	0	3	0.1
Brown Trout	0	3	0	0	3	0.1
Other Ducks	3	0	0	0	3	0.1
Total	1225	1739	1912	1195	6071	159.8

Results are based on the total number of Food Frequency Questionnaires completed (n=38).

*pp/yr = per person per year.

Bolded entries indicate the top ten country foods consumed.

TABLE 4.2-5

Seasonal and total frequency of country food use (by species) by BNA community members, based on Food Frequency Questionnaire results, 2015.

Country Food Species	Number of Portions Eaten				Total Portions	Average # of Portions pp/yr*
	Spring	Summer	Fall	Winter		
Walleye (Pickerel)	**105**	**117**	**78**	**60**	**360**	**24.0**
Moose Meat	**69**	**66**	**90**	**63**	**288**	**19.2**
Lake Whitefish	**33**	**33**	**117**	**21**	**204**	**13.6**
Blueberry	**24**	**67**	**51**	**45**	**187**	**12.5**
Smelt	**30**	**21**	**27**	**15**	**93**	**6.2**
Raspberry	**12**	**42**	**21**	**12**	**87**	**5.8**
Northern Pike (Jackfish)	**30**	**18**	**18**	**15**	**81**	**5.4**
Brook Trout	**18**	**28**	**15**	**15**	**76**	**5.1**
Pin Cherry	**12**	**27**	**15**	**12**	**66**	**4.4**
Yellow Perch	**15**	**18**	**15**	**15**	**63**	**4.2**
Rabbit	27	6	6	21	60	4.0
Lake Trout	15	24	6	12	57	3.8
Sauger	12	12	15	15	54	3.6
Ruffed Grouse	3	3	33	12	51	3.4
Deer Meat	6	6	15	9	36	2.4
Gray Partridge	12	0	15	9	36	2.4
Rainbow Trout	15	9	6	6	36	2.4
Spruce Grouse	0	9	21	3	33	2.2
Saskatoon Berry	0	21	9	0	30	2.0
Brown Trout	12	15	0	0	27	1.8
Cedar	0	15	3	3	21	1.4
Mallard Duck	7	3	6	3	19	1.3
Moose Liver	3	3	6	3	15	1.0
Moose Kidney	3	3	6	3	15	1.0
Wild Strawberry	0	12	1	0	13	0.9
Wild Rice	3	3	3	3	12	0.8
Canada Goose	10	0	1	1	12	0.8
Labrador Tea	0	6	0	3	9	0.6
Deer Liver	0	0	6	0	6	0.4
Gooseberry	0	3	3	0	6	0.4
Mushrooms	0	3	3	0	6	0.4
Chokecherry	0	3	3	0	6	0.4
Cutthroat Trout	0	3	0	0	3	0.2
Pheasant	0	0	3	0	3	0.2
Rosehips	0	0	3	0	3	0.2
Beaver	0	0	0	2	2	0.1
Lake Sturgeon	1	0	0	0	1	0.1
Salmon	1	0	0	0	1	0.1
Porcupine	0	0	0	0	0	0.0
Total	478	599	620	381	2078	138.5

Results are based on the total number of Food Frequency Questionnaires completed (n=15).

*pp/yr = per person per year.

Bolded entries indicate the top ten country foods consumed.

TABLE 4.2-6

Seasonal and total frequency of country food use (by species) by BZA community members, based on Food Frequency Questionnaire results, 2015.

Country Food Species	Number of Portions Eaten				Total Portions	Average # of Portions pp/yr*
	Spring	Summer	Fall	Winter		
Walleye (Pickerel)	**210**	**195**	**192**	**180**	**777**	**26.8**
Moose Meat	**54**	**66**	**289**	**245**	**654**	**22.6**
Raspberry	**42**	**258**	**129**	**42**	**471**	**16.2**
Blueberry	**42**	**257**	**129**	**39**	**467**	**16.1**
Lake Whitefish	**108**	**99**	**135**	**96**	**438**	**15.1**
Lake Trout	**72**	**108**	**96**	**99**	**375**	**12.9**
Brook Trout	**75**	**84**	**69**	**78**	**306**	**10.6**
Rainbow Trout	**57**	**66**	**99**	**70**	**292**	**10.1**
Wild Strawberry	**6**	**191**	**81**	**6**	**284**	**9.8**
Salmon	**57**	**60**	**81**	**63**	**261**	**9.0**
Smelt	54	54	72	57	237	8.2
Moose Kidney	24	12	119	81	236	8.1
Moose Liver	12	15	93	81	201	6.9
Northern Pike (Jackfish)	45	42	57	54	198	6.8
Rabbit	15	3	95	84	197	6.8
Yellow Perch	57	51	40	48	196	6.8
Sauger	36	36	51	63	186	6.4
Cisco (Tullibee)	39	48	51	36	174	6.0
Smallmouth Bass	36	36	36	36	144	5.0
Suckers	39	30	33	33	135	4.7
Wild Rice	3	60	51	6	120	4.1
Lake Sturgeon	24	30	30	18	102	3.5
Burbot (Mariah)	12	18	36	31	97	3.3
Ruffed Grouse	27	0	66	3	96	3.3
Wild Carrot	6	60	24	3	93	3.2
Spruce Grouse	27	0	57	3	87	3.0
Pin Cherry	0	80	6	0	86	3.0
Gray Partridge	18	3	54	3	78	2.7
Mallard Duck	39	0	30	0	69	2.4
Deer Meat	0	0	48	18	66	2.3
Saskatoon Berry	0	62	3	0	65	2.2
Mushrooms	3	42	9	3	57	2.0
Beaver	0	0	21	24	45	1.6
Canada Goose	21	0	21	0	42	1.4
Gooseberry	0	38	0	0	38	1.3
Bog Cranberry	0	32	0	0	32	1.1
Labrador Tea	3	26	3	0	32	1.1
Pheasant	18	0	9	0	27	0.9
Brown Trout	24	0	0	3	27	0.9
Roots	9	6	6	3	24	0.8
Woodland Caribou	0	0	15	7	22	0.8
Cedar	3	9	3	3	18	0.6
American Black Duck	9	0	3	0	12	0.4
Redhead	12	0	0	0	12	0.4
Sharp-Tail Grouse	0	0	9	0	9	0.3
Other	3	0	3	3	9	0.3

TABLE 4.2-6

Seasonal and total frequency of country food use (by species) by BZA community members, based on Food Frequency Questionnaire results, 2015.

Country Food Species	Number of Portions Eaten				Total Portions	Average # of Portions pp/yr*
	Spring	Summer	Fall	Winter		
Loon	0	0	6	0	6	0.2
Snow Goose	3	3	0	0	6	0.2
Wood Duck	3	0	3	0	6	0.2
Chokecherry	0	3	3	0	6	0.2
Wild Mint	3	0	3	0	6	0.2
Porcupine	0	3	3	0	6	0.2
Bird Eggs	3	0	0	0	3	0.1
Highbush Cranberry	0	3	0	0	3	0.1
Bear	0	0	3	0	3	0.1
Total	1353	2189	2475	1622	7639	263.4

Results are based on the total number of Food Frequency Questionnaires completed (n=30).

*pp/yr = per person per year.

Bolded entries indicate the top ten country foods consumed.

TABLE 4.2-7

Seasonal and total frequency of country food use (by species) by KZA community members, based on Food Frequency Questionnaire results, 2015.

Country Food Species	Number of Portions Eaten				Total Portions	Average # of Portions pp/yr*
	Spring	Summer	Fall	Winter		
Moose Meat	**37**	**58**	**315**	**203**	**613**	**51.1**
Pickerel (Walleye)	**224**	**219**	**42**	**27**	**512**	**42.7**
Blueberry	**48**	**309**	**57**	**33**	**447**	**37.3**
Lake Whitefish	**65**	**51**	**89**	**60**	**265**	**22.1**
Raspberry	**6**	**183**	**6**	**3**	**198**	**16.5**
Brook Trout	**0**	**3**	**96**	**72**	**171**	**14.3**
Spruce Grouse	**4**	**30**	**90**	**33**	**157**	**13.1**
Rabbit	**20**	**34**	**24**	**48**	**126**	**10.5**
Lake Trout	**42**	**21**	**33**	**21**	**117**	**9.8**
Lake Sturgeon	**65**	**36**	**3**	**0**	**104**	**8.7**
Ruffed Grouse	1	0	66	30	97	8.1
Moose Liver	10	10	48	24	92	7.7
Moose Kidney	10	10	26	26	72	6.0
Canada Goose	66	0	0	0	66	5.5
Northern Pike (Jackfish)	20	15	12	18	65	5.4
Muskrat	20	10	12	14	56	4.7
Beaver	20	10	12	14	56	4.7
Cedar	12	12	12	12	48	4.0
Wild Strawberry	0	39	0	3	42	3.5
Gray Partridge	13	0	15	6	34	2.8
Smelt	27	6	0	0	33	2.8
Burbot (Mariah)	0	0	9	21	30	2.5
Yellow Perch	12	12	0	0	24	2.0
Sharp-tailed Grouse	1	0	12	6	19	1.6
Mallard Duck	19	0	0	0	19	1.6
Wild Rice	0	12	1	0	13	1.1
Saskatoon Berry	0	12	0	0	12	1.0
Salmon	2	3	0	0	5	0.4
Suckers	0	3	0	0	3	0.3
Wild Mint	0	3	0	0	3	0.3
Mushrooms	3	0	0	0	3	0.3
Total	747	1101	980	674	3502	291.8

Results are based on the total number of Food Frequency Questionnaires completed (n=12).

*pp/yr = per person per year.

Bolded entries indicate the top ten country foods consumed.

TABLE 4.2-8

Average daily intake of country foods by type and season for all NTC communities.

Country Food Type	Average Daily Intake (g) - pp/season*				Average Daily Intake (g) - Yearly
	Spring	Summer	Fall	Winter	
Birds	10.0	2.0	**19.2**	4.2	8.9
Edible plants	4.8	**38.2**	15.0	5.0	15.8
Fish	54.7	**56.3**	52.6	46.2	52.4
Mammals	15.7	15.4	**42.7**	36.5	27.6
Total	85.3	111.9	**129.5**	91.9	104.6

*pp/season = average per person per season.

Bolded entries indicate top country foods by season and type.

TABLE 4.2-9

Average daily intake of country foods by species for all NTC communities based on Food Frequency Questionnaire results, 2015.

Country Food Species	AZA		BNA		BZA		KZA		All Communities	
	Avg. Daily Intake (g)	% of Total	Avg. Daily Intake (g)	% of Total	Avg. Daily Intake (g)	% of Total	Avg. Daily Intake (g)	% of Total	Avg. Daily Intake (g)	% of Total
Moose Meat	**15.8**	22.9	**12.4**	16.8	**13.9**	9.7	**33.9**	19.8	**16.8**	**16.1**
Walleye (Pickerel)	**14.2**	20.6	**15.2**	20.5	**16.0**	11.2	**26.8**	15.7	**16.3**	**15.6**
Blueberry	**5.5**	8.0	**6.5**	8.8	**5.7**	4.0	**16.3**	9.6	**7.0**	**6.7**
Lake Whitefish	**2.7**	4.0	**5.6**	7.5	**9.3**	6.5	**14.6**	8.5	**6.6**	**6.4**
Lake Trout	**2.8**	4.0	**2.1**	2.9	**8.1**	5.7	**6.3**	3.7	**4.7**	**4.5**
Brook Trout	**1.4**	2.0	**2.6**	3.6	**6.5**	4.5	**10.0**	5.9	**4.2**	**4.0**
Raspberry	**2.4**	3.6	**2.9**	4.0	**4.9**	3.4	**7.5**	4.4	**3.9**	**3.7**
Rabbit	**3.5**	5.0	**2.1**	2.9	**3.9**	2.7	**6.6**	3.8	**3.8**	**3.6**
Northern Pike (Jackfish)	**2.2**	3.1	**2.6**	3.5	**4.5**	3.1	**3.5**	2.0	**3.1**	**2.9**
Smelt	**1.1**	1.5	**3.3**	4.4	**5.7**	4.0	**1.6**	0.9	**2.9**	**2.8**
Ruffed Grouse	2.8	4.0	1.8	2.5	1.5	1.1	4.7	2.8	2.5	2.4
Moose Kidney	0.8	1.1	0.5	0.7	5.1	3.5	4.2	2.4	2.5	2.4
Spruce Grouse	1.8	2.6	1.0	1.4	1.5	1.1	7.5	4.4	2.3	2.2
Rainbow Trout	0.1	0.1	1.6	2.1	6.4	4.5	0.0	0.0	2.2	2.1
Yellow Perch	1.2	1.8	2.0	2.7	3.9	2.7	1.4	0.8	2.2	2.1
Moose Liver	0.3	0.5	0.5	0.7	4.5	3.2	4.4	2.6	2.2	2.1
Salmon	0.1	0.2	0.0	0.0	6.1	4.3	0.2	0.1	1.9	1.8
Sauger	0.6	0.9	1.8	2.4	4.5	3.2	0.0	0.0	1.9	1.8
Wild Strawberry	1.2	1.7	0.5	0.6	3.3	2.3	1.5	0.9	1.7	1.7
Cisco (Tulibee)	0.0	0.0	0.0	0.0	4.3	3.0	0.0	0.0	1.3	1.2
Lake Sturgeon	0.1	0.1	0.0	0.0	2.0	1.4	4.8	2.8	1.3	1.2
Canada Goose	1.3	1.9	0.5	0.6	0.7	0.5	3.2	1.9	1.2	1.2
Suckers	0.3	0.5	0.0	0.0	3.3	2.3	0.2	0.1	1.2	1.1
Smallmouth Bass	0.0	0.0	0.0	0.0	3.5	2.5	0.0	0.0	1.1	1.0
Burbot (Mariah)	0.3	0.4	0.0	0.0	2.3	1.6	1.7	1.0	1.0	1.0
Mallard Duck	1.0	1.5	0.6	0.7	1.2	0.9	0.7	0.4	1.0	0.9
Pin Cherry	0.9	1.3	1.7	2.4	1.0	0.7	0.0	0.0	0.9	0.9
Gray Partridge	0.5	0.7	1.3	1.7	1.2	0.8	1.3	0.7	0.9	0.9
Beaver	0.5	0.8	0.1	0.1	0.7	0.5	3.3	1.9	0.9	0.8
Deer Meat	0.3	0.5	1.3	1.8	1.3	0.9	0.0	0.0	0.7	0.7
Wild Rice	0.3	0.4	0.4	0.5	1.4	1.0	0.5	0.3	0.7	0.6
Saskatoon Berry	0.3	0.4	0.9	1.3	0.7	0.5	0.4	0.2	0.5	0.5

TABLE 4.2-9

Average daily intake of country foods by species for all NTC communities based on Food Frequency Questionnaire results, 2015.

Country Food Species	AZA		BNA		BZA		KZA		All Communities	
	Avg. Daily Intake (g)	% of Total	Avg. Daily Intake (g)	% of Total	Avg. Daily Intake (g)	% of Total	Avg. Daily Intake (g)	% of Total	Avg. Daily Intake (g)	% of Total
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	3.3	1.9	0.4	0.4
Brown Trout	0.0	0.1	1.2	1.6	0.4	0.3	0.0	0.0	0.3	0.3
Sharp-tailed Grouse	0.4	0.6	0.0	0.0	0.2	0.1	0.7	0.4	0.3	0.3
Gooseberry	0.2	0.3	0.1	0.2	0.5	0.4	0.0	0.0	0.3	0.3
Mushrooms	0.1	0.2	0.1	0.2	0.3	0.2	0.0	0.0	0.2	0.2
Wild Carrot	0.0	0.0	0.0	0.0	0.6	0.4	0.0	0.0	0.2	0.2
American Black Duck	0.2	0.3	0.0	0.0	0.2	0.2	0.0	0.0	0.1	0.1
Pheasant	0.0	0.0	0.0	0.1	0.4	0.3	0.0	0.0	0.1	0.1
Bog Cranberry	0.1	0.1	0.0	0.0	0.4	0.3	0.0	0.0	0.1	0.1
Teal	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Bear	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Other	0.2	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1
Brown Trout	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Canvasback Duck	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Woodland Caribou	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.1	0.1
Rosehips	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
Highbush Cranberry	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Chokecherry	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.1
Wood Duck	0.06	0.08	0.00	0.00	0.10	0.07	0.00	0.00	0.05	0.05
Bird Eggs	0.04	0.05	0.00	0.00	0.07	0.05	0.00	0.00	0.04	0.04
Snow Goose	0.00	0.00	0.00	0.00	0.12	0.09	0.00	0.00	0.04	0.04
Redhead	0.00	0.00	0.00	0.00	0.10	0.07	0.00	0.00	0.03	0.03
Deer Liver	0.00	0.00	0.19	0.26	0.00	0.00	0.00	0.00	0.03	0.03
Porcupine	0.00	0.00	0.00	0.00	0.10	0.07	0.00	0.00	0.03	0.03
Other Ducks	0.06	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
Loon	0.00	0.00	0.00	0.00	0.05	0.03	0.00	0.00	0.01	0.01
Cutthroat Trout	0.00	0.00	0.05	0.06	0.00	0.00	0.00	0.00	0.01	0.01
Cloudberry	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Total	68.8	100	73.9	100	143.5	100	171.1	100	104.6	100

Avg. Daily Intake (g) = Average daily intake of grams per person per day of country foods.

Bolded entries indicate the top ten country foods consumed.

TABLE 4.2-10

Average daily intake of country foods by species and season for all NTC communities, based on Food Frequency Questionnaire results, 2015.

Country Food Species	Average Daily Intake (g) - pp/season*				Average g/pp/day**
	Spring	Summer	Fall	Winter	
Moose Meat	2.5	2.7	6.5	5.2	**16.8**
Walleye (Pickerel)	4.7	5.1	3.4	3.1	**16.3**
Blueberry	0.7	4.0	1.6	0.8	**7.0**
Lake Whitefish	1.5	1.5	2.2	1.4	**6.6**
Lake Trout	1.0	1.4	1.1	1.2	**4.7**
Brook Trout	0.7	0.8	1.4	1.2	**4.2**
Raspberry	0.3	2.4	0.9	0.3	**3.9**
Rabbit	0.6	0.5	1.1	1.5	**3.8**
Northern pike (Jackfish)	0.8	0.8	0.8	0.7	**3.1**
Smelt	1.2	0.6	0.6	0.5	**2.9**
Ruffed Grouse	0.3	0.1	1.6	0.5	2.5
Moose Kidney	0.3	0.2	1.1	0.9	2.5
Spruce Grouse	0.2	0.2	1.5	0.4	2.3
Rainbow Trout	0.5	0.5	0.7	0.5	2.2
Yellow Perch	0.7	0.7	0.4	0.4	2.2
Moose Liver	0.2	0.2	1.0	0.8	2.2
Salmon	0.4	0.5	0.6	0.5	1.9
Sauger	0.4	0.5	0.5	0.6	1.9
Wild Strawberry	0.1	1.0	0.5	0.1	1.7
Cisco (Tulibee)	0.3	0.4	0.4	0.3	1.3
Lake Sturgeon	0.5	0.4	0.2	0.1	1.3
Canada Goose	0.8	0.1	0.3	0.1	1.2
Suckers	0.4	0.3	0.3	0.3	1.2
Smallmouth Bass	0.3	0.3	0.3	0.3	1.1
Burbot (Mariah)	0.1	0.1	0.3	0.5	1.0
Mallard Duck	0.5	0.0	0.4	0.0	1.0
Pin Cherry	0.0	0.8	0.1	0.0	0.9
Gray Partridge	0.2	0.0	0.6	0.1	0.9
Beaver	0.1	0.1	0.3	0.3	0.9
Deer Meat	0.0	0.1	0.4	0.2	0.7
Wild Rice	0.0	0.3	0.3	0.0	0.7
Saskatoon Berry	0.0	0.4	0.1	0.0	0.5
Muskrat	0.1	0.1	0.1	0.1	0.4
Brown Trout	0.2	0.1	0.0	0.0	0.3
Sharp-tailed Grouse	0.0	0.0	0.2	0.0	0.3
Gooseberry	0.0	0.3	0.0	0.0	0.3
Mushrooms	0.0	0.1	0.0	0.0	0.2
Wild Carrot	0.0	0.1	0.1	0.0	0.2
American Black Duck	0.1	0.0	0.0	0.0	0.1
Pheasant	0.1	0.0	0.1	0.0	0.1
Bog Cranberry	0.0	0.1	0.0	0.0	0.1
Teal	0.0	0.0	0.1	0.0	0.1
Bear	0.0	0.0	0.1	0.0	0.1
Other	0.0	0.0	0.0	0.1	0.1
Brown Trout	0.0	0.1	0.0	0.0	0.1
Canvasback Duck	0.1	0.0	0.0	0.0	0.1

TABLE 4.2-10

Average daily intake of country foods by species and season for all NTC communities, based on Food Frequency Questionnaire results, 2015.

Country Food Species	Average Daily Intake (g) - pp/season*				Average g/pp/day**
	Spring	Summer	Fall	Winter	
Woodland Caribou	0.0	0.0	0.0	0.0	0.1
Rosehips	0.0	0.0	0.0	0.0	0.1
Highbush Cranberry	0.0	0.0	0.0	0.0	0.1
Chokecherry	0.0	0.0	0.0	0.0	0.1
Wood Duck	0.0	0.0	0.0	0.0	0.1
Bird Eggs	0.04	0.00	0.00	0.00	0.04
Snow Goose	0.02	0.01	0.00	0.00	0.04
Redhead	0.03	0.00	0.00	0.00	0.03
Deer Liver	0.00	0.00	0.03	0.00	0.03
Porcupine	0.00	0.02	0.01	0.00	0.03
Other Ducks	0.02	0.00	0.00	0.00	0.02
Loon	0.00	0.00	0.01	0.00	0.01
Cutthroat Trout	0.00	0.01	0.00	0.00	0.01
Cloudberry	0.00	0.01	0.00	0.00	0.01
Total	**21.3**	**28.0**	**32.4**	**23.0**	**104.6**

Bolded entries indicate the top ten country foods consumed.

*pp/season = per person per season.

**pp/yr = per person per year.

TABLE 4.2-11

Average daily intake of country foods by type and community based on Food Frequency Questionnaire results, 2015.

Country Food Type	Average Daily Intake (g) - Per Community				
	AZA	BNA	BZA	KZA	Total
Fish	**27.3**	**38.0**	**86.9**	**71.0**	52.4
Birds	8.6	5.2	7.5	18.2	8.9
Mammals	21.6	17.2	30.1	55.6	27.5
Edible plants	11.3	13.4	19.0	26.2	15.8
Total	68.8	73.9	143.5	171.1	104.6

Bolded entries indicate the top country foods type at each community.

TABLE 4.2-12

Level of concern regarding potential contaminants, pesticides, and/or disease in the country foods harvested by NTC community members.

Country Food Type and Species	No Concern (1)	Slightly Concerned (2)	Moderately Concerned (3)	Very Concerned (4)	Extremely Concerned (5)	Number of People with Concerns	% of NTC Interviewed
Mammals							
Moose Meat	**16**	**21**	**17**	**17**	**10**	**65**	**68.4**
Rabbit	**5**	**12**	**9**	**14**	**4**	**39**	**41.1**
Moose Kidney	**3**	**6**	**2**	**9**	**5**	**22**	**23.2**
Moose Liver	1	6	3	10	3	22	23.2
Deer Meat	4	6	3	1	2	12	12.6
Beaver	1	3	2	6	1	12	12.6
Other	0	1	1	3	0	5	5.3
Woodland Caribou	0	1	0	2	1	4	4.2
Bear	0	1	1	0	1	3	3.2
Porcupine	0	0	0	1	1	2	2.1
Deer Liver	1	0	0	0	0	0	0.0
Muskrat	0	0	0	1	0	1	1.1
Fish							
Pickerel (Walleye)	**16**	**14**	**17**	**19**	**12**	**62**	**65.3**
Lake Whitefish	**9**	**7**	**12**	**15**	**10**	**44**	**46.3**
Lake Trout	**7**	**6**	**8**	**11**	**7**	**32**	**33.7**
Brook Trout	4	5	8	11	7	31	32.6
Yellow Perch	6	6	6	9	7	28	29.5
Northern Pike	6	4	4	10	8	26	27.4
Smelt	6	6	6	8	6	26	27.4
Lake Sturgeon	3	3	4	6	3	16	16.8
Salmon	2	4	1	5	5	15	15.8
Rainbow Trout	1	4	1	4	5	14	14.7
Burbot	0	2	2	4	5	13	13.7
Sauger	4	0	0	6	2	8	8.4
Suckers	0	2	0	2	4	8	8.4
Brown Trout	0	2	1	1	1	5	5.3
Cisco (Tullibee)	0	0	0	3	1	4	4.2
Cutthroat Trout	0	1	0	1	0	2	2.1
Smallmouth Bass	0	0	0	2	0	2	**2.1**
Birds							
Spruce Grouse	**12**	**4**	**11**	**10**	**8**	**33**	**34.7**
Ruffed Grouse	**10**	**4**	**13**	**10**	**5**	**32**	**33.7**
Canada Goose	**7**	**7**	**10**	**7**	**7**	**31**	**32.6**
Mallard Duck	5	6	7	7	6	26	**27.4**
Gray Partridge	5	5	8	6	3	22	23.2
Sharp-tailed Grouse	2	0	3	5	1	9	9.5
American Black Duck	1	1	0	4	1	6	6.3
Pheasant	1	0	1	1	2	4	4.2
Canvasback Duck	0	0	0	3	0	3	3.2
Teal	0	1	0	2	0	3	3.2
Bird Eggs	0	1	0	1	0	2	2.1
Loon	0	1	0	0	1	2	2.1
Snow Goose	0	0	0	1	1	2	2.1
Wood Duck	0	0	0	2	0	2	2.1
Other Ducks	0	0	0	1	0	1	1.1
Redhead	0	0	0	0	1	1	1.1

TABLE 4.2-12

Level of concern regarding potential contaminants, pesticides, and/or disease in the country foods harvested by NTC community members.

Country Food Type and Species	No Concern (1)	Slightly Concerned (2)	Moderately Concerned (3)	Very Concerned (4)	Extremely Concerned (5)	Number of People with Concerns	% of NTC Interviewed
Edible Plants							
Blueberry	**17**	**12**	**15**	**17**	**14**	**58**	**61.1**
Raspberry	**9**	**12**	**13**	**14**	**7**	**46**	**48.4**
Wild Strawberry	**3**	**9**	**7**	**10**	**4**	**30**	**31.6**
Pin Cherry	3	5	4	4	2	15	15.8
Saskatoon Berry	3	2	5	5	3	15	15.8
Wild Rice	3	3	4	3	5	15	15.8
Cedar	3	2	3	3	4	12	12.6
Mushrooms	1	1	3	2	1	7	7.4
Labrador Tea	1	2	1	2	1	6	6.3
Wild Carrot	2	1	2	2	0	5	5.3
Gooseberry	1	1	2	1	1	5	5.3
Chokecherry	1	1	2	1	0	4	4.2
Bog Cranberry	0	1	2	0	0	3	3.2
Highbush Cranberry	0	1	1	1	0	3	3.2
Rosehips	1	1	0	0	1	2	2.1
Other	1	0	0	0	1	1	1.1
Roots	0	0	1	0	1	2	2.1
Wild Mint	0	0	0	2	0	2	2.1
Cloudberry	0	0	0	1	0	1	1.1
Medicinal Plants							
Sweet Grass	**8**	**2**	**3**	**3**	**6**	**14**	**14.7**
Birch bark	**4**	0	**2**	**3**	**4**	**9**	**9.5**
Spruce Gum	**2**	**1**	**3**	**2**	**3**	**9**	**9.5**
Labrador Tea	2	0	2	2	4	8	8.4
Juniper	2	0	1	2	3	6	6.3
Balsalm bark	1	0	3	1	2	6	6.3
Bearberry	0	0	1	2	4	7	7.4
Dandelion	1	0	2	1	3	6	6.3
Other	2	1	1	1	2	5	5.3
St. John's Wort	1	0	2	2	2	6	6.3
Wild Mint	0	1	2	2	2	7	7.4
Birch Sap	1	1	1	1	2	5	5.3
Tamarack	1	0	2	1	2	5	5.3
Bunchberry	0	0	1	1	3	5	5.3
Pitcher Plant	0	0	1	2	2	5	5.3
Rat Root	0	0	1	1	3	5	5.3
Red Osier Dogwood	1	0	1	1	2	4	4.2
Yarrow	0	0	1	1	3	5	5.3
Lily Root	0	0	1	1	2	4	4.2
Sweet Flag	0	0	1	1	2	4	4.2

Bolded entries indicate the top country foods used by the community.

TABLE 4.2-13

Concerns identified by NTC community members regarding country foods harvested, based on Food Frequency Questionnaire results, 2015.

Mammal Concerns
Bear
Aerial spraying
Moose Meat and (organs)
Aerial spraying killing the habitat
Climate Change. Too much hunting in some areas
Concerned about herbicide spraying and the affects it has on moose that feed in the sprayed areas
Concerned about industry practices/herbicides and potential impacts on moose organs
Concerned about what the animals are surviving on and if its been sprayed where they are eating
Concerned with what the mammals are eating/spraying
Concerns on 801 trapline area
Concerns with liver, sometimes wonder about pesticides that are sprayed in the bush
Contaminated water E.coli
Illness in meat e.g. lyme disease or tick etc.
I've always cleaned my moose meat since I was young - Past few years I've noticed the kidneys and liver have white lines and lumps all over them so I have not consumed them
Liver spots on moose
Need to check for contaminates in these mammals to make sure that we are not ingesting certain chemicals
Pesticides that animals eat in the bush
Spraying in hunting areas
Spraying, cutting of woodlands
We use medicine plants and don't know if we are sharing contaminated medicine - make people more sick
What the moose has been eating in the past 20 years?
Fish Concerns
Lake Whitefish
Acid rain - Pollution
The amount of fish
Check for contaminates (especially methyl mercury)
Concerned with mining leaching - contaminants, hydro projects, mercury levels
Contaminated water E.coli
How safe and how much fish is contaminated - levels. Are there areas of lake more contaminated than others
Hydro dams being built
Hydro dams being built and mercury levels
Mercury levels
Mercury levels, spraying
Mercury present in the fish
Spray run-off into creeks
Pickerel (Walleye)
Concerned on the matter of mercury in fish
Concerned with developing hydro dam projects on Lake Nipigon - there has already been high mercury levels found above a hydro dam already present
Also concerned with invasive species affecting other fish in the lake due to people not properly taking care of boats as they enter

TABLE 4.2-13

Concerns identified by NTC community members regarding country foods harvested, based on Food Frequency Questionnaire results, 2015.

Fish Concerns
Pickerel (Walleye)
Is the water clean?
Metals in fish - Would be nice to know how much we can consume before metals show up or effect our bodies
Mine near Sturgeon River
Old underground mine nearby (Elbow Lake, Robinson Lake)
Partridge Lake - AZA reserve & Ombabika River
Same concerns as the mammals - what they are eating and the conditions of the waters they live in
When spawning, people taking too much
Bird Concerns
Canada Goose
Concerned with the locations in which Canada goose are flying to/from and what they eat
Migration
Unsure of where Geese fly to - Kinghorn and Sturgeon River
Gray Partridge
Concerned about where it lives and eats (if it has been sprayed around the areas where it eats)
Ruffed Grouse
Spraying - what the birds are eating
Spruce Grouse
Aerial spraying - habitat and location of hunt
Contaminates
Spraying
Spraying ,cutting of woodlands
Very concerned about migratory birds
What the birds are eating - especially around contaminants
Edible plants
Blueberry
Aerial spraying
Aerial spraying does it effect the berries?
Aerial spraying, cutting of woodlands
Blueberries small size this yea
Concerned if berries are sprayed
Contaminates
Herbicide use
Not as many as before
Spray program - very concerned with aerial spraying - specifically traditional areas and tree planting areas
Sprayed berries
Very concerned with aerial spraying - blueberries tend to stop growing when sprayed
Spraying of berries - Kinghorn and Partridge lakes
Spraying of the edible plants

TABLE 4.2-13

Concerns identified by NTC community members regarding country foods harvested, based on Food Frequency Questionnaire results, 2015.

Edible plants
Mushrooms (specify)
(Chaga) Aerial spraying
Raspberry
Aerial spraying
Concerned with woodland cutting where there are strawberries and raspberries
Wild Strawberry
Concerned with abandoned mines near the areas where there are often strawberries and raspberrie
Medicinal plants
Bearberry
Only used when needed - concerned with spraying
Only used when needed - concerned with the spraying of the plants
Spruce Gum
Used when needed - concerned with sprayin
Sweet Flag
Concerned about the plants they are sprayin
Sweet Grass
Braided for smudging - concerned with spraying and cutting of woodland

TABLE 4.7-1

Average daily intake of country foods consumed by four NTC communities in comparison to other Canadian First Nations communities.

Country Food Type	AZA (ON) (n =38)	BNA (ON) (n=15)	BZA (ON) (n= 30)	KZA (ON) (n= 12)	Lake Superior Region (ON)[1] (n=278)	Fort Smith (NWT)[2] (n= 87)	Fort Chip (AB)[2] (n= 91)	Old Crow (YT)[2] (n=29)	Teslin (YT)[2] (n=33)	Inuit of Nunavik (QC)[3] (n=178)
Mammals	21.6	17.2	30.1	55.6	31.0	58.0	52.0	124	104	96
Birds	8.6	5.2	7.5	18.2				28.6	4.6	
Fish	27.3	38.0	86.9	71.0	35.8	11.0	16.0	112	42.2	38
Edible Plants	11.3	13.4	19.0	26.2	N/A	7.0	4.0	81	33.1	17
Total	**68.8**	**73.8**	**143.5**	**171.0**	**66.8**	**76.0**	**72.0**	**345.6**	**183.9**	**151**

Units = grams/person/day.

[1] Assembly of First Nations and Health Canada (2001).

[2] Wein et al. (1991).

[3] Schuster et. al (2011).

[4] Duhaime et al. (2001).

Rounded to the nearest gram.

TABLE 6.1-1

Water chemistry results from the NTC country foods study area, October 2015.

Parameters	Units	CDWQG[1]	CEQG[2]	Windigokan Lake	Postagoni River	Parks Lake	Blackwater River	Namewaminikan River	Rocky Bay (BZA)	North Wind Lake	Partridge Lake (AZA)	Pijitawabik Bay (BNA)	Onaman River
				16-Oct-2015	15-Oct-2015	15-Oct-2015	16-Oct-2015	16-Oct-2015	17-Oct-2015	16-Oct-2015	15-Oct-2015	17-Oct-2015	16-Oct-2015
Physical Properties													
Conductivity	µS/cm	-	-	176	53.9	56.4	192	138	136	132	132	147	216
Hardness (as $CaCO_3$)	mg/L	-	-	90.8	26	28.4	89.4	70.4	71.2	66.9	70.8	74.6	118
pH	pH	6.5 to 8.5	6.5 to 9.0	8.1	7.56	7.72	7.84	7.96	8.13	7.95	8.09	8.06	8.09
Total Suspended Solids	mg/L	-	-	3.2	<2.0	<2.0	2.8	<2.0	2.3	7.9	<2.0	2.2	<2.0
Total Dissolved Solids	mg/L	500	-	106	55	46	129	92	91	86	94	86	144
Turbidity	NTU	-	-	1.3	1.13	0.51	1.2	0.76	0.72	2.36	1.01	1.11	1.6
Anions and Nutrients													
Alkalinity, Total (as $CaCO_3$)	mg/L	-	-	92.4	25.2	27.6	87.3	70.9	71.2	68.2	68.4	73.6	116
Ammonia, Total (as N)	mg/L	-	-	<0.020	<0.020	0.028	<0.020	<0.020	<0.020	0.023	<0.020	<0.020	<0.020
Bicarbonate	mg/L	-	-	92.4	25.2	27.6	87.3	70.9	71.2	68.2	68.4	73.6	116
Carbonate	mg/L	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Calcium	mg/L	-	-	28.9	7.38	8.21	27.9	21.4	21.9	19.9	21.5	22.6	35.1
Hydroxide	mg/L	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Nitrate (as N)	mg/L	45	13	<0.020	0.04	0.035	0.033	0.029	0.041	<0.020	<0.020	0.039	<0.020
Total Kjeldahl Nitrogen	mg/L	-	-	1.01	0.52	0.31	0.38	<0.25	0.3	0.46	0.49	0.34	0.45
Phosphorus	mg/L	-	-	0.0071	0.0089	0.0046	0.0129	0.0065	0.0056	0.0096	0.008	0.0072	0.0074
Sulfate	mg/L	500	-	1.15	1.21	1.3	1.63	0.93	1.59	1.23	0.98	1.49	0.75
Total Organic Carbon	mg/L	-	-	7	13.8	11	12.2	11.1	5.7	12.1	11.8	6.4	14.8
Anion Sum	meq/L	-	-	1.88	0.55	0.59	2.02	1.48	1.48	1.41	1.42	1.53	2.36
Cation Sum	meq/L	-	-	1.86	0.59	0.61	2.05	1.48	1.5	1.4	1.49	1.58	2.45
Cation - Anion Balance	%	-	-	-0.4	3.4	1.8	0.7	0.2	0.5	-0.5	2.4	1.8	1.7
Metals and Trace Elements													
Aluminum	mg/L	0.1	0.1 [3]	0.0075	**0.102**	0.0438	0.0387	0.0137	0.0214	0.0287	0.0251	0.08	0.0485
Antimony	mg/L	0.006	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	mg/L	0.01	0.005	0.00052	0.00043	0.00045	0.00483	0.00072	0.00054	0.00045	0.00081	0.00052	0.00056
Barium	mg/L	1	-	0.00746	0.0109	0.00857	0.0122	0.00825	0.00788	0.00656	0.00874	0.00739	0.00996
Beryllium	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Boron	mg/L	5	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	mg/L	0.005	0.00005 to 0.00018[4]	<0.0000050	0.0000065	0.0000062	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	0.05	-	0.00024	0.0005	0.00034	0.00034	0.00033	0.00012	0.00023	0.00019	0.00018	0.00019
Cobalt	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper	mg/L	1	0.002 to 0.00272[4]	0.00202	0.00091	0.00083	0.00083	0.00052	0.00134	0.00102	0.00055	0.00146	0.00053
Cyanide, Total	mg/L	0.2	0.005	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Iron	mg/L	0.3	0.3	0.101	0.187	0.058	0.173	0.084	0.036	0.047	0.12	0.09	0.197
Lead	mg/L	0.01	0.001 to 0.00393[4]	0.000109	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000052	<0.00005
Magnesium	mg/L	-	-	4.56	1.83	1.92	4.77	4.12	4.03	4.18	4.19	4.43	7.26
Manganese	mg/L	0.05	-	**0.0738**	0.0123	0.00586	0.0169	0.00852	0.00083	0.00263	0.019	0.00464	0.00889
Mercury	mg/L	0.001	0.000026	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum	mg/L	-	0.073	0.000094	0.000066	<0.000050	0.000076	0.000079	0.000095	0.000068	0.000069	0.000094	0.000104
Nickel	mg/L	-	0.025 to 0.10839[4]	<0.0005	0.00082	0.00052	0.00072	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

TABLE 6.1-1

Water chemistry results from the NTC country foods study area, October 2015.

Parameters	Units	CDWQG[1]	CEQG[2]	Windigokan Lake	Postagoni River	Parks Lake	Blackwater River	Namewaminikan River	Rocky Bay (BZA)	North Wind Lake	Partridge Lake (AZA)	Pijitawabik Bay (BNA)	Onaman River
				16-Oct-2015	15-Oct-2015	15-Oct-2015	16-Oct-2015	16-Oct-2015	17-Oct-2015	16-Oct-2015	15-Oct-2015	17-Oct-2015	16-Oct-2015
Potassium	mg/L	-	-	0.299	0.613	0.52	0.619	0.49	0.593	0.408	0.531	0.627	0.602
Selenium	mg/L	0.05	0.001	0.000057	0.000072	0.000074	0.000072	0.000073	0.000067	0.000064	0.000054	0.000072	0.000052
Silver	mg/L	-	0.0025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium	mg/L	200	-	0.677	0.831	0.476	5.3	1.29	1.27	1.01	1.17	1.45	1.47
Strontium	mg/L	-	-	0.0282	0.0127	0.0106	0.0288	0.0199	0.0196	0.0201	0.0206	0.0202	0.0394
Thallium	mg/L	-	0.0008	<0.000010	<0.000010	0.000021	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium	mg/L	-	-	0.00056	0.00086	0.00043	0.00055	<0.00030	0.00064	0.0011	0.00047	0.00267	0.00197
Uranium	mg/L	0.02	0.015	0.000032	0.000032	0.000062	0.00007	0.000092	0.000083	0.000027	0.000123	0.000082	0.000114
Vanadium	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	5	0.03	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003

[1]Guidelines are Health Canada's Canadian Drinking Water Quality Guidelines (CDWGQ; HC 2014).

[2]Guidelines are Canadian Environmental Quality Guidelines (CEQG) for the protection of freshwater life (CCME 2015). When short and long term guidelines were available, the most conservative one was used.

[3]Guideline based on the field pH measurements: 0.1 mg/L if pH ≥ 6.5

[4]Guideline depends on total hardness.

Bolded values exceed guidelines.

TABLE 6.2-1

Summary of walleye tissue chemistry from the NTC country foods study area, July to December 2015.

Parameters[1]	Guidelines	HC (TDS)[2] Supermarket Freshwater Fish	FNFNES[3]		Gull Bay/River					Jean Lake					McIntrye Bay				
			Mean	Max	N	Mean	S.D.	Max	<MDL	N	Mean	S.D.	Max	<MDL	N	Mean	S.D.	Max	<MDL
Arsenic	-	0.44	0.144	0.743	8	0.096	0.0164	0.114	0	5	0.0049	0.0068	0.042	0	5	0.117	0.0373	0.182	0
Cadmium	-	-	0.01	0.01	8	0.0005	-	0.0005	8	5	0.00023	0.00033	0.0019	0	5	0.001	0.001	0.003	2
Cobalt	-	0.004	-	-	8	0.002	-	0.002	8	5	0.002	-	0.002	5	5	0.002	-	0.002	5
Lead	-	-	0.004	0.013	8	0.002	-	0.002	8	5	0.0007	0.001	0.0042	4	5	0.0191	0.00734	0.0309	0
Mercury	0.5	-	0.319	**0.823**	8	0.138	0.0434	0.244	0	5	0.0498	0.0639	0.257	0	5	0.273	0.161	0.493	0
Molybdenum	-	0.005	-	-	8	0.002	0.0007	0.0041	7	5	0.002	-	0.002	5	5	0.002	-	0.002	5
Selenium	-	0.43	-	-	8	0.180	0.00625	0.188	0	5	0.0202	0.0244	0.263	0	5	0.198	0.0158	0.219	0
Zinc	-	4.6	-	-	8	3.94	0.377	4.72	0	5	0.25	0.33	3.7	0	5	5.24	0.606	5.99	0

TABLE 6.2-1

Summary of walleye tissue chemistry from the NTC country foods study area, July to December 2015.

Parameters[1]	Guidelines	HC (TDS)[2] Supermarket Freshwater Fish	FNFNES[3]		Ombabika Bay					Ombabika River					Postagoni Lake					Wabinash Bay		
			Mean	Max	N	Mean	S.D.	Max	<MDL	N	Mean	S.D.	Max	<MDL	N	Mean	S.D.	Max	<MDL	N	Value	<MDL
Arsenic	-	0.44	0.144	0.743	2	0.0859	0.0355	0.111	0	10	0.0913	0.0554	0.202	0	6	0.0657	0.00811	0.0734	0	1	0.0387	0
Cadmium	-	-	0.01	0.01	2	0.004	0.005	0.0075	1	10	0.0008	0.0007	0.0027	8	6	0.001	0.002	0.0047	5	1	<0.001	1
Cobalt	-	0.004	-	-	2	0.002	-	0.002	2	10	0.002	-	0.002	10	6	0.004	0.006	0.0167	5	1	<0.004	1
Lead	-	-	0.004	0.013	2	0.004	0.003	0.0059	1	10	0.002	0.001	0.0064	9	6	0.003	0.002	0.0074	5	1	0.0046	0
Mercury	0.5	-	0.319	**0.823**	2	0.157	0.00212	0.158	0	10	0.40	0.14	**0.611**	0	6	0.358	0.493	**1.36**	0	1	0.429	0
Molybdenum	-	0.005	-	-	2	0.00325	0.002	0.0045	1	10	0.003	0.002	0.0069	7	6	0.003	0.002	0.0074	5	1	<0.004	1
Selenium	-	0.43	-	-	2	0.161	0.0113	0.169	0	10	0.22	0.060	0.324	0	6	0.22	0.042	0.301	0	1	0.194	0
Zinc	-	4.6	-	-	2	3.43	0.297	3.64	0	10	3.0	0.62	4.68	0	6	4.0	0.79	5.11	0	1	3.57	0

[1]All concentrations are presented in mg/kg wet weight basis

[2]Health Canada (Total Diet Study) 2005 to 2007 average concentration for freshwater fish (HC 2011); data for molybdenum are from 1993 to 1999. Data could not be included for a number of parameters because of differences in MDLs

[3]First Nations Food, Nutrition and Environmental Study; Results from Ontario 2011 to 2012 (Chan et al. 2014).

S.D. = Standard deviation

<MDL = number of samples less than the laboratory method detection limit (MDL).

Values less than the MDL were set to half the MDL when calculating summary statistics.

Bolded values exceed mercury guidelines.

TABLE 6.2-2

Summary of brook trout, lake whitefish, and white sucker tissue chemistry results from the NTC country food study area, July to December 2015.

Parameters[1]	Guidelines	HC (TDS)[2] Supermarket Freshwater Fish	FNFNES[3]		Blackwater River			Postagoni River			FNFNES[3]		McIntyre Bay					Parks Lake				
			Brook Trout		Brook Trout			Brook Trout			Lake Whitefish		Lake Whitefish					White Sucker				
			Mean	Max	N	Value	<MDL	N	Value	<MDL	Mean	Max	N	Mean	S.D.	Max	<MDL	N	Mean	S.D.	Max	<MDL
Arsenic	-	0.44	0.277	0.277	1	0.0749	0	1	0.0648	0	0.662	2.77	5	0.360	0.189	0.688	0	4	0.057	0.019	0.0803	0
Cadmium	-	-	-	-	1	< 0.001	1	1	< 0.001	1	0.004	0.016	5	0.01	0.02	0.03	2	4	0.0029	0.0008	0.0037	0
Cobalt	-	0.004	-	-	1	0.0052	0	1	0.0084	0	-	-	5	0.0058	0.0008	0.0065	0	4	0.005	0.002	0.0064	1
Lead	-	-	-	-	1	< 0.004	1	1	< 0.004	1	0.004	0.017	5	0.006	0.004	0.0119	2	4	0.005	0.002	0.0063	1
Mercury	0.5	-	0.112	0.112	1	0.104	0	1	0.0796	0	0.084	0.154	5	0.071	0.028	0.115	0	4	0.237	0.204	**0.541**	0
Molybdenum	-	0.005	-	-	1	< 0.004	1	1	< 0.004	1	-	-	5	0.002	-	0.002	5	4	0.005	0.002	0.0059	1
Selenium	-	0.43	-	-	1	0.244	0	1	0.247	0	-	-	5	0.202	0.0246	0.236	0	4	0.216	0.0191	0.244	0
Zinc	-	4.6	-	-	1	3.91	0	1	3.99	0	-	-	5	3.83	0.663	4.75	0	4	3.03	0.416	3.64	0

[1]All concentrations are presented in mg/kg wet weight basis.

[2]Health Canada (Total Diet Study) 2005 to 2007 average concentration for freshwater fish (HC 2011); data for molybdenum are from 1993 to 1999. Data could not be included for a number of parameters because of differences in MDLs.

[3]First Nations Food, Nutrition and Environmental Study; Results from Ontario 2011 to 2012 (Chan et al. 2014).

S.D. = Standard deviation.

<MDL = number of samples less than the laboratory method detection limit (MDL).

Values less than the MDL were set to half the MDL when calculating summary statistics.

Bolded values exceed mercury guidelines.

TABLE 6.2-3

Summary of lake trout tissue chemistry from the NTC country foods study area, July to December 2015.

Parameters[1]	Guidelines	HC (TDS)[2] Supermarket Freshwater Fish	FNFNES[3]		Lake Nipigon														
					Lake Nipigon			Pipestone Point					McIntyre Bay					Wabinash Bay		
			Mean	Max	N	Value	<MDL	N	Mean	S.D.	Max	<MDL	N	Mean	S.D.	Max	<MDL	N	Value	<MDL
Arsenic	-	0.44	0.151	0.411	1	0.165	0	5	0.0247	0.00955	0.0354	0	5	0.176	0.0447	0.242	0	1	0.125	0
Cadmium	-	-	0.005	0.008	1	0.0032	0	5	0.0046	0.0029	0.0083	0	5	0.0005	-	0.0005	5	1	0.003	0
Cobalt	-	0.004	-	-	1	0.0041	0	5	0.004	0.001	0.0056	1	5	0.002	-	0.002	5	1	0.0043	0
Lead	-	-	0.005	0.022	1	0.0071	0	5	0.003	0.001	0.0046	4	5	0.002	-	0.002	5	1	0.0066	0
Mercury	0.5	-	0.301	**0.533**	1	0.0885	0	5	**0.517**	0.226	**0.816**	0	5	0.108	0.0231	0.145	0	1	0.0942	0
Molybdenum	-	0.005	-	-	1	0.0062	0	5	0.002	-	0.002	5	5	0.002	-	0.002	5	1	0.0049	0
Selenium	-	0.43	-	-	1	0.17	0	5	0.272	0.0517	0.316	0	5	0.171	0.0131	0.189	0	1	0.195	0
Zinc	-	4.6	-	-	1	2.89	0	5	2.9	0.23	3.13	0	5	3.3	0.29	3.53	0	1	3.96	0

[1]All concentrations are presented in mg/kg wet weight basis.

[2]Health Canada (Total Diet Study) 2005 to 2007 average concentration for freshwater fish (HC 2011); data for molybdenum are from 1993 to 1999. Data could not be included for a number of parameters because of differences in MDLs.

[3]First Nations Food, Nutrition and Environmental Study; Results from Ontario 2011 to 2012 (Chan et al. 2014).

S.D. = Standard deviation.

<MDL = number of samples less than the laboratory method detection limit (MDL).

Values less than the MDL were set to half the MDL when calculating summary statistics.

Bolded values exceed mercury guidelines.

TABLE 6.2-4

Summary of northern pike and yellow perch tissue chemistry results from the NTC country food study area, July to December 2015.

Parameters[1]	Guidelines	HC (TDS)[2] Supermarket Freshwater Fish	FNFNES[3] Northern Pike		Postagoni Lake Northern Pike					FNFNES[3] Yellow Perch		Blackwater River Yellow Perch					Ombabika River Yellow Perch			Wabinash Bay Yellow Perch		
			Mean	Max	N	Mean	S.D.	Max	<MDL	Mean	Max	N	Mean	S.D.	Max	<MDL	N	Value	<MDL	N	Value	<MDL
Arsenic	-	0.44	0.12	0.633	5	0.021	0.010	0.0386	0	0.042	0.13	2	0.0392	0.002	0.0406	0	1	0.0135	0	1	0.0208	0
Cadmium	-	-	0.002	0.004	5	0.001	0.0005	0.0018	2	0.004	0.018	2	0.0005	-	0.0005	2	1	0.0014	0	1	< 0.001	1
Cobalt	-	0.004	-	-	5	0.002	-	0.002	5	-	-	2	0.002	-	0.002	2	1	< 0.002	1	1	< 0.004	1
Lead	-	-	0.02	0.086	5	0.002	0.0009	0.0041	4	0.009	0.036	2	0.003	0.001	0.004	1	1	< 0.002	1	1	< 0.004	1
Mercury	0.5	-	**0.633**	**2.75**	5	**0.897**	0.325	**1.44**	0	0.208	0.297	2	0.258	0.0071	0.263	0	1	0.322	0	1	0.322	0
Molybdenum	-	0.005	-	-	5	0.002	-	0.002	5	-	-	2	0.002	-	0.002	2	1	< 0.002	1	1	< 0.004	1
Selenium	-	0.43	-	-	5	0.22	0.034	0.25	0	-	-	2	0.1855	0.012	0.194	0	1	0.182	0	1	0.191	0
Zinc	-	4.6	-	-	5	3.94	0.788	4.98	0	-	-	2	3.2	0.15	3.3	0	1	4.53	0	1	6.09	0

[1]All concentrations are presented in mg/kg wet weight basis

[2]Health Canada (Total Diet Study) 2005 to 2007 average concentration for freshwater fish (HC 2011); data for molybdenum are from 1993 to 1999. Data could not be included for a number of parameters because of differences in MDLs.

[3]First Nations Food, Nutrition and Environmental Study; Results from Ontario 2011 to 2012 (Chan et al. 2014).

S.D. = Standard deviation.

<MDL = number of samples less than the laboratory method detection limit (MDL).

Values less than the MDL were set to half the MDL when calculating summary statistics.

Bolded values exceed mercury guidelines.

TABLE 6.3-1

Summary of bird tissue chemistry from the NTC country foods study area, July to December 2015.

Parameters[1]	HC (TDS)[2] Supermarket Poultry	FNFNES[3] Canada Goose		Canada Goose			Spruce Grouse					FNFNES[3] Partridge		Partridge					FNFNES[3] Waterfowl		Waterfowl				
		Mean	Max	N	Value	<MDL	N	Mean	S.D.	Max	<MDL	Mean	Max	N	Mean	S.D.	Max	<MDL	Mean	Max	N	Mean	S.D.	Max	<MDL
Arsenic	0.009	0.01	0.031	1	0.009	0	4	0.011	0.0035	0.014	0	0.011	0.0241	6	0.02	0.02	0.044	2	0.0307	0.096	7	0.01	0.02	0.068	2
Cadmium	0.003	0	0.005	1	0.005	0	4	0.012	0.019	0.041	0	0.018	0.07	6	0.07	0.08	0.226	0	0.03	0.058	7	0.008	0.01	0.024	1
Cobalt	-	-	-	1	0.007	0	4	0.004	0.002	0.005	2	-	-	6	0.06	0.1	0.253	1	-	-	7	0.02	0.01	0.038	1
Lead	-	0.39	1.19	1	< 0.002	1	4	0.05	0.09	0.179	1	1.204	8.78	6	0.14	0.10	0.282	0	0.5407	2.883	7	0.009	0.01	0.03	3
Mercury	-	0	0.006	1	0.003	0	4	0.002	0.0007	0.003	0	0	0.003	6	0.002	0.002	0.006	0	0.0393	0.065	7	0.19	0.35	0.957	0
Molybdenum	0.05	-	-	1	0.017	0	4	0.019	0.012	0.037	0	-	-	6	0.12	0.21	0.532	0	-	-	7	0.02	0.01	0.039	1
Selenium	0.42	-	-	1	0.293	0	4	0.27	0.13	0.451	0	-	-	6	0.28	0.11	0.409	0	-	-	7	0.39	0.42	1.27	0
Zinc	17.5	-	-	1	16.8	0	4	4.95	0.294	5.39	0	-	-	6	9.6	8.0	24.7	0	-	-	7	17	11	38.9	0

[1]All concentrations are presented in mg/kg wet weight basis.

[2]Health Canada (Total Diet Study) 2005 to 2007 average concentration for poultry (HC 2011); data for molybdenum are from 1993 to 1999. Data could not be included for a number of parameters because of differences in MDLs.

[3]First Nations Food, Nutrition and Environmental Study; Results from Ontario 2011 to 2012 (Chan et al. 2014).

S.D. = Standard deviation.

<MDL = number of samples less than the laboratory method detection limit (MDL).

Values less than the MDL were set to half the MDL when calculating summary statistics.

TABLE 6.4-1

Summary of snowshoe hare tissue chemistry from the NTC country foods study area, July to December 2015.

Parameters[1]	HC (TDS)[2] Supermarket Meat	FNFNES[3] Snowshoe Hare		Snowshoe Hare				
		Mean	Max	N	Mean	S.D.	Max	<MDL
Arsenic	0.005	0.005	0.0346	3	0.002	-	0.002	3
Cadmium	-	0.035	0.245	3	0.009	0.0060	0.015	0
Cobalt	0.004	-	-	3	0.004	0.004	0.008	2
Lead	0.004	0.04	0.241	3	0.008	0.008	0.017	1
Mercury	-	0.002	0.011	3	0.002	0.0003	0.002	0
Molybdenum	0.02	-	-	3	0.007	0.0018	0.009	0
Selenium	0.32	-	-	3	0.065	0.012	0.076	0
Zinc	53.6	-	-	3	15	3.9	19.2	0

[1]All concentrations are presented in mg/kg wet weight basis.

[2]Health Canada (Total Diet Study) 2005 to 2007 average concentration for meat (steak, roast beef, ground beef, fresh pork, cured pork, veal, and/or lamb; HC 2011); data for molybdenum are from 1993 to 1999. Data could not be included for a number of parameters because of differences in MDLs.

[3]First Nations Food, Nutrition and Environmental Study; results from Ontario 2011 to 2012 (Chan et al. 2014).

S.D. = Standard deviation.

<MDL = number of samples less than the laboratory method detection limit (MDL).

Values less than the MDL were set to half the MDL when calculating summary statistics.

TABLE 6.5-1

Summary moose chemistry from the NTC country foods study area, July to December 2015.

Parameters[1]	HC (TDS)[2] Supermarket Meat	FNFNES[3] Flesh		Flesh					FNFNES[3] Heart		Heart		
		Mean	Max	N	Mean	S.D.	Max	<MDL	Mean	Max	N	Value	<MDL
Arsenic	0.005	0.004	0.014	13	0.005	0.004	0.0156	8	0.003	0.011	1	0.0065	0
Cadmium	-	0.026	0.279	13	0.51	1.80	6.53	0	0.011	0.034	1	0.0104	0
Cobalt	0.004	-	-	13	0.007	0.01	0.0383	3	-	-	1	0.0189	0
Lead	0.004	0.985	12.9	13	4.96	13.49	44.7	3	0.01	0.035	1	0.018	0
Mercury	-	0.0023	0.0137	13	0.0028	0.0028	0.0117	0	0.0004	0.0019	1	0.0011	0
Molybdenum	0.02	-	-	13	0.02	0.06	0.226	3	-	-	1	0.0363	0
Selenium	0.32	-	-	13	0.08	0.1	0.459	0	-	-	1	0.054	0
Zinc	53.6	-	-	13	46	11	60.5	0	-	-	1	24.6	0

Parameters[1]	FNFNES[3] Kidney		Kidney					FNFNES[3] Liver		Liver				
	Mean	Max	N	Mean	S.D.	Max	<MDL	Mean	Max	N	Mean	S.D.	Max	<MDL
Arsenic	0.008	0.028	2	0.0366	0.016	0.0481	0	0.016	0.085	3	0.052	0.1	0.106	0
Cadmium	13.926	24.9	2	3.7	0.17	3.8	0	1.469	2.73	3	1.10	0.4	1.61	0
Cobalt	-	-	2	0.0351	0.01	0.0424	0	-	-	3	0.115	0	0.144	0
Lead	0.02	0.092	2	0.0341	0.017	0.0458	0	0.031	0.136	3	0.02	0	0.052	1
Mercury	0.018	0.048	2	0.0242	0.006	0.0281	0	0.0068	0.024	3	0.0032	0	0.0035	0
Molybdenum	-	-	2	0.271	0.004	0.274	0	-	-	3	0.906	0.3	1.17	0
Selenium	-	-	2	0.480	0.03	0.501	0	-	-	3	0.1	0.1	0.187	0
Zinc	-	-	2	28.6	7.00	33.5	0	-	-	3	20.0	3.8	24.3	0

[1]All concentrations are presented in mg/kg wet weight basis.

[2]Health Canada (Total Diet Study) 2005 to 2007 average concentration for meat (steak, roast beef, ground beef, fresh pork, cured pork, veal, and/or lamb) (HC 2011); data for molybdenum are from 1993 to 1999. Data could not be included for a number of parameters because of differences in MDLs.

[3]First Nations Food, Nutrition and Environmental Study; Results from Ontario 2011 to 2012 (Chan et al. 2014).

S.D. = Standard deviation.

<MDL = number of samples less than the laboratory method detection limit (MDL).

Values less than the MDL were set to half the MDL when calculating summary statistics.

TABLE 6.7-1

Summary of vegetation chemistry from the NTC country food study area, July to December 2015.

Parameters[1]	HC (TDS)[2] Supermarket Berries	FNFNES[3] Blueberry		Blueberry					FNFNES[3] Strawberry		Shadow Mountain Area
		Mean	Max	N	Mean	S.D.	Max	<MDL	Mean	Max	Wild Strawberry
Arsenic	0.01	0.004	0.012	3	0.004	0.0032	0.008	2	0.001	0.006	0.0103
Cadmium	0.001	0.002	0.012	3	0.001	0.0010	0.002	2	0.019	0.042	0.0005
Cobalt	-	-	-	3	0.003	0.002	0.005	2	-	-	0.002
Lead	-	0.006	0.024	3	0.002	-	0.002	3	0.053	0.193	0.002
Mercury	-	-	-	3	0.0005	-	5E-04	3	-	-	0.0005
Molybdenum	0.05	-	-	3	0.071	0.0971	0.183	0	-	-	0.0224
Selenium	-	-	-	3	0.005	-	0.005	3	-	-	0.005
Zinc	1.0	-	-	3	0.953	0.1604	1.12		-	-	0.98

[1]All concentrations are presented in mg/kg wet weight basis.

[2]Health Canada (Total Diet Study) 2005 to 2007 average concentration for blueberrries (HC 2011); data for molybdenum are from 1993 to 1999. Data could not be included for a number of parameters because of differences in MDLs.

[3]First Nations Food, Nutrition and Environmental Study; Results from Ontario 2011 to 2012 (Chan et al. 2014).

S.D. = Standard deviation.

<MDL = number of samples less than the laboratory method detection limit (MDL).

Values less than the MDL were set to half the MDL when calculating summary statistics.

APPENDICES

LIST OF APPENDICES

APPENDIX A

LETTERS OF SUPPORT

Animbiigoo Zaagi'igan Anishinaabek
Lake Nipigon Reserve
P.O. Box 120
Beardmore, ON
P0T 1G0

BAND COUNCIL RESOLUTION

Chronological no. 38-13

File reference no.

NOTE:
The words "from our Band Funds" "capital" or "revenue", whichever is the case, must appear in all resolutions requesting expenditures from Band Funds.

Animbiigoo Zaagi'igan Anishinaabek

Cash free balance

Capital account $

Revenue account $

Date of duly convened meeting	D	M	Y	Province
	13	11	2013	ONTARIO

DO HEREBY RESOLVE:

WHEREAS, Animbiigoo Zaagi'igan Anishinaabek members regularly consume animals, fish and plants from Lake Nipigon, the lands surrounding the lake, and the islands found in the lake as part of our diet and for community and ceremonial purposes; and

WHEREAS, the lands surrounding Lake Nipigon have both past and present been exposed to mineral exploration, mining, power generation and transmission, forestry, and the associated transportation corridors via road, rail and pipeline, along with proposed activities in these and other sectors, have raised concerns regarding the impact on both the ecosystem (plants, animals...) and the health and wellbeing of our members who rely on the lake and the lands around it for their food; and

WHEREAS, the maintenance and protection of the Lake Nipigon ecosystem is of the utmost importance to the health of our members and the economic and cultural sustainability of our community; and

WHEREAS, the Nokiiwin Tribal Council is dedicated to working together with the member communities of the Tribal Council by supporting and assisting them plan and adapt to the challenges represented by industrial development; and

WHEREAS, Health Canada has funding available through the First Nation Environmental Contaminants Program; and

WHEREAS, Nokiiwin Tribal Council is submitting a project proposal titled: Country Foods Study in the Lake Nipigon Area in partnership with Canada North Environmental Services on behalf of Animbiigoo Zaagi'igan Anishinaabek, Bingwi Neyaashi Anishinaabek, Biinjitiwaabik Zaaging Anishinaabek and Kiashke Zaaging Anishinaabek; and

WHEREAS, the project involves conducting a community based research program,

THEREFORE BE IT RESOLVED THAT the Animbiigoo Zaagi'igan Anishinaabek Chief and Council support this important initiative that will provide valuable information that will assist the First Nation in decision making and strategies that will ensure the maintenance and protection of the Lake Nipigon Ecosystem; and

THEREFORE BE IT FURTHER RESOLVED THAT we, the undersigned, support the Nokiiwin Tribal Council submission to the First Nation Environmental Contaminants Program Proposal titled: Climate Change Adaptation Program titled: Country Foods Study in the Lake Nipigon Area .

Quorum
Any 3

(Chief Theresa Nelson)

(Councillor Lynda Lynch)

(Councillor Alice Sasines)

(Councillor Denise Bottle)

(Councillor Cynthia Kindla)

FOR DEPARTMENTAL USE ONLY

Expenditure	Authority (Indian Act Section)	Source of funds	Expenditure	Authority (Indian Act Section)	Source of funds
		◯ Capital ◯ Revenue			◯ Capital ◯ Revenue

Recommending officer — Signature — Date

Approving officer — Signature — Date

Recommending officer — Signature — Date

Approving officer — Signature — Date

BINGWI NEYAASHI ANISHINAABEK
Sand Point First Nation

146 South Court Street, Thunder Bay, ON P7B 2X6
Phone: (807) 623-2724 Fax: (807) 623-2764

Chronological no.
13-11-002
File reference no.

FIRST NATION COUNCIL RESOLUTION

Date of duly convened meeting – November 13, 2013	**Place of meeting** - Thunder Bay, ON

DO HEREBY RESOLVE:

WHEREAS, Bingwi Neyaashi Anishinaabek members regularly consume animals, fish and plants from Lake Nipigon, the lands surrounding the lake, and the islands found in the lake as part of our diet and for community and ceremonial purposes, and

WHEREAS, the lands surrounding Lake Nipigon have both past and present been exposed to mineral exploration, mining, power generation and transmission, forestry, and the associated transportation corridors via road, rail and pipeline, along with proposed activities in these and other sectors, have raised concerns regarding the impact on both the ecosystem (plants, animals...) and the health and wellbeing of our members who rely on the lake and the lands around it for their food.

WHEREAS, the maintenance and protection of the Lake Nipigon ecosystem is of the utmost importance to the health of our members and the economic and cultural sustainability of our community, and

WHEREAS, the Nokiiwin Tribal Council is dedicated to working together with the member communities of the Tribal Council by supporting and assisting them plan and adapt to the challenges represented by industrial development;

WHEREAS, Health Canada has funding available through the First Nation Environmental Contaminants Program;

WHEREAS, Nokiiwin Tribal Council is submitting a project proposal titled: Country Foods Study in the Lake Nipigon Area in partnership with Canada North Environmental Services on behalf of Animbiigoo Zaagi'igan Anishinaabek, Bingwi Neyaashi Anishinaabek, Biinjitiwaabik Zaaging Anishinaabek and Kiashke Zaaging Anishinaabek; and

WHEREAS, the project involves conducting a community based research program;

THEREFORE BE IT RESOLVED THAT

Bingwi Neyaashi Anishinaabek Chief and Council support this important initiative that will provide valuable information that will assist the First Nation in decision making and strategies that will ensure the maintenance and protection of the Lake Nipigon Ecosystem; and

THEREFORE BE IT FURTHER RESOLVED THAT

we, the undersigned, support the Nokiiwin Tribal Council submission to the First Nation Environmental Contaminants Program Proposal titled: Climate Change Adaptation Program titled: Country Foods Study in the Lake Nipigon Area

Quorum: **2**

Chief Laura Airns	Councillor Joe Ladouceur	Councillor Lillian Calder

Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

Chronological no.

File reference no.

BAND COUNCIL RESOLUTION

NOTE:
The words "from our Band Funds" "capital" or "revenue", whichever is the case, must appear in all resolutions requesting expenditures from Band Funds.

Cash free balance

Biinjitiwaabik Zaaging Anishinaabek

Capital account $

Date of duly convened meeting D 13 M 11 Y 13

Province ONTARIO

Revenue account $

DO HEREBY RESOLVE:

WHEREAS, Biinjitiwaabik Zaaging Anishinaabek members regularly consume animals, fish and plants from Lake Nipigon, the lands surrounding the lake, and the islands found in the lake as part of our diet and for community and ceremonial purposes, and

WHEREAS, the lands surrounding Lake Nipigon have both past and present been exposed to mineral exploration, mining, power generation and transmission, forestry, and the associated transportation corridors via road, rail and pipeline, along with proposed activities in these and other sectors, have raised concerns regarding the impact on both the ecosystem (plants, animals...) and the health and wellbeing of our members who rely on the lake and the lands around it for their food.

WHEREAS, the maintenance and protection of the Lake Nipigon ecosystem is of the utmost importance to the health of our members and the economic and cultural sustainability of our community, and

WHEREAS, the Nokiiwin Tribal Council is dedicated to working together with the member communities of the Tribal Council by supporting and assisting them plan and adapt to the challenges represented by industrial development;

WHEREAS, Health Canada has funding available through the First Nation Environmental Contaminants Program;

WHEREAS, Nokiiwin Tribal Council is submitting a project proposal titled: Country Foods Study in the Lake Nipigon Area in partnership with Canada North Environmental Services on behalf of Animbiigoo Zaagi'igan Anishinaabek, Bingwi Neyaashi Anishinaabek, Biinjitiwaabik Zaaging Anishinaabek and Kiashke Zaaging Anishinaabek; and

WHEREAS, the project involves conducting a community based research program;

THEREFORE BE IT RESOLVED THAT the Biinjitiwaabik Zaaging Anishinaabek Chief and Council support this important initiative that will provide valuable information that will assist the First Nation in decision making and strategies that will ensure the maintenance and protection of the Lake Nipigon Ecosystem; and

THEREFORE BE IT FURTHER RESOLVED THAT we, the undersigned, support the Nokiiwin Tribal Council submission to the First Nation Environmental Contaminants Program Proposal titled: Climate Change Adaptation Program titled: Country Foods Study in the Lake Nipigon Area

Quorum (4) FOUR	(Chief)	
(Councillor)	(Councillor)	(Councillor)
(Councillor)	(Councillor)	(Councillor)

FOR DEPARTMENTAL USE ONLY

Expenditure	Authority (Indian Act Section)	Source of funds	Expenditure	Authority (Indian Act Section)	Source of funds
		◯ Capital ◯ Revenue			◯ Capital ◯ Revenue

Recommending officer		Recommending officer	
Signature	Date	Signature	Date
Approving officer - Approuvé par		Approving officer	
Signature	Date	Signature	Date

Ontario

Nipigon District
Ontario Government Building
5 Wadsworth Drive, PO Box 970
Nipigon ON P0T 2J0

Ministry of
Natural Resources

Ministère des
Richesses naturelles

Tel: (807) 887-5000
Fax: (807) 887-2993

November 14, 2013

Subject: Country Foods Study in the Lake Nipigon Area First Nations Environmental Contaminants Program Funding Application

To Whom It May Concern:

Please accept this letter as formal support of Nokiiwin Tribal Council's application for funding from the First Nations Environmental Contaminants Program.

The Ministry of Natural Resources, Nipigon District recognizes the value and importance of gathering traditional knowledge as well as establishing a sampling program that will provide data related to the quality of country foods. Data will ultimately be communicated to community members enabling more informed decisions regarding food consumption.

If you have any questions or concerns, please contact Kimberly McNaughton, Area Biologist at (807)887-5113.

Yours truly,

Phil Couture
Area Supervisor
Nipigon West

KIASHKE ZAAGING ANISHINAABEK

Gull Bay First Nation
General Delivery
Gull Bay, Ontario P0T 1P0
Tel. (807) 982-0006
Fax (807) 982-0009

To whom it may concern,

Kiashke Zaaging Anishinaabek members regularly consume animals, fish and plants from Lake Nipigon, the lands surrounding the lake, and the islands found in the lake as part of our diet and for community and ceremonial purposes.

These lands have been, both in the past and at the present time, exposed to mineral exploration, mining, power generation, forestry, and the associated transportation corridors via road and pipeline, along with proposed activities in these and other sectors.

We are concerned about the impact on both the ecosystem (plants, animals…) and the health and wellbeing of our members who rely on the lake and the lands around it for their food. The maintenance and protection of the Lake Nipigon ecosystem is of the utmost importance to the health of our members and the economic and cultural sustainability of our community.

We fully support Nokiiwin Tribal Council's submission, to the First Nations Environmental Contaminants Program for 2014-15, of a funding proposal titled "Country Foods Study in the Lake Nipigon Area" in partnership with Canada North Environmental Services.

We feel that this important initiative will provide valuable information that will assist our First Nation in decision making and strategies that will ensure the maintenance and protection of the Lake Nipigon Ecosystem.

Signed

Date: November 15, 2013

Anthony Esquega
Kiashke Zaaging Anishinaabek Councilor/ Resource Portfolio Holder

APPENDIX B

COUNTRY FOODS BROCHURES

Your Community Liaisons

Alice Sasines

Animbiigoo Zaagi'igan Anishinaabek.

204 Main Street
P.O. Box 120
Beardmore, ON
P0T 1G0
http://www.aza.ca/
Tel: (807)-875-2785
Fax: (807)-875-2786
Toll Free: 1-877-669-6606
asasines@aza.ca

Erica Mickelson

Biinjitiwaabik Zaaging Anishinaabek

501 Spirit Bay Road
General Delivery
MacDiarmid, ON
P0T 2B0
info@rockybayfn.ca
Tel: (807) 885-3401
Fax: (807) 885-1218
http://www.rockybayfn.ca

Audrey Mandula

Bingwi Neyaashi Anishinaabek

Sand Point First Nation - Satellite Office
146 South Court Street
Thunder Bay, ON
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Tel: (807) 623-2724
Fax: (807) 623-2764
amundula@bnafn.ca

Kiashke Zaaging Anishinaabek

General Delivery
Gull Bay, ON
P0T 1P0
Tel: (807) 982-0006
Fax: (807) 982-0009

Issue
03

November
2015

Country Foods Study in the Lake Nipigon Area

PROJECT UPDATE - November 2015

We Need Your Help!

We need as many samples of animals and berries as you can spare from your freezer.

How can you Help?

We need you to donate samples of the animals and berries you have harvested so we can have them tested for environmental contaminants.

By providing our team with samples from your freezer you will be helping us to make sure the traditional foods you eat are safe.

The "Country Foods Study" is well underway. The "survey" phase of the project is winding down and we are now fully focused on getting samples from community members. Getting these samples is very important to the project.

A very big "Thank You" to everyone who participated in each community and special thanks to the Community Liaisons and other volunteers for all their hard work over the summer months.

We now need as many samples of traditional foods as you can spare from your freezers. The samples will be sent to be tested for chemical contaminants and the results presented to the communities early next year.

If you have any traditional foods – fish, mammals, birds etc. in your freezers, you know where they were harvested, and can spare a little as a sample, please contact your Community Liaison or Nokiiwin Tribal Council and they will arrange to pick them up.

The results of this study belong to the participating First Nations. The study will provide a snapshot of the traditional foods you eat and will create and important baseline of data on the area surrounding Lake Nipigon.

This will be a "first" for the First Nation communities in this area.

What Country Foods do we need to Sample ?

Country Foods, or "Traditional Foods" refers to wild food you harvest directly from the land or lakes.

These foods include mammals, birds, fish, and harvestable plants like wild rice and blueberries.

If you eat any of these, we would like to sample them to see if they contain chemical contaminants like mercury. Because these traditional foods are not processed we have little or no data to determine if environmental pollutants or other toxins from human activity are present.

We need community members to donate samples of traditional foods which we can send for chemical analysis.

The results of the analysis will give us the chance to determine the levels of chemical contaminants in the animals and plants you are eating.

Can I Still Get Involved?

Yes, there is still time!

The team at CanNorth

Canada North is an environmental consulting company by **Kitsaki Management Limited Partnership**, the business arm of the **Lac La Ronge Indian Band**.

We are working with a team of scientists and technicians from CanNorth to complete the "Country Foods study"

In October Ryan Froess, Community Programs Division Manager and a Senior Aquatic Biologist with CanNorth, visited the area to conduct a "Sample Study" which included taking water samples from the area's lakes, as well as collecting and cataloguing samples.

The GIS / IT team at CanNorth have begun collating survey information, and mapping "high use" areas critical to community harvesting practices.

Remember: All information gathered remains the property of the communities that provided it.

The study should provide valuable information about the food you harvest.

Our goal is to gather information on the traditional foods you consume, how much and how often. By providing samples of the foods you harvest we can then have these analyzed.

When we have the results of the analysis CanNorth will review the results and make their recommendations in a report which will be presented in the communities.

The findings of the report can be used by your community as a resource and for health promotion and planning purposes.

Regional results will be used to help identify any pollution and food safety problems and may be used to develop guidelines for health promotion and disease prevention.

If you are interested in providing us with some "food samples" please contact your Community Liaison or Nokiiwin Tribal Council.

Providing samples is great way to get involved.

Its Sample Season!

What sort of samples are we looking for?

Why Are We Doing This?

The results of the study will allow us to begin to build a picture of the health of the environment in the area and hopefully will pave the way for ongoing monitoring and evaluation of the impact of human activity around the lake.

The study will help your community protect your territories for future generations to enjoy.

What samples are we looking for?

1. Mammal samples
2. Fish samples
3. Birds
4. Berries

Ideally, each sample should be about half-a-pound. For rabbit, birds and other small game skinned or processed is best.

How should the samples be stored?

Each sample should be stored in a properly closed separate Ziploc freezer bag. We can provide suitable bags. If samples are not already frozen we will freeze them the day you hand them in.

What we need to know.

We need to know:

- your community;
- where you harvested the sample;
- name of the lake, the bay, river; near which island?
- show us on a map, or even provide the coordinates
- the approximate date

Because we are testing for metal pollution we would need to know what type of shot you used as this might influence the results.

Protect yourself, your loved ones and your home with these cold weather safety tips!

This month's safety tip

- Dress warmly and stay dry.
- Wear a hat, scarf, and mittens.
- Avoid frostbite.
- If you have to do heavy outdoor chores, dress warmly and work slowly.
- Avoid walking on ice or getting wet.

Q. Who you gonna call?
A. Your Community Liaison

If you have a question or concern, or if you have some samples you want to donate – call your community liaison. They will explain how the project works and what are main goals are. If they can't answer your question they can direct you to someone who does.

Any data collected is protected and the results of the study will belong to the First Nations involved.

“This project is an important first step towards ensuring our traditional way of life, our fishing, our hunting, and our values are protected for our future generations”

- Audrey Gilbeau, Executive Director, Nokiiwin Tribal Council

Have a question or concern you would like to discuss? Please feel free to contact one of the following project staff.

Alice Sasines
Animbiigoo Zaagi’igan Anishinaabek
807-875-2785

Alice Sasines,
AZA Country Foods Liaison

Lila Onakanakis
Biinjitiwaabik Zaaging Anishinaabek
807-885-3401

Celine Belleau
Bingwi Neyaashi Anishinaabek
807-632-2724

Anthony Esquega
Kiashke Zaaging Anishinaabek
807-982-0006

Kevin Sherlock
Nokiiwin Tribal Council
807-474-4230

Country Foods Study in the Lake Nipigon Area

NOKIIWIN TRIBAL COUNCIL

Fall 2014

What is this project about?

This study will gather information on “country foods” use practices, as well as test many traditional foods for nutrient specific hazardous environmental chemicals, such as mercury.

A number of community members will be invited to complete a survey of the country foods they consume in order to determine if these foods increase exposure to containminants and contribute to health risks.

Who is conducting this project?

The study is being done in collaboration with:

- Animbiigoo Zaagi’igan Anishinaabek
- Biinjitiwaabik Zaaging Anishinaabek
- Bingwi Neyaashi Anishinaabek
- Kiashke Zaaging Anishinaabek

The study is being coordinated by Nokiiwin Tribal Council Inc., Canada North Environmental Services Ltd., with funding from the First Nations Environmental Contaminants Program.

The goal of the project

The goal of the project will be to determine the presence or absence of specific chemical contaminants within the country foods harvested from the area.

What is the study area?

The study area will be Lake Nipigon and 10 to 15 kilometers of the land surrounding the lake. The study will focus on mammals, fish, birds and harvestable plants for eating and medicinal purposes by community members harvested from within this area

What is the benefit of this study?

Benefits to the community include developing a baseline of exposure to contaminants through traditional food; improved knowledge of levels of exposure to contaminants in the environment and knowledge of regional risks assoicated with food such as the reliance on traditional foods and the importance of maintaining traditional foods in the daily diet.

How the study will be conducted?

The study includes a survey of wild foods consumed by community members in four communities bordering Lake Nipigon, a study of their harvesting practices, and the collection and analysis of samples of representative foods.

How will the survey results will be used?

Results may be used by your community for resources and health promotion planning purposes. Regional results will be used to identify any pollution and food safety problems and may be used to develop guidelines for health promotion and disease prevention.

Country Foods Study Project Timeline

Fall 2014 → Develop Survey

Winter 2014 into 2015 → Survey Approved → Deliver Surveys

Spring 2015 → Collate Data → Collect Samples

Summer 2015 → Analyze Samples

Fall 2015 → Report to each Community

APPENDIX C

FOOD FREQUENCY QUESTIONNAIRE

Nokiiwin Tribal Council - Country Foods Study in the Lake Nipigon Area

If you have any questions or concerns about the study and/or the interview process please contact:

Kevin Sherlock (Mining Development Coordinator)

Phone Number: 1 (807) 474-4230

Address: 292 Court Street South
Thunder Bay, Ontario
P7B 6C6

NOKIIWIN TRIBAL COUNCIL
COUNTRY FOODS STUDY IN THE LAKE NIPIGON AREA
SEMI-QUANTITATIVE FOOD FREQUENCY QUESTIONAIRE (FFQ)
(NFNECP 2015)

Date: ___ /____/_____ Time:_____ Community: (circle) AZA BNA BZA KZA
(day/month/year)

Member's Name: _____ **Member's ID: _____** (mandatory)
(optional: name/address - will be used for honorarium only)

Address: _____

Phone Number: _____ **Email: _____**

Payment for Participation:(circle) **Pick Up** (band office) **Mail** (30 days) (above address) **Other** (Specify)

Age range: (circle) **Must be over 18 years old** **18-30;** **31-50;** **51-70;** **70+**

Gender: (circle) **Male / Female** **Interview Language: _____ Translation required** ☐

Number of years harvesting in the area: _____

How many people in your family eat "country foods "?

Do you have an active trap line in your family? (circle) **YES** **NO**

If YES, where is your family trap line located?

Block: _____ **Zone: _____**

How many people consume food from this trap line? **_____**

Has the respondent completed the Individual Consent Form? **YES** **NO***

***If "NO" Do Not proceed until the respondent has read, understood and signed-off on the Individual Consent Form!**

Member's ID:_____

Category 1: Land and Aquatic Mammals

In the past year, what mammal species have you eaten? If none, go to next section.		How Much? (average portion size eaten) *(Check only 1 per species)*			Approximately how often? (# of times eaten per season) (# of times eaten per season) *Type in total for 90 days, use "How often (eaten) chart below*			
Mammals:	**Please Circle** (if yes how much/often?)	**Small (3 oz)**	**Medium (6 oz)**	**Large (9 oz)**	**Spring (Mar/Apr/May)**	**Summer (Jun/Jul/Aug)**	**Fall (Sept/Oct/Nov)**	**Winter (Dec/Jan/Feb)**
Bear	No / Yes >							
Moose meat	No / Yes >							
Moose liver	No / Yes >							
Moose kidney	No / Yes >							
Deer meat	No / Yes >							
Deer liver	No / Yes >							
Deer kidney	No / Yes >							
Caribou (woodland) meat	No / Yes >							
Caribou (woodland) liver	No / Yes >							
Caribou (woodland) kidney	No / Yes >							
Porcupine	No / Yes >							
Rabbit	No / Yes >							
Beaver	No / Yes >							
Muskrat	No / Yes >							
Squirrels	No / Yes >							
Lynx	No / Yes >							
Others? (specify)	No / Yes >							

Rate your concern about the quality (potential contamination) of the mammals you have selected above.

Concern: (circle one >)	No Concern 1	Slightly Concerned	Moderately Concerned	Very Concerned	Extremely Concerned

Additional notes for concerns:

How often (eaten)	
2 x per day	180
1 x per day	90
6 x per week	72
5 x per week	60
4 x per week	48
3 x per week	36
2 x per week	24
Once per week	12
Once every two weeks	6
Once per month	3

Mapping : Where are the majority of these mammals harvested from? (Please mark a location on the map and print species name next to the area).

Do you have any mammal samples you would be willing to donate for chemistry sampling ? **Yes** **No**

Member's ID:_____

Category 2: Fish

In the past year, what fish species have you eaten? If none, go to next section.		How Much? (average portion size eaten) *(Check only 1 per species)*			Approximately how often? (# of times eaten per season) (# of times eaten per season) *Type in total for 90 days, use "How often (eaten) chart below*			
Fish:	**Please Circle (if yes how much/often?)**	**Small (3 oz)**	**Medium (6 oz)**	**Large (9 oz)**	**Spring (Mar/Apr/May)**	**Summer (Jun/Jul/Aug)**	**Fall (Sept/Oct/Nov)**	**Winter (Dec/Jan/Feb)**
Lake whitefish	No / Yes >							
Pickerel (Walleye)	No / Yes >							
Sauger	No / Yes >							
Lake trout	No / Yes >							
Northern pike (jackfish)	No / Yes >							
Burbot (Mariah, Ling)	No / Yes >							
Yellow Perch	No / Yes >							
Smelt	No / Yes >							
Suckers	No / Yes >							
Cisco (Tullibee, Lake herring)	No / Yes >							
Brook trout (Speckeled trout)	No / Yes >							
Brown trout	No / Yes >							
Rainbow trout	No / Yes >							
Cutthroat trout	No / Yes >							
Salmon	No / Yes >							
Lake Sturgeon	No / Yes >							
Smallmouth Bass	No / Yes >							
Others? (specify)	No / Yes >							

Rate your concern about the quality (potential contamination) of the mammals you have selected above.

Concern: (circle one >)	No Concern 1	Slightly Concerned	Moderately Concerned	Very Concerned	Extremely Concerned

Additional notes for concerns:

How often (eaten)	
2 x per day	180
1 x per day	90
6 x per week	72
5 x per week	60
4 x per week	48
3 x per week	36
2 x per week	24
Once per week	12
Once every two weeks	6
Once per month	3

Mapping : Where are the majority of these mammals harvested from? (Please mark a location on the map and print species name next to the area).

Do you have any fish samples you would be willing to donate for chemistry sampling ? **Yes** **No**

Member's ID:_____

Category 3: Birds

In the past year, what bird species have you eaten? If none, go to next section.		How Much? (average portion size eaten) *(Check only 1 per species)*			Approximately how often? (# of times eaten per season) (# of times eaten per season) *Type in total for 90 days, use "How often (eaten) chart below*			
Birds:	**Please Circle (if yes how much/often?)**	**Small (3 oz)**	**Medium (6 oz)**	**Large (9 oz)**	**Spring (Mar/Apr/May)**	**Summer (Jun/Jul/Aug)**	**Fall (Sept/Oct/Nov)**	**Winter (Dec/Jan/Feb)**
Spruce grouse	No / Yes >							
Ruffed grouse	No / Yes >							
Sharp-Tail grouse	No / Yes >							
Mallard duck	No / Yes >							
American Black duck	No / Yes >							
Canvasback duck	No / Yes >							
Wood duck	No / Yes >							
Teal	No / Yes >							
Scoter	No / Yes >							
Redhead	No / Yes >							
Other ducks (specify)	No / Yes >							
Loon	No / Yes >							
Gray partridge	No / Yes >							
Pheasant	No / Yes >							
Canada Goose	No / Yes >							
Snow Goose	No / Yes >							
Bird eggs (specify)	No / Yes >							
Others? (specify)	No / Yes >							

Rate your concern about the quality (potential contamination) of the mammals you have selected above.

Concern: (circle one >)	No Concern 1	Slightly Concerned	Moderately Concerned	Very Concerned	Extremely Concerned

Additional notes for concerns:

How often (eaten)	
2 x per day	180
1 x per day	90
6 x per week	72
5 x per week	60
4 x per week	48
3 x per week	36
2 x per week	24
Once per week	12
Once every two weeks	6
Once per month	3

Mapping : Where are the majority of these birds harvested from? (Please mark a location on the map and print species name next to the area).

Do you have any bird samples you would be willing to donate for chemistry sampling ? **Yes** **No**

Member's ID:_____

Category 4: Edible Plants:

In the past year, what edible plant species have you eaten? If none, go to next section.		How Much? (average portion size eaten) *(Check only 1 per species)*			Approximately how often? (# of times eaten per season) (# of times eaten per season) *Type in total for 90 days, use "How often (eaten) chart below*			
Edible Plants:	**Please Circle (if yes how much/often?)**	**Small (1/2 cup)**	**Medium (1 cup)**	**Large (1 1/2 cups)**	**Spring (Mar/Apr/May)**	**Summer (Jun/Jul/Aug)**	**Fall (Sept/Oct/Nov)**	**Winter (Dec/Jan/Feb)**
Blueberry	No / Yes >							
Bog cranberry	No / Yes >							
Pin cherry	No / Yes >							
Gooseberry	No / Yes >							
Raspberry	No / Yes >							
Wild strawberry	No / Yes >							
Cloudberry	No / Yes >							
Saskatoon berry	No / Yes >							
Crowberry	No / Yes >							
Highbush cranberry	No / Yes >							
Chokecherry	No / Yes >							
Currant	No / Yes >							
Rosehips	No / Yes >							
Buffaloberry	No / Yes >							
Wild Mint	No / Yes >							
Labrador Tea	No / Yes >							
Wild Carrot	No / Yes >							
Roots	No / Yes >							
Wild Rice	No / Yes >							
Cedar	No / Yes >							
Mushrooms (specify)	No / Yes >							
Others? (specify)	No / Yes >							

Rate your concern about the quality (potential contamination) of the mammals you have selected above.

Concern: (circle one >)	No Concern 1	Slightly Concerned	Moderately Concerned	Very Concerned	Extremely Concerned

Additional notes for concerns:

How often (eaten)	
2 x per day	180
1 x per day	90
6 x per week	72
5 x per week	60
4 x per week	48
3 x per week	36
2 x per week	24
Once per week	12
Once every two weeks	6
Once per month	3

Mapping : Where are the majority of these edible plants harvested from? (Please mark a location on the map and print species name next to the area).

Do you have any edible plant samples you would be willing to donate for chemistry sampling ? **Yes** **No**

Member's ID:_____

Category 5: Medicinal Plants

In the past year, what medicinal species have you eaten? If none, go to next section.		How Much? (average portion size eaten) *(Check only 1 per species)*			Approximately how often? (# of times eaten per season) (# of times eaten per season) *Type in total for 90 days, use "How often (eaten) chart below*			
Medicinal Plants:	**Please Circle (if yes how much/often?)**	**Small (1/2 cup)**	**Medium (1 cup)**	**Large (1 1/2 cups)**	**Spring (Mar/Apr/May)**	**Summer (Jun/Jul/Aug)**	**Fall (Sept/Oct/Nov)**	**Winter (Dec/Jan/Feb)**
Sweet flag	No / Yes >							
Pitcher plant	No / Yes >							
Wild Mint	No / Yes >							
Red osier dogwood	No / Yes >							
Birch sap	No / Yes >							
Bearberry	No / Yes >							
Birch bark	No / Yes >							
Baslam Bark	No / Yes >							
Spruce Gum	No / Yes >							
Rat Root	No / Yes >							
Bunchberry	No / Yes >							
Labrador tea	No / Yes >							
Yarrow	No / Yes >							
Lily root	No / Yes >							
Juniper	No / Yes >							
Tamarack	No / Yes >							
Sweet grass	No / Yes >							
Dandelion	No / Yes >							
St. Johns Wort	No / Yes >							
Others? (specify)	No / Yes >							

Rate your concern about the quality (potential contamination) of the mammals you have selected above.

Concern: (circle one >)	No Concern 1	Slightly Concerned	Moderately Concerned	Very Concerned	Extremely Concerned

Additional notes for concerns:

How often (eaten)	
2 x per day	180
1 x per day	90
6 x per week	72
5 x per week	60
4 x per week	48
3 x per week	36
2 x per week	24
Once per week	12
Once every two weeks	6
Once per month	3

Mapping : Where are the majority of these medicines harvested from? (Please mark a location on the map and print species name next to the area).

Do you have any medicinal plant samples you would be willing to donate for chemistry sampling ? **Yes** **No**

Food Frequency Questionnaire - Serving Size (Pictures) - Nokiiwin Tribal Council 2015

Please note: Use these pictures to help estimate your usual serving sizes.

Medium serving sizes a will be used when no answer is selected on the Food Questionnaire.
A small serving is about one-half (3 oz) the medium (6 oz) serving size.

Meat, fish, and birds (grilled or cooked)

Small (3 oz)

Medium (6 oz)

Large (9 oz)

3 ounces of meat is about the size if deck of playing cards or palm of womens hand.

Food Frequency Questionnaire - Serving Size (Pictures) - Nokiiwin Tribal Council 2015

1 cup serving sizes a will be used when no aportion size is selected on the Food Questionnaire.

A 1/2 cup serving is about one-half (1/2) the medium (1 cup) serving size.

Edible and medicinal plants (raw)

1/2 cup

1/2 cup of berries is about the size of pool ball or a small hand full

1 cup

1 cup of berries is about the size of baseball or two small hand fulls

1 1/2 cups

1 cup of berries is about the size of softball or two large hand fulls

APPENDIX D

RESEARCH ETHICS APPROVAL

Health Canada and Public Health Agency of Canada
Research Ethics Board

Santé Canada et l'Agence de la santé publique du Canada
Comité d'éthique de la recherche

APR 15 2015

Address Locator 0909C
Ottawa, Ontario K1A 0K9

Kevin Sherlock
Mining Development Coordinator
Nokiiwin Tribal Council
1000 Chippewa Road
Fort William First Nation, ON P7J 1B6

Dear Mr. Sherlock,

Protocol Number: **REB 2014-0038**
Protocol Title: **Country Foods Study in the Lake Nipogon Area**

Departmental Approval

This letter will inform you of the results of the Health Canada and Public Health Agency of Canada's Research Ethics Board's (REB) ethics review of your application which took place on February 12, 2015 and the ethics review of your responses to the REB members' questions which took place on March 23 and April 13, 2015.

The REB members are providing their approval for Phase 1 of the project to proceed in accordance with the protocol submitted to the REB Secretariat on January 21 and the responses to the REB members' questions submitted to the REB Secretariat on March 19, 2015. Please forward a detailed application for Phase 2 for ethics review before you implement Phase 2.

Please be informed that, following the receipt of this approval to proceed with the project, Principal Investigators must:

- obtain an annual Certificate of Ethics Approval until the research is complete (the approval is given for one year and will expire on April 13, 2016);
- seek re-approval of the REB for any amendment or modification of the approved research protocol or consent form;
- report immediately to the REB Secretariat, any adverse or unexpected events resulting from the research on human subjects; and
- notify the REB Secretariat, upon termination or completion of the project.

..../2

These templates and instructions for their completion may be found at http://www.hc-sc.gc.ca/sr-sr/advice-avis/reb-cer/index-eng.php; once completed these should be forwarded to the:

Research Ethics Board Secretariat
9th Floor, Room 941C (0909C)
70 Colombine Driveway
Brooke Claxton Building
Tunney's Pasture
Ottawa, Ontario, K1A 0K9

Would you kindly confirm that the research will be carried out in accordance with the approved protocol, by signing the enclosed Certificate of Ethics Approval and sending a copy to the REB Secretariat.

If you require further information, you may contact Richard Carpentier, Manager, REB Secretariat at (613) 941-5199. Please cite the file number (REB 2014-0038) on all correspondence pertaining to your application.

Yours sincerely,

Laird Roe
Health Canada's Decisional Authority for Research Involving Humans

Attachment: REB Certificate of Ethics Approval

APPENDIX E

NOKIWIIN TRIBAL COUNCIL CONSENT TO PARTICIPATE

Country Foods Study of the Lake Nipigon Area

Individual Consent Form

Please take as much time as you want to read this form, ask questions, and talk about this project with family or friends.

What is this project about?

This study will gather information on "country foods" use practices in four participating First Nations adjacent to Lake Nipigon, Ontario, in order to determine which country foods are consumed most often and from where. The most popular country food sources from these areas will then be sampled and tests conducted to detect the presence or absence of common chemical contaminants.

The results of the study will be published in a final report made available to each participating First Nation.

Who is conducting this project?

This study is being done in collaboration with:

Animbiigoo Zaaging Anishinaabek; Bingitiwaabik Zaaging Anishinaabek; Bingwi Neyaashi Anishinaabek; Kiashke Zaaging Anishinaabek;

The study is being coordinated by Nokiiwin Tribal Council Inc. and Canada North Environmental Services Ltd., with funding for the project provided by First Nations Environmental Contaminants Program (Federal Govt.).

Why are we interested in this project?

We feel it is important to gather information about the traditional foods which community members harvest from Lake Nipigon and the surrounding areas and to test these country foods. Our goal is to determine if there is any chemical contamination in the traditional foods most commonly consumed by the members of your community, and to make the results of the study available to community members. By doing this we hope to promote well- being and assist community members to make informed and healthy choices.

How will the survey results be used?

Results of the study may be used by your community for resource management, and health promotion planning purposes. Regional results will be used to compile a final report which will identify the findings of the study, highlighting any concerns or food safety problems.

What will happen if I agree to participate in this project?

Participation in this study is VOLUNTARY.

- If you agree to participate it will require about one to two hours of your time, mainly to answer questions about the food you eat (see attached questionnaire).
- You only answer questions that you feel comfortable with and you can end your participation at any time.
- You can withdraw from the project at any time and any information you have provided will be destroyed.

Will there be any compensation or expenses for participating in this study?

Each participant who completes the survey will be eligible for compensation.

How will you protect my privacy?

- All information you provide in this interview will be treated with respect and held in confidence.
- Information shared between you and the interviewer will be maintained in confidence. All hardcopies of the questionnaires collected will be protected by the Community Liaison in your community, and the project manager for this project.
- All records will be kept in the Nokiiwin Tribal Council offices in Thunder Bay until the final report of this project is complete and thereafter for a maximum of 5 years.
- Data will be entered into a computer with an ID number and without your name, and the computerized dataset will be analyzed and used to generate the final report.
- If any changes are made to the study or new information becomes available , you will be informed.
- The Final Report with any recommendations will be shared with the participating communities, Nokiiwin Tribal Council, CanNorth, and Health Canada.

All information derived from the study will be kept strictly confidential and your name will not be associated with the samples or data we collect.

Your identity will remain confidential in all publications and public presentations related to this research.

What are the benefits of having my survey results used in this project?

The results of this study will provide the participating communities with insights into the types and amounts of country foods consumed by their members. Benefits to each community include developing a baseline of potential exposure to contaminants through traditional food and improved knowledge of levels of exposure to chemical contaminants in the environment.

Is there any chance of harm if I participate in this study?

There is no physical harm anticipated for participating in the project. There will be the inconvenience of taking the time to complete the "Food Frequency Questionnaire".

The study may pose the following risks to yourself and your community: fear/stress, concerns over collective privacy, misperception of traditional foods as negative, disruption of other First Nations projects or issues.

Can I change my mind after I agree to let my questionnaire be used?

At any time during this study you can choose to drop out or refuse to answer questions you feel may be too personal. You can also ask that the data collected by questionnaire not be used in the study. In such cases the questionnaire will be destroyed and the data removed from the study.

How will I find out what happens with this project?

You will be informed of the progress of the study through project specific newsletters released periodically throughout the duration of the project, information published in the Nokiiwin Advisor (newsletter), and posted on the Nokiiwin web site (www.nokiiwin.com). A public meeting will be held in each community to discuss the final report and seek direction on next steps for your community. The community will also receive copies of the final report, along with any recommendations.

At any time you are welcome to contact your community liaison for the project or Nokiiwin Tribal Council directly.

Who can I talk to if I have a question or problems?

The local community interviewer or the community liaison will answer any questions you may have about this study. You are welcome to contact the following project staff at any time.

Animbiigoo Zaagi'igan Anishinaabek:	Alice Sasines	Ph. 807 875-2785
Biinjitiwaabik Zaaging Anishinaabek:	Lila Onakanakis	Ph. 807 885-3401
Bingwi Neyaashi Anishinaabek:	Celine Beleau	Ph. 807 632-2724
Kiashke Zaaging Anishinaabek:	Anthony Esquega	Ph.807 982-0006
Nokiiwin Tribal Council:	Kevin Sherlock	Ph. 807 474-4230

Consent and Signature:

By signing this form I agree that:

- The study has been explained to me Yes No
- All my questions were answered Yes No
- The possible harms, discomforts and benefits (if any) of this study have been explained to me Yes No
- I understand that I have the right not to participate and the right to stop at any time Yes No
- I have the choice of not answering any specific question Yes No
- I am free now, and in the future, to ask any question Yes No
- I have been told that my personal information will be kept confidential Yes No
- I agree that in case of excess trace metals in any of the country foods tested the results will be communicated to the proper authorities Yes No
- I hereby consent to participate in the study Yes No
- I hereby grant permission to the recording (voice only) of this interview for the purposes of data/knowledge collection and transcription Yes No

_____ _____

Signature Date

Name of participant (Print): _____

Telephone number: _____

Mailing address

_____

_____

Name of person who obtained consent: _____

_____ _____

Signature Date

ID _____

(The community liaison keeps this page and gives the remaining pages, to the participant)

APPENDIX F

OATH OF CONFIDENTIALITY

Oath of Confidentiality

Country Foods Study in the Lake Nipigon Area

Associate Staff/Temporary Staff/Summer Student

Full Name:	
Current Address:	
Permanent Address:	

I understand that during the course of my association with Nokiiwin Tribal Council's "Country Foods Study in the Lake Nipigon Area" i) I will have access to personal information about project participants who contribute to the study and may also have contact with external third parties; and ii) that I may be given, or have access to, information from one or more of the communities participating in the "Country Foods Study in the Lake Nipigon Area" (Animbiigoo Zaagi'igan Anishinaabek; Bingwi Neyashi Anishinaabek; Biinjitiwaabik Zaaging Anishinaabek; Kiashke Zaaging Anishinaabek) and Nokiiwin Tribal Council information which is confidential or culturally sensitive. I understand that when processing any personal information as in i) above I am bound by the Freedom of Information and Protection of Privacy Act R.S.O. 1990 and in ii) above I am bound by a duty of confidence to Nokiiwin Tribal Council.

As an associate/Temporary staff member/visiting student therefore I agree to:

- Only ever access and process personal/confidential/culturally sensitive information in order to carry out the designated, agreed purposes for my association with Nokiiwin Tribal Council
- Never disclose the information to any other members of the Nokiiwin community except those whom I have been informed are entitled to have access to it in order to carry out their authorised duties
- Never disclose any data to any individual or organisation external to the Tribal Council or participating community other than in strict accordance with the Act and /or with the express written permission
- Adhere to the obligations set out above and below during the time of my association with the Tribal Council or community and after this has ended

I understand further that:

- Disclosure or processing of personal information outside these terms may only ever take place in consultation with my supervising/sponsoring member of staff
- I am bound by the terms of the Nokiiwin Tribal Council's Human Resources Policy and Procedures and I must comply with the Council's policies and procedures to which I have been directed or to which I have been given a copy.

Signed:		**Date:**	

Witness (supervising staff member)

Name:			
Department:		**Post:**	
Signed:		**Date:**	

APPENDIX G

COUNTRY FOODS MAPPING INSTRUCTIONS

Nokiiwin Tribal Council – Country Foods Mapping

Supplies needed

- Interview questionnaire (1)
- Fin tip black sharpie or dark ink pen (s)
- Paper map per interviewee (1)
- Tape recorder (optional - if agreed upon)

Please do not use different colors of markers, pens or sharpies. Select a good dark fine tip marker and use it for entire mapping exercise if possible.

Note: If you make a mistake **please just mark with an X and your initials** so that we know not to include this data in mapping project.

Refer to the example map provided for a number of different scenarios and visual examples.

Mapping Instructions

First please **make sure the member ID of the individual interviewee matches that on the map** and their community is circled. Each person will have their own map during this process.

1. For **each type of country food species (moose, walleye etc.)** interviewees harvest please get them to mark it down on the map with a **fin-tipped black marker**. This information can be collected in a number of different ways **(point, circle, square, polygon, line etc.)** depending on where they say they go to harvest these country foods. Please see the map of examples provided.

2. Begin with mammal(s), followed by fish, birds, edible plants, and finally medicinal plants as the interview questionnaire is laid out. This will help you keep you and them organized and on track.

3. For example; if they say they harvest moose on the southwest shoreline of Onaman Lake get them to outline the area (point, circle, polygon etc.) they normally would typically hunt their moose and draw a line to that area and to write the word **Moose**.

4. Ask them try to be as **orderly and detailed as possible** (especially with multiple species in one area) as this will make it easier to map later on and a superior product in the end.

5. For example; if an individual harvests **more than one species of country food in the same area** (i.e. 4 fish in McIntyre Bay) get them to make a list directly on the map and draw a line from that list to the area (circle, line polygon etc.).

Once the mapping exercise is complete please ask the interviewee to have a final look over their harvest locations in order to **make sure the areas selected are correct**. Also, make sure the boxes on the bottom of the map alongside their community member ID are checked off to match those country foods they have mapped. Finally, please roll up your map for **safe keepings** so they can be scanned at a later date.

If you have any further questions on the mapping exercise please contact Kevin Sherlock of the Nokiiwin Tribal Council at 807 474-4230

APPENDIX H

DETAILED CHEMISTRY TABLES

APPENDIX H, LIST OF TABLES

APPENDIX H, TABLE 1

Detailed fish flesh chemistry results from rivers in the NTC country foods study area.

Parameters	Units	MDL	Blackwater River			Gull River								Ombabika River										Postagami River
			YP 1	YP 2	BT 1	WE 1	WE 2	WE 3	WE 4	WE5	WE 6	WE 7	WE 8	WE 1	WE 2	WE 3	WE 4	WE 5	WE 6	WE 7	WE 8	WE 9	WE 10	YP 1	BT 1
			29-Sep-15	29-Sep-15	29-Sep-15	15-May-15	15-May-15	15-May-15	15-May-15	15-May-15	15-May-15	15-May-15	15-May-15	7-Sep-15	23-Sep-15	23-Sep-15	23-Sep-15	23-Sep-15	23-Sep-15	23-Sep-15	23-Sep-15	23-Sep-15	23-Sep-15	7-Sep-15	4-Aug-15
Inorganic Ions																									
Calcium	mg/kg	4	142	134	144	132	110	115	248	212	113	106	181	219	141	99.6	92.3	109	101	101	151	137	94.7	1150	250
Magnesium	mg/kg	0.4	279	280	337	296	306	319	297	286	286	288	302	288	280	325	310	344	307	338	342	310	303	310	281
Potassium	mg/kg	4	4490	4420	4870	3760	3920	4170	3880	3750	3350	3470	3960	3870	4240	4560	4300	4660	4580	4850	4760	4600	4510	4080	4480
Sodium	mg/kg	4	309	296	405	236	276	259	253	272	269	273	252	590	236	228	253	214	224	217	223	225	223	579	542
Metals																									
Aluminum	mg/kg	0.4	0.46	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	3.68	<0.4	<0.4	<0.4	<0.4	<0.4	0.42	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Antimony	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	0.0109	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	mg/kg	0.004	0.0406	0.0378	0.0749	0.108	0.0814	0.0741	0.106	0.114	0.0795	0.0909	0.114	0.0648	0.0436	0.0859	0.148	0.0613	0.148	0.0743	0.042	0.202	0.0429	0.0135	0.0648
Barium	mg/kg	0.01	<0.01	<0.01	<0.01	0.023	0.021	0.016	0.028	0.027	0.027	0.025	0.021	<0.01	0.012	<0.01	0.012	<0.01	<0.01	<0.01	0.012	0.013	<0.01	0.037	<0.01
Beryllium	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	0.0048	0.0114	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Boron	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	mg/kg	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.0027	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	<0.001
Cesium	mg/kg	0.001	0.0361	0.0363	0.0222	0.0163	0.0179	0.0236	0.0178	0.0174	0.0158	0.0153	0.0187	0.0253	0.0266	0.0171	0.0187	0.0212	0.0209	0.0164	0.0293	0.0219	0.0225	0.0211	0.0352
Chromium	mg/kg	0.01	0.02	0.025	0.01	0.022	0.011	0.013	0.013	0.013	0.016	0.016	0.02	<0.01	0.023	0.018	0.027	<0.01	0.017	0.019	0.018	0.048	0.057	<0.01	<0.01
Cobalt	mg/kg	0.004	<0.004	<0.004	0.0052	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0084
Copper	mg/kg	0.02	0.171	0.149	0.36	0.248	0.21	0.185	0.221	0.275	0.216	0.197	0.217	0.148	0.157	0.166	0.205	0.163	0.144	0.164	0.148	0.153	0.185	0.169	0.286
Iron	mg/kg	0.6	1.67	1.56	2.03	1.99	1.95	1.54	1.91	2.3	7.36	1.8	1.85	1.45	1.24	1.16	1.83	1.13	1.06	1.18	1.18	1.54	1.44	1.67	2.06
Lead	mg/kg	0.004	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	<0.004	<0.004	<0.004	0.0064	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Lithium	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	0.01	0.086	0.087	0.08	0.125	0.136	0.112	0.156	0.158	0.157	0.137	0.165	0.155	0.087	0.109	0.102	0.107	0.082	0.085	0.159	0.098	0.085	0.662	0.061
Mercury	mg/kg	0.001	0.253	0.263	0.104	0.119	0.128	0.244	0.112	0.136	0.127	0.126	0.115	0.0887	**0.611**	0.369	0.466	0.31	0.466	0.353	0.44	**0.502**	0.397	0.322	0.0796
Molybdenum	mg/kg	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0041	0.004	<0.004	<0.004	<0.004	0.0049	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0053	0.0069	<0.004	<0.004
Nickel	mg/kg	0.04	0.055	0.042	0.051	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	<0.04	<0.04	0.041	<0.04	0.046	<0.04	<0.04	<0.04	<0.04	<0.04	0.046	0.059	<0.04	<0.04
Rubidium	mg/kg	0.01	24.9	23.4	16.4	17.5	18.4	22.4	18.5	17.4	16.3	16.9	18.2	22.4	12.9	12.9	14.2	14.1	15.3	12.2	15	17.1	11.4	14.7	12.9
Selenium	mg/kg	0.01	0.194	0.177	0.244	0.186	0.186	0.188	0.176	0.179	0.171	0.174	0.182	0.164	0.172	0.224	0.299	0.204	0.292	0.21	0.174	0.324	0.169	0.182	0.247
Strontium	mg/kg	0.01	0.014	0.013	0.029	0.04	0.038	0.029	0.057	0.052	0.044	0.036	0.043	0.021	0.024	0.014	0.023	0.013	0.011	<0.01	0.019	0.02	0.011	0.179	0.056
Tellurium	mg/kg	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thallium	mg/kg	0.0004	0.00765	0.00675	0.00341	0.00367	0.00373	0.00436	0.00332	0.00336	0.00315	0.00278	0.00334	0.00153	0.0151	0.00483	0.00514	0.00491	0.00487	0.00549	0.00435	0.00536	0.00441	0.00332	0.00463
Tin	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.027	0.028	<0.02	0.029	0.024	0.021	<0.02	<0.02	<0.02
Uranium	mg/kg	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.049	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc	mg/kg	0.1	3.3	3.09	3.91	4.01	3.71	3.84	4.22	4.72	3.65	3.58	3.78	4.68	2.61	2.65	3.17	2.77	2.7	2.77	3.1	2.77	2.72	4.53	3.99
Zirconium	mg/kg	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Nutrients																									
Phosphorus, Total	mg/kg	2	2450	2370	3070	2190	2260	2410	2370	2270	1980	2080	2360	2150	2250	2350	2270	2410	2330	2440	2470	2390	2340	2740	2810
Physical Properties																									
% Moisture	%	0.25	79	79.2	76	78.8	78.9	78.3	79.4	79.1	78.8	79.6	78.7	78.5	80	79.7	79.6	66	79.4	81.3	79	79.8	79.6	79.6	76.8

MDL = method detection limit; BT = brook trout, WE = walleye, YP = yellow perch.

Bolded values exceed mercury guidelines.

APPENDIX H, TABLE 2

Detailed fish flesh chemistry results from the inland lakes in the NTC country foods study area.

Parameters	Units	MDL	Jean Lake					Parks Lake				Postagoni Lake									
			WE 1	WE 2	WE 3	WE 4	WE 5	WSU 1	WSU 2	WSU 3	WSU 4	NP 2	NP 3	NP 4	NP 5	NP 6	WE 1	WE 1	WE 2	WE 3	WE 4	WE 5
			18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	31-Jan-16	18-Oct-15	31-Jan-16	31-Jan-16	31-Jan-16	31-Jan-16	31-Jan-16
Inorganic Ions																					
Calcium	mg/kg	4	117	126	129	99	127	152	86	136	110	393	665	360	332	106	860	181	106	362	446	86.4
Magnesium	mg/kg	0.4	247	250	228	286	267	273	256	302	259	304	308	292	289	288	264	302	288	312	328	335
Potassium	mg/kg	4	2600	2210	1970	3200	2800	3960	3760	4300	3720	4080	4310	3940	4130	3470	4180	3960	3470	4160	4320	4370
Sodium	mg/kg	4	153	164	142	188	165	442	422	403	392	394	408	314	394	273	410	252	273	286	288	288
Metals																					
Aluminum	mg/kg	0.4	<0.4	0.45	<0.4	0.46	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Antimony	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0104	0.0108	0.0099	0.0048	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	mg/kg	0.004	0.0249	0.042	0.0319	0.0264	0.0287	0.0409	0.066	0.0803	0.0419	0.014	0.0215	0.0147	0.017	0.0909	0.0506	0.114	0.0909	0.0659	0.0721	0.0653
Barium	mg/kg	0.01	0.02	0.026	0.025	0.024	0.021	0.025	0.019	0.016	0.013	0.027	0.037	0.026	0.021	0.025	0.072	0.021	0.025	0.012	0.019	<0.01
Beryllium	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0108	0.0111	0.0102	0.0052	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Boron	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	mg/kg	0.001	0.0011	0.0019	0.0014	0.0011	0.0013	0.0033	0.0037	0.0028	0.0019	0.0011	<0.001	0.0018	0.0011	<0.001	0.0047	<0.001	<0.001	<0.001	<0.001	<0.001
Cesium	mg/kg	0.001	0.125	0.104	0.0957	0.183	0.136	0.136	0.168	0.146	0.113	0.282	0.274	0.506	0.316	0.0153	0.443	0.0187	0.0153	0.0212	0.0204	0.0192
Chromium	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.014	<0.01	<0.01	<0.01	<0.01	0.016	<0.01	0.02	0.016	0.027	0.021	10.1
Cobalt	mg/kg	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0064	0.0042	0.0059	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0167
Copper	mg/kg	0.02	0.246	0.397	0.364	0.28	0.269	0.394	0.349	0.319	0.202	0.195	0.182	0.244	0.198	0.197	0.127	0.217	0.197	0.156	0.196	0.164
Iron	mg/kg	0.6	1.38	2.08	1.52	1.58	1.52	6.59	3.41	2.17	1.65	2.13	2.05	3.09	2.35	1.8	1.97	1.85	1.8	1.59	1.58	68.4
Lead	mg/kg	0.004	<0.004	<0.004	0.0042	<0.004	<0.004	0.0063	0.006	0.0058	<0.004	<0.004	<0.004	<0.004	0.0041	<0.004	0.0074	<0.004	<0.004	<0.004	<0.004	<0.004
Lithium	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	0.01	0.13	0.153	0.128	0.134	0.144	0.118	0.086	0.181	0.088	0.152	0.256	0.161	0.135	0.137	0.132	0.165	0.137	0.139	0.172	0.517
Mercury	mg/kg	0.001	0.178	0.125	0.101	0.257	0.115	**0.541**	0.144	0.109	0.154	**0.724**	**0.915**	**1.44**	**0.803**	0.126	**1.36**	0.115	0.126	0.231	0.149	0.152
Molybdenum	mg/kg	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0049	0.0059	0.0059	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0074
Nickel	mg/kg	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.182
Rubidium	mg/kg	0.01	11.1	9.63	9.12	15.3	12.1	6.31	8.58	10.3	6.41	8.85	10	15.2	11.9	16.9	18.4	18.2	16.9	19.3	20.2	21.2
Selenium	mg/kg	0.01	0.226	0.263	0.208	0.263	0.251	0.213	0.201	0.244	0.207	0.233	0.25	0.245	0.199	0.174	0.301	0.182	0.174	0.202	0.217	0.19
Strontium	mg/kg	0.01	0.04	0.053	0.054	0.024	0.044	0.028	0.014	0.032	0.018	0.09	0.162	0.087	0.079	0.036	0.195	0.043	0.036	0.042	0.053	<0.01
Tellurium	mg/kg	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thallium	mg/kg	4E-04	0.00767	0.00768	0.00684	0.00996	0.00797	0.0125	0.0126	0.0132	0.0069	0.00263	0.00524	0.00506	0.00658	0.00278	0.009	0.00334	0.00278	0.00565	0.00587	0.00526
Tin	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.024	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Uranium	mg/kg	4E-04	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.044
Zinc	mg/kg	0.1	2.99	3.37	2.86	3.7	3.19	3.64	2.91	2.81	2.74	3.49	4.57	3.13	3.55	3.58	2.65	3.78	3.58	3.85	5.11	3.85
Zirconium	mg/kg	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Nutrients																						
Phosphorus, Total	mg/kg	2	1420	1340	1200	1760	1550	2210	2030	2330	2020	2570	2730	2520	2480	2080	2650	2360	2080	2450	2590	2440
Physical Properties																						
% Moisture	%	0.25	81.2	80.1	82.5	76.5	79.8	79.9	81	79.6	81.8	78.2	78.6	79.3	79.4	79.6	81.3	78.7	79.6	78.3	78.8	78.8

MDL = method detection limit; WE = walleye, WSU = white sucker, NP = northern pike.

Bolded values exceed mercury guidelines.

APPENDIX H, TABLE 3

Detailed fish flesh chemistry results from Lake Nipigon in the NTC country foods study area.

Parameters	Units	MDL	Lake Nipigon	Pipestone Point					McIntyre Bay														Ombabika Bay		Wabinash Bay		
			LT 1	LT 1	LT 2	LT 3	LT 4	LT 5	LT 1	LT 2	LT 3	LT 4	LT 5	LW 1	LW 2	LW 3	LW 4	LW 5	WE 1	WE 2	WE 3	WE 4	WE 5	WE 1	WE 2	LT 1	YP 1	WE 1
			17-May-15	30-Oct-15	30-Oct-15	30-Oct-15	30-Oct-15	30-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	13-Oct-15	23-Sep-15	23-Sep-15	14-Jul-15	14-Jul-15	14-Jul-15
Inorganic Ions																												
Calcium	mg/kg	4	122	121	81.7	85.4	105	94.4	152	258	107	156	104	700	712	221	666	197	221	216	114	164	364	118	114	132	596	227
Magnesium	mg/kg	0.4	251	244	259	250	240	233	240	253	234	246	245	249	254	277	243	233	242	234	243	258	226	275	295	287	296	318
Potassium	mg/kg	4	3820	3760	3880	3880	3670	3510	3500	3770	3730	4070	3490	3560	3590	4080	3840	3570	3590	3650	3510	3860	3180	3460	3500	4240	4100	4370
Sodium	mg/kg	4	307	321	341	446	530	499	530	602	579	451	454	556	547	547	602	535	600	712	443	491	627	292	269	488	649	602
Metals																												
Aluminum	mg/kg	0.4	<0.4	<0.4	<0.4	0.41	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1.08	<0.4	<0.4	<0.4	72.4	<0.4	<0.4	0.49	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Antimony	mg/kg	0.002	0.0103	0.0047	0.0049	0.0047	0.0048	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0117	<0.002	0.0103	<0.002	<0.002
Arsenic	mg/kg	0.004	0.165	0.0236	0.0211	0.0322	0.0354	0.0113	0.179	0.179	0.165	0.117	0.242	0.251	0.307	0.219	0.688	0.337	0.0998	0.104	0.182	0.112	0.0879	0.111	0.0608	0.125	0.0208	0.0387
Barium	mg/kg	0.01	0.011	<0.01	0.013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.041	0.01	0.045	0.014	0.022	0.012	0.012	<0.01	0.023	0.012	0.011	<0.01	0.024	<0.01
Beryllium	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg	0.002	0.0105	0.0046	0.0047	0.0046	0.0049	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0064	<0.002	<0.002	<0.002	<0.002	0.0107	<0.002	0.0101	<0.002	<0.002
Boron	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	mg/kg	0.001	0.0032	0.0026	0.0025	0.0071	0.0023	0.0083	<0.001	<0.001	<0.001	<0.001	<0.001	0.0298	0.0015	<0.001	0.03	<0.001	0.0017	0.003	0.0012	<0.001	<0.001	0.0075	<0.001	0.003	<0.001	<0.001
Cesium	mg/kg	0.001	0.0139	0.22	0.156	0.311	0.276	0.206	0.0105	0.0127	0.0136	0.0131	0.0156	0.0065	0.0071	0.0067	0.0091	0.0068	0.0173	0.0208	0.0223	0.0195	0.018	0.0237	0.0233	0.0131	0.0576	0.0642
Chromium	mg/kg	0.01	0.022	<0.01	<0.01	<0.01	0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	0.033	<0.01	<0.01	<0.01	<0.01	0.011	0.03	<0.01	<0.01	<0.01
Cobalt	mg/kg	0.004	0.0041	0.004	0.0043	0.0056	0.0056	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0065	0.0046	0.0065	0.0053	0.0062	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0043	<0.004	<0.004
Copper	mg/kg	0.02	0.285	0.297	0.273	0.252	0.284	0.296	0.502	0.481	0.407	0.285	0.451	0.312	0.367	0.366	0.256	0.293	0.446	0.452	0.586	0.387	0.342	0.231	0.21	0.355	0.182	0.135
Iron	mg/kg	0.6	2.04	4.02	4.86	2.76	2.84	2.66	3.48	4.22	3.53	2.33	3.38	4.44	5.14	3.34	4.26	3.09	3.94	6.73	5.76	4.34	3.57	1.08	1.25	1.71	1.62	0.96
Lead	mg/kg	0.004	0.0071	<0.004	0.0046	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0092	<0.004	<0.004	0.0064	0.0119	0.0309	0.0143	0.0119	0.0201	0.0183	0.0059	<0.004	0.0066	<0.004	0.0046
Lithium	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	0.01	0.107	0.096	0.097	0.087	0.107	0.086	0.087	0.095	0.087	0.088	0.084	0.137	0.229	0.115	0.189	0.109	0.318	0.116	0.099	0.102	0.114	0.128	0.164	0.101	0.19	0.086
Mercury	mg/kg	0.001	0.0885	0.377	0.308	**0.816**	**0.702**	0.382	0.112	0.0832	0.102	0.0983	0.145	0.0752	0.0469	0.071	0.115	0.0459	0.0918	0.381	0.493	0.188	0.211	0.158	0.155	0.0942	0.322	0.429
Molybdenum	mg/kg	0.004	0.0062	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0045	<0.004	0.0049	<0.004	<0.004
Nickel	mg/kg	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.043	<0.04	0.051	0.045
Rubidium	mg/kg	0.01	13.5	12.7	10.9	20	18.8	14.1	10.6	12.6	14.2	14.1	11.9	5.06	5.22	7.41	7.95	5.88	16.2	17.5	17.1	17.5	15.7	21	19.6	14.6	16	16.3
Selenium	mg/kg	0.01	0.17	0.316	0.308	0.279	0.269	0.186	0.189	0.175	0.167	0.153	0.173	0.198	0.207	0.236	0.201	0.167	0.177	0.204	0.219	0.189	0.199	0.169	0.153	0.195	0.191	0.194
Strontium	mg/kg	0.01	0.02	0.021	0.01	0.014	0.014	0.013	0.028	0.043	0.016	0.028	0.014	0.202	0.267	0.068	0.229	0.058	0.031	0.03	0.013	0.026	0.062	0.025	0.023	0.024	0.114	0.029
Tellurium	mg/kg	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thallium	mg/kg	0.0004	0.0128	0.0144	0.0142	0.0158	0.0151	0.00572	0.00308	0.00308	0.00316	0.00417	0.00407	0.00214	0.00202	0.00171	0.00268	0.00337	0.00219	0.00239	0.00378	0.0021	0.00168	0.0144	0.00308	0.0132	0.00407	0.00385
Tin	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02	0.023	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Uranium	mg/kg	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc	mg/kg	0.1	2.89	3.04	3.13	2.6	2.83	2.65	3.5	3.53	3.5	2.86	3.2	4.75	4.19	3.53	3.69	3.01	5.37	5.58	4.58	5.99	4.66	3.64	3.22	3.96	6.09	3.57
Zirconium	mg/kg	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Nutrients																												
Phosphorus, Total	mg/kg	2	2300	2200	2330	2280	2160	2010	2210	2420	2230	2360	2300	2520	2570	2460	2510	2140	2090	2150	2160	2200	2000	1910	1990	2540	2370	2290
Physical Properties																												
% Moisture	%	0.25	77	76.2	76.9	76.3	78.8	75.1	75.5	72.6	73.9	76.7	73	74.6	75.2	75.5	76.5	75.6	79.9	78.2	78.4	78.9	78.4	79.9	80.2	73.9	79.1	79.6

MDL = method detection limit; LT = lake trout, LW = lake whitefish, WE = walleye, YP = yellow perch.

Bolded values exceed mercury guidelines.

APPENDIX H, TABLE 4

Detailed bird and small mammal chemistry results from the NTC country foods study area.

Parameters	Units	MDL	Candido Road	FairLoch	Gorge Creek Road	Jean Lake Road	Jean Lake Road	Jean Lake Road	Little Jean Lake	Little Jean Lake	Little Jean Lake	O'Sullivan Lake	Parks Lake	Sand Point Road	Shadow Mountain	Shadow Mountain	Shadow Mountain	Shadow Mountain	Shadow Mountain	Sturgeon River	Wildgoose Lake	Wildgoose Lake	Wildgoose Lake
			Unknown Grouse 1	Unknown Partidge 1	Unknown Snowshoe Hare 1	Spruce Grouse 1	Spruce Grouse 2	Spruce Grouse 3	Unknown Duck 1	Goldeneye 1	Goldeneye 2	Unknown Duck 1	Mallard 1	Unknown Partridge 1	Pintail 1	Pintail 2	Snowshoe Hare 1	Snowshoe Hare 2	Unknown Partridge 1	Canada Goose 1	Unkown Partridge 1	Unknown Partridge 2	Unknown Partridge 3
			19-Oct-15	19-Jun-15	15-Sep-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	18-Oct-15	26-Oct-15	27-Sep-15	14-Sep-15	24-Sep-15	24-Sep-15	19-Oct-15	19-Oct-15	30-Sep-15	21-Apr-15	25-Oct-15	24-Oct-15	24-Oct-15
Inorganic Ions																							
Calcium	mg/kg	4	85.3	79.6	48.5	102	45.7	139	61.9	48.3	582	99.6	55.7	155	42.2	31.7	85.7	108	349	44.4	68	40.9	100
Magnesium	mg/kg	0.4	217	333	282	317	357	324	285	296	307	315	229	360	264	224	280	293	496	324	250	353	262
Potassium	mg/kg	4	2810	3390	4070	3350	3360	3640	3440	3340	3370	3830	3460	3760	3200	2760	3410	3610	4510	4120	2250	3550	2340
Sodium	mg/kg	4	961	562	549	598	749	475	725	631	718	598	778	642	780	640	568	496	1050	627	357	654	361
Metals																							
Aluminum	mg/kg	0.4	0.52	0.46	<0.4	<0.4	<0.4	<0.4	1.18	<0.4	<0.4	<0.4	1.1	0.85	<0.4	<0.4	<0.4	<0.4	68	0.73	<0.4	<0.4	<0.4
Antimony	mg/kg	0.002	0.0102	0.0059	0.0028	0.0055	<0.002	<0.002	<0.002	<0.002	<0.002	0.0488	0.211	0.0056	<0.002	0.0052	<0.002	<0.002	0.0031	0.0027	0.037	0.0042	0.0147
Arsenic	mg/kg	0.004	0.0128	0.0075	<0.004	0.0092	0.0139	0.0062	0.0058	<0.004	0.0098	0.0684	0.0055	<0.004	<0.004	0.0062	<0.004	<0.004	0.0342	0.0091	0.0443	<0.004	0.0046
Barium	mg/kg	0.01	0.034	0.084	0.045	0.033	0.016	0.044	0.028	0.012	0.158	0.095	0.067	0.172	0.098	0.074	0.101	0.134	15	0.057	0.024	0.015	0.023
Beryllium	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0031	<0.002	<0.002
Bismuth	mg/kg	0.002	0.0107	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0508	<0.002	<0.002	<0.002	0.0046	<0.002	<0.002	<0.002	<0.002	0.034	<0.002	<0.002
Boron	mg/kg	0.2	0.25	0.22	0.27	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.32	<0.2	<0.2	0.24	0.2	6.19	<0.2	<0.2	<0.2	<0.2
Cadmium	mg/kg	0.001	0.0406	0.0926	0.0092	0.0029	0.0019	0.0016	0.0039	<0.001	0.0017	0.0241	0.0029	0.01	0.0117	0.0087	0.0146	0.0026	0.226	0.0045	0.0106	0.0497	0.0288
Cesium	mg/kg	0.001	0.0289	0.071	0.0303	0.314	0.0985	0.273	0.0212	0.0113	0.2	0.0043	0.047	0.354	0.0097	0.0084	0.0906	0.122	0.23	0.039	0.0513	0.08	0.0857
Chromium	mg/kg	0.01	0.029	0.046	0.058	0.019	<0.01	0.016	0.064	<0.01	0.019	0.021	0.024	0.072	0.084	<0.01	<0.01	<0.01	0.264	0.032	0.193	0.066	0.023
Cobalt	mg/kg	0.004	0.0051	0.0045	0.0083	<0.004	0.005	<0.004	0.0104	0.0057	0.0056	0.0377	<0.004	0.0083	0.0279	0.0231	<0.004	<0.004	0.253	0.0074	0.0135	0.0041	<0.004
Copper	mg/kg	0.02	0.412	0.518	1.67	1.09	2.4	0.884	5.79	7.95	7.72	6.09	1.17	0.611	3.85	3.29	2.28	2.42	3.38	4.05	1.29	2.6	0.576
Iron	mg/kg	0.6	12.3	5.47	37	15.9	32.4	11.5	100	56.2	75.2	93.5	31.8	6.67	58.7	50.9	36.6	26.9	172	68.1	18	41.9	6.69
Lead	mg/kg	0.004	0.0059	0.101	0.0173	0.179	0.0073	<0.004	0.0143	<0.004	0.0046	0.03	0.0047	0.237	<0.004	<0.004	<0.004	0.004	0.071	<0.004	0.0836	0.0164	0.282
Lithium	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	0.01	0.146	0.117	0.257	0.263	0.348	0.342	0.707	0.482	0.732	0.712	0.164	0.195	0.443	0.345	0.184	0.231	318	0.491	0.214	0.549	0.135
Mercury	mg/kg	0.001	0.0012	0.0018	0.0019	0.0025	0.0027	0.0023	0.0766	0.117	0.142	0.957	0.0017	0.0013	0.0012	0.0014	0.0024	0.0021	0.0063	0.0028	0.0013	0.0013	0.0013
Molybdenum	mg/kg	0.004	0.0365	0.0101	0.0086	0.0178	0.0084	0.0152	0.0313	0.0119	0.0254	0.039	<0.004	0.0151	0.0197	0.0108	0.0072	0.0051	0.532	0.0171	0.0327	0.0194	0.0088
Nickel	mg/kg	0.04	<0.04	<0.04	0.075	<0.04	<0.04	<0.04	0.046	<0.04	<0.04	0.045	<0.04	0.098	0.082	<0.04	<0.04	<0.04	0.507	0.051	0.144	0.179	0.062
Rubidium	mg/kg	0.01	7.14	10.3	7.01	9.74	4.48	10.1	9.21	12.2	17.7	3.91	10.3	7.41	5.54	4.78	11	9.93	20.1	7.7	4.12	7.06	4.25
Selenium	mg/kg	0.01	0.145	0.121	0.066	0.251	0.451	0.25	0.443	0.395	0.375	1.27	0.027	0.255	0.132	0.121	0.052	0.076	0.409	0.293	0.28	0.325	0.129
Strontium	mg/kg	0.01	0.084	0.075	0.034	0.056	0.029	0.066	<0.01	<0.01	0.127	0.037	0.032	0.142	0.029	0.023	0.054	0.062	9.23	0.012	0.055	0.022	0.068
Tellurium	mg/kg	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0068	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thallium	mg/kg	0.0004	0.0101	<0.0004	0.0011	0.00177	0.00306	0.00226	0.00222	0.00245	0.00603	0.051	<0.0004	<0.0004	<0.0004	0.00489	0.00126	0.00155	0.0262	0.00281	0.0354	<0.0004	<0.0004
Tin	mg/kg	0.02	0.022	0.041	0.023	0.03	<0.02	0.029	0.027	0.02	<0.02	0.035	<0.02	0.033	0.025	0.02	<0.02	<0.02	0.02	<0.02	0.032	0.028	<0.02
Uranium	mg/kg	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.00283	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium	mg/kg	0.02	<0.02	<0.02	<0.02	0.052	<0.02	<0.02	0.067	<0.02	<0.02	0.037	0.039	<0.02	<0.02	0.061	<0.02	<0.02	0.131	<0.02	0.024	<0.02	<0.02
Zinc	mg/kg	0.1	4.79	5.23	12.1	4.83	5.39	4.79	9.83	12.2	11.7	8.81	38.9	6.74	21	18.5	19.2	13	24.7	16.8	3.89	8.58	3.9
Zirconium	mg/kg	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Nutrients																							
Phosphorus, Total	mg/kg	2	1740	2550	2500	2650	3020	2710	2930	2880	3220	3150	1930	2780	2270	2030	2460	2590	2380	2910	1980	2970	1980
Physical Properties																							
% Moisture	%	0.25	80.6	73.1	77.5	73	71.9	73.6	72.5	73	71.9	71.8	74	72.5	76.5	78	74	76.1	71.4	73.1	76.3	73.3	77.3

MDL = method detection limit.

APPENDIX H, TABLE 5

Detailed moose chemistry results from the NTC country foods study area.

Parameters	Units	MDL	Moose Flesh													Moose Liver			Moose Kidney		Moose Heart
			Beardmore Highway	BNA Road (near Fairlock)	Bonner Lake	Calvin Island	Candido Road[1]	Humboldt Bay of Lake Nipigon	KZA Community[2]	McConnell Creek[2]	Nipigon River[1]	Odic Lake	Ombabika River	Postagomi River	Shadow Mountain	Atigogama Lake	Candido Road	Wildgoose Lake	Beardmore Highway	Onaman River	Wildgoose Lake
			19-Feb-15	4-Aug-15	17-Sep-15	3-Sep-15	19-Oct-15	13-Oct-15	19-Oct-15	17-Oct-15	22-Sep-15	25-Sep-15	27-Sep-15	9-Sep-15	16-Oct-15	1-Oct-15	19-Oct-15	2-Oct-15	7-Oct-15	5-Oct-15	2-Oct-15
Inorganic Ions																					
Calcium	mg/kg	4	51.3	41.8	47.5	39.2	113	109	45.4	38.9	37.3	41.8	67.8	211	53.9	39.3	55.4	50.9	78.3	94.3	306
Magnesium	mg/kg	0.4	208	267	220	272	145	182	252	225	268	221	233	210	213	160	184	173	180	150	200
Potassium	mg/kg	4	3100	4060	3320	3900	2180	3030	3690	3230	3870	3680	3340	3260	3550	2930	3190	3130	3000	2530	2630
Sodium	mg/kg	4	719	448	576	523	1430	831	446	682	505	450	612	636	563	689	825	677	1190	1320	934
Metals																					
Aluminum	mg/kg	0.4	0.52	0.47	<0.4	<0.4	1.52	0.87	1.96	<0.4	<0.4	2.33	2.37	0.67	4.26	<0.4	<0.4	<0.4	0.66	<0.4	1.13
Antimony	mg/kg	0.002	0.005	<0.002	<0.002	<0.002	0.0821	0.359	0.0021	<0.002	<0.002	0.0051	0.0112	0.0058	<0.002	0.0025	0.0988	0.0249	0.0112	0.0387	0.0033
Arsenic	mg/kg	0.004	0.0074	<0.004	<0.004	<0.004	<0.004	0.0059	<0.004	<0.004	<0.004	0.0055	0.0156	0.01	<0.004	0.0051	0.106	0.044	0.0251	0.0481	0.0065
Barium	mg/kg	0.01	0.084	0.046	0.057	0.025	0.564	0.126	0.049	0.035	0.018	0.057	0.043	0.31	0.04	0.061	0.252	0.069	0.138	0.126	0.251
Beryllium	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0099	0.0024	<0.002	0.0035	<0.002
Bismuth	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	0.0022	0.0054	<0.002	<0.002	<0.002	0.0053	0.01	0.0056	<0.002	<0.002	0.0967	0.0244	0.0098	0.0388	<0.002
Boron	mg/kg	0.2	<0.2	0.24	0.31	<0.2	0.35	<0.2	0.26	0.28	<0.2	<0.2	0.31	<0.2	<0.2	0.24	0.38	0.22	0.23	0.33	<0.2
Cadmium	mg/kg	0.001	0.0046	0.0097	0.0099	0.008	6.53	0.013	0.0092	0.0027	0.0185	0.0109	0.0061	0.0085	0.0073	0.866	1.61	0.809	3.56	3.8	0.0104
Cesium	mg/kg	0.001	0.0575	0.0569	0.0095	0.0124	0.0262	0.0128	0.0131	0.0694	0.018	0.106	0.0103	0.0293	0.0366	0.019	0.0221	0.042	0.0863	0.0188	0.0456
Chromium	mg/kg	0.01	0.046	0.025	<0.01	0.103	0.026	0.03	0.116	0.045	0.047	0.014	0.081	0.084	0.019	0.029	0.04	0.017	0.171	0.031	0.207
Cobalt	mg/kg	0.004	0.0051	0.0042	<0.004	0.0049	0.0383	0.0074	0.0096	<0.004	<0.004	0.0046	0.006	0.005	0.0054	0.0766	0.144	0.124	0.0278	0.0424	0.0189
Copper	mg/kg	0.02	1.08	1.23	1.43	1.04	3.86	0.91	1.45	1.17	1.23	1.06	1.32	0.938	0.786	55.4	74.9	77.1	5.34	3.6	2.98
Iron	mg/kg	0.6	36.2	41	41.1	37.5	61.5	98.4	47.2	27	35.4	36.5	25.3	32	37.2	128	86.3	98.2	39	53.8	34.3
Lead	mg/kg	0.004	0.204	0.0042	<0.004	<0.004	19.6	44.7	0.0096	0.0046	<0.004	0.0219	0.0441	0.0058	0.0049	<0.004	0.052	0.0157	0.0223	0.0458	0.018
Lithium	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	0.01	0.16	0.181	0.195	0.13	4.91	0.157	0.346	0.242	0.134	0.219	0.325	0.136	0.165	2.76	5	2.65	2.52	2.31	0.364
Mercury	mg/kg	0.001	0.0014	0.0029	0.0032	0.0015	0.0117	0.0032	0.0019	0.0015	0.0018	0.0016	0.0019	0.0016	0.0016	0.0035	0.0033	0.0028	0.0203	0.0281	0.0011
Molybdenum	mg/kg	0.004	0.0075	0.0056	<0.004	0.0128	0.226	<0.004	0.0131	0.0071	0.0075	0.0043	0.0142	0.0135	<0.004	0.642	0.907	1.17	0.268	0.274	0.0363
Nickel	mg/kg	0.04	<0.04	<0.04	<0.04	0.47	0.094	<0.04	0.099	0.062	0.059	<0.04	0.062	0.06	<0.04	0.064	0.067	<0.04	0.132	0.06	0.185
Rubidium	mg/kg	0.01	9.2	10.7	3.13	5.69	9.04	4.92	6.1	8.63	9.5	11.9	8.06	7.12	7.46	19.6	18	29.2	18.1	9.33	15.4
Selenium	mg/kg	0.01	0.034	0.036	0.101	0.063	0.459	0.081	0.046	0.04	0.042	0.043	0.062	0.033	0.03	0.085	0.187	0.1	0.501	0.458	0.054
Strontium	mg/kg	0.01	0.026	0.02	0.017	0.012	0.128	0.036	0.082	0.014	<0.01	0.033	0.03	0.101	0.021	0.012	0.046	0.025	0.028	0.042	0.119
Tellurium	mg/kg	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0116	<0.004	<0.004	<0.004	<0.004
Thallium	mg/kg	0.0004	0.0007	<0.0004	<0.0004	<0.0004	0.0059	<0.0004	<0.0004	<0.0004	<0.0004	0.005	0.00984	0.00566	<0.0004	0.00098	0.0995	0.0263	0.0284	0.0485	0.00056
Tin	mg/kg	0.02	0.116	<0.02	<0.02	<0.02	<0.02	0.024	<0.02	<0.02	<0.02	0.028	<0.02	0.025	0.04	<0.02	0.057	0.031	0.024	0.03	<0.02
Uranium	mg/kg	0.0004	0.00045	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.00045	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium	mg/kg	0.02	<0.02	0.032	0.042	0.132	<0.02	0.025	0.032	0.04	0.026	<0.02	0.064	0.042	0.1	0.082	0.06	0.021	0.229	0.037	0.255
Zinc	mg/kg	0.1	50.9	41.6	46.8	58.8	20.3	49.3	52.3	48.9	55	32.3	39	60.5	40.8	17.4	24.3	18.3	33.5	23.6	24.6
Zirconium	mg/kg	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Nutrients																					
Phosphorus, Total	mg/kg	2	1840	2280	1980	2090	2030	1660	2140	1890	2230	2020	1970	1850	1930	3280	3590	3730	2740	2240	2000
Physical Properties																					
% Moisture	%	0.25	75.4	74	73	77.6	83.1	74.2	76.6	75.8	74.5	76.5	77.6	76.9	73.8	71.2	71.5	72	77.3	81.7	74.3

MDL = method detection limit.

[1]Denotes flesh sample from a cow moose.

[2]Denotes flesh sample from a bull moose.

APPENDIX H, TABLE 6

Detailed vegetation chemistry results from the NTC country foods study area.

Parameters	Units	MDL	Blueberries			Wild Strawberry
			Detour Lake Road	Poplar Lodge Road	Shadow Mountain Area	Shadow Mountain Area
			19-Oct-15	19-Oct-15	20-Aug-15	17-Sep-15
Inorganic Ions						
Calcium	mg/kg	4	138	192	181	196
Magnesium	mg/kg	0.4	70.3	70.2	78.7	71.7
Potassium	mg/kg	4	795	695	861	737
Sodium	mg/kg	4	<4	<4	<4	<4
Metals						
Aluminum	mg/kg	0.4	7.32	1.12	2.19	3.79
Antimony	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	mg/kg	0.004	<0.004	0.0075	<0.004	0.0103
Barium	mg/kg	0.01	1.65	2.44	3.56	2.8
Beryllium	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002
Boron	mg/kg	0.2	0.82	0.92	1.08	1.15
Cadmium	mg/kg	0.001	<0.001	<0.001	0.0023	<0.001
Cesium	mg/kg	0.001	<0.001	0.0444	0.0484	0.0367
Chromium	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	mg/kg	0.004	0.0054	<0.004	<0.004	<0.004
Copper	mg/kg	0.02	0.511	0.505	0.646	0.527
Iron	mg/kg	0.6	7.41	1.71	2.76	5.27
Lead	mg/kg	0.004	<0.004	<0.004	<0.004	<0.004
Lithium	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	0.01	55.5	14.4	108	62.9
Mercury	mg/kg	0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/kg	0.004	0.0154	0.183	0.0142	0.0224
Nickel	mg/kg	0.04	0.123	0.075	0.113	0.076
Rubidium	mg/kg	0.01	1	3.13	2.76	2.47
Selenium	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01
Strontium	mg/kg	0.01	0.117	0.121	0.174	0.188
Tellurium	mg/kg	0.004	<0.004	<0.004	<0.004	<0.004
Thallium	mg/kg	0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Tin	mg/kg	0.02	0.092	0.029	0.095	0.231
Uranium	mg/kg	0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02
Zinc	mg/kg	0.1	0.8	0.94	1.12	0.98
Zirconium	mg/kg	0.04	<0.04	<0.04	<0.04	<0.04
Nutrients						
Phosphorus, Total	mg/kg	2	147	126	98.8	136
Physical Properties						
% Moisture	%	0.25	86.3	84.6	81.3	85.2

MDL = method detection limit.