Government and Industry Relations
Suite 208, 9715 Main Street
Fort McMurray, AB T9H 1T5

November 11, 2010

Dave Bartesko, RPFT
Land Use Secretariat
Alberta Sustainable Resource Development
9th Floor, 10035 -108 St.
Centre West Building
Edmonton, Alberta T5J 3E1

Attention: Mr. Dave Bartesko, RPFT

Re: Mikisew Cree LARP submission

Dear Mr. Bartesko,

Please accept the attached submission as Mikisew's suggestion on protected areas, including recommendations on management of land in the LARP region.

It should be noted that from an ecosystem management perspective, as well as from a First Nation's land stewardship perspective, it is not possible to separate land from water and air. Responsible land management requires that all environmental components are assessed concurrently as they are connected and depend on one another.

The protected areas that Mikisew have identified in this report represent our best attempt to comply with GOA's request for Mikisew to provide suggestions on areas of importance to Mikisew within the LARP region. It should however be noted that the areas identified in this report do not represent complete and final areas of interest to Mikisew, due to rushed timelines, lack of complete data and inadequate financial and technical capacity. We remain concerned that GoA did not meet our requests in terms of funding and process for LARP.

In order for Mikisew to have been able to provide more complete information, the following additional information was needed, the essence of which has been outlined throughout the LARP process to Alberta, including in various versions of a Traditional

Resource Use Plan ("TRUP") which Alberta did not agree to fund: information that would properly enable Mikisew to determine and comment on cumulative impacts to Mikisew's section 35 rights and cultural impacts to the Mikisew community; thresholds for determination of impacts to section 35 rights, and other cultural impacts information. Again, Mikisew has been clear and up front about the need for this information and the need for resources required to collect it. Unfortunately Alberta did not agree to discuss or fund this information although the concepts were raised over two years ago. It is still not too late for this information to be collected and integrated into LARP if GoA shows a willingness to actually engage with us.

This information is important for a number of reasons. For example, it is not possible in Mikisew's view for the GoA to identify thresholds to things like air, land and water without understanding the cumulative impacts of already existing development generally and in respect of Mikisew's section 35 rights. We are also concerned that "trade offs" will be made without GoA understanding what is being "traded off." Absent critical information of the kind referenced above, Mikisew fears that LARP is being developed in an information vacuum.

Mikisew has on numerous occasions raised concerns with GOA regarding the apparent lack of information on the listed above, as noted earlier. Specifically, Mikisew has made requests for GOA to fund studies necessary in order to identify and mitigate these concerns. However, GOA has not provided capacity for or conducted any of the studies called for. Given that is not possible to make fully informed decisions on land management without necessary information on impacts to Treaty rights or how to mitigate these impacts without this kind of information, Mikisew is making the following recommendations to GOA:

1) GOA should not make critical land use decisions under LARP until the following actions take place:

    a) Provide capacity for Mikisew to undertake the TLRUMP study that has previously been tabled with Alberta (please see attached)

    b) Funding a study that assesses cumulative impacts to the environment and First Nations rights as a result of existing, planned and reasonably foreseeable development

    c) Identify, together with Mikisew, thresholds for the meaningful exercise of section 35 rights now and into the future, taking into account direct and cumulative impacts of existing, planned and reasonably foreseeable development on those rights

2) In the event that GoA decides to go ahead with LARP, including land classification and selection of protected areas, Mikisew recommends that LARP should be re-visited, including ensuring there are mechanisms for such re-visiting of previous decisions, on the basis of new information on impacts and thresholds that becomes

available. Such decisions may include re-designation of areas and possibly the buying back of certain leases, among other options.

3) Without a clear understanding of existing impacts as a result of development occurring to date, it is not possible to develop thresholds necessary to reduce impacts in the future. **Mikisew is strongly recommending that GOA calls for a moratorium on the issuance of all approvals or licenses pertaining to all future oil sands development until existing cumulative impacts have been assessed and environmental thresholds, based on best available science, have been identified, including in relation to the ability of Mikisew and other First Nations to meaningfully exercise their section 35 rights.** Mikisew is taking this position not because they are "anti development" in all instances but because the existing impacts of oil sands and other activities have already adversely affected and infringed their rights. While Mikisew cannot undo previous decisions and development of oil sands, Mikisew is of the strong view that decision making about future projects must be made on better information of the kind referenced in this letter.

4) Mikisew is recommending that GOA should enforce that companies use best available technology to achieve environmentally sustainability outcomes as a prerequisite for all existing projects and for all future approvals that are issued once cumulative impacts have been assessed.

As a final point, and as raised previously with you at our recent meeting to discuss the RAC Vision Document, Mikisew expects to engage in deep and meaningful consultation with GoA on LARP. The first steps in such consultation would be for GoA to meet with Mikisew and our advisors to discuss these submissions. Mikisew would be happy to answer any questions that GoA planners have on these submissions. Further meetings would focus on development of the LARP, as well as discussion of further information needed to develop LARP.

Once you have reviewed these submissions, please contact me to set up a schedule of meetings so that GoA can fully understand our input, issues and concerns, and so that we can continue to contribute to the development of LARP.

Sincerely yours,

Linda Aidnell, MCFN GIR Land use coordinator

cc. Chief Roxanne Marcel, MCFN
Melody Lepine, MCFN GIR Director
Sebastien Fekete, MCFN GIR
Robert Freedman, MCFN legal advisor

Patterns of Mikisew Cree land and resource use

Prepared for :
Mikisew Cree First Nation

Prepared by :
Peter Douglas Elias, Ph.D.
Tuesday, November 09, 2010

Disclaimer

Given the financial and information limitations, nothing in this report should be construed as a definitive list of MCFN concerns, impacts, needs, rights and uses; nor should it be taken as a limitation on the uses or rights of the MCFN. MCFN reserves the rights to alter, amend, revise or update any portion of this report if and when further information becomes available.

Executive summary

The Mikisew Cree First Nation has been asked by the Government of Alberta (GoA) to provide information in the context of the development of the Lower Athabasca Regional Plan (LARP). The Mikisew Cree First Nation expects the GoA to engage in a process of meaningful consultation as the GoA develops LARP. The First Nation's goal for the LARP is to protect lands where Mikisew Cree can exercise their treaty and aboriginal rights now and in the future. These rights are important in sustaining Mikisew Cree culture and livelihood, and are consistent with rights as specified in section 35 of the *Constitution Act* 1982. The Mikisew Cree First Nation is making this submission to the Alberta Land Use Secretariat as part of their contribution to the planning process.

In recent years, the Mikisew Cree First Nation has participated in several research projects which resulted detailed descriptions of past and present traditional land and resource use, and definitions of lands and resources which they intend to use in the exercise of traditional practices in the future. Archaeological, ethnographic and historic literature shows that the Mikisew Cree and their ancestors have occupied a vast territory in north-eastern Alberta for many centuries. As a series of traditional land use (TLU) studies clearly demonstrates, the Mikisew Cree use the same territory and resources today and intend to do so in the future.

Six TLU studies involving the Mikisew Cree have been conducted in the past seven years. They provide a wealth of detail describing Mikisew Cree land and resource use since the signing of Treaty 8 in 1899. The data produced by these studies is used extensively in this submission to demonstrate past and present patterns of land and resource use.

The six studies conducted a total of 305 interviews with members of the Mikisew Cree First Nation, and together recorded a total of 23,868 land and resource use sites and features.[1] While this is a very large record of Mikisew Cree use features, it is still a partial record because only about ten percent of the Mikisew Cree population was interviewed in the course of these six studies. Nevertheless, when all the data produced in the six studies are aggregated into a single database, clear images of Mikisew Cree land and resource use patterns are revealed.

[1] Throughout these submissions, the terms "sites" and "features" are used. These terms are meant to reflect the information contained in the TLU studies discussed in this report – both specific sites described as points where activities were carried out in the past and are currently carried out, as well as other features described as lines and polygons, such as travel routes, traplines, place names and areas of ecological significance.

The six TLU studies considered here had different purposes, geographic focuses, and time and money constraints, and as a result different characteristics and qualities. Even with their differences, these six studies share important features. They all dealt with the same community – the Mikisew Cree – and the same general geography – places within Mikisew Cree Territory where use has been documented.[2] They used the same general approach to data collection and they all used compatible GIS technology to store, organize and present data. The shared characteristics make finding a common basis for aggregating the data collected by each study straightforward. Once aggregated into a single database, the data from all six studies can then be used to address common issues.

The result is a series of analytical maps showing where, why and when the Mikisew Cree have used their lands and resources over the past century. These maps and the TLU data underlying them were then subjected to a detailed statistical and distributional analysis of harvesting features and ecological features to reveal factors which Mikisew Cree take into account in their definition of terrain which is culturally favoured for the exercise of their traditional practices. This definition is used to identify principles which should be developed in the LARP to protect preferred habitat important in Mikisew Cree traditions.

The statistical analysis clearly shows Mikisew Cree select lands with very specific qualities when they embark on a hunt. They select prime habitat which is close to places suitable for establishing habitations, on a well-travelled traditional trail or other access route, in backcountry with easy river access, and distant from industrial disturbance. In other words, protecting just any extent of territory in the LARP is not sufficient to protect Mikisew Cree rights and interests – protected lands must also incorporate Mikisew Cree cultural definitions of suitable hunting, fishing, gathering and trapping terrain.

Finally, this submission provides maps and descriptions of the lands and resources the Mikisew Cree anticipate using in the future, along with a detailed rationale for the selection of these lands and resources, including an explanation of why the selected areas are important from a cultural, ecological and traditional perspective.

Briefly, the Mikisew Cree First Nation proposes protection for several major features of the regional landscape, including:

[2] In these submissions, reference is made to Mikisew's "territory" or, at times, "use area" and related terms. For purposes of these submissions, any such reference indicates the places where Mikisew past or current use has been documented through the TLU studies described in this submission. As noted elsewhere in these submissions, the recording of use sites or features is not meant to indicate the totality of all available information, since (due to time and financial constraints), only ten per cent of Mikisew members have been interviewed in these studies.

- A buffer five kilometres wide on each side of the Athabasca River
- A buffer which takes in the TLU features clustered within and around the Peace-Athabasca Delta
- Over time, the limiting or elimination of industrial impacts on all remaining intact landscapes in the LARP region
- Protection for remaining large tracts of habitat suitable for moose, bison and woodland caribou
- A buffer one kilometre wide on each side of category 1, 2 and 3 streams throughout Mikisew Cree traditional use territory and a buffer one kilometre wide around all lakes. In addition, the slopes of the Birch Mountains also need to be protected.

The LARP applies to 93,217 kilometers^2 of north-eastern Alberta, and together the areas proposed by the Mikisew Cree for protection totals 37,621 kilometers^2 – about 40.4% of the LARP area. The Regional Municipality of Wood Buffalo is 68,816 kilometers^2. The Mikisew Cree proposals would protect 54.7% of the municipality. While this area does not protect all of their traditional territory, the protected lands and resources will enable the Mikisew Cree to continue their traditional practices well into the future.

Table of contents

List of maps

List of tables

Appendices

1. Introduction

The Mikisew Cree First Nation has been asked by the Government of Alberta (GoA) to provide information in the context of the development of the Lower Athabasca Regional Plan (LARP). The Mikisew Cree First Nation expects the GoA to engage in a process of meaningful consultation as the GoA develops LARP. These submissions should be read together with other materials that are appended to this report including: Mikisew submissions on the RAC "vision document", Mikisew submissions on the IFN process; Mikisew's community report on IFN; Mikisew's joint proposal with ACFN to develop a Traditional Resource Use Plan; Mikisew's joint submission on the Regulatory Enhancement Project, and other related materials and documents.

A Government of Alberta website describes the purpose of the LARP.

> "The Lower Athabasca Regional Plan will identify and set resource and environmental management outcomes for air, land, water and biodiversity, and guide future resource decisions while considering social and economic impacts."[3]

The regional plan will be constructed in accordance with Alberta's Land Use Framework. The Land Use Framework is guided by "seven key strategies for improving land-use decision-making in Alberta." One of these strategies is "Inclusion of Aboriginal peoples in land-use planning."[4] The Mikisew Cree First Nation must be consulted because LARP and decisions made in accordance with LARP have the potential to adversely affect and infringe their Treaty and aboriginal rights. Mikisew expects GoA to engage in a process of meaningful consultation prior to the development and finalization of LARP and to seriously consider and substantially address Mikisew's concerns and input related to LARP, including the issues raised in these submissions.

The First Nation's goal for the LARP is to protect lands and resources to ensure that the Mikisew Cree can meaningfully exercise their treaty and aboriginal rights now and in the future. These rights are essential in sustaining Mikisew Cree culture and livelihood, and are consistent with rights as specified in section 35 of the *Constitution Act* 1982. Terms of protection incorporated in the LARP must take into account patterns of historical use, current use, and anticipated future use.

Towards the end of gaining protection for lands and resources, this submission documents where in their territory within LARP the Mikisew Cree exercise their treaty and aboriginal rights and carry out their cultural and spiritual practices. Moreover, due to the lack of comprehensive TLU information regarding traditional land use and

[3] Alberta nd
[4] Alberta 2009:2

cumulative environmental impacts, it should be cautioned that there are other areas which may be beneficial to protect. However, what this submission will show is:

1. where in the past have Mikisew Cree First Nation members exercised their rights of use and occupancy,
2. where they currently exercise their rights, and
3. where they intend to exercise their rights in the future.

The submission includes,

1. maps and descriptions of Mikisew Cree First Nation historical use of lands and resources,
2. maps and descriptions of Mikisew Cree First Nation current use of lands and resources,
3. maps and descriptions of Mikisew Cree First Nation anticipated future use of lands and resources, and
4. a detailed rationale for the identification of areas selected by the Mikisew Cree First Nation for protection, including an explanation of why these areas are important to the Mikisew Cree from a cultural, traditional, and ecological perspective.

The data and information used to construct the maps and descriptions presented in this submission come largely from a series of traditional land use (TLU) studies in which the Mikisew Cree First Nation participated or actively promoted over the past several years.[5] The historic and contemporary patterns of use shown in the maps and descriptions define the properties of lands and resources which the Mikisew Cree want protected in the LARP, because historically and at present, these are the kinds of lands the Mikisew Cree favour for their cultural purposes. In this submission, the social and cultural patterns of use are compared to other data and maps describing biological features and ecological values. This comparison helps identify areas within the LARP region which satisfy Mikisew Cree requirements for lands and resources possessing qualities needed for them to continue to meaningfully practice their treaty and aboriginal rights.

The Mikisew Cree First Nation recognizes that certain areas preferred for protection are already subject to industrialization, and other areas may be industrialized over time. The Mikisew Cree would potentially consider protection for areas reclaimed following industrial uses, only if Alberta agrees that the reclaimed areas are restored to a state equal to conditions existing prior to development, and are thus capable of supporting the exercise of Mikisew Cree traditional rights. However, proposing protection of

[5] Due to time and funding constraints, the TLU studies referenced here cannot and should not be taken as representing the totality of the Mikisew Cree First Nation's historical and current use of lands within their Traditional Territory.

reclaimed areas is uncertain for the Mikisew Cree, because today there is no proof that reclamation efforts will succeed in re-establishing conditions suitable for their traditional practices.

This report is only a first attempt to engage in the LARP process by describing which areas the Mikisew Cree First Nation would like to protect now and in the future. While based on the best information available today, this submission is by no means enough of a foundation upon which to make well-informed decisions. The Mikisew Cree First Nation could provide GoA with a complete rationale and maps of areas that they would like to protect only after a Traditional Resources Use study has been completed and the cultural needs of the Mikisew Cree First Nation are better understood.[6] Furthermore, baseline and cumulative environmental impact measures must be identified and assessed to establish thresholds of change relevant to the practice of Mikisew's section 35 rights. Therefore, Mikisew Cree expects to continue consultation with Alberta on the Lower Athabasca Regional Plan and to engage in ongoing discussions on management of regional resources. In light of this imperfect knowledge on the consequences of development, the Mikisew Cree First Nation suggests that the Alberta Government adopt a more precautionary approach to development, which may include a halt in development in parts of the LARP region until the necessary information required to make enlightened decisions has been produced and analysed.

2. Historical Mikisew Cree Land Use

Development of the LARP requires the Mikisew Cree to show where in the past they have exercised their rights of use and occupancy.

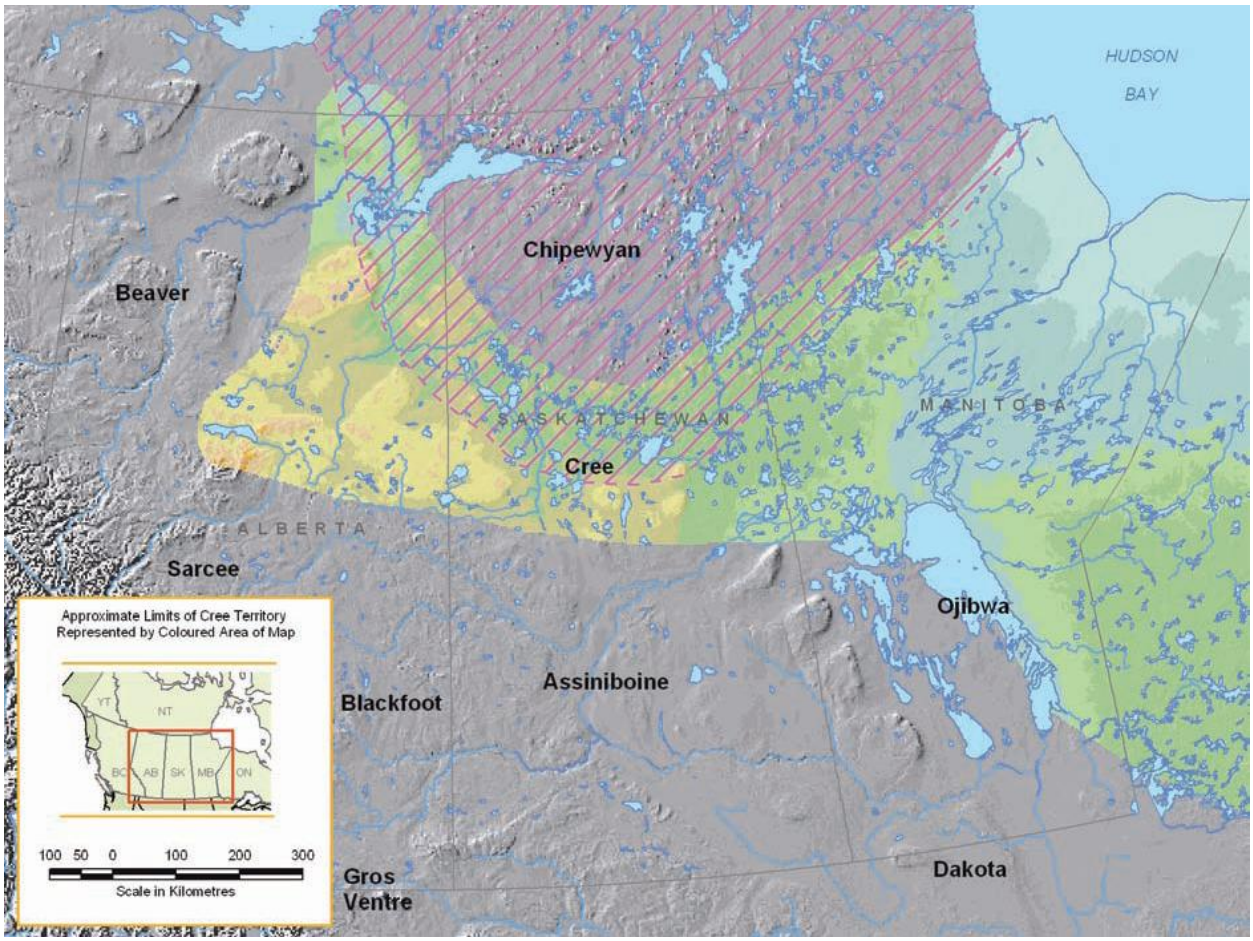
2.1 The past to 1900

Until about 10,000 years ago, much of the territory presently occupied by the Mikisew Cree First Nation was under the waters of glacial Lake McConnell, a large body of water trapped behind receding Ice Age glaciers. People could not have lived in the region until the glaciers melted, the lake drained, and the land dried enough to support plants, animals and humans.[7] While the details of the prehistory of northern Alberta are still poorly known, early humans who entered the region in the past 8,000 to 10,000 years included the ancestors of Cree and Chipewyan.[8]

Today, the Mikisew Cree First Nation includes members from two ethnic populations – the Western Woods Cree and the Athabasca Denesuline. As Map One shows, by at least the beginning of the 19th century, these populations were entrenched in slightly

[6] Mikisew first raised the need for such a study with GoA in October, 2008.
[7] University of Calgary nd
[8] Royal Alberta Museum 2005

overlapping territories in what is now north-western Saskatchewan, north-eastern Alberta, and the adjacent



Map One – Distribution of Cree and Chipewyan in 1800
(From: Tanner, J. 2006:24)

Northwest Territories.[9] Map Two shows annual travel routes of the Cree and Chipewyan who were occupying lands in the vicinity of Fort Chipewyan and Fort McMurray in the early 19th century.

Map Two was constructed on the basis of Hudson Bay Company records, which are fairly detailed for the early part of the 19th century. This map emphasizes the enduring relationship the MCFN have to their land and resources in the Athabasca oil sands region. Later trade records are not as detailed, but in her thesis Pamela Mathewson, a graduate student at the University of Alberta, was able to approximate the distribution of the Cree and Chipewyan in the mid-19th century. According to Mathewson, Cree hunters moved towards the west and northwest, following herds of bison which were retreating to the north in the face of increasing hunting pressure from the south, and the Chipewyan moved further west of Lake Athabasca.

By the middle of the 19th century, both peoples had expanded into territories closer to Fort Chipewyan where they conducted much of their trade with the Hudson Bay Company.[10] Map Two is an approximation of where the Cree and Chipewyan were located by the late 1800's and early 1900's when traditional land use study data are available to provide more detailed descriptions of use and occupancy patterns.

2.2 The 20th and 21st centuries

Six traditional land use studies conducted in the past seven years provide a wealth of detail describing Mikisew Cree land and resource use since the signing of Treaty 8 in 1899. The data produced by these studies is used extensively in this submission.

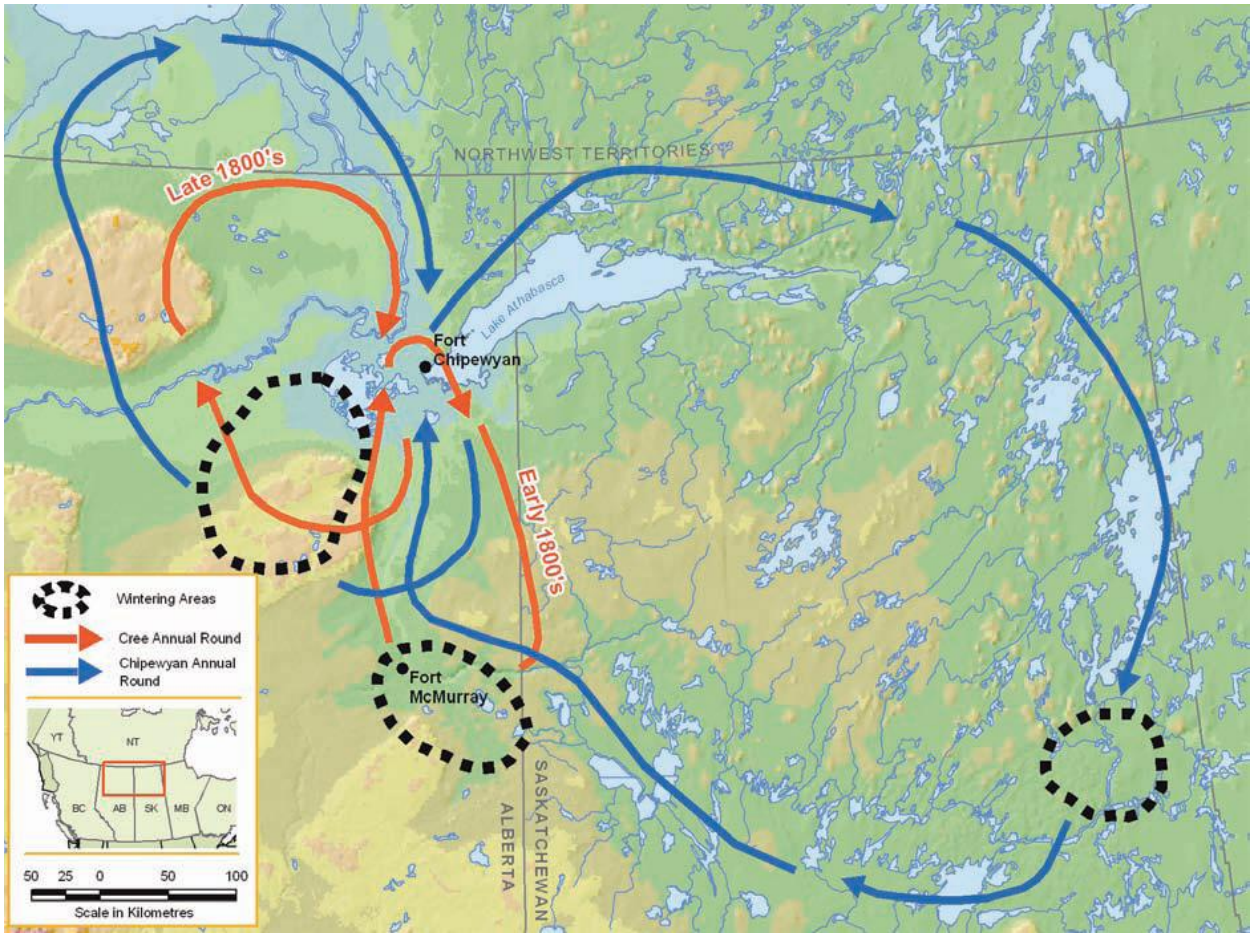
2.2.1 The six traditional land use studies

Because of the importance of TLU study data and information in this submission, the six studies deserve description. The traditional land use studies are:

- The *Ayapaskowinowak Study* (Tanner Northern Study)[11]
- The *Husky Sunrise/Imperial Kearl Study* (Husky/Imperial Study)
- The *PACTeam Historic Study* (PACTeam Study)
- The *Phase 1: Mikisew Cree First Nation TLU-Total Joslyn North Mine Study* (Tanner Southern Study)

[9] Smith, J.G.E. 1981:256-270; Lovisek, J.A. nd; Natcher, D.A 2000
[10] Mathewson, P.A. 1974
[11] For the sake of simplicity, the six TLU studies are referred to by the name of their primary researcher or sponsor.

- The *Phase 2: Mikisew Cree First Nation TLU- Total Joslyn North Mine Study* (Calliou Study)
- The *Mikisew Cree First Nation Comprehensive TLU Study* (Tobias Study)



Map Two – Annual rounds of the Cree and Chipewyan in the mid-19th century
(From: Tanner, J. 2006:44)

In addition to these TLU studies, other studies documenting Mikisew use and concerns will also be referred to in this submission, such as reports by Sherri Labour and the Firelight Group.

The ***Ayapaskowinowak Study*** (Tanner Northern Study)

The Tanner Northern Study was managed by James Tanner of Fish Creek Consulting, Calgary. The study began in 2002 and was completed in 2006. It focused on "specific land uses associated with the Wood Buffalo Park and historical concentrations of activity from the 1940's to 1980's."[12] The intention of the study was to show land use of "the Mikisew Cree and their ancestors from the earliest times to the present day."[13]

Fifty Elders between ages 55 and 90, including 35 men and 15 women, were interviewed in the course of the Tanner Northern Study. They identified 4,100 use features. They were asked to discuss their use activities in three periods:

- First Period – Before 1970
- Second Period – 1971-1984
- Third Period – After 1984

Respondents were also asked questions about their annual rounds of seasonal activities in each of the three periods. Information was elicited detailing:

- genealogy
- family composition
- personnel involved in seasonal activities
- division of labour while in seasonal camps
- the amount of time spent on particular hunting, fishing, trapping and gathering activities
- how harvested products were processed, consumed, and distributed
- estimates of seasonal rates of harvesting

Finally, respondents were asked to describe environmental changes they observed and experienced during their career of land and resource use. The report includes several maps showing the distribution of categories of use features.

- Figure 5.4 Cabins
- Figure 5.5 Cabins and Spiritual Sites

[12] Tanner, J. 2006:p.x
[13] Tanner, J. 2006:p.9

- Figure 7.1 Big Game
- Figure 8.2 Fur Bearers
- Figure 9.1 Fish
- Figure 10.1 Birds
- Figure 11.1 Plants and Medicines
- Figure 11.2 Berries
- Figure 13.1 Place Names Map
- Figure 13.1b Place Names Detail

All map data are digitized and compatible with ArcGIS technology.

The ***Husky Sunrise/Imperial Kearl Study*** (the Husky/Imperial Study)

The *Husky Sunrise/Imperial Kearl Study* (Husky/Imperial Study) was carried out by FMA Heritage Consultants (FMA) and completed in two parts. The first part involved a small collection of use data, and resulted in a report entitled "*Mikesew Cree First Nation Traditional Land Use Impact Assessment: Husky Sunrise Thermal Project*".[14] The second part resulted in a large record of use features, although no report was written.

The smaller study focused exclusively within the boundaries of the Husky Thermal Project's terrestrial local study area (LSA). The objective of the smaller study was to provide information on "areas of historical and current use by the MCFN; potential effects of the proposed Husky Sunrise Project on MCFN traditional land uses, potential cumulative/additive effects of the proposed project and other proximal projects on the MCFN traditional land uses; and project boundaries in relation to MCFN traditional land uses."[15] The result of the smaller study was a map showing the footprint of Husky Thermal Project and the location of use features identified by the five Elders who were interviewed. The map shows approximately fifty use features for birch, moose, blueberry, poplar, chicken, rabbit, cranberry, raspberry, deer, saskatoon, spruce, duck, fungus, spruce gum, sweat rocks, tamarack, muskeg tea, and tenting.

The larger study considered a much larger area in the northern part of Mikisew Cree use territory. Forty respondents identified 3,647 use features, including use features for cabins, bear, beaver, bison, blueberry, burbot, camps, caribou, chickens, chokecherry, coyote, cranberry, deer, duck, duck eggs, eagles, whitefish, walleye, pike, jackfish, pickerel, suckers, goldeyes, lake trout, fisher, fox, goose, grave sites, lynx, martin, mink, moose, muskrat, rabbit, raspberries, rat root, rose hips, skunk, spiritual sites, squirrel, swans, sweetgrass, weasels, wolf, wolverine, and place names.

[14] Husky Oil Operations Limited 2005
[15] Husky Oil Operations Limited 2005:1

A single map was included in the Husky Oil Operations Limited 2005 report. The map is of poor quality and only shows use features within the footprint of the proposed thermal project. However, all map data are digitized and compatible with ArcGIS technology.

The ***PACTeam Historic Study*** (the PACTeam Study)

This study was undertaken by PACTeam Canada, Inc of Edmonton, Alberta, in 2006 and 2007. The purpose of the PACTeam Study was to provide evidence to support the MCFN's outstanding treaty land entitlement (TLE) claim in northern Alberta. It was also intended to address other legal, regulatory and educational purposes.

The study area covered approximately 70,000 km^2 from Embarras in the north to the south of Anzac, east to the Saskatchewan boundary, and to the west of Red Earth Creek. The northern boundary of the PACTeam Study area overlaps the southern boundary of the Tanner Northern Study, described above. While there is a small amount of use information after 1926, the focus of the study was in the period from approximately the time of treaty until 1926, as noted above.

Thirty-three respondents were interviewed and resulted in the recording of 1,003 use features and a series of seventeen maps :

- Figure 2 All Recorded Use and Occupancy
- Figure 3 Major occupancy centers and patterns of travel
- Figure 4 All Recorded Use and Occupancy in the Fort McMurray Area
- Figure 5 All Recorded Use and Occupancy in the Fort McKay Area
- Figure 6 All Recorded Use and Occupancy in the Poplar Point Area
- Figure 7 All Recorded Use and Occupancy in the Birch Mountain Area
- Figure 8 All recorded Use and Occupancy before 1927
- Figure 9 All Recorded Use and Occupancy after 1926
- Figure 10 Winter Use and Occupancy recorded before 1927
- Figure 11 Winter Use and Occupancy recorded after 1926
- Figure 12 Summer Use and Occupancy before 1927
- Figure 13 Summer Use and Occupancy after 1926
- Figure 14 Overnight Sites
- Figure 15 Recorded Place Names and Story Sites
- Figure 16 Recorded Trails
- Figure 17 Recorded Burial, Birth, Death and Sacred Sites
- Figure 18 Recorded Trapping Areas

All map data are digitized and compatible with ArcGIS technology.

The ***Phase 1: Mikisew Cree First Nation TLU-Total Joslyn North Mine Study*** (the Tanner Southern Study)

James Tanner of Fish Creek Consulting, Calgary, was initially contracted to undertake a TLU study for the southern part of Mikisew Cree use territory. In 2008, the Calliou Group, Calgary, used some of the Tanner Southern Study map biography data to prepare its own report. The Calliou Study is described below.

The Tanner Southern Study was intended to replicate the work done in the Tanner Northern Study (described above) and extend coverage to include more Mikisew Cree use territory. In particular, the study was to focus on the vicinity of the proposed Joslyn North Mine. Tanner did not write a report.

Twenty-nine interviews with 20 men and 9 women between ages 35 and 85 years were completed, resulting in 1,238 recorded use features and two composite maps at slightly different map scales. All map data are digitized and compatible with ArcGIS technology.

The ***Phase 2: Mikisew Cree First Nation TLU- Total Joslyn North Mine Study*** (the Calliou Study)

The Calliou Group of Calgary used the Tanner Southern data as a starting point for their work. Their final report was submitted to the Mikisew Cree First Nation in August of 2010.

The geographic scope of the study extended north to the twenty-sixth baseline, east to the Marguerite River Wildland Provincial Park, west to the Birch Mountains Wildland Provincial Park, and south to Fort McMurray.

Of the twenty-six MCFN members interviewed, twelve were under 50 years old and fourteen were over 50 years old. Seventeen participants were male and nine were female. The study recorded 190 use features and the resulting report includes three maps.

- Figure 4-1 Past Use Areas
- Figure 4-2 Current Use Areas
- Figure 4-3 Future Use Areas

All map data are digitized and compatible with ArcGIS technology.

The ***Mikisew Cree First Nation Comprehensive TLU Study*** (the Tobias Study)

Terry Tobias and Associates was contracted to collect the data for the *2010 Mikisew Cree First Nation Comprehensive TLU Project* which was designed "to obtain a quality baseline inventory of mapped harvesting sites and fixed cultural sites."[16] All components of the proposed research were conducted according to best practices

[16] Tobias, T.N. 2010. Data-Collection Methodology Report, Mikisew Cree First Nation 2009-2010 Use-And-Occupancy Map Survey. Tobias & Associates, August, 2010. p.3

described in Tobias' recently-published methods text, *Living Proof: The Essential Data-Collection Guide for Indigenous Use-and-Occupancy Map Surveys.*[17]

A total of 98 individuals were interviewed, including 85 men and 13 women between age 25 and 90 years. A total of 13,635 use features were recorded. Of the 98 respondents, 35 indicated less than 100 use-and-occupancy features on their map biographies; 39 respondents indicated 101-200 features; 17 indicated 201-300 features; three indicated 301-400 features; and four individuals indicated 400+ features. The average number of features per respondent was 152. The smallest number of features indicated by a respondent was ten, and the highest was 478.

Tobias was not required to write an analytical report, but all map data are digitized and compatible with ArcGIS technology and ready for detailed analysis.

2.2.2 Aggregating the six Traditional Land Use Studies

The six studies conducted a total of 305 interviews and recorded 23,868 land and resource use features. While this is a very large record of Mikisew Cree use features, it is still a partial record because only about ten percent of the Mikisew Cree population was interviewed in the course of these six studies. Nevertheless, when all the data produced in the six studies are aggregated into a single database, clear images of Mikisew Cree land and resource use patterns are revealed.

The six TLU studies considered here had different purposes, geographic focuses, and time and money constraints, and as a result different characteristics and qualities. Even with their differences, these six studies share important features. They all dealt with the same community – the Mikisew Cree – and the same general geography – Mikisew Cree use territory. They used the same general approach to data collection and they all used compatible GIS technology to store, organize and present the data. The shared characteristics make finding a common basis for aggregating the data collected by each study straightforward. Once aggregated into a single database, the data from all six studies can then be used to address common issues.

2.2.3 The result of aggregating the six Traditional Use Studies

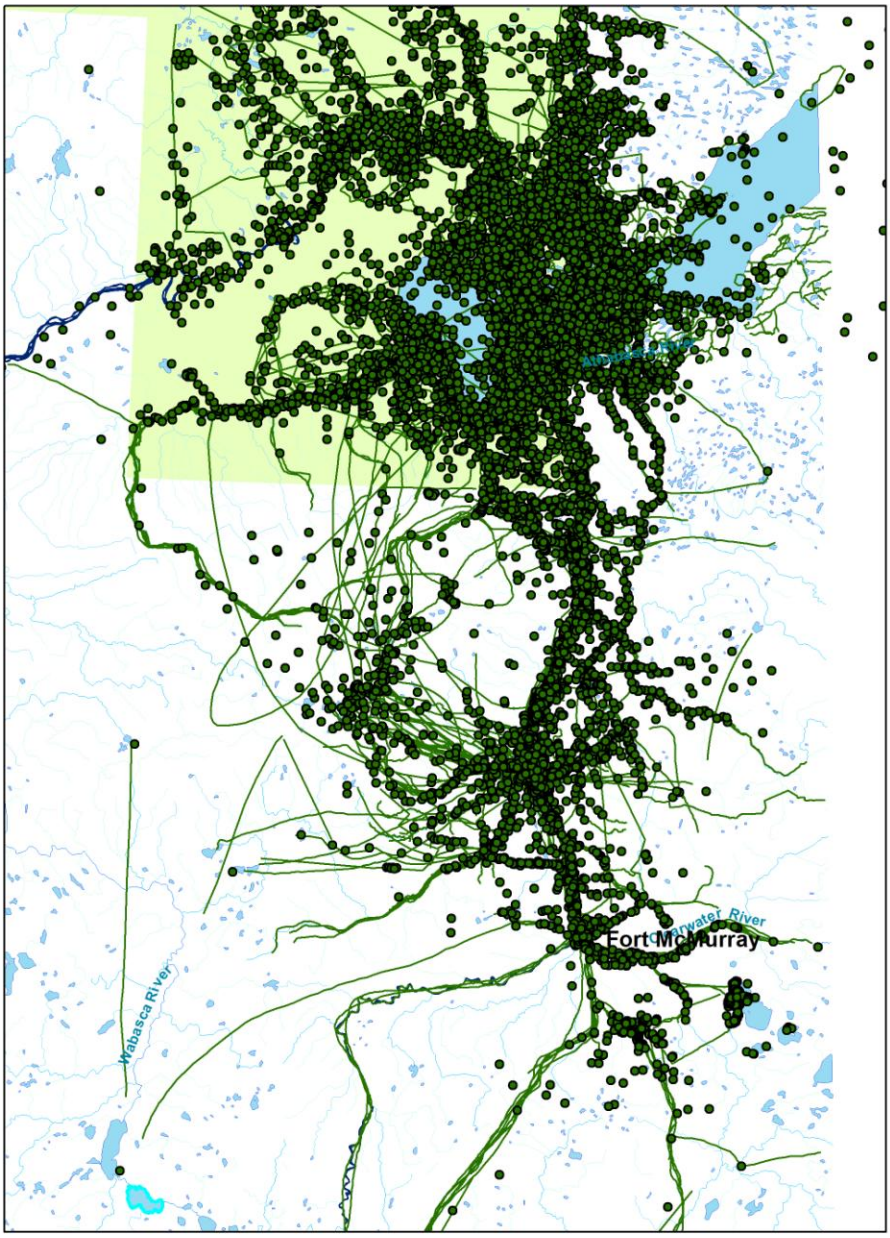
Map Three aggregates all the use sites and features recorded as points, lines and polygons in the six studies on a single map. The purpose of this aggregate map is to show the extent of Mikisew Cree use territory since the beginning of the 20th century. Even by eye, it is possible to 'draw' a line around the vast majority of recorded sites and features to visualize the location and extent of Mikisew Cree use territory as defined by records of over a century of use.

[17] Tobias, T.N. 2009

As well, aggregating the six studies results in a very large database which can be used for more detailed analysis than is possible with the data from any one study. This aggregated database is used in the analysis below.

2.3 Impact events of the 20th and 21st centuries

Mikisew Cree history in the 20th and 21st centuries includes many events which were imposed on them and resulted in changes to their patterns of land and resource use. In 1899, Treaty 8 laid the foundation for the imposition of Canadian legal, political and economic systems which



Map Three – Aggregate of all Point, Polygon and Line Data in the Six TLU studies
(based on available MCFN TLU studies; prepared by MSES Inc 2010)

ultimately undermined the Cree economy and their domestic and fur trade mode of production.[18] Gradually, and then more relentlessly, the representatives of these intrusive systems made their way into lands the Mikisew Cree were actively using at the time of treaty. Set out below are examples of events that have adversely affected the Mikisew Cree First Nation's ability to exercise their rights within their Traditional Territory.

The creation of the Province of Alberta in 1905 saw the beginning of provincial regulation of resources, including the Alberta Game Act of 1906 which interfered with Mikisew Cree allocation of animal resources. Provincial control over resources was transferred from Canada to Alberta pursuant to the Natural Resources Transfer Act, 1930. Provincial laws and regulations limited the choices the Mikisew Cree could make as to when, where and how they would harvest fur and food animals.[19] Once federal and provincial jurisdiction was extended into the region, Indian agents, police and missionaries arrived and with them came increased scrutiny of Mikisew Cree practices, followed by regulation. The Migratory Game Birds Convention Act of 1917 restricted hunting of waterfowl and, along with other game and fur regulations enacted at this time, limited the resource use choices available to the Mikisew Cree.

Just before World War I, Fort McMurray was established as a freighting depot and a railroad was extended to Athabasca Landing. The construction of transportation facilities diminished the importance of Fort Chipewyan as a major northern depot, but made it easier for increasing numbers of outside, non-aboriginal trappers using the railway to reach the northern region.[20]

The treaty and the imposition of Canadian political and legal systems allowed outsiders to compete with the Mikisew Cree for resources, including fur and food animals. Transient prospectors became trappers and they and full-time non-aboriginal trappers used poison which killed animals indiscriminately. Métis arrive from Lac La Biche to trap and settle permanently in the region, thus increasing pressure on fur and food resources. By the mid-1920's, the Mikisew Cree were complaining that "White trappers were crowding them out of their hunting and trapping grounds."[21] They were also a serious threat to the endangered wood bison population. Later, in 1937, the Northern Transportation Company was established on the Athabasca and Peace Rivers and improved transportation further opened the region to competitors for lands and resources.

The flu epidemic of 1920 and 1926 swept through the region, devastating the population and disrupting Mikisew Cree knowledge traditions. Several Chipewyan bands were

[18] McCormack, P.A. 2004:46
[19] Tanner, J. 2004:63
[20] Tanner, J. 2004:63
[21] McCormack, P.A. 2004:54

killed off completely.[22] Soon after, residential schools were instituted. Their social and cultural effects are well-known. "Perhaps the most pervasive effect of the residential school system upon this generation of Mikisew People was the corporal punishment environment where people lived in fear of punishment. This environment alienated the students from their traditional spiritual existence where they knew their purpose and place. Instead of living in fear of losing their jobs or opportunities they should be able to live in peace with their lands and traditional livelihood. Many of them lost their language, their ability to communicate with their Elders. Others lost their way."[23]

In 1922 Wood Buffalo Park North was created, followed by Wood Buffalo Park South in 1926. The park restricted Mikisew Cree access to the northwest part of their use territory. Special provisions allowing access to Treaty 8 people created two classes of trappers and hunters in the region – those with and those without park privileges. The only Mikisew Cree allowed into the park were those who had permits to maintain residences there. Others could not even enter the park to visit their relatives and family. This provision encouraged distant Treaty 8 people to migrate north into Mikisew Cree territory, increasing pressure on resources. It also encouraged Mikisew Cree who had been located north of Lake Athabasca to abandon their old ranges and move into the park. "A reduction in choice meant an overall decline in the flexibility of their economy"[24] At a time when food and fur resources were in serious decline, park regulations were rigorously enforced. Hunters and trappers who violated park regulations were expelled with no other nearby lands to which they could relocate.

Commercial fishing opened up on Lake Athabasca and lasted for decades, resulting in a gradual depletion of the fish in the lake and neighbouring waterways which Mikisew Cree hunters and trappers needed to feed their dogs. It is estimated 1,000 fish are needed each year to feed a team of working dogs, and commercial fishing was in direct competition with Cree trappers and hunters for those fish.[25] Without sufficient dog food, extended travel into remote parts of Mikisew Cree use territory declined. In 1948, McInnes Fish Corporation licensed to fish commercially in Park. The decision to allow commercial fishing in the Park was made over the objections of the Mikisew Cree. McInnes said "… we cannot see any reason for any harm being done. The area itself is in the remote district, far from any human habitation."[26] Apparently, the Mikisew Cree camps and villages did not qualify as 'human habitations'. Within a year, Mikisew Cree and Chipewyan fishermen working for McInnes were demanding the fishery be stopped, because it was eliminating fish stocks.

[22] Tanner, J. 2004:76
[23] Tanner, J. 2004:171
[24] McCormack, P.A. 2004:61
[25] Tanner, J. 2004:116
[26] McCormack, P.A. 2004:89

Traders had set up small stores within the Park, but in 1935 these were closed. "The loss of trading convenience was another source of economic stress for members of the Cree Band."[27] To trade their furs and get their supplies, Cree trappers faced the long trip to Embarras or Fort Chipewyan where there were still stores.

Industrial operations began to encroach when in 1926 Sidney Ells drilled for oil at Mildred and Ruth Lakes, followed in 1936 when Industrial Minerals Ltd opened a salt mine at Waterways.

Layers of new federal and provincial regulations reduced the ability of Mikisew Cree families to decide their own economic strategies. Starting in 1939, Alberta licences were required for trapping outside Wood Buffalo Park. The two management regimes for those inside and outside the Park meant a two-tier structure of trappers, putting all trappers on unequal and conflicting footings. In 1940, Alberta fur management areas were imposed. Fixed and regulated traplines greatly limited the choices the Mikisew Cree could make on the land. All the trapping areas were quickly registered, leaving some Mikisew Cree without any legitimate access to trapping areas. Federal regulations of 1946 allowed only one male moose per hunter in the Park. At a time when all animal resources in the park were in serious decline, this regulation made it almost impossible for families to remain on their traplines and feed themselves. The imposition of group trapping areas further limited the ability of Mikisew Cree trappers to make choices about use and management of resources.[28]

The Great Depression and cycles of drought saw a precipitous decline in the numbers of furbearers in the region, dealing a crippling blow to trappers and their families. Trappers were forced to "travel farther and farther afield to secure their season's quota of pelts." Those who could not afford distant travel or who were unwell suffered the most.[29] Water control structures were built in the park as conservation efforts, forcing seven or eight Mikisew Cree families in the area to relocate without compensation or assistance. With drought came forest fires and in 1947 fires swept through half of Park. In part, the fires were the result of Mikisew Cree being forced to stop their controlled burns, allowing fuel debris to accumulate to a dangerous level.[30] Accessible wildlife habitat was greatly reduced for the better part of a generation.

In 1945, the Family Allowance Act was instituted. To keep their children in school, Mikisew Cree parents were paid in cash or with store credits. This added some liquidity to their economy, but to receive the payments parents were encouraged to remain in Fort Chipewyan and send children to school.[31] By 1950, the Mikisew Cree began settling

[27] McCormack, P.A. 2004:82
[28] Tanner, J. 2004:75
[29] McCormack, P.A. 2004:72
[30] Tanner, J. 2004:74
[31] Tanner, J. 2004:85

in townsites, especially Fort Chipewyan. The trapping industry began a long downward spiral as the cost of outfitting rose and returns plummeted. Many trappers found it is too expensive to engage in full-time trapping. They began to relocate from their traditional settlements to seek wage labour and live in the towns. By the 1960's most of the bush settlements were gone.

As more people relocated to Fort Chipewyan, their children were swept into the residential school, making it even more difficult for people to spend months at a time on the land and to educate their children in traditional subsistence skills. By the end of the 1960's, some of the younger Mikisew Cree people were unwilling to engage in the risky work of trapping.

By mid-century, Canada's northern development policies were evolving. Northern resources were managed by outside, private interests and treated as business opportunities. The result was a reduction in Cree control of resources. "The Cree economy did not thrive under these circumstances, and the ability of the Cree to support themselves by means of a mixed economy deteriorated. Nor did the new industrial economy provide an economy that could provide an adequate replacement for the mixed economy."[32]

In 1951, Eldorado Mining and Refining received a permit to build a sawmill in the Park. This was the first of several sawmills to operate in the park. Many Mikisew Cree were hired as labourers, an alternative to trapping and the very low returns available from fur. Some lumber companies offered their Mikisew Cree employees training, apprenticeships, and union membership. Mikisew Cree employees remained close to their settlements, and continued their cycles of domestic production. Their mixed economy demanded cash, and "Sawmill work (wage labour) had replaced trapping (independent commodity production) as their primary source of cash income, and they were steady workers."[33] In the end, the spruce stands were cut down and the lumbering companies departed, leaving the Mikisew Cree loggers without a source of earned cash income. Logging damaged traplines, but there was no compensation to the trappers, so when their employment ended many could not return to trapping to earn cash. When commercial logging in Park was halted in 1970, many woodsworkers were left unemployed. The Mikisew Cree who worked in the lumber camps were amongst the first to relocate from their bush settlements to Fort Chipewyan. "Town life became acceptable and even desirable for many Crees."[34]

Forestry expanded dramatically in later decades, taking on the characteristics of very large-scale industrial operations spread out over vast areas in Alberta's north. Even

[32] McCormack, P.A. 2004:84
[33] McCormack, P.A. 2004:97
[34] McCormack, P.A. 2004:98

though sawmills, pulp mills, and woodland operations displaced Mikisew Cree hunters, trappers and fishers, they were not consulted before the Government of Alberta allowed commercial exploitation of the forests to proceed.

By 1965, dogs were replaced by snow machines. Domestic and commodity production now required more cash and capital than labour. Those without cash and the technology only cash can buy were limited in their ability to use remote lands and resources. "… in recent years the people most able to travel from Fort Chipewyan into the surrounding countryside … for hunting, trapping, fishing or recreation are those who hold reliable, well-paid jobs, which allow them to outfit themselves with essential equipment for bush activities, such as boats and snow machines."[35]

With increased settlement in the town, in 1954 the federal Department of Indian Affairs built a school at Fort Chipewyan, followed by a health centre in 1958, and a nursing station in 1961. Over the next two decades, the range of services available in the townsite continued to draw in Mikisew Cree from the region, placing them under direct control of imposed institutions, especially the school.

By the early 1960's, industrialization of the region was underway in earnest. In 1962, Shell received permits to begin production, marking the beginning of the oil sands industry. Royalite, Syncrude, and Suncor operations quickly followed. These operations are all within territory used by the Mikisew Cree at that time and were established without their involvement.

In 1967, the WAC Bennett dam was completed. "The dam would change the hydrological regime of the Peace River and the Peace-Athabasca Delta, with significant deleterious impacts on the traditional Cree lands and the bush-based components of their mixed economy."[36] "People used to make enough money from trapping to buy boats, motors, skidoos, and trucks. Can't do that anymore. People used to make good living on muskrats. Now people don't even bother going out anymore. Lack of water is the cause…. No floods…places where we used to go through by boat you can't now unless you walk. It is so dry. The biggest cause I think is the Bennett Dam. Water started going down every year, every year right until today. Before there used to be puddles everywhere in the spring and now the water just goes down into the ground because it so dry…it's hard for a person to think about long ago."[37] In 1986, Cree reserves were established, and substantial dwellings and public buildings lent permanency to town life.

[35] McCormack, P.A. 2004:108
[36] McCormack, P.A. 2004:111
[37] Harvey Antoine quoted in Tanner, J. 2004:88-89

Oil sands operations in the region expanded rapidly, starting in the 1970's. Shell expanded its operations and started a new mine, Syncrude opened a second mine, and Imperial Oil began using new SAGD technology near Cold Lake. By 1996, the environmental cost of industrial development became obvious when Health Canada and Alberta Health issued fish consumption advisories due to toxins in the water. In 2004, barge traffic and dredging on the Athabasca River stopped due, some observers say, to the industrial use of water which made the river too shallow for large-craft navigation.

Finally, in 2005 the Mikisew Cree won a major victory in the Supreme Court of Canada, which ruled that under the terms of Treaty 8 First Nations must be properly consulted before their lands are taken up.

Clearly, the Mikisew Cree have experienced numerous events which had an impact on their land and resource use patterns. Some of the events described above had immediate and profound direct and cumulative impacts on the Mikisew Cree – for example, the epidemics which suddenly wiped out some of the most knowledgeable and productive members of the population, or forest fires which incinerated trappers' camps. Other events left their mark much more gradually, such as the consequences of the long decline in the value of furs which were felt over the course of a generation.

Just as clear, however, are the consequences for the Mikisew Cree of recent, full-scale industrialization of the region, and it is primarily industrialization which has shaped their current land and resource patterns.

3. Current Use of Lands and Resources by the Mikisew Cree

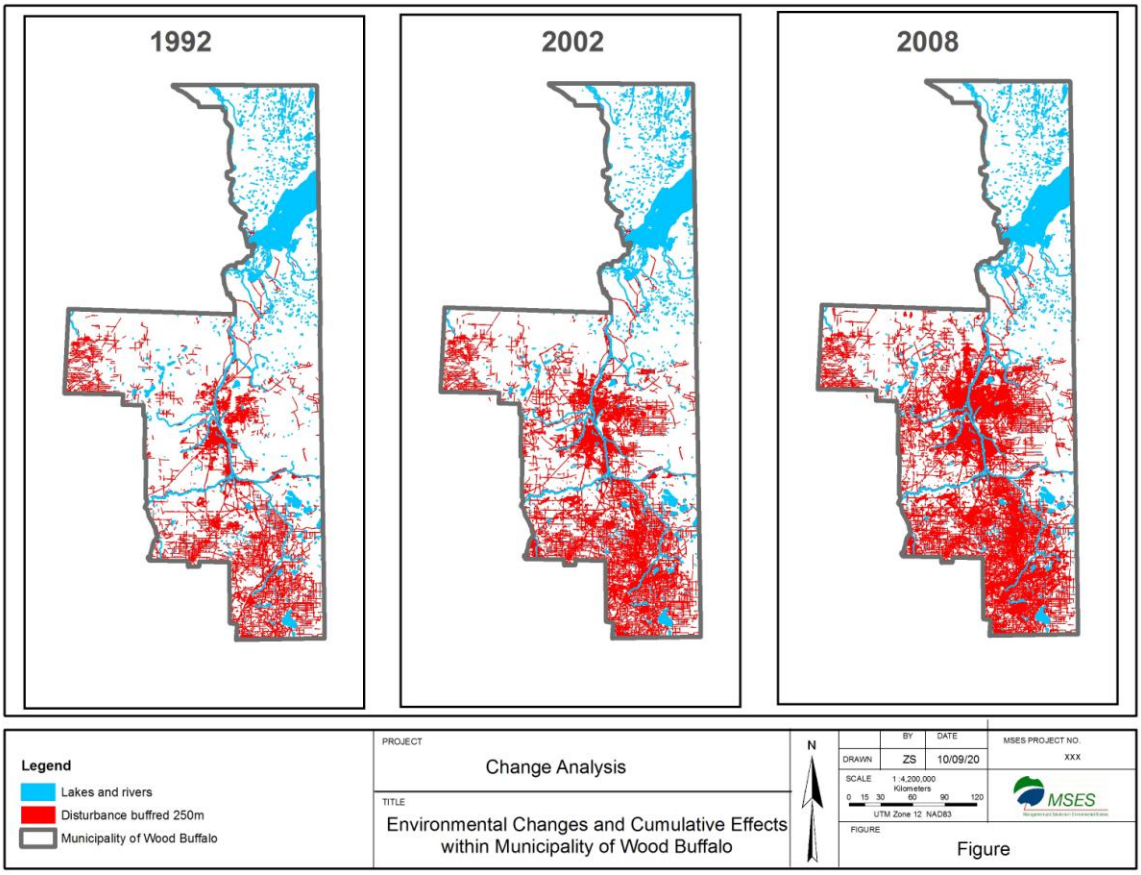
The LARP process asks the Mikisew Cree to show where they currently exercise their rights.

3.1 Consequences of 20th and 21st century impact events

Map Four shows the extent of industrial activities in the Mikisew Cree use territory in 1992, 2002 and 2008. With each passing decade the footprint of industrial activity has grown larger until by 2008 it covered almost all of the southern part of Mikisew Cree use territory. A comparison of Map Three and Map Four makes it obvious that industry has been rapidly and thoroughly encroaching on many of the places used by the Mikisew Cree for the exercise of traditional practices.

The Mikisew Cree First Nation's objective is to have the LARP protect lands and resources which can still be used by the Mikisew Cree for the exercise of their aboriginal and treaty rights today and in the future. As stated in the recommendations at the end of this report, where it is no longer possible for the Mikisew Cree First Nation to exercise their rights within parts of their Traditional Territory, despite their desire to continue

doing so, there needs to be discussion of ways of accommodating the Mikisew Cree First Nation for the loss of the ability to exercise those rights.



Map Four – Extent of Industrial Disturbance in the Municipality of Wood Buffalo 1992, 2002 and 2008
(prepared by MSES Inc 2010)

4. Future Use of Lands and Resources by the Mikisew Cree

This submission provides maps and descriptions of the lands and resources the Mikisew Cree anticipate using in the future, along with a detailed rationale for the selection of these lands and resources, including an explanation of why these areas are important from a cultural, ecological and traditional perspective.

The TLU studies asked people to point out where they hunted, fished, trapped and gathered each of the many species of plants and animals important in the Mikisew Cree traditional way of life. A simple sorting of the species associated with each use feature (Table One) shows that amongst those most commonly pursued by the Mikisew Cree are moose, waterfowl, fish and beaver.

Such a simple sort says nothing about the importance attached to these taxa[38] by the Mikisew Cree. For example, some medicine plants are only gathered by a few people at select locations in a short annual season, but may be of great importance to a person who can benefit from their use.

The results of the simple sort are important only as a way of managing the method of the analysis presented here.[39]

The purpose of this analysis is to demonstrate an approach to providing the required explanation as to why particular areas are important from a cultural, ecological and traditional perspective, and why they will be important in the future. Four taxa – moose, waterfowl, fish and beaver – were selected because of their importance in contemporary Mikisew Cree culture. As Table One shows, some of the most common use features recorded in the 2010 TLU study (the Tobias Study) pertain to these four taxa. Bison and caribou are also included in this analysis because of their historic importance in Mikisew Cree culture and because, if industrial impacts are appropriately

[38] A taxon (*plural:* taxa) is a group of (one or more) organisms.

[39] This submission does not attempt to analyze issues such as how much of a particular resource is needed by the Mikisew Cree First Nation to maintain their rights and culture. The Mikisew Cree First Nation has tabled proposals for a Traditional Resource Use Plan (October, 2008 and updated in August, 2010) with GoA and Canada to develop this and other kinds of information to better understand what is needed to exercise and maintain those rights now and into the future. The Mikisew Cree First Nation is still awaiting a response from Alberta (and Canada) in terms of funding this study. The selection of these taxa for analytical purposes is not meant to indicate that other taxa are not important to the Mikisew Cree First Nation. Further, in the past, muskrat trapping was an important part of the Mikisew Cree local economy. Since the construction of the Bennet Dam in British Columbia, muskrat trapping was almost eliminated as a rewarding use activity. The large number of muskrat harvest sites recorded here are those of now-elderly Mikisew individuals who trapped extensively before the dam was built.

managed and if restoration of impacted lands is truly effective, they might regain their importance.

Table One : Ranking of Activities Recorded in the 2010 TUS Project

Activity	Counts
Waterfowl	
Ducks	982
Geese	577
Bird Eggs	201
Mud Hens	123
Swans	68
Total waterfowl harvest features	**1,951**
Moose	
Moose	1,606
Total moose harvest features	**1,606**
Fish	
Jackfish	404
Pickerel	345
Whitefish	314
Goldeye	262
Maria	95
Sucker	95
Lake Trout	42
Other Fish	24
Total fish harvest features	**1,581**
Beaver	
Trapping-Beaver	706
Shot Beaver	527
Total beaver harvest features	**1,233**
All other activities	
Trapping-Muskrat	1,458
Grouse	541
Rabbit	539
Current Cabins (stayed in)	420
Ptarmigan	401
Tent (no stove)	384

Tent (with wood-burning stove)	371
Other Overnight Structure	330
Abandoned Cabins (stayed in)	325
Firewood	221
Current Cabins (not stayed in)	202
Berries	201
Bear	201
Medicine Plants	175
Buffalo	162
Burial Place	161
Abandoned Cabins (not stayed in)	157
Other Mammal	144
Heritage Cabins	81
Settlement	63
Deer	62
Death Site	61
Gathering Place	61
Birth Site	58
Specialty Wood	55
Abandoned Tent-Frames (stayed in)	53
Construction Wood	42
Other Plant	41
Ceremony Plants	40
Other Cultural Site	36
Food Plants	32
Sandhill Crane	29
Caribou	27
Earth Material	26
Moss	23
Current Tent-Frames (stayed in)	20
Tobacco Plants	19
Owl	17
Spirit Site	16
Current Tent-Frames (not stayed in)	14
Dye Plants	10
Abandoned Tent-Frames (not stayed in)	8
Heritage Tent-Frames (not stayed in)	5
Other Bird	5
Protection Site	5
Other Animal	2

Total all other activities	**7,304**
Total use features	**13,675**

The discussion of importance begins with references to the ethnographic and historic records. These records clearly show that moose, caribou, bison, waterfowl, fish and beaver have been central in Mikisew Cree economy for many generations and are important today. A detailed statistical and distributional analysis of harvesting features and species habitat reveals the factors which the Mikisew Cree take into account in their definition of culturally favoured harvesting terrain. This definition is used to identify the principles which should be developed in the LARP to protect preferred habitat for the exercise of Mikisew Cree traditions.

4.1 Importance of moose, bison and caribou

Over 300,000 archaeological artifacts have been found in the oil sands mining area[40], and archaeological sites in northern Alberta underscore the importance of moose, caribou and bison in local economies of the earliest human inhabitants of the region. The Nezu Site near Fort McKay[41], dated to about 9,000 years ago, and the Quarry of the Ancestors[42] in the same area and of a similar age, contain plentiful bones of all three animals. Moose is central in Mikisew Cree culture today, and caribou and bison remained important to northern peoples until their existence was threatened in the late 18th and early 19th centuries by commercial hunting and industrialization.[43]

The historic and ethnographic records are replete with references to boreal peoples hunting and consuming large ungulates, and the Mikisew Cree are no exception. Prior to 1970,

> "A major portion of the Mikisew traditional livelihood and traditional diet was big game animals. The average diet included at least one pound of big game meat per day of moose, bison, caribou or bear. Earlier diet studies have shown that up to 90% of the Mikisew hunter-gatherer diet was made up of meat and fish. A large portion of this diet of meat came from big game. Approximately 50% of the big game meat eaten during the period before 1970 was moose meat.
>
> During the period before 1970 most hunters hunted moose, fewer hunted caribou and bear, one quarter hunted Woodland caribou and very few admitted to hunting bison. During the period after 1970 most hunters continued to hunt

[40] Oilsands Developer nd
[41] Legion Magazine 2006
[42] Oilsands Review 2006
[43] Royal Alberta Museum 2005; Tanner, J. 2006:23

> moose but hunting of Barrenland caribou and Woodland caribou declined considerably."[44]

The decline in caribou hunting may be attributed to strict regulation of caribou hunting, industrial disturbance of caribou habitat, and the rising costs of long-distance hunting expeditions into places where their habitat survived.[45]

The importance of big game in Mikisew Cree way of life is underscored by the effort hunters have put and still put into the pursuit of these animals.

> "The Mikisew hunters would hunt for big game for an average of 188 days or 50% of the year. Over 25% of this hunting time was done while trapping during the winter months. Mikisew hunters would spend an average of two months hunting in the fall, 2-1/2 months in the winter, 1/2 a month in the spring and one month in the summer.
>
> Some Mikisew Cree hunters would hunt for moose all year long. Others would hunt regularly in the fall and winter and would also hunt moose while on their winter traplines. A summer moose hunting expedition was common. The average large family would obtain one moose in the summer, occasionally one moose in the spring, two in the fall and two in the winter. This would vary depending upon the size of the family and the moose abundance of a particular year. A large extended family would likely harvest an average of six moose in one year. The moose hunting was most common in the fall but the winter months were also very active. During the winter, hunting would occur while trapping. Dedicated big game hunting excursions were made if no moose was taken on the trapline."[46]
>
> "On average before 1970 a large extended family would take 6 moose, 1 bison, 16 caribou and 1 bear. These numbers would vary considerably depending upon the habits and activities of the hunter. Some hunters would be more involved in hunting caribou than others. Some would take more bison while others took bear more frequently. Results would also depend upon the availability of various animals during the season. [47]"

In 1991, E.E.Wein et al reported that moose was consumed in Fort Chipewyan homes on an average of 58 occasions each year, caribou 53 times each year, and bison on 15 occasions. Many households consumed these animals much more frequently.[48] Because of the lack of dietary research over the past two decades, it is difficult to say with

[44] Tanner, J. 2006:92
[45] Tanner, J. 2006:92
[46] Tanner, J. 2006:92
[47] Tanner, J. 2006:92
[48] Wein, E.E. 1989; Wein, E.E., J. H. Sabry, F. T. Evers 1991a; Wein, E.E., J. H. Sabry, F. T. Evers 1991b

precision whether today the Mikisew Cree consume more or less ungulate meat that they did two decades ago. According to one historical study, "In the period after 1981 hunting for moose declined to two-thirds of what it was before 1970. The quantities of traditional red meat consumed by the Mikisew People declined as the hunting declined."[49] However, evidence suggests that the Mikisew Cree's diet still includes considerable quantities of moose meat and other traditional foods. Anecdotal reports suggest up to 80% of the diet of Fort Chipewyan people consists of traditional foods today.[50]

Moose and moose hunting are still important in Mikisew Cree culture in ways other than economic. Big game hunting in general and moose hunting in particular is a prestigious activity in boreal cultures, and success at hunting eases the way into leadership roles. Boreal peoples prize generosity and sharing, especially the sharing of food, and because of their size, nutritive value, and palatability, moose, caribou and bison are esteemed in social systems of sharing. Indeed, all activities – hunting, fishing, trapping, berry picking and travelling on the water and land – are vital social expressions of Mikisew Cree cultural and spiritual traditions. Without ample opportunities to exercise these traditions, the context for one generation to educate the next disappears and with it Mikisew Cree culture.

The importance of big game and big game hunting in Mikisew Cree culture is now established: Moose today, and caribou and bison in the past, were important food resources in the local economy, and important markers of prestige and personal capability in Mikisew Cree social organization. Moose, while still culturally important, is a source of concern for Mikisew Cree as meat taste and quality in some parts of their territory is said to be degraded, raising doubts about its safety when ingested.
Much less attention is paid in the ethnographic and historic research to the importance of waterfowl, fish and beaver in the traditions of the Mikisew Cree. This may be because there has been relatively little research conducted in this community and perhaps because the few who have done research simply take it as common-knowledge that the Mikisew Cree, like other boreal populations, hunt, fish, trap and consume these animals. A proposed Traditional Resource Use study would further elaborate on the importance of these resources to Mikisew Cree culture and livelihood.

4.2 Importance of fish

Fish were an important source of protein in the economy of the earliest people to inhabit the lower Athabasca River region[51]. The Peace Point archaeological site, for example, includes eighteen separate occupation surfaces, each of which contains plentiful fish

[49] Tanner, J. 2006:93-94
[50] Timoney, K.P. 2007; Thomas-Müller, C. 2008; Nakagawa, M. 2008; International Indian Treaty Council 2008
[51] Tanner, J. 2006:23

bones[52]. The site is dated at between 1,000 and 2,000 years ago[53]. Unlike small and big terrestrial game species, which are susceptible to cyclical changes in numbers and distribution, fish populate most of the numerous lakes and rivers of the region. Fish are a stable food source available to fishers widely scattered throughout Mikisew Cree use territory.[54] The fish favoured by the Mikisew Cree include white fish (atikamek), pike (iynkonosiw), walleye (okaw), burbot (malay), trout (namekos), suckers (namepe), and goldeye (wepichesis).[55]

In early times, small local hunting and trapping bands congregated as soon as ice melted from prime fishing waters. The larger population of the regional bands could subsist on fish and spend a few weeks exchanging information, celebrating, participating in religious activities, and arranging marriages. Today, fishing is still a social activity involving friends and relations and rich fishing sites are highly valued by the Mikisew Cree.[56]

Unlike many other food animals, fish were and are available year-round. Mikisew Cree would establish their summer camps on fishing waters[57] and from spring thaw to autumn freeze-up most fish were eaten fresh. As the weather turned colder, more were dried for winter use and when it was cold enough large numbers were frozen to be used for feeding sled dogs.[58] By the late 1800's, when trappers established central winter cabins from which they trapped fine furs, they made certain their homes were located on productive fishing water.[59]

The Mikisew Cree were proficient fish harvesters, and when European traders arrived in the region, they were soon recruited to supply the trade posts with fresh, frozen and dried fish. These fish were crucial to the traders' survival well into the 20th century.[60]

The importance of fish in the economy of the Mikisew Cree was underscored by the consequences of drought which affected lakes and rivers in much of northern North America in the 1880's. According to a Catholic missionary who was resident in Fort Chipewyan at the time,

> "... the extraordinary decrease for many years in the waters of the rivers and lakes, which has destroyed the fish to an immense extent, and driven away wild fowl, caused such a famine that many died of hunger and misery between 1879

[52] Stevenson, M.G. 1986
[53] Holliday, V.T. 2004:150
[54] Royal Alberta Museum 2005:1; Canadian Museum of Civilization 2008:8.
[55] Wein, E.E., J. H. Sabry, F. T. Evers. 1991a:200
[56] Rogers, E.S. and J.G.E.Smith. 1981
[57] Tanner, J. 2006:42
[58] Mathewson, P. A. 1974:39
[59] Tanner, J. 2006:54
[60] Tanner, J. 2006:28

> and 1881…. Now there is but one single family of Cree at the lake [Claire], and the remnants of the tribe have gone away to join their fellows in the Peace River."[61]

When, a decade later, the Treaty Commission arrived in Fort Chipewyan to negotiate the terms of Treaty 8, a Commissioner insisted, "There should be as little interference as possible with hunting and fishing here. Every interference must inevitably lead to large demands for food from the Government for the Indians."[62]

The Mikisew Cree believed their fishing rights were protected by the treaty, but as early as the 1920's they were protesting that their treaty rights to fish were being infringed by non-aboriginal people who had a licence from the provincial government to fish in waters protected for Mikisew Cree purposes.[63]

By the early 1960's, the main and preferred occupations of people living in Fort Chipewyan was either trapping or fishing.[64] At that time, "the annual round of the Mikisew Cree included hunting moose, bison and caribou and trapping for fine furs during the winter, trapping muskrats in the early spring, and birding in the spring break up, picking berries, plants and medicines in the summer and fall, and fishing throughout the year."[65]

Further, "a major portion of the Mikisew traditional livelihood and traditional diet was big game animals. The average diet included at least one pound of big game meat per day of moose, bison, caribou or bear. Earlier diet studies have shown that up to 90% of the Mikisew hunter-gatherer diet was made up of meat and fish."[66]

The effort Mikisew Cree put into fishing is a fair measure of the importance of fish in their economy.

> "Mikisew People fished regularly during every season but during the summer months they fished more. Fishing usually involved two people. In the summer they might fish four to five days per week on an average of four hours per day."[67]

The historic and ethnographic records are clear: "Traditional fishing has been a mainstay of the Mikisew livelihood."[68] This is still true today, although diminishing water quantity and quality makes it more difficult for Mikisew Cree to fish.

[61] Stuart Adams & Associates 1998
[62] Quoted in Tanner, J. 2006:58
[63] Tanner, J. 2006:64
[64] Tanner, J. 2006:73
[65] Tanner, J. 2006:83
[66] Tanner, J. 2006:92
[67] Tanner, J. 2006:116
[68] Tanner, J. 2006:115

4.3 Importance of waterfowl

The Mikisew Cree harvest a variety of birds including eagles (mikisew), grouse (paspasko), owls (oho), ptarmigans (wapehew), ravens (ka ka ko), loons (makwa), and seagulls (keyask), but the most important birds in their economy are waterfowl – geese (niska) and ducks (se sep)[69]. Mikisew Cree mostly harvest waterfowl in the spring and autumn[70]. In the late 1980's, Mikisew Cree were eating waterfowl about twenty times a year[71].

Intensive duck and goose hunting started soon after the spring muskrat season. The spring hunt lasted about a month with hunters spending two or three days each week shooting waterfowl. Waterfowl hunting took five or six hours a day, with the rest of the day spent cleaning, plucking and gathering feathers. In an average spring season, a family might take fifty ducks and fifty geese. In the spring and early summer, eggs would be gathered from the nesting areas of ducks, seagulls and geese.

Most waterfowl were passing though the region on their way to more northerly nesting grounds, but a few stayed and nested in the Peace-Athabasca Delta. There is less hunting in the summer because the birds are in moult and lose their fat as they mate, nest and have their young. However, those Mikisew Cree who do hunt waterfowl in the summer hunt for six hours per day and harvest an average of forty birds over a two month summer season.

Intensive waterfowl hunting resumed in the fall when the birds are again fat. The autumn season lasted about a month and one to two people would hunt together three times each week. In an average season, hunters took about 47 ducks and 57 geese. Hunting took six or seven hours a day with the rest of the day spent processing the results.[72]

The record demonstrates that, "Geese and ducks have always been an important and reliable food supply for the Mikisew Cree. Geese and ducks … are still considered a significant food source."[73]

4.4 Importance of beaver

Archaeologists suggest that the beaver was one of the first mammals to colonize the boreal's newly-exposed post-glacial landscape and, "If the beavers are present, humans

[69] Tanner, J. 2006:123
[70] Wein, E.E., J. H. Sabry, F. T. Evers. 1991a:198
[71] Wein, E.E., J. H. Sabry, F. T. Evers. 1991a:200
[72] Tanner, J. 2006:124-125
[73] Tanner, J. 2006:123

may not be far behind."[74] Beaver bones are commonly found in boreal archaeological sites. Beaver pelts were used for clothing, their teeth for making hafted carving tools, and their flesh for food[75], and when the fur traders finally penetrated Mikisew Cree territory, they were experienced and proficient at the beaver hunt. Not only did beaver give the Mikisew Cree access to trade goods, they continued to be a staple in their food economy.[76] They were especially prized for their high fat content in winter when many other food animals were quite lean.[77] Beaver are still an important item in Mikisew Cree diet.[78]

4.5 Analyses of moose, waterfowl and beaver

In 2010, Management and Solutions in Environmental Science (MSES) of Calgary, Alberta, produced a geospatial and statistical analysis of relationships between taxa habitat, taxa harvesting sites, Mikisew Cree habitation sites, traditional access routes, and disturbance history to define the characteristics of lands preferred by moose, beaver, and waterfowl and by the Mikisew Cree for the purpose of hunting and trapping. [79] The analysis was not carried forward for fish, even though fish are important in Mikisew Cree culture. Each species of fish has its preferred habitat, but unlike moose, beaver and waterfowl there is not enough fine-grained habitat identification in the region to make the analysis meaningful. Instead, 'water' is taken to be fishes' preferred habitat (rather than water of a certain depth, temperature, chemical composition, and so on) and Mikisew Cree concern is focused on water in general as the element needed to sustain fish and their ability to engage in fishing.

Neither was the detailed statistical analysis of bison and caribou carried forward. The populations of these animals have been in serious decline for many decades. The numbers of bison and caribou harvested by even the oldest respondents in the TLU studies is not large enough to provide meaningful statistical results.

For the purposes of these analyses, taxa are defined as moose, fish, waterfowl and beaver. Taxa harvesting sites are recorded in the *Mikisew Cree First Nation 2009-2010 Use-and-Occupancy Map Survey* as places where individuals indicated they harvested each of the four taxa. The dataset from this one study was selected for use in these analyses because it was produced using state-of-the-art technology and techniques developed by Terry Tobias. The result is data points which are recorded with 'positional accuracy', defined by Tobias as "the closeness of fit between a feature's mapped location

[74] Morlan, R. nd:1
[75] Pentney, S.P. 2002
[76] Carlos, A.M. and F.D. Lewis. 2009
[77] Yesner, D.R. 1989
[78] Wein, E.E., J. H. Sabry, F. T. Evers. 1991a:199
[79] The findings of these analyses are summarized here, but the method and complete statistics are contained in Appendix A of this submission. The method is also described in Stewart A., P.E. Komers and D.J. Bender 2009; MSES 2009.

and its actual position on the earth."[80] The precise locations of use features are needed to confidently match the locations of taxa habitat, yielding analytical results which reliably and accurately represent Mikisew Cree behavior on the land.

Mikisew Cree habitation sites are recorded in the *Mikisew Cree First Nation 2009-2010 Use-and-Occupancy Map Survey* as places where individuals constructed or occupied solid-walled cabins, frame tents, and free-standing tents which were typically used as bases for hunting, trapping and fishing. (Map Five)

Traditional access routes are overland trails, water routes, or ice routes connecting place to place. Map Six shows travel routes used by the Mikisew Cree over the past century.

'Disturbance history' is a graphic illustration of the spread of industrial disturbance in the region. The illustration of industrial disturbance is set out in Map Four, above.

These analyses compare use features identified by TLU study respondents as places where they hunted or trapped to maps showing the locations of habitat suitable for one of three taxa of animals – moose, beaver, and waterfowl. The objective is to demonstrate the criteria by which Mikisew Cree select places for the exercise of their traditional practices. The analysis requires use data which precisely identify places where the specified activities were carried out, and then observing the extent to which those precisely identified places correspond with precisely located taxa habitat.

4.6 Analytical results: human ecology and moose, waterfowl and beaver

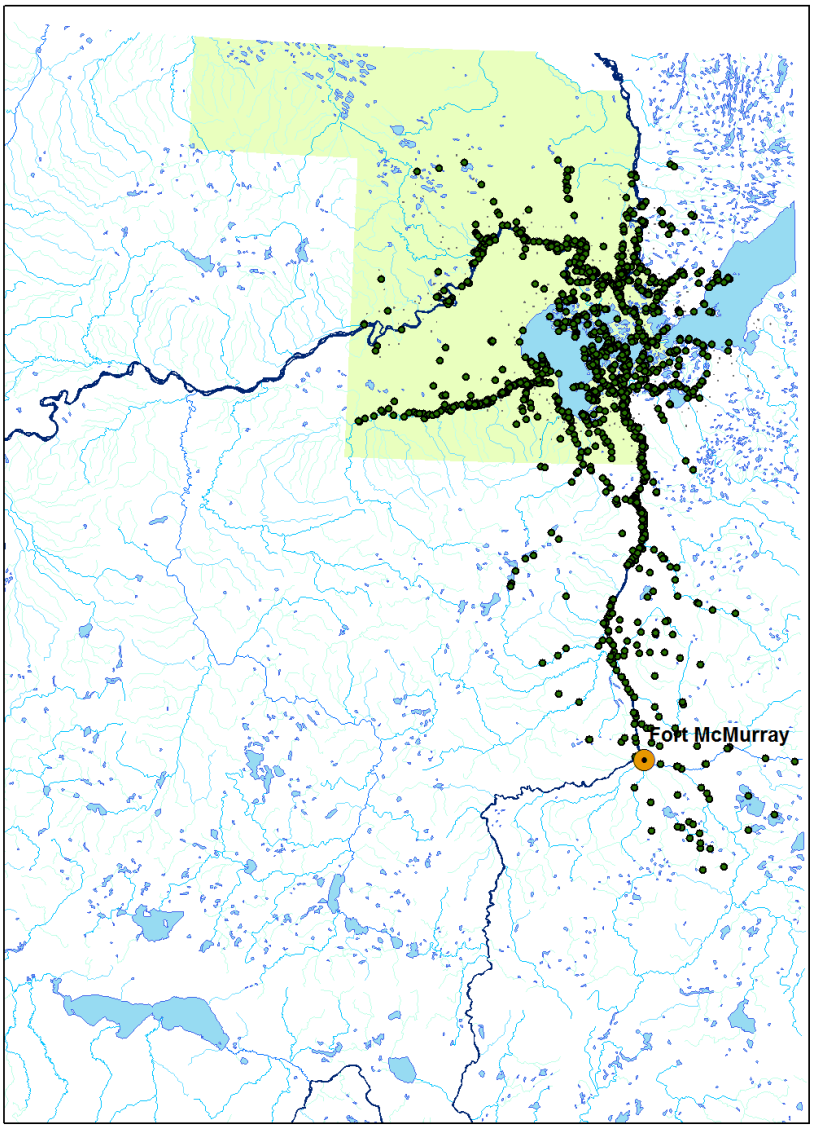
Maps Seven through Ten show the distribution of moose, fish, waterfowl and beaver habitat in the Lower Athabasca Region in 1992, 2002, and 2008. The maps show habitat for each taxa, the record of sites where each taxa was harvested, and the extent of industrial disturbance in the three time periods. In the following analyses, moose receives the greatest attention as a detailed illustration of how the analysis proceeded because the most extensive habitat data is available for this species. Once illustrated, the analysis for the other taxa will be presented in brief.

4.7 Moose : An illustration of method and findings

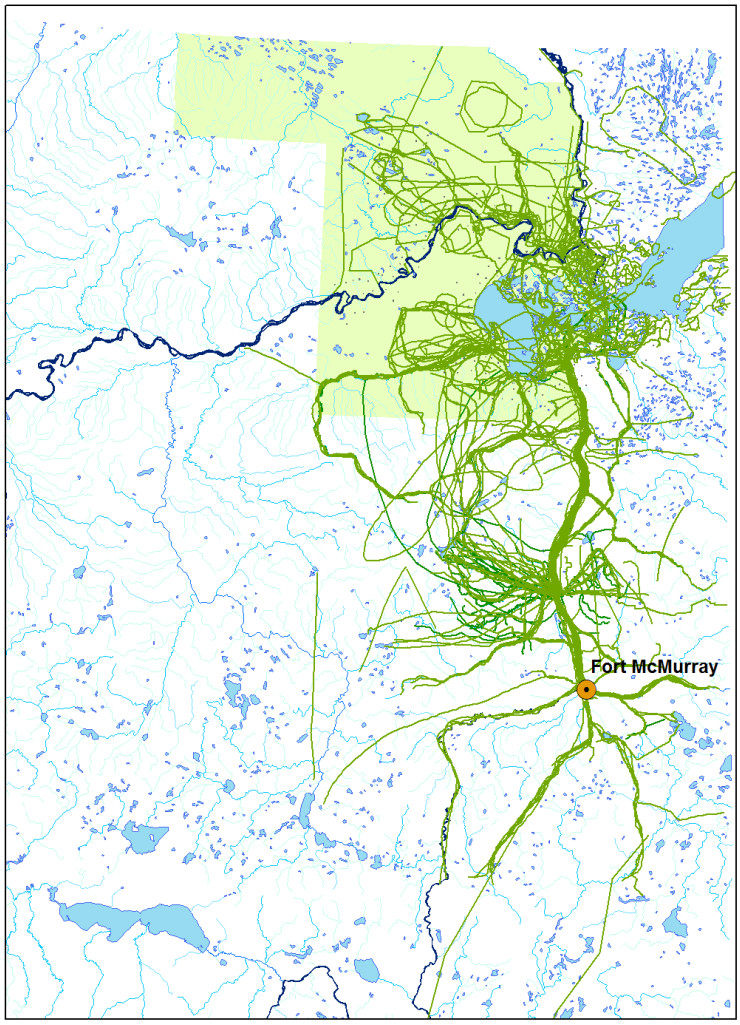
Although, as Map Seven shows, there has been considerable habitat reduction over the years from 1992 to 2008, moose habitat appears widely and evenly distributed in the Regional Municipality of Wood Buffalo. In principle, Mikisew Cree hunters could pursue moose throughout much of their use territory although, as indicated below, this is not the case in reality. Moreover, further studies are required to determine the actual health of moose populations, because Mikisew hunters (as noted earlier) are already reporting concerns with the quality of moose in certain parts of their territory.

[80] Tobias, T.N. 2009:143

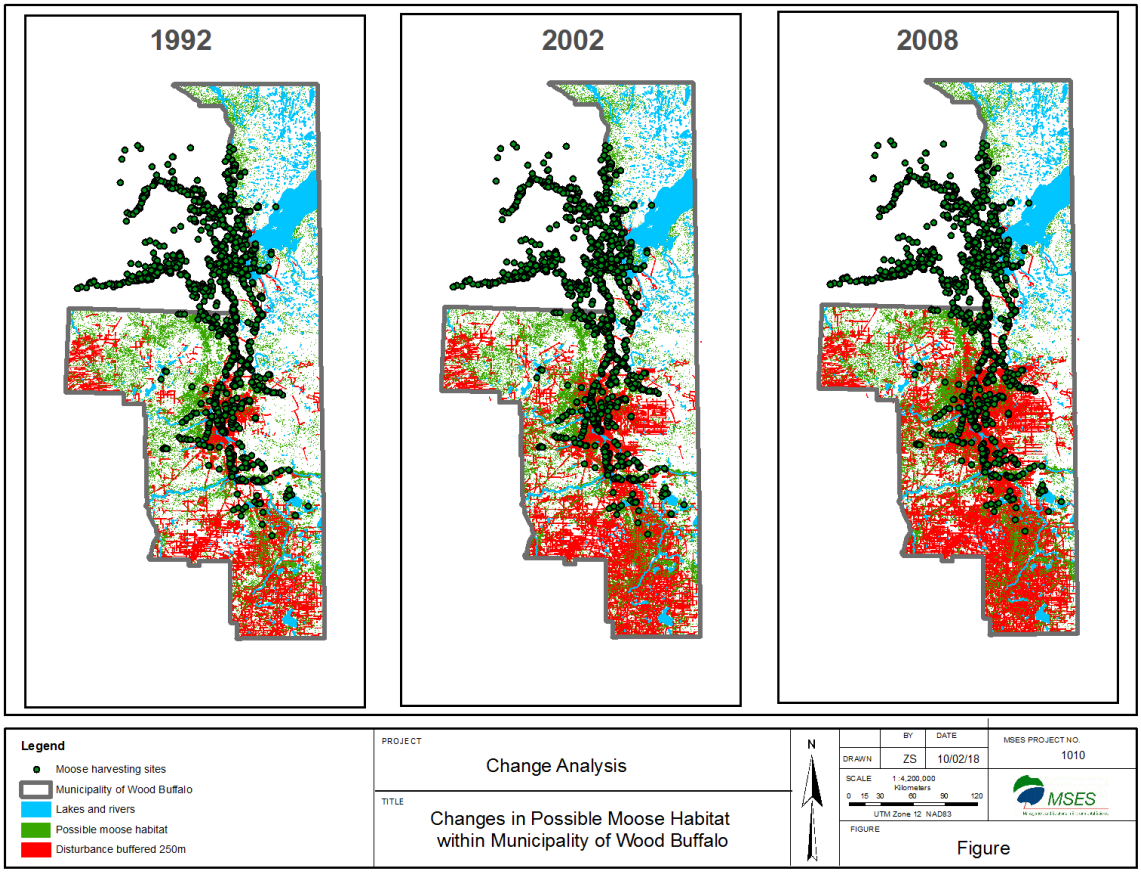
Deeper analysis, however, makes it clear that moose do not favour just any habitat which is capable of sustaining a moose. Further, Mikisew Cree hunters do not pursue moose in just any patch of apparently suitable habitat. Instead, moose have an affinity for habitat which is undisturbed by humans and predators, and Mikisew Cree select places which satisfy Mikisew Cree cultural standards and technological capacities.



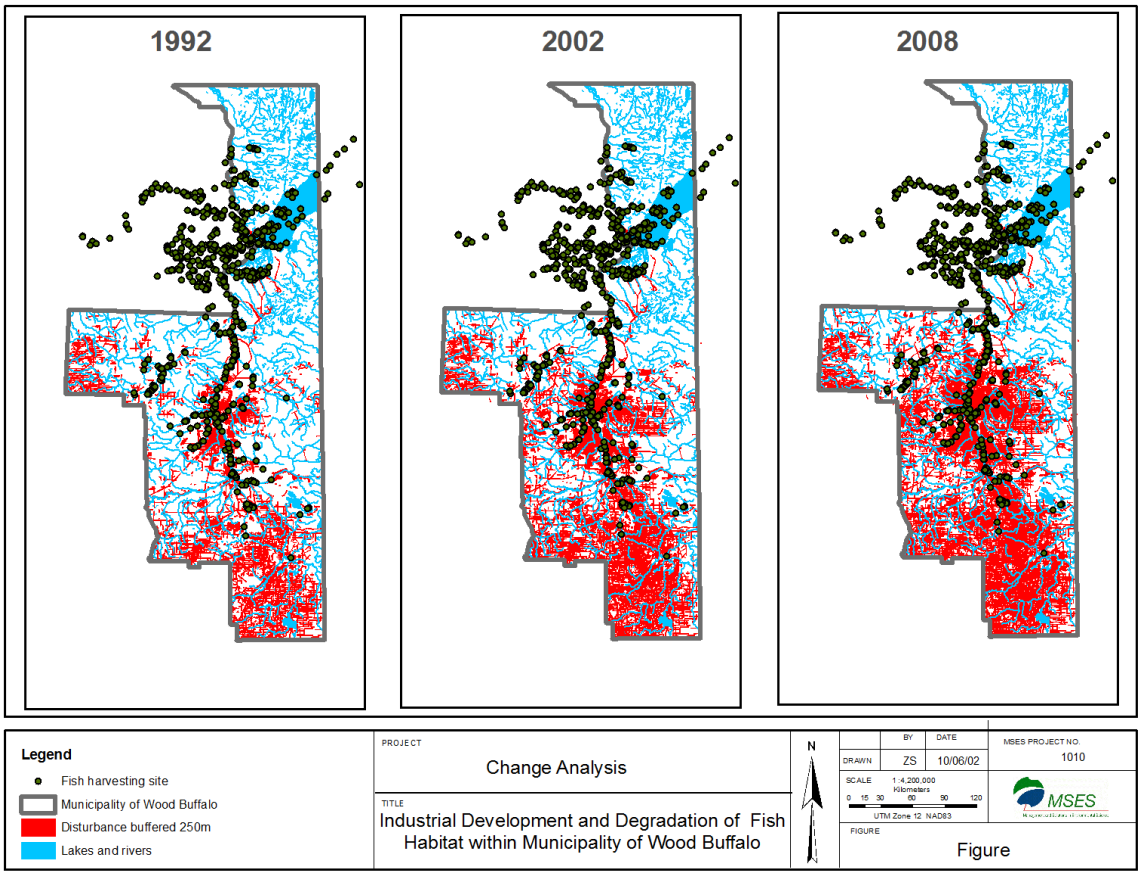
Map Five – Habitation Sites
(use data from the Tobias Study and prepared by MSES Inc 2010)



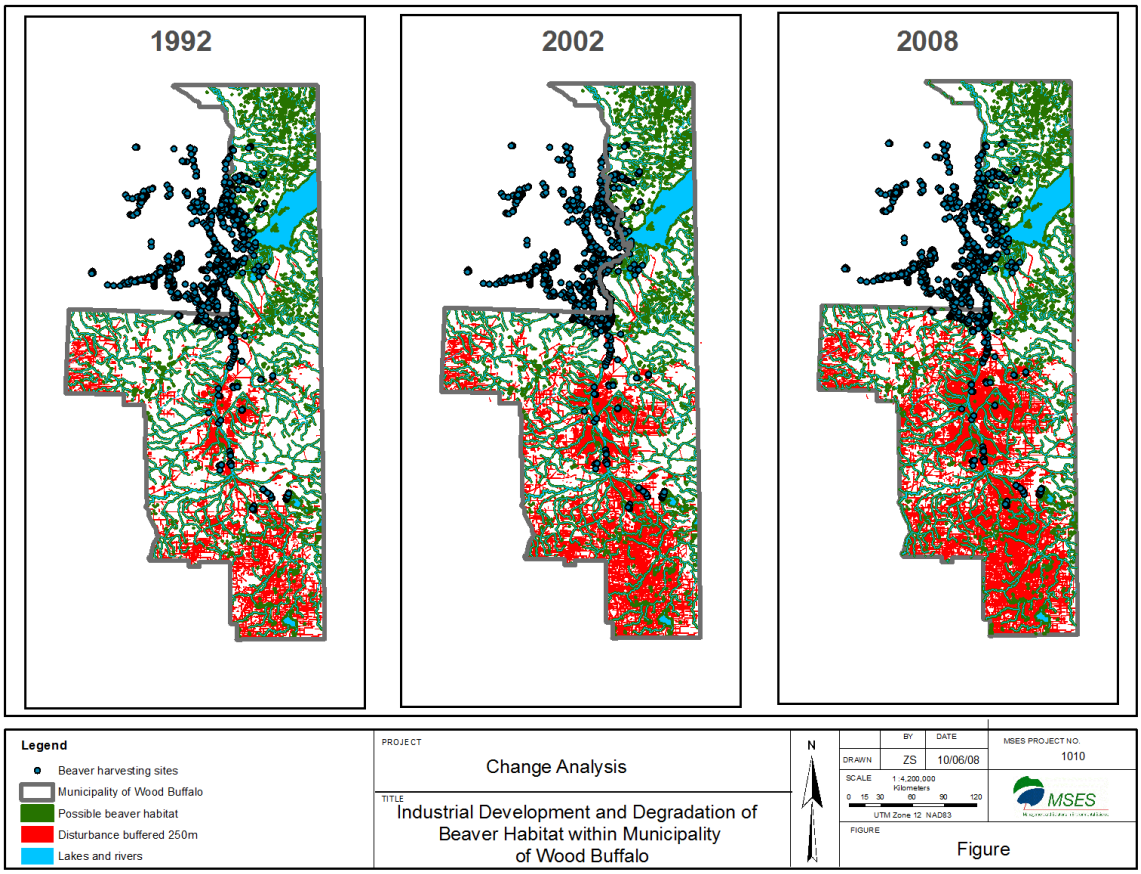
Map Six – Land, Water and Ice Travel Routes
(use data from the Calliou and PACTeam Studies and prepared by MSES Inc 2010)



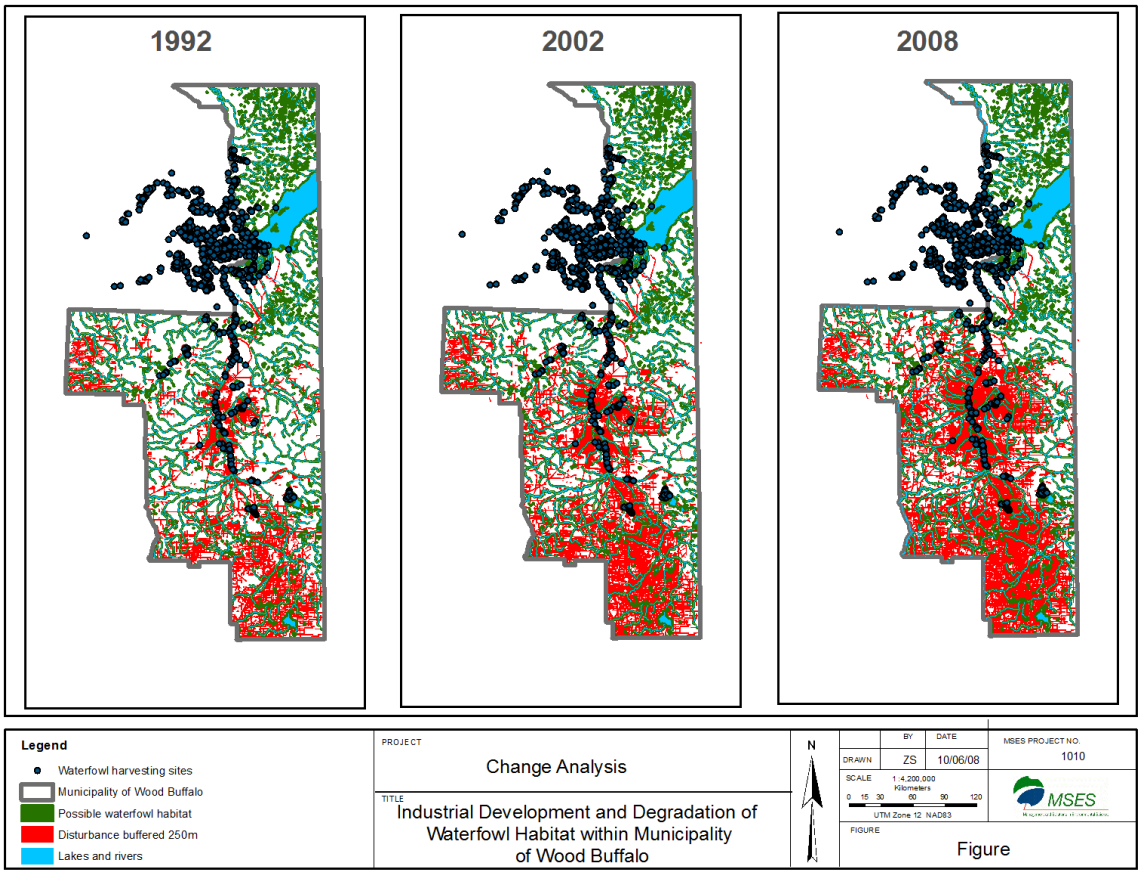
Map Seven – Changes in Possible Moose Habitat
(use data from the Tobias Study and prepared by MSES Inc 2010)



Map Eight – Changes in Possible Fish Habitat
(use data from the Tobias Study and prepared by MSES Inc 2010)



Map Nine – Changes in Possible Beaver Habitat
(use data from the Tobias Study and prepared by MSES Inc 2010)



Map Ten – Changes in Possible Waterfowl Habitat
(use data from the Tobias Study and prepared by MSES Inc 2010)

In their analysis, MSES produced a geospatial and statistical account of relationships between moose habitat, moose harvesting sites, habitation sites, access routes, and disturbance history to define the characteristics of lands preferred by moose *and* by the Mikisew Cree for the purpose of moose hunting. The first part of the analysis shows that shrub, deciduous, and mixed wood vegetation types are moose-preferred habitat. Bog/fen/wetland vegetation types and coniferous vegetation types are used by moose significantly less. Simply because preferred moose habitat (in terms of vegetation types) is found in a certain place does not mean there will actually be moose found in those places.

As Map Seven shows, there is moose habitat in the southern part of Mikisew Cree use territory, but the places where there is suitable habitat are small, fragmented, and disconnected. This points to the importance of protecting large areas with buffer zones rather than protecting small, fragmented "island" areas. Further, these small patches of habitat are embedded in an industrial landscape[81], and are very likely polluted by industrial emissions, effluents, noise and light.[82] There is only a small probability that moose will actually be found in those places, even though those places may offer preferred vegetation types. Maps showing moose habitat reflect the findings that moose have an affinity for places with shrub, deciduous, and mixed wood vegetation *and* which are distant from industrial activities and attendant pollution.

Map Seven shows moose habitat and moose harvesting sites as recorded in the *Mikisew Cree First Nation 2009-2010 Use-and-Occupancy Map Survey* (the Tobias Study). Not surprisingly, statistical analysis shows that a much higher proportion of recorded moose kill sites occurred within habitat preferred by moose, that is, habitat which includes shrub, deciduous, and mixed wood vegetation *and* which is distant from industrial activities.

While Map Seven shows that Mikisew Cree hunters harvest moose in places where there is suitable moose habitat, it also shows that hunting effort is not expended uniformly throughout the region where there is suitable moose habitat. Quite obviously, Mikisew Cree hunters are selecting places where they prefer to hunt moose. If they were not being selective, there should be harvest sites more-or-less uniformly distributed wherever there is moose habitat, that is, moose harvesting sites would be selected by the Mikisew Cree at random.

The objective of the *Mikisew Cree First Nation 2009-2010 Use-and-Occupancy Map Survey* was to record resources Mikisew Cree people used and places they occupied throughout their lives, known as 'living memory'. Thus, Map Seven includes places where moose were harvested decades ago as well as places where they were harvested within the past year. Even this map shows diminished moose harvesting activities in the

[81] MSES 2009:6
[82] Lee P.G., M. Hanneman, J.D. Gysbers, and R. Cheng 2009:32-49

southern part of Mikisew Cree use territory, and Map Seven shows the reason why – over the years, industry has greatly reduced the extent of moose habitat available to moose and moose hunters alike. Consequently, a conclusion may be drawn that Mikisew Cree moose hunters select places distant from industrial disturbances.

There are 1606 moose harvest sites shown in Map Seven. These sites were recorded in the 2010 Tobias Study. GIS technology was used to create an array of 1606 random points (the same number as the number of recorded moose harvest sites) spread across the study area as a comparison to see whether any observed patterns were real or simply a matter of chance. The technology then measured the proximity of recorded moose harvest sites – and random sites – to preferred moose habitat, navigable waterways, backcountry access routes, and habitation sites.

The numbers of recorded moose kill sites decreased with distance from a navigable water body. Almost 70% of moose harvest sites were located within 500 metres of a water body. This points to the importance of protecting water and waterways. The numbers of recorded moose kill sites near a water body was significantly higher than the randomly generated points in the landscape. This indicates that Mikisew Cree hunters kill moose preferentially near water bodies and that the kill sites are not randomly distributed relative to water bodies. Evidently, Mikisew Cree hunters are electing to hunt in prime moose habitat which is accessible by river water in summer and on the ice in winter, and which offers nearby access to backcountry moose habitat.

The numbers of recorded moose kill sites decreased with distance from a habitation site, defined here as solid-walled cabins, frame tents, and free-standing tents. About two-thirds of moose kills were located within one kilometer of a habitation site. The numbers of recorded moose kill sites near a habitation site was found to be significantly higher than the randomly generated points in the landscape. This indicates that hunters kill moose preferentially near habitation sites and that the kill sites are not randomly distributed relative to habitation sites. Further, this demonstrates that Mikisew Cree prefer habitation sites which are near prime moose habitat.

The analysis clearly shows Mikisew Cree select lands with very specific qualities when they embark on a moose hunt. For moose hunting purposes, they select **prime moose habitat** which is **close to places suitable for establishing habitations**, **on a well-travelled traditional trail or other access route**, **in backcountry with easy river access,** and **distant from industrial disturbance**. In other words, protecting just any extent of moose habitat in the LARP is not sufficient to protect Mikisew Cree rights and interests – protected lands must also incorporate Mikisew Cree cultural definitions of ‘moose habitat’.

4.8 Other taxa: findings

Briefly, the results of the analysis for the beaver and waterfowl closely parallel those of the moose analysis.

Key habitat components for beaver include the presence of adjacent tree and shrub habitat and permanent, low-gradient water bodies. Preferred beaver habitat includes shrub, deciduous forest, and mixed-wood forest within 150 m of a water body, coniferous forest within 100 m of a water body, and permanent water. Proximity to industrial development also has an impact on beaver habitat selection in addition to the vegetation and water characteristics.

Key habitat components for waterfowl include the presence of adjacent graminoid, herbaceous, and low shrub habitat and open water. Based on this information, shrub, bog/fen, and grass vegetation types within 100 m of a water body and open water were defined as waterfowl habitat for the analyses discussed here.

For beaver or waterfowl, the statistical and geospatial analyses (similar to those applied to moose harvest sites) show that Mikisew Cree select **prime habitat for each taxa** which is **close to places suitable for establishing habitations**, **on a well-travelled traditional trail or other access route**, **in backcountry with easy river access,** and **distant from industrial disturbance**.

Similar analyses were not performed for bison and caribou – there are not enough harvest sites for those species to yield statistically valid conclusions. However, this submission assumes that in the past, when hunting of these animals was much more common, Mikisew Cree organized their bison and caribou hunting activities according to the same cultural principles as for moose.

5. Observed Changes

In recent years a number of traditional ecological knowledge (TEK) studies have been conducted in the region as part of project-specific regulatory approval processes. Among other things, the purpose of such studies was to determine whether or not a particular project (alone or in combination with other projects) may adversely affect the rights and interests of aboriginal peoples. One project specific study conducted by Synenco Energy in 2007[83] enquires specifically into Mikisew Cree TEK and involved twenty-five interview respondents. The Synenco study includes a literature review which suggests the contents of that study are very similar to the contents of others[84].

Typically, TEK studies address a wide range of issues and concerns of interest to aboriginal people, including water quality and quantity; air quality; animal, bird and

[83] FMA Heritage Resources Consultants Inc. 2007
[84] For example, see FMA Heritage Resources Consultants Inc. 2006

fish health, distribution and numbers; vegetation; access management; socio-economics; health and well-being; and cumulative effects. The issues of greatest interest here are those which directly touch upon the variables taken into account by Mikisew Cree when deciding where to hunt for the animals considered in the analyses above – the availability of **prime habitat** for each taxa which is **close to places suitable for establishing cabins**, **on a well-travelled traditional trail or other access route**, **in backcountry with easy river access,** and **distant from industrial disturbance**.

The paragraphs below briefly compile environmental changes observed by participants in the Synenco TEK study, and which impact their ability to decide where to hunt, fish and trap.

Mikisew Cree hunters have observed a decline in the numbers of moose in parts of their use territory. They attribute the decline to industrial activities which have damaged moose habitat. In particular they suggest air pollution has rendered inedible some plant species which are important in moose diet. Noise pollution forces moose away from places they once favoured, including adjacent riverbanks where motorized river traffic is increasing.[85] Encroaching industrialization makes it more difficult for hunters to locate prime moose habitat which is distant from industrial disturbance.

Industrial disruption of water flows has altered flood regimes, causing small inland lakes to dry up and become grown over with grasses and willows. The result is a decline in both the quality and quantity of prime beaver habitat.[86] Surviving beaver colonies may be forced to move into less-favoured river habitat.[87] Even where small lakes and ponds have not dried up completely, the mix of plants has changed to such an extent that they are no longer favoured by beaver.[88] Where there is still suitable habitat in the Peace-Athabasca Delta region, BC Hydro releases water along the impounded Peace River at inappropriate times, drowning beaver under the ice.[89] As a result, parts of the backcountry with easy river access are no longer hospitable to beaver and no longer rewarding for Mikisew Cree trappers.

In places, lake and river water is too shallow to support fish[90], and in other places once-flooded channels are too shallow to allow fish migrations and too built-up with silt to serve as spawning grounds.[91] Low water levels and slow-moving water result in

[85] FMA Heritage Resources Consultants Inc. 2007:29
[86] FMA Heritage Resources Consultants Inc. 2007:22
[87] FMA Heritage Resources Consultants Inc. 2007:29
[88] FMA Heritage Resources Consultants Inc. 2007:34
[89] FMA Heritage Resources Consultants Inc. 2007:25
[90] FMA Heritage Resources Consultants Inc. 2007:18
[91] FMA Heritage Resources Consultants Inc. 2007:19-20

excessive siltation and degraded fish habitat.[92] Places which were once well-known spawning grounds are now shallows and mud flats.[93] Prime fish habitat is much reduced. Airborne and waterborne industrial pollutants from up-stream pulp mills as well as oil sands operations have altered water characteristics, resulting in reduced habitat and reduced fish populations. Fish taken from polluted water are frequently grossly deformed or inedible.[94] Fish which do survive in polluted waters show declining spawning success.[95] Again, and as a result of altered water quantity and quality, parts of the backcountry with easy river access are no longer hospitable to fish and no longer available for selection by Mikisew Cree fishers.

There is an increasing body of research literature which supports the observations made by Mikisew Cree fishers.[96] Recent research commissioned by the Nunee Health Board Society of Fort Chipewyan concluded that,

> "Mercury levels in fish used for human consumption present a serious concern. If US EPA standards are applied, all walleye (pickerel), all female whitefish, and 90 % of male whitefish exceed subsistence fisher guidelines for mercury consumption. Another study observed similarly high levels of mercury in fillets of lake whitefish, sucker, goldeye, pike, walleye, burbot, and lake trout. Under US EPA subsistence fisher guidelines, all of those fishes would be considered unsafe to eat. Levels of arsenic in local fishes may also pose a health risk."[97]

A Mikisew Cree Elder described the disappearance of the 'water boatman' insect, one of the main foods for ducks, resulting in a decline in ducks and duck habitat.[98] The decline in prime waterfowl habitat may have forced ducks to shift their feeding grounds south and west into territory unfamiliar to Mikisew Cree hunters.[99] Waterfowl avoid the oil sands exhaust stacks, plumes and pollutants which have caused changes to the spring flyway. Birds which do fly through Mikisew Cree use territory do not land because of a lack of favoured food and water. [100] Waterfowl harvested in the region taste different as a result of water pollution.[101] Waterfowl find increasing difficulty in locating habitat which is distant from industrial disturbance.

According to participants in the Synenco TEK study, habitat favoured by moose, fish, waterfowl and beaver is declining in quality or quantity or both as a result of industrial

[92] FMA Heritage Resources Consultants Inc. 2007:31
[93] FMA Heritage Resources Consultants Inc. 2007:31
[94] FMA Heritage Resources Consultants Inc. 2007:27
[95] FMA Heritage Resources Consultants Inc. 2007:32
[96] Kelly E. N., David W. Schindler,Peter V. Hodson, et al. 2010
[97] Timoney, K.P. 2007:4
[98] FMA Heritage Resources Consultants Inc. 2007:30
[99] FMA Heritage Resources Consultants Inc. 2007:20,44
[100] FMA Heritage Resources Consultants Inc. 2007:29
[101] FMA Heritage Resources Consultants Inc. 2007:30

activities. Not only is it more difficult for Mikisew Cree harvesters to locate suitable places to hunt, fish and trap, it is also more difficult to simply reach those remaining places of prime habitat. Participants in the Synenco study described how low water makes it impossible to reach their cabin sites. Smaller rivers which formed the network of traditional travel routes could no longer be used even with small boats.[102] Damming and the oil sands industries are singled out as the cause of low water.[103]

A recent research report commissioned by the MCFN[104] and entitled *As Long As The Rivers Flow: Athabasca River Knowledge, Use and Change* confirms the observations and comments recorded in the Synenco TEK study.

> "In Spring, Summer and Fall (the primary seasons for hunting, fishing, and subsistence procurement), boat access is still the only option for moving between Fort Chipewyan and seasonal camps and villages, Indian Reserves, and core MCFN territories along the Athabasca delta, the river itself, and its tributaries. Water-based access by boat is particularly important in accessing lands and habitation areas inside Wood Buffalo National Park. Boat is also the preferred mode of practicing aboriginal and treaty rights, including hunting, trapping, and fishing, even where road access is possible. The ecology of the delta and Athabasca river means that, at good water levels, a web of interconnected waterways exists that can be used to 'go anywhere' in the delta area. At good water levels, tributaries to the Athabasca River also allow access deep into adjacent watersheds. Moose, the preferred game sought by most MCFN hunters, tend to congregate near water in summer months, so boats make for an ideal means of locating, shooting, and carrying the many hundreds of pounds of meat that results from a successful kill. Boats also allow for procurement of fish or other resources adjacent to river banks, and allow MCFN members to access territories without disturbance from industrial traffic associated with many of the roads closer to Fort McMurray and the oil sands developments. These advantages, combined with MCFN member's familiarity with water navigation for subsistence, and associated creek, rivers and water based knowledge, help explain why boat access is the preferred means by which MCFN members choose to exercise rights such as hunting, trapping, and fishing.
>
> Without exception, respondents reported that the seasonal flow of the Athabasca has changed over their lifetimes, that the trend is for the river to be lower than in the past, and that the reduction in flow is making it more difficult for boat travel or subsistence practice. Many of the participants identified oil sands withdrawals as the most likely cause of reduced water levels on the Athabasca. Many participants also mentioned or described the cumulative effects occurring in delta

[102] FMA Heritage Resources Consultants Inc. 2007:17-20
[103] FMA Heritage Resources Consultants Inc. 2007:17
[104] Firelight Group Research Cooperative 2010

> areas as a result of the combined influence of reduced water flowing from the Peace River watershed, including the W.A.C. Bennett Dam, and reduced water flowing from the Athabasca River." [105]

Map Eleven is reproduced from the Firelight report. It shows in red rivers which cannot be accessed during extreme low water events. Map Twelve shows the extent of lands which are not available to Mikisew Cree hunters when adjoining rivers are inaccessible due to low water conditions.

The difficult nature of travel using traditional land, water and ice routes limits access to the backcountry favoured by both the Mikisew Cree and the animals they pursue, but seismic lines and access roads have opened much of the country up to non-aboriginal people. The result has been damage to traplines and cabins.[106] In order to find increasingly scarce prime habitat and to avoid intruders, Mikisew Cree hunters, trappers and fishers must spend more money outfitting for the backcountry and more time getting there. As an added insult, they must carry drinking water with them if they cannot avoid polluted sources.[107]

Map Eleven is reproduced from the Firelight report. It shows in red rivers which cannot be accessed during extreme low water events. Map Twelve shows the extent of lands which are not available to Mikisew Cree hunters when adjoining rivers are inaccessible due to low water conditions.

The difficult nature of travel using traditional land, water and ice routes limits access to the backcountry favoured by both the Mikisew Cree and the animals they pursue, but seismic lines and access roads have opened much of the country up to non-aboriginal people. The result has been damage to traplines and cabins.[108] In order to find increasingly scarce prime habitat and to avoid intruders, Mikisew Cree hunters, trappers and fishers must spend more money outfitting for the backcountry and more time getting there. As an added insult, they must carry drinking water with them if they cannot avoid polluted sources.[109]

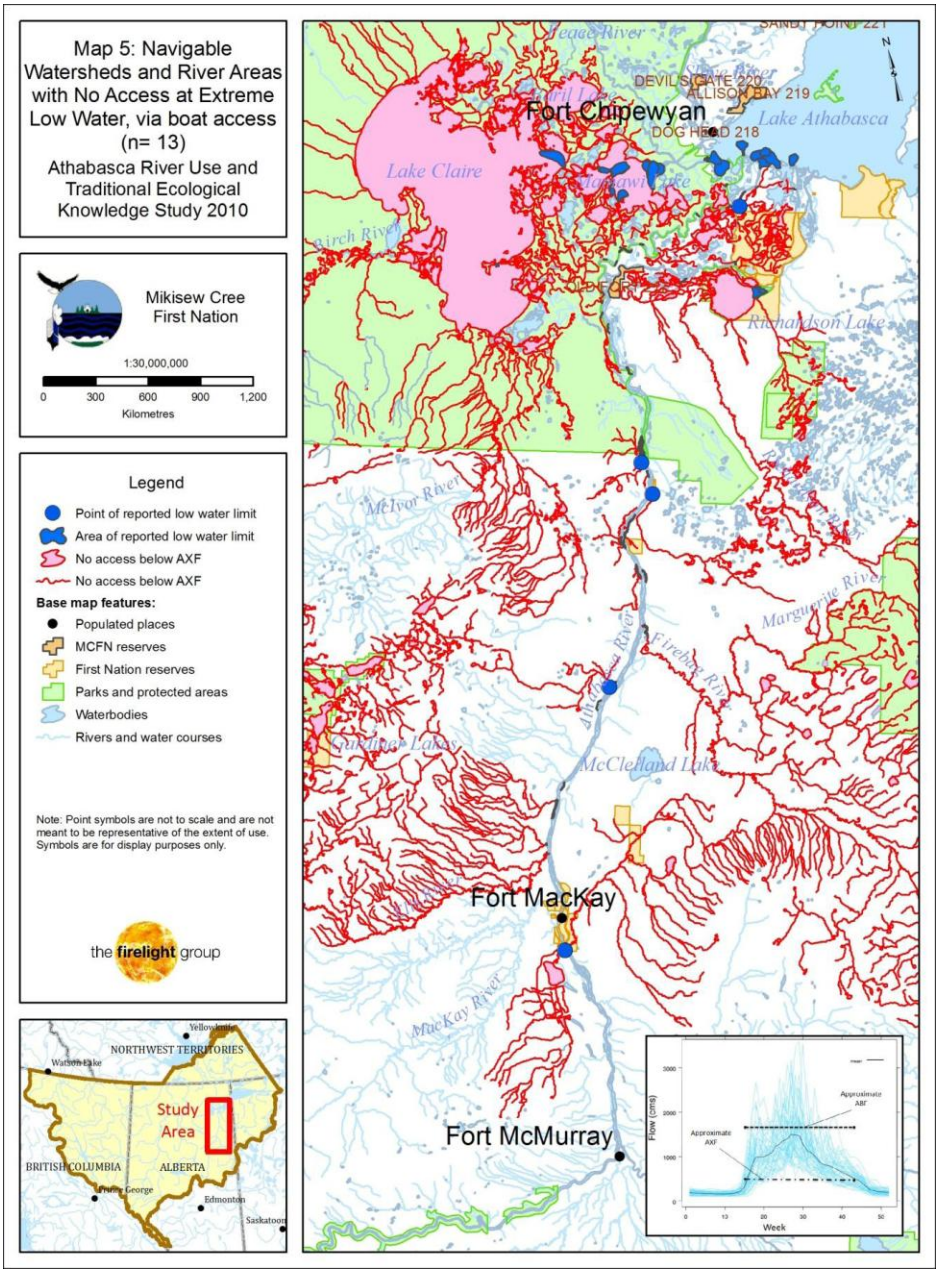
Participants in the Synenco TEK study suggest that greater expansion of the oil sands industry will further reduce prime habitat, limit access to cabin sites, damage traditional travel routes, further reduce the quality and quantity of resources, and fragment the most productive backcountry. They are concerned about their ability to conduct themselves comfortably in their own territory as hunters, trappers and fishers. The

[105] Firelight Group Research Cooperative 2010:18
[106] FMA Heritage Resources Consultants Inc. 2007:35
[107] FMA Heritage Resources Consultants Inc. 2007:48
[108] FMA Heritage Resources Consultants Inc. 2007:35
[109] FMA Heritage Resources Consultants Inc. 2007:48

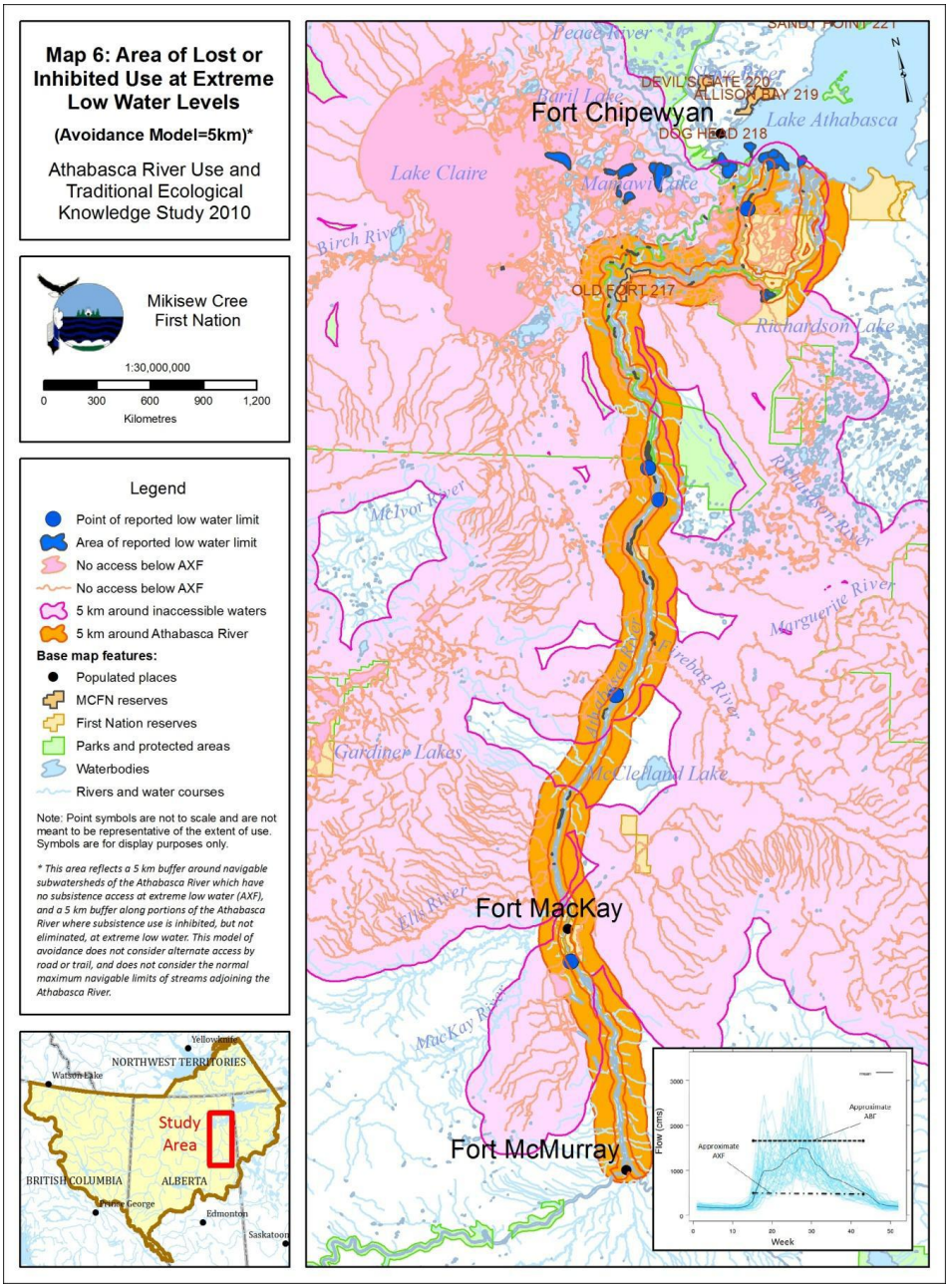
result will be erosion of the Mikisew Cree ability to practice their traditions and perpetuate their culture.

6. Protecting Mikisew Cree use territory for the future

The combined results of the Mikisew Cree's research clearly identify lands which must be protected for the exercise of their traditional practices.



Map Eleven – Navigable Waters without Boat Access at Extreme Low Water
(The Firelight Group 2010)



Map Twelve – Area of Lost or Inhibited Use at Extreme Low Water
(The Firelight Group 2010)

6.1 Athabasca River

The historic information and the TLU data clearly show that the Athabasca River is a vital transportation corridor which gives the Mikisew Cree access to a large part of their traditional use territory. As well, the TLU data show that the Mikisew Cree make considerable use of lands and resources on both sides of the river extending at least five kilometres into the adjacent country.

The report prepared by the Firelight Group[110] shows the negative consequences for the Mikisew Cree if the quality and quantity of river flow is impaired – the water becomes undrinkable, the health of water animals is at risk, and transportation along the river and into the adjacent backcountry is curtailed.

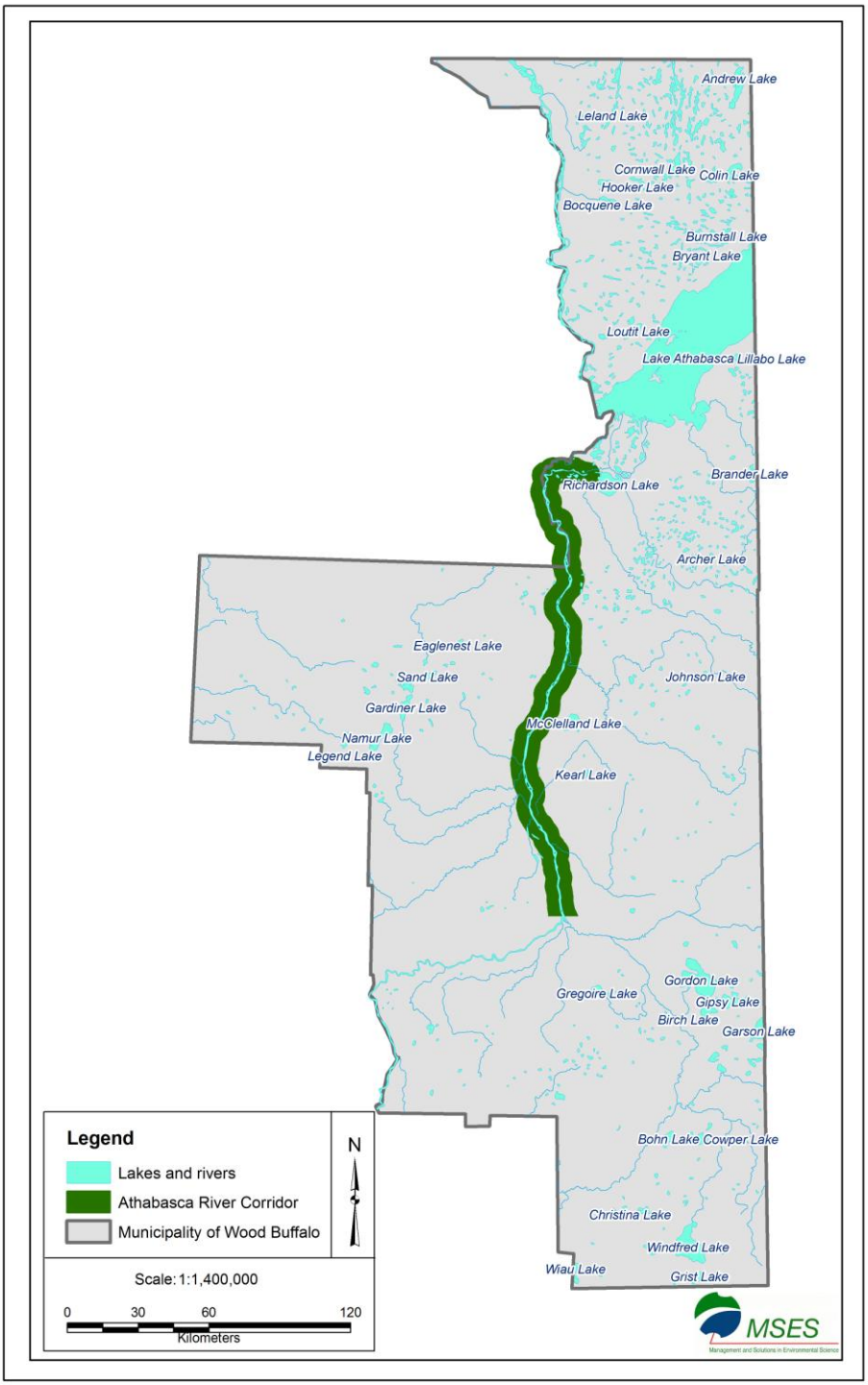
The Mikisew Cree propose that a five kilometre wide, no-development buffer be applied to each sides of the river, extending from just upstream of Fort McMurray down to the Peace-Athabasca Delta. The resulting ten kilometre wide buffer captures the narrowest cluster of TLU locations along the Athabasca River, making this a conservative buffer. Map Thirteen shows the proposed buffer along both sides of the Athabasca River. This buffer would restrict industrial activities from encroaching too near the river, preserve the quality and quantity of water in the river, and maintain the health of water animals. Furthermore, areas within the buffer that have already been developed must be restored back to their natural state in a timely fashion. The buffer would help establish conditions in which Mikisew Cree traditional land and resource use practices may be exercised. As noted in the recommendations Section of this submission, the Firelight Group Study also recommends an Aboriginal Base Flow for the Athabasca River.

6.2 Peace-Athabasca Delta

The Peace-Athabasca Delta is listed as a wetland of international significance under the Ramsar Convention (The Convention on Wetlands of International Importance). According to Article 2 of the Ramsar Convention, the objective of the wetland list is to "develop and maintain an international network of wetlands which are important for the conservation of global biological diversity and for sustaining human life through the maintenance of their ecosystem components, processes and benefits/services."[111]

The Peace-Athabasca Delta is the largest undisturbed boreal delta of the world. Because of its recognized significance, there are already provincial and federal protections in place. The TLU data show that the Delta is one of the most intensely and extensively used parts of Mikisew Cree traditional use territory and additional protection is needed to recognize the importance of the Delta to Mikisew Cree land and resource users. An outline of TLU features clustered within and around the PAD helps delineate the proposed area for protection.

[110] Firelight Group Research Cooperative 2010:18
[111] Ramsar 2010



Map Thirteen – Athabasca River Buffer
(MSES 2010)

The Mikisew Cree propose a substantial buffer around the entire Peace-Athabasca Delta. The buffer would be designed to incorporate all use sites in the region of Delta.

6.3 Intact Landscape

Intact landscapes are an indicator of the absence of major industrial impacts on a region. Over the decades since the 1960's, the extent and distribution of intact forests in the LARP region have been shrinking as forestry and oil sands operations have expanded. Mikisew Cree hunters and trappers select undisturbed forests for the practice of their traditions and if they are to continue doing so, forests which are currently intact must be protected.

Generally, increased fragmentation of the boreal forest can result in the isolation of wildlife habitat patches and smaller habitat patch sizes. Use of small and isolated habitat patches by particular animals becomes less likely as the energetic cost and risks associated with reaching these patches increases.[112] In addition, as fragmentation increases, edge density increases.[113] Effects of human caused habitat edges on forest ecosystem processes include abiotic factors such as temperature and evapotranspiration, changes in vegetation and wildlife species, and influx of invasive species.[114] The overall effect is a reduction in habitat effectiveness making the protection of remaining intact forest a high priority.

Wood Buffalo National Park is already a protected area. Even with protected status, the Mikisew Cree First Nation has historically experienced, and continues to experience, various restrictions and adverse impacts on their treaty hunting rights within the Park. Immediately to the south of the Park lies intact forest, and protection of these forests will maintain the ecological function of the Park and reduce edge effects. Protecting the integrity of national parks by establishing buffers around them is a high priority[115]; the remaining intact forests near the park boundary should serve this purpose.

There is an overarching reason for protecting remaining intact forests. Boreal forests store more carbon than any other terrestrial ecosystem on earth – twice as much per area as tropical forests.[116] According to the Canadian Boreal Initiative,

> "Changes in land use and deforestation release significant amounts of stored carbon into the atmosphere. The Boreal Forest is the world's largest terrestrial storehouse of carbon, storing hundreds of billions of tons of carbon in its forests,

[112] Collingham et al. 2000; Laurence et al. 2002
[113] Hargis et al. 1998
[114] Ries et al 2004
[115] Rivard et al 2000
[116] Carlson, M., J. Wells, D., Roberts 2009

> wetlands and peat lands. Conserving intact ecosystems will help species, systems and local communities adapt to changing climate conditions."[117]

Protecting intact forests would in small part help offset carbon released into the atmosphere by oil sands operations.

The Mikisew Cree propose that industrial impacts on all remaining intact landscapes be greatly limited or eliminated in the future. Intact forests are defined as areas of at least 500 km² in extent with no disturbance visible in Landsat imagery at 30 metre resolution.[118] In addition, these intact forest patches must be linked by "corridors" at least two kilometres wide. Map Fourteen shows the locations and extent of intact landscapes proposed for protection.

6.4 Contiguous Ungulate Habitat

Wood bison and the woodland caribou are considered threatened under the Species at Risk Act, and moose is one of the cultural keystone species for the Mikisew Cree. Habitat loss and fragmentation is probably the most significant threat to wildlife populations.[119] The viability of a species in a landscape depends on the quantity and quality of habitat.[120]

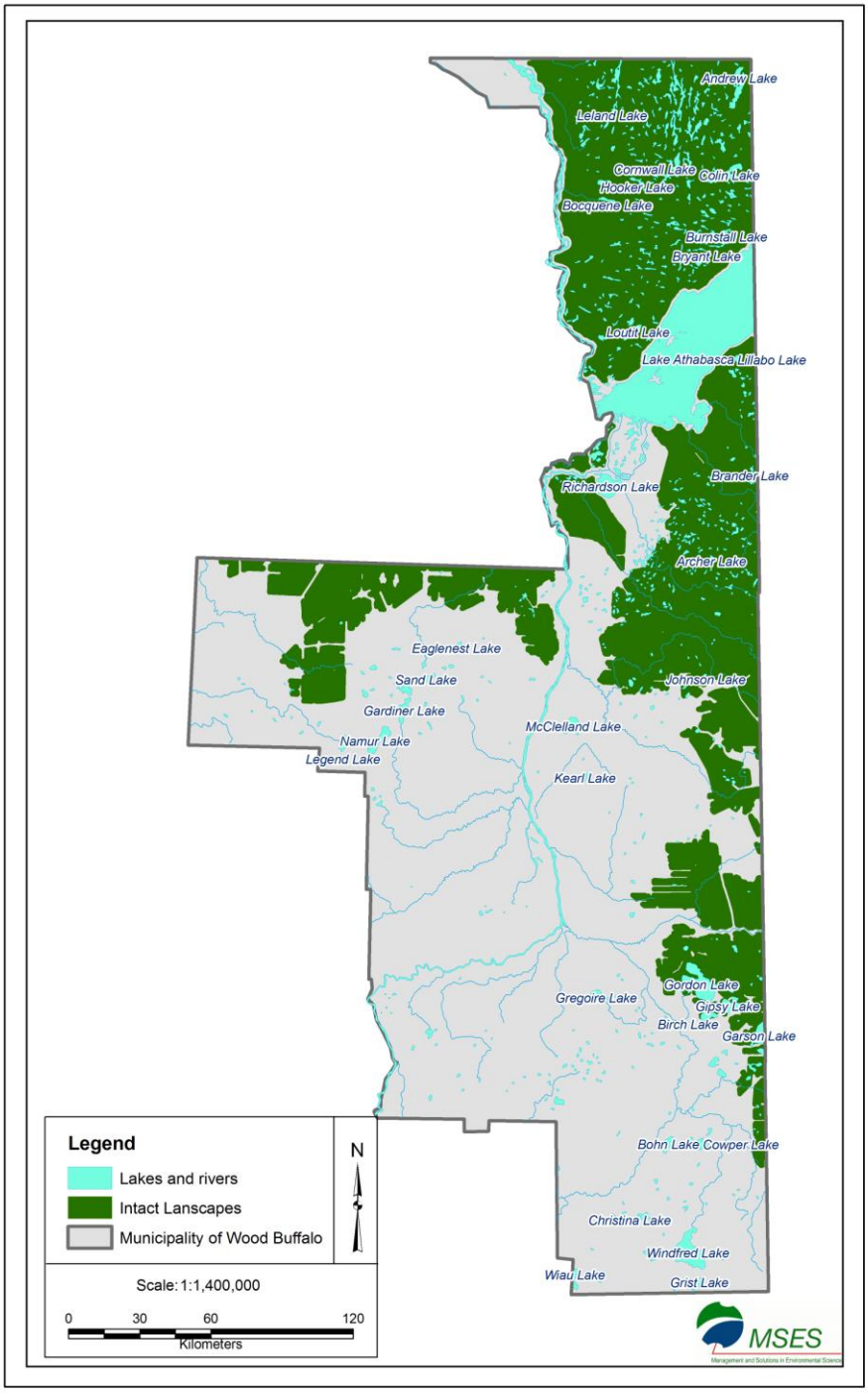
In order to maintain the ungulate populations in the Lower Athabasca Region, remaining habitat needs to be protected. The Mikisew Cree propose protecting remaining large tracts of habitats suitable for moose, woodland caribou, and wood bison. Protection of large ungulate habitat not only directly protects traditional resources of the Mikisew Cree but also indirectly protects species who occupy the same habitat as moose, caribou and bison. Map Fifteen shows the townships within which large aggregations of ungulate habitat still exist and for which the Mikisew Cree propose protection. In addition to habitat loss, ungulate populations also suffer from the indirect impacts of development, including reduced water and air quality. The oil sands companies should therefore be required by government to invest in best available technologies to help minimize direct and indirect impact on these populations.

6.5 Backcountry streams and lakes

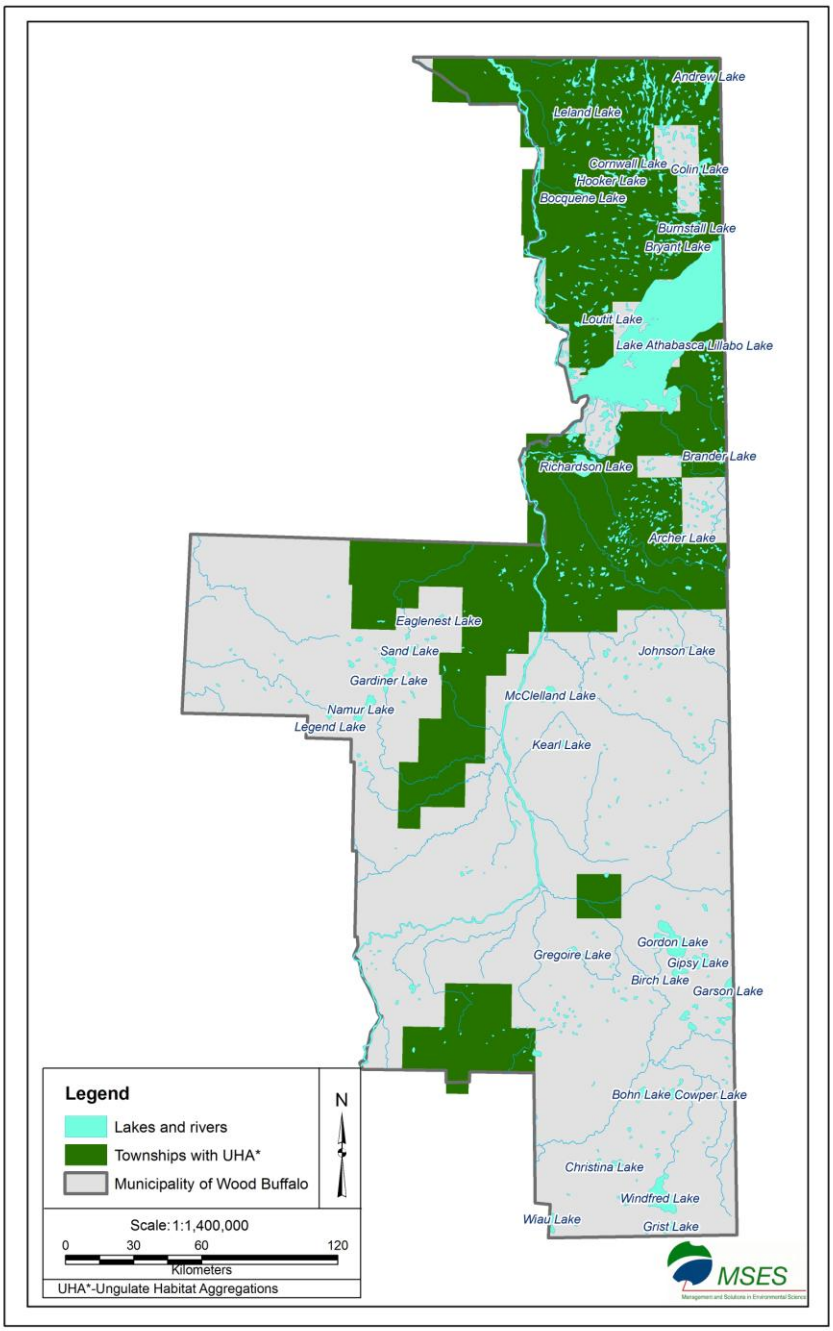
The statistical analyses of the TLU data clearly show that the Mikisew Cree select backcountry streams as their preferred places to practice their traditions. They use the streams as access to remote habitat occupied by animal species important to their way of life. They hunt and trap important species near those waterways, and they construct

[117] Canadian Boreal Initiative 2009
[118] Potapov et al. 2008
[119] Mills 2007
[120] Rutledge and Lepczyk 2002

habitations on and very near navigable waterways – for example, by far most sites where moose are harvested are located



Map Fourteen – Intact Landscapes
(MSES 2010)



Map Fifteen – Townships with Tracts of Ungulate Habitat
(MSES 2010)

within one kilometre of a water body, and habitation sites are typically immediately adjacent to water.

Near-shore areas support a myriad of ecological processes including habitat for species at risk as noted by Environment Canada in their submission to the Total Joslyn North Mine hearings. Protection of streams and lakes and riparian habitat bordering these water bodies ensures the protection of important wildlife habitat, wildlife corridors, waterfowl staging and nesting areas, biodiversity, and other important biotic and abiotic ecosystem functions.

Because backcountry waterways are crucial to Mikisew Cree culture, they propose the establishment of a two kilometre no-development buffer (1 km on either side of the watercourse) for category 1, 2 and 3 streams throughout their traditional use territory and a one kilometre buffer around all lakes. In addition, because the MCFN members use the water bodies downstream of the Birch Mountains Headwaters, the slopes of the Birch Mountains also need to be protected. Map Sixteen shows the extent of buffers around streams and lakes.

As well as cultural reasons, there are important ecological reasons for protecting streams, lakes and wetlands with a buffer. The protection of all areas around water bodies is key to the establishment of an interconnected network of source habitats as Environment Canada argued in their testimony at the Total Joslyn North Mine hearings, because it combines all the functions needed to help maintain regional ecosystem and traditional land use processes, including:

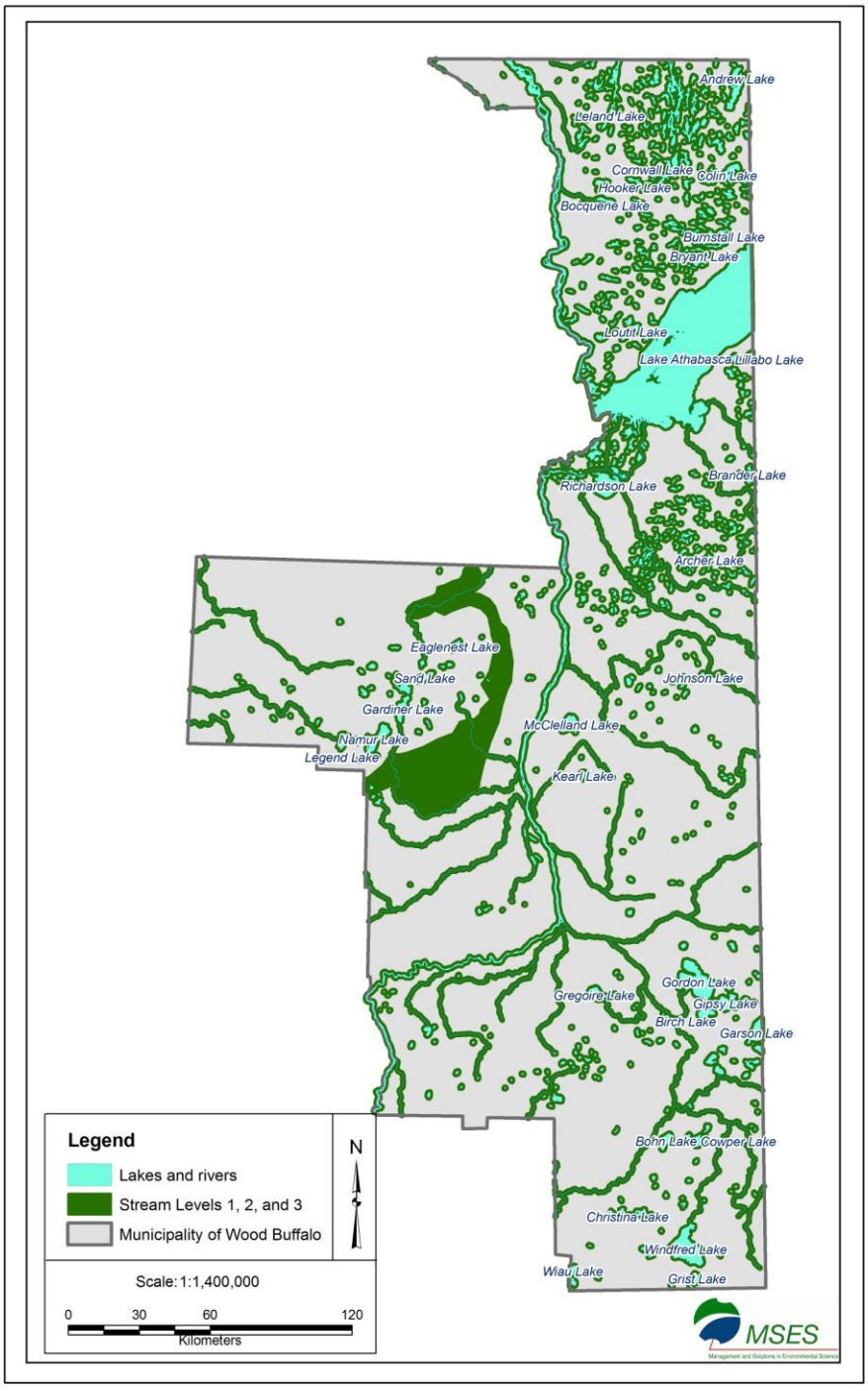
- Wildlife corridors to allow for regional dispersal
- Setbacks from waterbodies to protect the water
- Setbacks to protect the riparian habitats
- Protecting important waterfowl habitat for both nesting and staging
- Protecting wetlands
- Protecting traditional use sites and resources

Setting aside a one kilometre buffer around each waterbody will support the Provincial Water Act and the Federal Policy on Wetland Conservation. The conservation of wetlands in Alberta is supported by a variety of laws, policies, guidelines, and initiatives. The Federal Policy on Wetland Conservation is the main policy relating to wetlands on federal lands. Two key goals of this policy include:

- Maintenance of the functions and values derived from wetlands, and
- No net loss (NNL) of wetland functions.

Land use changes, climate change, human population growth and industrial development all contribute to the reduction of wetlands. Wetland loss in the Green

Area, which is represented by the forested public land in northern and western Alberta, is unknown but has likely increased



Map Sixteen – Buffers along Streams and around Lakes
(MSES 2010)

due to the rapid industrial development in the oil sands region.[121] Map Four shows the extent of industrial disturbance in the Regional Municipality of Wood Buffalo, supporting the view of the Alberta Water Council that wetland loss is on the increase. The analyses of landscape disturbance indicate the urgent need for immediate protection of all wetlands in that region, because wetlands sustain populations of plants and animals which are important in the Mikisew Cree local economy.

All water in Alberta, including water on public and private land, is the property of the Crown under the Provincial Water Act.[122] The Water Act prohibits water bodies from being disturbed, drained, filled in, or altered, unless authorized by an approval from Alberta Environment.
It is unlikely that a comprehensive wetland inventory exists for the Mikisew Cree use territory. It is, therefore, essential to provide the Mikisew Cree First Nation with detailed information on wetland extent, distribution and function in order to support the NNL of wetland functions. Furthermore, any NNL approach must take into account, through consultation, the requirements for sustaining the First Nation's treaty and aboriginal rights. It cannot be assumed, for example, that simply exchanging one water body or wetland area for another will be sufficient for the exercise of those rights.

Community members stated on a number of occasions that wetlands are being degraded. If true, then protection, restoration and compensation initiatives must take place immediately in support of the NNL policy. The NNL policy can only work if the extent and distribution of wetlands is quantified to assess how much wetland exists, how much is disturbed and how much is compensated. There is a strong need for such a baseline study.

Waterfowl research was conducted in the early days of oil sands development. For example, at Gordon Lake, south of Fort McMurray, one-day counts as high as 5,600 birds have been documented during the spring, and estimates during fall migration of up to 100,000 ducks have been reported.[123] This indicates that Gordon Lake was of major importance for waterfowl at that time. Oral accounts by Mikisew Cree suggest that migration flyways existed west of the Athabasca River. Unfortunately, there is, at present, insufficient reliable and accurate western scientific information to confirm Mikisew Cree oral accounts of waterfowl habitat being at risk due to industrial development.[124] Further research from both a western scientific and TEK perspective is

[121] Alberta Water Council 2008
[122] First Nations such as the Mikisew Cree First Nation assert, either by virtue of their Aboriginal rights, or as a necessary incident of their Treaty 8 rights, certain rights to water.
[123] Syncrude Canada. 1973
[124] This situation may change. On October 22, 2010, Syncrude agreed to pay the largest fine in Canadian history for an environmental offence after 1,600 ducks died in one of its toxic tailings ponds in April

needed to better understand the impacts of industrial development on waterfowl and waterfowl habitat. Ducks Unlimited Canada (DUC) offers a model for the protection of waterfowl habitat and waterfowl.

> "DUC is working to achieve a mosaic of natural, restored and managed landscapes capable of perpetually sustaining populations of waterfowl and other wildlife."[125]

Clearly, at the current rate of development in Mikisew Cree territory, the maintenance of "landscapes capable of *perpetually* sustaining populations of waterfowl and other wildlife" is a mirage. The disturbance of wetlands must not only be stopped, it must be reversed to achieve that vision. The Mikisew Cree indicated that lakes and wetlands need protection not only to sustain their traditional practices, but to achieve DUC's vision as well.

Moreover, DUC's conservation goals aim at restoring Canadian landscapes to support the annual life cycle needs of waterfowl at a national level. In order to achieve this, four major habitat goals have been embraced that broadly capture DUC's conservation programs:

Goal 1: No loss of wetlands with value to waterfowl
Goal 2: Restore wetlands to support waterfowl
Goal 3: No loss of upland cover with value of waterfowl
Goal 4: Restore upland cover to improve habitat conditions for waterfowl

These goals are similar to the federal wetland policies noted above, but add the need for the protection of the surrounding upland. Again, the goal to restore uplands is in harmony with the Mikisew Cree goals. The buffers proposed here would go far towards achieving this goal.

7.0 Conclusions

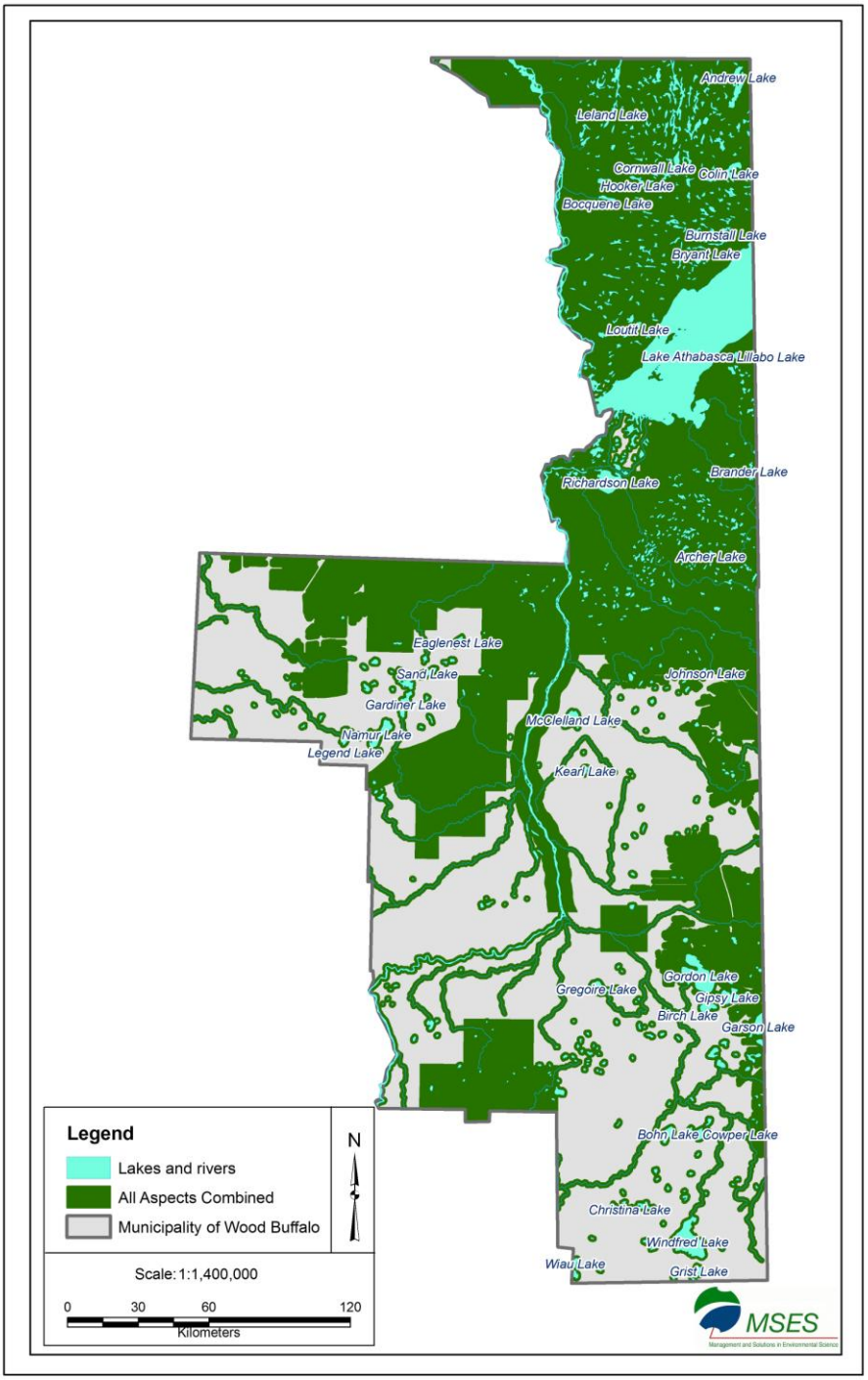
Map Seventeen shows the extent and locations of all lands which the Mikisew Cree propose for protection. The LARP applies to 93,217 kilometers^2 of north-eastern Alberta, and together the areas proposed by the Mikisew Cree for protection totals 37,621 kilometers^2 – about 40.4% of the LARP area. The Regional Municipality of Wood Buffalo is 68,816 kilometers^2 in area. The Mikisew Cree proposals would protect 54.7%

2008. The fine totalled $3 million, and of that $1.3 million will go to the University of Alberta to fund a research project into bird migration and the effectiveness of bird deterrents. This may finally yield the information needed to properly assess the impact of oil sands operations on waterfowl habitat. (CBC News, cbc.ca, Updated: October 22, 2010 6:09 PM)

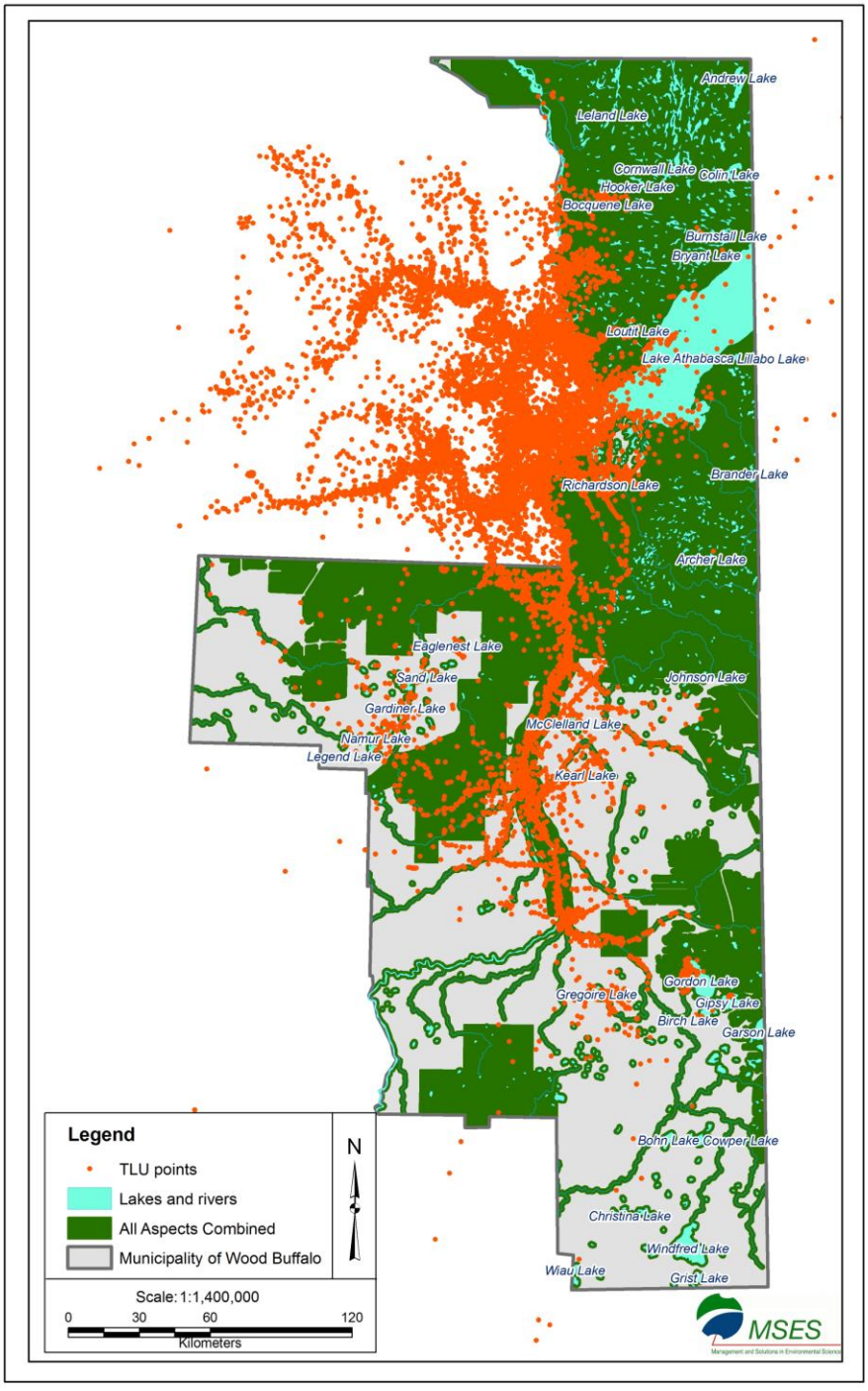
[125] Ducks Unlimited Canada 2010

of the municipality. The Mikisew Cree are proposing protections[126] for a considerable part of the LARP area, but as Map Eighteen shows, it

[126] From the Mikisew Cree's perspective, "protection" can come in a variety of forms: prohibiting industrial activity in certain areas, limiting the kinds of industrial activity in certain areas, Mikisew-GoA co-management of certain areas, and related measures. As part of the consultation process surrounding LARP, Mikisew is interesting in discussing these issues with the GoA.



Map Seventeen – All Areas Proposed by the Mikisew Cree for Protection
(MSES 2010)



Map Eighteen – Mikisew Cree Land and Resource Use Sites and Features And Areas Proposed for Protection
(use data from all six TLU studies; MSES 2010)

does not take in all of their traditional territory, nor all of the area they have used extensively and intensively over the past century. Nevertheless, the protected lands and resources will enable the Mikisew Cree to continue their traditional practices well into the future.

Further, the Mikisew Cree proposals are for the most part consistent with recommendations made by the Lower Athabasca Regional Advisory Council (RAC) which was established in 2008 to offer advice to the provincial government regarding future resource development, land conservation objectives, regional air and water thresholds, and human development considerations in the region. The RAC submitted its report to the Government of Alberta's Land Use Secretariat in early 2010.[127]The RAC examined numerous issues and the advice they offered on several of these parallel what is proposed by the Mikisew Cree. The RAC recognized that,

> "The foundation of the culture and economy of the Lower Athabasca Region is the land itself. The Lower Athabasca Region contains diverse landforms, vegetation, species and resources. Maintaining this biodiversity is essential for supporting human, plant and animal life. Maintaining the health and abundance of wildlife is also important to aboriginal peoples and communities, and the exercise of their rights."

To achieve this outcome, the RAC advised the Government of Alberta to implement management strategies aimed at

- ensuring healthy ecosystems and processes
- conservation of land in the region
- maintenance and improvement of landscape connectivity
- reduction of the industrial footprint
- implementation of Alberta's new wetland policy
- the development and implementation of a biodiversity management framework
- increasing the capacity of mixed-use resource lands to support movement of native species and communities
- connecting conservation areas to improve their resilience to changing environmental conditions
- managing water quality and quantity to enhance and maintain ecological integrity and human health
- conservation of a regional network for the maintenance of ecological components and processes in representative and high conservation value landscapes

[127] Lower Athabasca Regional Advisory Council 2010. Advice to the Government of Alberta Regarding a Vision for the Lower Athabasca Region.

By taking all this advice into account, "The RAC has identified 14 per cent of the region as recommended conservation areas, to bring the total conservation area in the region up to 20 per cent. As per the terms of reference, an additional 12 per cent of lands in the region are also recommended by RAC as proposed conservation areas."[128] If all lands identified by the RAC were made into conservation areas, about 32 percent of the region would be protected from industrial intrusion. The RAC's advice compares very well with both the rationale for protection offered by the Mikisew Cree and the total part of the region which would be protected.

In some ways, the Mikisew Cree's proposals offer better protection than does the RAC scheme. The river buffers proposed by the Mikisew Cree would connect the conservation areas that are currently proposed by RAC for the outskirts of the Rural Municipality of Wood Buffalo. The comprehensive river buffers proposed by the Mikisew Cree would be more effective at conserving aquatic ecosystems and ecological and traditional resources that are associated with water bodies.

Caution should be exercised in associating conservation with "mixed use resources" land classification. About 50% of these areas are already disturbed and the remaining 50% exist in many small and often isolated patches. Given the current rate of development, and given that all mixed-use areas are leased, these areas will be fully disturbed (with not even any patches of undisturbed land left) within the next 20-30 years. The Mikisew Cree propose to place greater emphasis on the preservation of intact landscapes.

Finally, the need for establishing multi-use corridors is understandable, but where the Athabasca River is affected, this corridor must be managed tightly and strict conservation, reclamation, and restoration efforts must be established and enforced to protect the resources that are relevant for the MCFN. This is exactly why the Mikisew Cree propose a five kilometer buffer on either side of the Athabasca River.

The RAC report uses the terms "ecosystem health" and "integrity". However, there are no measurable targets or benchmarks, not even approaches concretely defined to protect ecosystem health and integrity. As it stands, the protection and re-establishment of these conditions are in the eye of the beholder. The RAC report states that, "Alberta land uses should be managed to ensure healthy ecosystems. Albertans accept the responsibility to steward our land, air, water and biodiversity so that they can be passed on to the next generation in as good or better condition."[129]

[128] Lower Athabasca Regional Advisory Council 2010. Advice to the Government of Alberta Regarding a Vision for the Lower Athabasca Region. pp.26-27

[129] Lower Athabasca Regional Advisory Council 2010. Advice to the Government of Alberta Regarding a Vision for the Lower Athabasca Region. pp.16

Under current development scenarios, mixed use areas are not sustainable, given this definition of sustainability, because no disturbance in these areas, literally none, has yet been returned to pre-disturbance conditions. In other words, the mixed use areas may eventually (in several decades, but more likely centuries) have some ecosystems with wildlife and vegetation supporting ecosystem processes, if reclamation and restoration efforts are done seriously. Nevertheless, whatever will be restored will be different from what it was before disturbance. The Mikisew Cree do not believe that the future conditions, while different, will be as good as or better after industrial disturbance.

8.0 Recommendations

Government Conduct and Practice

1. Alberta must respond more promptly to requests from First Nations to develop the data and information (including thresholds) required to properly assess and accommodate Section 35 rights in land use planning. This might include setting timelines for the Government of Alberta to respond to a proposal for a Traditional Resource Use Plan and other proposals necessary to properly assess and accommodate section 35 rights.

2. The Government of Alberta must describe in writing how any areas it recommends for protection in land use planning takes into account information supplied by Mikisew Cree First Nation necessary to protect section 35 rights.

3. The Government of Alberta must ensure that all of its regulatory and legislative mechanisms relating to land use – across all government departments and ministries – use a rights-based focus and are consistent with the protection of section 35 rights.

4. The Government of Alberta must carefully and transparently consider how LARP will be affected by, or affect, other enactments and processes such as CRISP, IFN, REP, and tribunal and regulatory decisions.

Conservation and Reclamation

5. The *Land Stewardship Act* and land use plans made under it must guarantee that if certain areas are protected they will remain protected, even if this requires amendments to the *Land Stewardship Act*.

6. LARP must ensure that aboriginal and treaty rights can be exercised in "conservation" and other areas not only if they are compatible with other uses in those areas, but to ensure that they are given priority over other uses in those areas.

7. LARP must describe how conservation objectives are to be selected, and it must describe the implementation and monitoring of those objectives. As neither the RAC Document nor the Government of Alberta has thus far described these in any meaningful way, LARP's land-use classification system must be revised so that the way in which competing uses are to be balanced can be defined based on the meaningful incorporation of aboriginal knowledge.

8. The idea of parks being privately managed is not consistent with First Nation's being able to practice their treaty rights in a meaningful way, as it may not make economic sense for private park management to allow for hunting, fishing or other traditional land use. Therefore, it is recommended that large tracts of land designated as conservation areas come under the management of First Nations.

9. Any plans for development of future conservation areas, particularly in areas of mixed use or industrial use, should not rely on untested or unproven reclamation plans. Instead, future conservation areas should be developed on the basis of sound science and incorporation of traditional knowledge.

10. Sustaining the exercise of section 35 rights, now and in the future, should be one of the key foci in development of the LARP.

Planning Methodology

11. Alberta should work cooperatively with First Nations to develop studies, criteria and thresholds to sustain the exercise of section 35 rights now and in the future and to use that information to select conservation areas.

12. The Government of Alberta must conduct proper studies and consider freezing development in certain areas until more information is known about potential direct and cumulative impacts of existing, planned and reasonably foreseeable development, including impacts on section 35 rights and what is needed to practice and sustain those rights (ecosystem, environment, lands, air, water, fish, wildlife).

13. LARP must define how environmental assessment and monitoring data collected by aboriginal peoples will be used in land use planning and decision-making.

14. LARP should require the inclusion of traditional ecological knowledge in land use planning.

15. The Government of Alberta must slow the pace of extraction in areas which are being intensely developed, until knowledge of the current state of affairs becomes clearer. This precautionary approach to development should be a statutory

requirement, as it is the social responsibility of the government to protect its citizens.

Assessing Impacts and Effects

16. The Government of Alberta, together with Aboriginal peoples, must develop criteria, methods and thresholds for assessing the direct and cumulative impacts of existing, planned and reasonably foreseeable development on the meaningful exercise of section 35 rights. Criteria, methods, and thresholds assessing what is required to sustain those rights are needed as well.

17. More work must be done to understand how cumulative effects of oil sands and other development impact First Nations (culturally, spiritually, economically, and in terms of human health). A holistic understanding of the effects of development is needed. LARP should also describe how the enhanced understanding of cumulative effects will be used in the planning process and should make provision for further research into the health effects of development in the LARP area.

Incorporating Aboriginal Knowledge

18. Regulatory change is needed to require that aboriginal knowledge of historical and recent changes in water quality and quantity, air quality, land and biodiversity be incorporated into land use planning and decision-making.

19. RAC's recommendation calling for use of aboriginal traditional knowledge to enhance understanding of cumulative effects and develop appropriate mitigation/minimization strategies must include regulatory changes that require incorporation of such knowledge at an early point in project and application planning.

Aboriginal Participation

20. Project-specific terms of reference for environmental assessments as well as all regulatory decision-making must expressly require information gathering and consideration of potential direct and cumulative impacts on the exercise of section 35 rights.

21. There must be a real chance for First Nations to influence planning and project decision-making in land-use planning and environmental assessment at all levels, and planning processes and regulatory instruments must make that happen.

22. The RAC recommendation stating that aboriginal peoples be included in terms of conservation and enhancement of regional biodiversity and ecosystem function and in respect of developing a traditional knowledge base of the variety and intensity of impacts of individual and cumulative industrial activities on

biodiversity and ecosystem functions through time must address when this will occur, how it will influence LARP or future project-specific decision-making, and must be made a requirement of GoA policy, regulations and legislation.

Required Regulatory Changes

23. LARP must clarify the relationship between its contents and any project-specific decisions that must be made by regulatory agencies or individual line ministries. The extent to which Crown decision-makers and regulatory bodies will be bound by LARP, irrespective of information put before them, must also be clarified.

24. Alberta must create a new process, or modify existing processes, to assess the infrastructure, social and economic implications of major projects and the growth they create in a manner that parallels the application approval process. That process also needs to involve meaningful consultation with First Nations people at all key decision-making steps, starting with scoping of projects, terms of reference, etc. Any focus on increasing "regulatory efficiency" must set out how section 35 rights will be protected.

25. The RAC recommendation that a cap be placed on the amount of the LARP's land base in mixed-use areas that can be disturbed for oil sands extraction footprint at any one time needs to be expanded to include all development zones and also needs to consider placing a limit on all kinds of development depending on cumulative impacts, not just in terms of oil sands extraction. A cap should be created in light of information concerning cumulative impacts, and depending on changes in the environment mechanisms must exist to allow for its revision.

26. The Lieutenant Governor in Council should not have exclusive and final jurisdiction over regional plans or the ability to amend regional plans without criteria to guide such decision-making. If that exclusive authority remains, criteria should be enshrined in ALSA that guides, or better guides, how the Lieutenant Governor in Council will make decisions to modify any regional plans.

27. The Lieutenant Governor in Council should not have the authority to determine and amend planning boundaries without addressing section 35 rights and without First Nation input, consultation and accommodation, and without criteria to guide such decision-making.

28. First Nations must be included in the process for setting the terms for the ten-year review of each regional plan. The authority to set such terms should not rest with the Lieutenant Governor in Council alone. Should cumulative impacts prove to be excessive then revisions must be undertaken at an earlier date.

29. First Nations should be involved in deciding how to use the conservation tools created under ALSA, such as stewardship units, off-set programs, etc. This will require Alberta to limit the discretion of the Lieutenant Governor in Council to reject management procedures and to ensure that economic, infrastructure and resource development will not interfere with the promotion of conservation of these sites.

30. Alberta must ensure that regional planning regulations and related legislation recognizes the priority allocation of resources to aboriginal peoples or, at a minimum constitutional requirements concerning the sustenance of aboriginal rights, when balancing access to limited resources requiring conservation.

31. Alberta must ensure that regional planning regulations and related legislation acknowledge that the ability of aboriginal peoples to exercise traditional uses of the land may be linked to specific lands and territories and the resources thereon, which require conservation to maintain the ability of aboriginal peoples to exercise traditional uses.

32. The RAC recommendation to work with aboriginal peoples to improve quality of information to inform and co-ordinate current planning processes, infrastructure and services planning must be combined with assurances as to what is to be done with this information, and must ensure adequate safeguards exist for the protection and appropriate use of such information. This must be enshrined in regulations and legislation.

Section 35 Rights

33. LARP must make express provision for the protection of section 35 rights and set out specifics on where and how those rights will be protected.

34. Alberta must recognize that even where the province has valid conservation objectives, any infringement of aboriginal and treaty rights must still meet the standard of justified infringement, including priority allocation of resources.

35. LARP must address the impacts of population growth and infrastructure on the environment and on section 35 rights in the LARP region, and the involvement of aboriginal peoples in addressing those impacts.

36. Alberta must make provision for Aboriginal *control* over culturally/historically significant sites. Renaming sites is not a sufficient land-use plan.

37. More attention must be paid to aboriginal use of the Athabasca River and other waterways for travel and for the exercise of treaty rights and the Aboriginal Base Flow recommendation must be adopted.

Accommodation for Adverse Impacts and Infringements

38. Alberta alone, or with Canada, should establish a fund which can be used by First Nations to adjust to socio-economic and environmental impacts on their section 35 rights from development, where such development adversely impacts or infringes their rights.

39. A system of compensation should be developed with First Nations where it can be shown that development in a particular area has already infringed section 35 rights.

40. Where First Nations wish to participate in economic development a dedicated First Nations fund should be set up to facilitate such participation, such as loans and grants for start-up businesses, purchase of equipment, training.

41. Following on other models, there should be a requirement that, as a condition of project approvals (at least on larger oil sands projects), a company should be required to negotiate an IBA with the affected First Nations.

References

Alberta nd. http://www.landuse.alberta.ca/RegionalPlans/LowerAthabasca/Default.aspx

Alberta 2009. Terms of Reference for Developing the Lower Athabasca Regional Plan. P.2. http://www.landuse.alberta.ca/RegionalPlans/LowerAthabasca/documents/TermsOfRefDevLowerAthabascaRegionalPlan-Jul2009.pdf

Alberta Water Council. 2008. Recommendations for a new Alberta Wetland Policy. http://www.albertawatercouncil.ca/Portals/0/pdfs/WPPT%20Policy%20web.pdf.

Canadian Boreal Initiative 2009. Canadian Boreal Forest Conservation Framework. Ottawa. http://www.borealcanada.ca/documents/CBI_Framework_EWeb_0509.pdf

Canadian Museum of Civilization. 2008 Archaeological Discovery in Organic Terrain in Canada. http://www.civilization.ca/cmc/explore/resources-for-scholars/essays/archaeology/ken-spayze/archaeological-discovery-in-organic-terrain-in-canada

Carlson, M., J. Wells, D., Roberts 2009, The Carbon the World Forgot: Conserving the Capacity of Canada's Boreal Forest Region to Mitigate and Adapt to Climate Change', Boreal Songbird Initiative and Canadian Boreal Forest Initiative, Seattle, WA, and Ottawa. http://www.borealbirds.org/resources/carbon/report-full.pdf

Collingham, Y.C. and B. Huntley. 2000. Impacts of habitat fragmentation and patch size upon migration rates. Ecological Applications 10:131-144.

Carlos, A.M. and F.D. Lewis. 2009 Property Rights, Standards of Living, and Economic Growth: Western Canadian Cree. Queen's Economics Department Working Paper No. 1232. Kingston: Queen's University.

Ducks Unlimited Canada 2010. Ducks Unlimited Canada's Mission and Vision. http://www.ducks.ca/aboutduc/who/mission.html.

Firelight Group Research Cooperative 2010. As Long As The Rivers Flow: Athabasca River Knowledge, Use and Change. MCFN Community Report August 16, 2010.

FMA Heritage Resources Consultants Inc. 2006. Traditional Ecological and Land Use Report: Deer Creek Joslyn North Mine Project. Prepared for Deer Creek Energy Limited, Calgary.

FMA Heritage Resources Consultants Inc. 2007. Mikisew Cree First Nation Traditional Ecological Knowledge Report. Prepared for Mikisew Cree First Nation, Fort Chipewyan, Alberta, on Behalf of Synenco Energy Inc.

Hargis, C.D., J.A. Bissonette, and J.L. Davis. 1998. The behaviour of landscape metrics commonly used in the study of habitat fragmentation. Landscape Ecology 13:167-186.

Holliday, V.T. 2004 Soils in Archaeological Research. Oxford: Oxford University Press, p.150

International Indian Treaty Council. 2008. Joint Submission to the United Nations Human Rights Council in regard to the Universal Periodic Review Concerning Canada in February 2009. http://www.treatycouncil.org/PDFs/T6FN%20IITC%20UPR%20Submission%20Canada.pdf

Kelly E. N., David W. Schindler,Peter V. Hodson, et al. 2010. Oil sands development contributes elements toxic at low concentrations to the Athabasca River and its tributaries. Proceedings of the National Academy of Sciences, Early Edition. ww.pnas.org/cgi/doi/10.1073/pnas.1008754107

Laurance, W.F., T.E. Lovejoy, H.L. Vasconcelos, E.M. Bruna, R.K. Didham, P.C. Stouffer, C. Gascon, S.G Laurance and E. Sampaio. 2002. Ecosystem decay of Amazonian fragments: a 22 year investigation. Conservation Biology 16:605-618.

Lee P.G., M. Hanneman, J.D. Gysbers, and R. Cheng. 2009. The Last Great Intact Forests of Canada: Atlas of Alberta. (Part II: What are the threats to Alberta's forest landscapes?) Edmonton, Alberta: Global Forest Watch Canada. p. 32-49

Legion Magazine 2006. http://www.legionmagazine.com/en/index.php/2006/01/archeology-in-the-oilsands/

Lovisek, J.A. nd. Western Woodland Cree. *In*The Encyclopedia of Canada's Peoples. http://www.multiculturalcanada.ca/Encyclopedia/ A-Z/a4/5

Mathewson, P. A. *The Geographic Impact of Outsiders on the Community of Fort Chipewyan*. M.A. Thesis, University of Alberta. 1974

McCormack, P.A. 2004 The Economic History of the Mikisew Cree First Nation: Late 19th Century to c.1970. Prepared for Rath and Company and the Mikisew Cree First Nation.

Mills, L.S. 2007. Conservation of wildlife populations: demography, genetics, and management. Blackwell Publishing, Oxford.

Morlan, R. nd Canadian Archaeological Radiocarbon Database. Ottawa: Canadian Museum of Civilization.

MSES 2009. Effects on Traditional Resources of the Mikisew Cree First Nation: The Joslyn Creek Project Specific and Cumulative Effects in the Oil Sands Region. Prepared for Mikisew Cree First Nation. Appendix B1.

Nakagawa, M. 2008. Downstream from the Tar Sands: Community's Public Health Concerns Falling on Deaf Ears? Natural Resources Defence Council. http://switchboard.nrdc.org/blogs/mnakagawa/ downstream_from_the_tar_sands.html

Natcher, D.A. Institutionalized Adaptation: Aboriginal Involvement in Land and Resource Management. The Canadian Journal of Native Studies XX, 2(2000):263-282.

Oil Sands Developer nd. http://www.oilsandsdevelopers.ca/index.php/oil-sands-information/oil-sands-facts/unearthing-the-past/

Oilsands Review 2006. The Oilsands of the Ancient Hunter. Oilsands Review September 2006. http://www.heavyoilinfo. com/feature _items/osr_070901_pg66-72.pdf

Pentney, S.P. 2002 The Archaeology of Brabant Lake. M.A. Thesis, Department of Anthropology and Archaeology, University of Saskatchewan, Saskatoon.

Pilon, Jean-Luc 2006. http://www.jrank.org/history/pages/6372/ The-North-American-Subarctic.html; Tanner, J. 2006:23

Potapov, P. et al. 2008. Mapping the world's forest landscapes by remote sensing. Ecology and Society, 13: Art.No. 51.

RAMSAR. 2010. The Ramsar Convention on Wetlands – The Ramsar List of Wetlands of International Importance. http://www.ramsar.org/cda/en/ramsar-documents-list/main/ramsar/1-31-218_4000_0__.

Ries L., R.J. Fletcher, L. Battin , and T.D. Sisk. 2004. Ecological responses to habitat edges: mechanisms, models, and variability explained. Annual Review of Ecology, Evolution, and Systematics 35: 491-522.

Rivard D.H., J. Poitevan, D. Plasse, M. Carleton, and D.J. Currie. 2000. Changing species richness and composition in Canadian National Parks. Conservation Biology 14:1099-1109.

Rogers, E.S. and J.G.E.Smith. 1981. Environment and Culture in the Shield and Mackenzie Borderlands. *In* Subarctic. Handbook of North American Indians. Volume 6. Ed. Helm, June. Washington, D.C.: Smithsonian Institution Press. p.130-145

Royal Alberta Museum. 2005 Archaeology: Prehistoric Hunters and Fishers of Alberta's Northern Forests.
http://www.royalalbertamuseum.ca/human/archaeo/aspects/hunters.htm

Rutledge, D.T. and C.A. Lepczyk. 2002. Landscape change: Patterns, effects, and implications for adaptive management of wildlife resources. *In:* J. Liu and W. Taylor, editors, Integrating Landscape Ecology into Natural Resource Management, Cambridge University Press, pp.312-333.

Smith, J.G.E. 1981. Western Woods Cree. *In* Subarctic. Handbook of North American Indians. Volume 6. Ed. Helm, June. Washington, D.C.: Smithsonian Institution Press. 256-270

Stevenson, M.G. 1986.Window on the Past. Archaeological Assessment of the Peace Point Site,Wood Buffalo National Park, Alberta. Studies in Archaeology, Architecture and History. National Historic Parks and Sites Branch, Parks Canada, Environment Canada, Ottawa.

Stewart A., P.E. Komers and D.J. Bender. 2009. Assessing Landscape Relationships for Habitat Generalists. Ecoscience 17(1)

Stuart Adams & Associates. Fort Chipewyan Way of Life Study: An Assessment of Impacts of the W.A.C. Bennett Dam on the People of Fort Chipewyan and the Peace-Athabasca Delta & Suggestions for Action; Final Report. Vancouver, British Columbia: Stuart Adams & Associates Planning Consultants Limited. 1998

Syncrude Canada. 1973. Migratory Waterfowl and the Syncrude Tar Sands Lease: A Report. Environmental Research Monograph 1973-3, Syncrude Canada.

Tanner, J. 2006. Ayapaskowinowak: The Traditional Land Use of the Mikisew Cree First Nation. Prepared for the Mikisew Cree First Nation.

Timoney, K.P. 2007. A Study of Water and Sediment Quality as Related to Public Health Issues, Fort Chipewyan, Alberta. Nunee Health Board Society, Fort Chipewyan, Alberta.

Thomas-Müller, C. 2008. Tar Sands: Environmental justice, treaty rights and Indigenous Peoples. Canadian Dimension. http://canadiandimension.com/articles/1760/

Tobias, T.N. 2009. Living Proof: The Essential Data-Collection Guide for Indigenous Use-and-Occupancy Map Surveys. Vancouver: Ecotrust Canada and Union of British Columbia Indian Chiefs. p.143.

University of Calgary nd. http://people. ucalgary. ca/~walde/testtime.html

Wein, E.E. 1989. *Nutrient Intakes and Use of Country Foods by Native Canadians Near Wood Buffalo National Park*. A thesis presented to the Faculty of Graduate Studies of the University of Guelph. February 1989.

Wein, E.E., J. H. Sabry, F. T. Evers. 1991. Food Consumption Patterns and Use of Country Foods by Native Canadians near Wood Buffalo National Park, Canada. Arctic 44/3: 196-205

Wein, E.E., J. H. Sabry, F. T. Evers. 1991. Nutrient intakes of native Canadians near Wood Buffalo National Park. Nutrition Research 11/1: 5-13

Yesner, D.R. 1989 Moose Hunters of the Boreal Forest? **A** Re-examination of Subsistence Patterns in the Western Subarctic. Arctic 42(2):97-108

Appendix A

Appendix A is a series of memos containing the results of the statistical analyses comparing use sites, use selection criteria, and specific ecological parameters of moose, beaver and waterfowl habitat.

Memo

To:	**Doug Elias**	File no:	**1010**
From:	Abbie Stewart (abbie.stewart@mses.ca)	cc:	**Petr Komers**
Tel:	(403) 701-2398		
Date:	June 1, 2010		

Subject: Considerations for Moose for the Lower Athabasca Regional - UPDATE

Moose Habitat

Moose Habitat Defined

Affinity indices, which indicated habitat preferences (Cairns & Telfer 1980), provided a quantitative analysis of moose habitat use using an empirical dataset available from the Alberta Lower Foothills Natural Subregion and the Land Capability Classification (LCC) system.

Affinity indices were calculated using spring pellet group field survey data collected in Alberta Lower Foothills Natural Subregion in 2005 and 2006.This dataset included information on moose abundance and survey effort. The large dataset (N=937) provided accurate information on moose habitat use.

A primary goal of moose habitat mapping was to be able to predict the distribution and abundance of moose by extrapolating from sampled to un-sampled areas. A quantitative analysis on moose habitat preferences in the Fort McMurray region yielded similar results to that of the Alberta Lower Foothills Natural Subregion (MSES Inc. 2007). These similarities in moose habitat preference across Natural Regions in Alberta justified the application of moose habitat preference results based on the dataset from the Alberta Lower Foothills Natural Subregion and the dataset from the Fort McMurray region to areas across Alberta.

Alberta Study Area

The Alberta Foothills Natural Region (AFNR) covers about 25 000 km^2 along the eastern edge of the Rocky Mountains in Alberta, Canada and is further divided into the Upper and Lower Foothills Natural Subregions. The boundaries of Alberta Natural Regions are defined according to vegetation, soils and physiographic features, resulting in multiple regions, each with relatively consistent vegetation composition (Natural Regions Committee 2006). Vegetation in the AFNR consists mainly of closed-canopied coniferous, deciduous and mixedwood forests. Grassland and shrubland vegetation is infrequently interspersed among forest stands (Strong 1992, Beckingham et al. 1996). Commercial timber management has been ongoing for over 50 years in this region (Murphy et al. 2002). Other human activity in this region includes mining, agriculture, urbanization, and oil and gas production. Only data collected from the Alberta Lower Foothills Natural Subregion was used in order to minimize the influence of any gradient in vegetation distribution across the study area.

Pellet Group Survey

We gathered winter habitat use data on moose using fecal pellet group surveys in the spring of 2005 and 2006 (sites not re-sampled). The surveys were conducted prior to leaf-out (late April to early June) in both years to provide an index of moose distribution in winter. Our method ensured that new pellets (those lying above the previous years' leaf litter) were easily observed, while the older pellets were concealed by leaf litter (Neff 1968, Augustine & Frelich 1998). Spring fecal pellet group surveys provided an index of moose occurrence representing the cumulative depositions over the entire preceding winter period (Neff 1968, Augustine & Frelich 1998, Weckerly & Ricca 2000).

Pellet groups were counted within a 5.65 m radius circular plot (100 m^2) (Neff 1968). Using a stratified random sampling procedure, we attempted to proportionally represent all vegetation types using pellet group plots, excluding water and non-vegetated types. Plots were distributed a minimum of 200 m from each other and roads, preferably within a separate vegetation patch and separated by natural features, such as rivers. A total of 937 plots were sampled once each in the Lower Foothills Natural Region.

Pellet group surveys were conducted by 6 different observers working independently. We trained all observers and allowed observers to independently sample plots once we obtained consistency between our pellet group counts. To maintain consistency, observers sampled at least 1 plot together per day to compare counts and species identification. Multiple observers were distributed within each site.

Within a plot, moose pellet groups were identified. A moose pellet group is defined as a minimum of 5 pellets, within 1 pellet's-length of one another, and more than half of the pellets in the group must be within the sample plot to be counted (Strong & Freddy 1979, Harkonen & Heikkila 1999). Pellet groups occurring beneath fallen leaves or showing signs of decomposition (distorted shape and/or mold growth) were recorded as 'old' and not included in analyses (Franzman et al. 1976, Cairns & Telfer 1980).

Analysis

The proportion of plots in each vegetation type (expected) was compared with the proportion of moose pellet groups counted within each vegetation type (observed; p_i) using a chi-square test. If the chi-square was significant, indicating that observed moose pellet groups were not distributed proportionately amongst vegetation types, then Affinity indices and Bonferroni confidence intervals were calculated to determine which vegetation types generated the statistical significance (Neter et al. 1996). The vegetation types that were used significantly more than expected were considered as preferred moose habitat (Neu et al. 1974, Arthur et al. 1996).

Affinity indices were calculated using methods outlined in Neu et al. (1974), Cairns and Telfer (1980), and Harkonen and Heikkila (1999). Affinity indices for moose were calculated as: (proportion of total counts of moose pellet groups on plots in vegetation group x (p_i)) / (proportion of study plots in vegetation group x). Affinity indices are positive values with no upper limit. The calculation of affinity indices takes sampling effort into consideration. An index <1.0 indicated that the vegetation group was used less than one would expect based on sampling effort. An index equal to 1.0 indicated that the vegetation group was used in proportion to its sampling effort. An index >1.0 indicated that the vegetation group was used more than one would expect based on sampling effort (preferred). Bonferroni confidence intervals were calculated to determine which vegetation groups were used significantly more or less than would be expected based on sampling effort (Neu et al. 1974, Arthur et al. 1996). Affinity indices give an indication of habitat preference, while Bonferroni confidence intervals determine statistical significance of vegetation use. Bonferroni confidence intervals were constructed for each observed proportion of moose pellet groups (p_i) to identify whether the expected proportion of moose pellet groups (proportion of study plots in vegetation group x) fell within the magnitude of the significant effects. Bonferroni confidence intervals use an adjusted z-statistic that widens the confidence intervals (to bound the probability error rate at α=0.05) and takes into consideration that multiple simultaneous estimates are being made.

Results

Moose pellet groups were not distributed proportionately amongst the available vegetation types (Chi-square, P ≤0.05, χ^2=12.63, df=6). Moose used shrubland habitat significantly more often than expected according to Bonferroni confidence intervals (Table 1). Coniferous vegetation was used by moose significantly less than expected (Table 1). Deciduous, shrub, and herb vegetation types had affinity indices >1 indicating that these habitats were used more than expected based on sampling effort.

Table 1: Habitat affinity indices and Bonferroni confidence intervals for moose using pellet group data from the Alberta Foothills Natural Region

Vegetation Type	Number of Plots	Observed Proportion of Pellet Groups (P_i)	Expected Proportion of Pellet Groups	Affinity Index	Bonferroni Confidence Intervals
Deciduous	187	0.23	0.20	1.16	0.17≤ pi ≥0.29
Coniferous	412	0.27	0.44*	0.62	0.21≤ pi ≥0.33
Shrub	215	0.32	0.23*	1.38	0.26≤ pi ≥0.37
Water	1	0	0.01	0	n/a†
Wetland - Treed	6	0.01	0.01	0.79	-0.06≤ pi ≥0.07
Herb	115	0.18	0.12	1.43	0.11≤ pi ≥0.24
Mixedwood	1	0	0.01	0	n/a†

* Observed significantly different expected; † Confidence cannot be calculated with 0 observations.

A quantitative analysis using moose pellet group data from the Fort McMurray region using similar methods yielded similar results (MSES Inc. 2007). Moose used deciduous and mixed wood habitat significantly more often than expected according to Bonferroni confidence intervals (Table 2). Bog/fen/wetland vegetation was used by moose significantly less than expected (Table 2). Deciduous, mixed wood, shrub, and water had affinity indices >1 indicating that these habitats were used more than expected based on sampling effort.

Table 2: Habitat affinity indices and Bonferroni confidence intervals for moose using pellet group data from the Fort McMurray region

Vegetation Type	Expected Proportion of Pellet Group	Affinity Index	Bonferroni Confidence Intervals
Bog/fen/wetland	0.38*	0.65	0.17≤ pi ≥0.28
Coniferous	0.16	0.66	0.05≤ pi ≥0.17
Deciduous	0.17*	1.80	0.18≤ pi ≥0.29
Disturbed	0.01	0	n/a†
Mixed wood	0.13*	1.03	0.22≤ pi ≥0.33
Shrub	0.13	1.44	0.03≤ pi ≥0.15
Water	0.03	2.68	0.01≤ pi ≥0.12

* Observed significantly different expected; † Confidence cannot be calculated with 0 observations.

Based on the significant results of the Bonferroni confidence intervals from these two datasets, shrub, deciduous, and mixed wood vegetation types were defined as moose preferred habitat.

Kill Sites in Moose Habitat

A Chi square test was used to test whether moose kill sites (terry data) were predominantly located within moose habitat (shrub, deciduous, and mixedwood vegetation). Locations of known moose kill sites (observed) were compared to set of random locations (expected) distributed throughout the study area. It was determined whether each point fell within moose habitat or outside of moose habitat for these two datasets. The numbers of observed and expected kill sites within moose habitat and outside moose habitat was compared.

It was found that the observed number of moose kill sites was significantly different than the expected number of moose kill sites (Chi square, χ^2=21.48, df=1). Figure 1 shows the observed proportion of moose kill sites in moose habitat compared to the expected proportion of moose kills sites in moose habitat. A higher proportion of observed moose kill sites occurred within moose habitat.

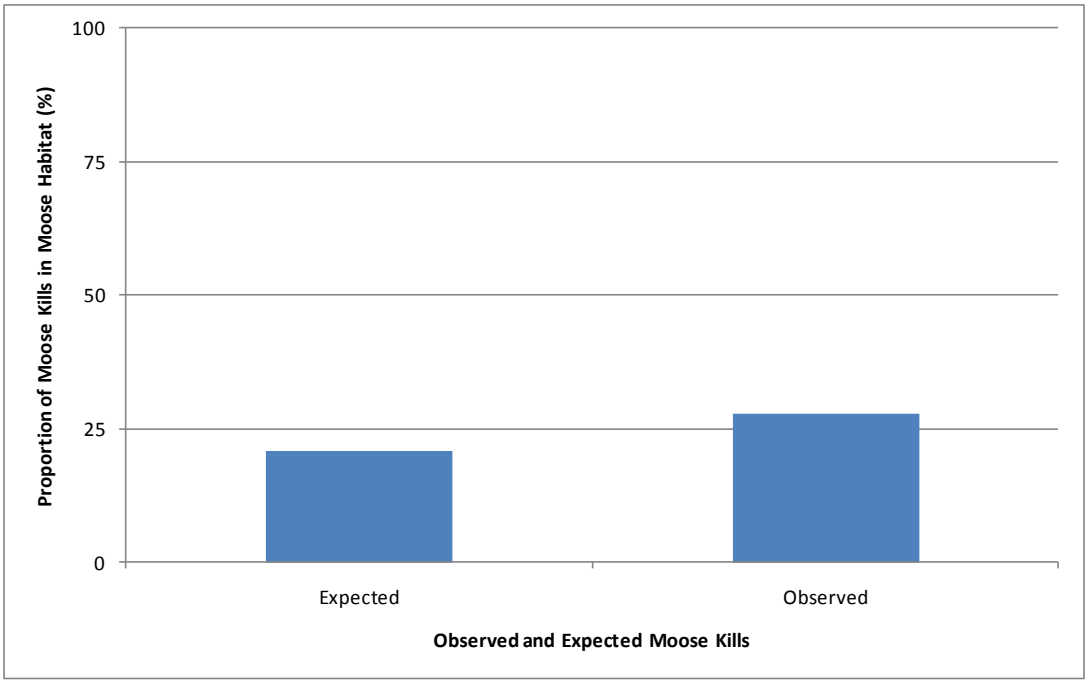


Figure 1: Moose Kill Sites in Moose Habitat

Proximity to Water Bodies to Moose Kill Sites

A Chi square test was used to test whether moose kill sites were predominantly located near a water body. Locations of known moose kill sites (observed) were compared to set of random locations (expected) distributed throughout the study area. The distance of the closest water body was calculated for each point within these two datasets. The number of observed and expected kill sites within 11 (250, 500, 750, 1000, 1250, 1500, 1750, 2000, 2250, >2500) distance categories was compared.

It was found that the observed number of moose kill sites decreased as distance from a water body increased (Figure 2). The observed number of moose kill sites near a waterbody was found to be significantly different than the expected (Figure 3) number of moose kill sites near a waterbody (Chi square, χ^2=446.99, df=10).

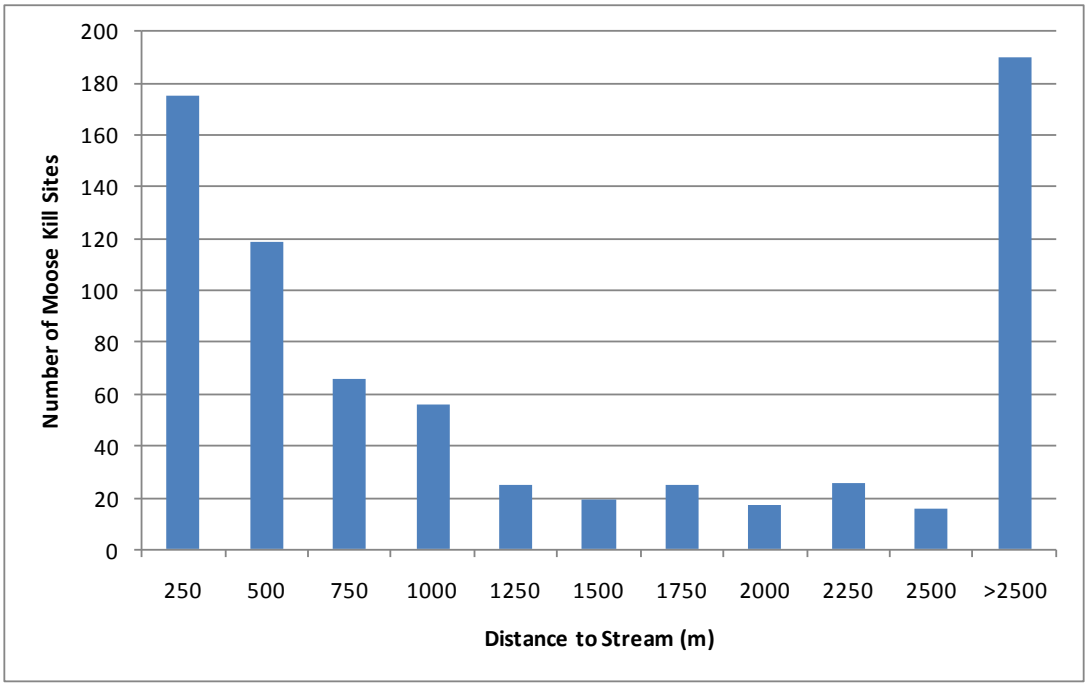


Figure 2: The observed numbers of moose kill sites at increasing distance from water

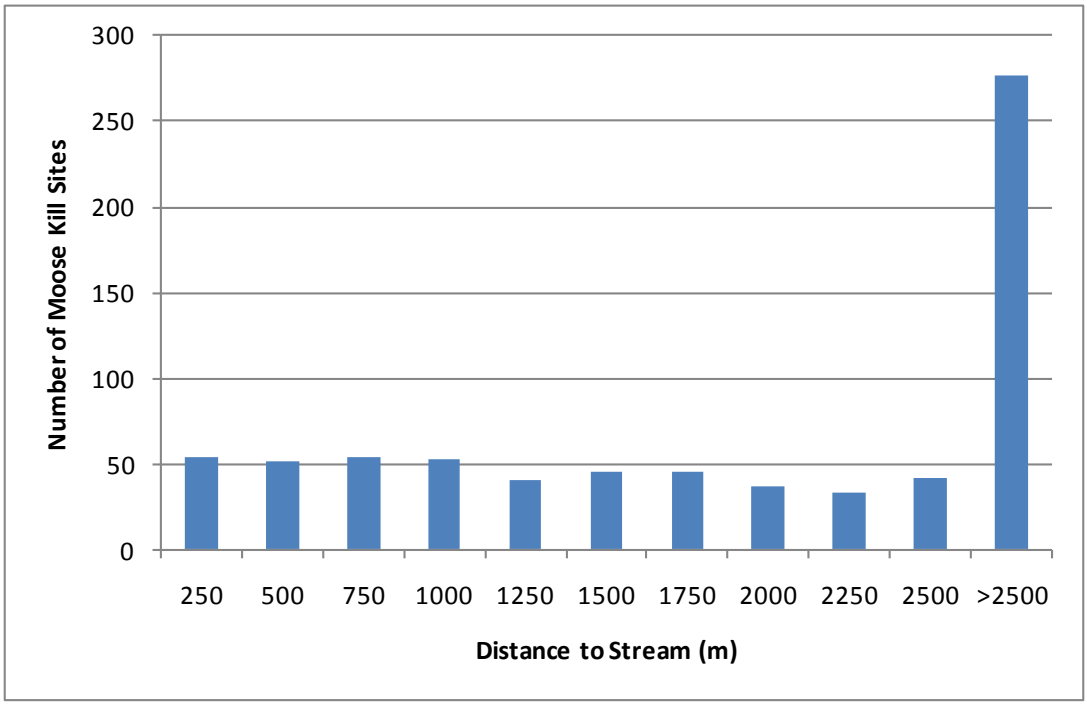


Figure 3: The expected numbers of moose kill sites at increasing distance from water

Proximity of Cabins to Moose Kill Sites

A Chi square test was used to test whether moose kill sites were predominantly located near cabins. Locations of known moose kill sites (observed) were compared to set of random locations (expected) distributed throughout the study area. The distance of the closest cabin was calculated for each point within these two datasets. The number of observed and expected kill sites within 11 (250, 500, 750, 1000, 1250, 1500, 1750, 2000, 2250, >2500) distance categories was compared.

It was found that the observed number of moose kill sites decreased as distance from a cabin increased (Figure 4). The observed number of moose kill sites near a cabin was found to be significantly different than the expected (Figure 5) number of moose kill sites near a cabin (Chi square, χ^2=8787.43, df=10).

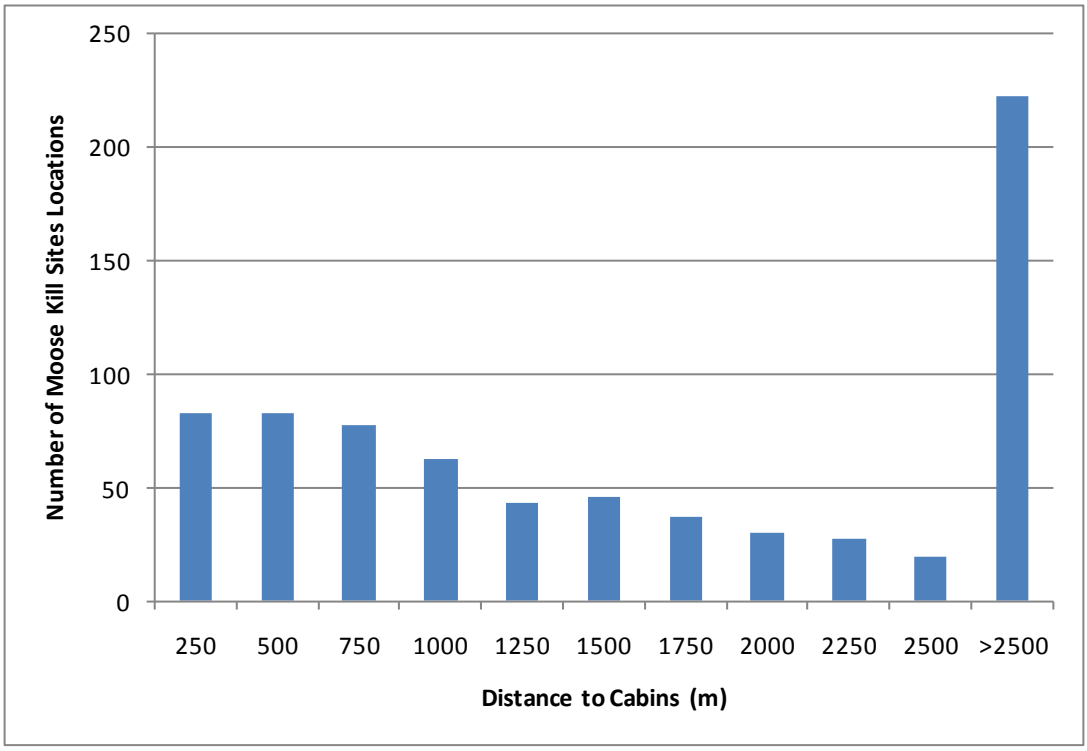


Figure 4: The observed numbers of moose kill sites at increasing distance from cabins

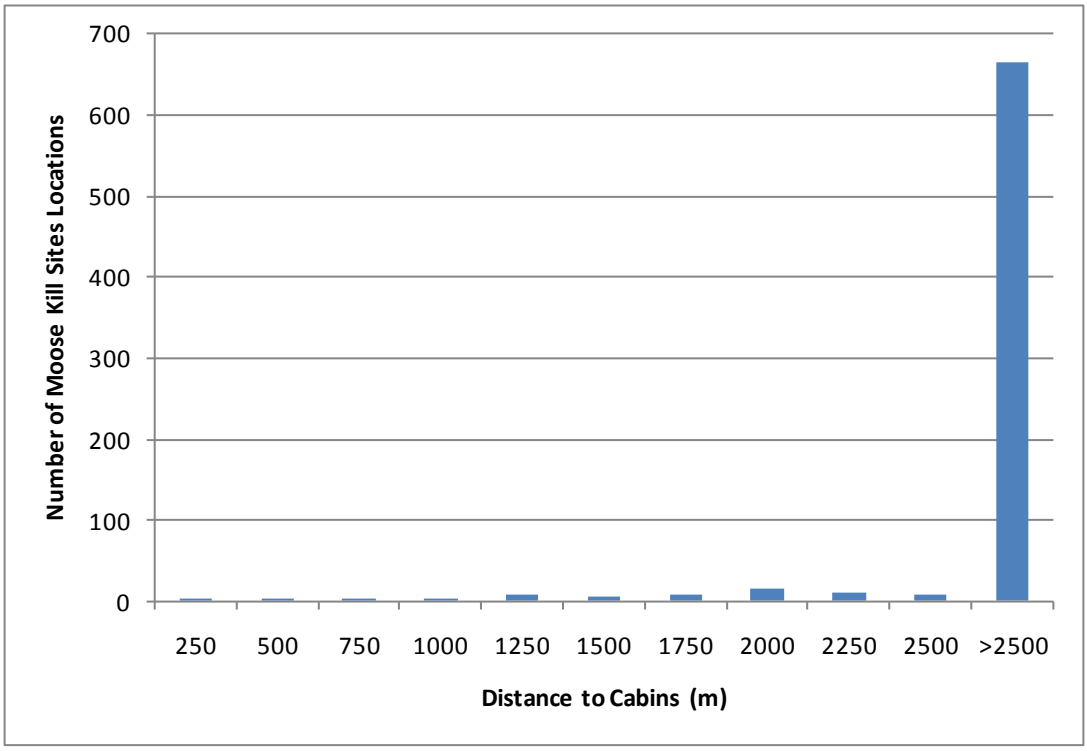


Figure 5: The expected numbers of moose kills sites at increasing distance from cabins

Literature Cited

Arthur, S. M., B. F. J. Manly, L. L. McDonald & G. W. Garner, 1996. Assessing habitat selection when availability changes. Ecology, 77: 215-227.

Augustine, D. J. & L. E. Frelich, 1998. Effects of white-tailed deer on populations of an understory forb in fragmented deciduous forests. Conservation Biology, 12: 995-1004.

Weckerly, F. W. & M. A. Ricca, 2000. Using presence of sign to measure habitats used by Rossevelt elk. Wildlife Society Bulletin, 28: 146-153.

Beckingham, J. D., I. G. W. Corns & J. H. Archibald, 1996. Field guide to ecosites of west-central Alberta, Special Report 9 edition. Natural Resources Canada, Canadian Forest Service, Northwest Region, Northern Forestry Centre, Edmonton, Alberta.

Cairns, A. L. & E. S. Telfer, 1980. Habitat use by 4 sympatric ungulates in boreal mixedwood forest. Journal of Wildlife Management, 44: 849-857.

Franzman, A. W., J. L. Oldemeyer, P. D. Arneson & R. K. Seemel, 1976. Pellet-group count evaluation for census and habitat use of Alaskan moose. Proceedings of the North American Moose Conference and Workshop, 12: 127-142.

Harkonen, S. & R. Heikkila, 1999. Use of pellet group counts in determining density and habitat of moose Alces alces in Finland. Wildlife Biology, 5: 233-239.

MSES 2007. Wildlife Impact Assessment Report for the Parsons Creek Resources Project. Part A: Wildlife Baseline. Prepared for Millenium EMS Solutions Ltd., Alberta, Canada.

Murphy, P. J., R. Udell & R. E. Stevenson, 2002. The Hinton Forest 1955-2000. A Case Study in Adaptive Forest Management, The Weldwood-Hinton Story.

Natural Regions Committee, 2006. Natural Regions and Subregions of Alberta. in D. J. P. W. W. Downing (ed), Government of Alberta Publication No. T/852,

Neff, D. J., 1968. The pellet-group count technique for big game trend, census, and distribution: a review. Journal of Wildlife Management, 32: 597-614.

Neter, J., M. H. Kutner, C. J. Nachtsheim & W. Wasserman, 1996. Applied Linear Statistical Models, 4th edition. WCB McGraw-Hill, Boston, Massachusetts.

Neu, C. W., C. R. Byers & J. M. Peek, 1974. A technique for analysis of utilization-availability data. Journal of Wildlife Management, 38: 541-545.

Strong, W. L., 1992. Ecoregions and ecodistricts of Alberta. Alberta Forestry, Lands and Wildlife, Edmonton, T/244.

Strong, L. L. & D. J. Freddy, 1979. Number of pellets per mule deer defecation. Journal of Wildlife Management, 43: 563-564.

Memo

To:	**Doug Elias**	File no:	**1010**
From:	Abbie Stewart (abbie.stewart@mses.ca)	cc:	**Petr Komers**
Tel:	(403) 701-2398		
Date:	June 21, 2010		

Subject: Considerations for Waterfowl for the Lower Athabasca Regional - UPDATE

Waterfowl Habitat

Waterfowl Habitat Defined

Waterfowl habitat was based on a Green-winged teal habitat model previously developed for a project in the Fort McMurray region, Alberta (MSES Inc. 2007). The Green-winged teal habitat model was developed using published literature (Hickie 1985, Bent 1987, Roof 1999) and adapted from a waterfowl model developed by OPTI-Nexen (2006). Key habitat components for waterfowl include the presence of adjacent graminoid, herbaceous, and low shrub habitat and open water. Based on this information, shrub, bog/fen, and grass vegetation types within 100 m of a water body and open water were defined as waterfowl habitat for the analyses herein.

Harvesting Sites in Waterfowl Habitat

A Chi square test was used to test whether waterfowl harvesting sites (terry data) were predominantly located within waterfowl habitat (as described above). Locations of known waterfowl harvesting sites (observed) were compared to set of random locations (expected) distributed throughout the study area. It was determined whether each point fell within waterfowl habitat or outside of waterfowl habitat for these two datasets. The numbers of observed and expected harvesting sites within waterfowl habitat and outside waterfowl habitat was compared.

It was found that the observed number of waterfowl harvesting sites was significantly different than the expected number of waterfowl harvesting sites (Chi square, χ^2=1199.25, df=1). Figure 1 shows the observed proportion of waterfowl harvesting sites in waterfowl habitat compared to the expected proportion of waterfowl harvestings sites in waterfowl habitat. A higher proportion of observed waterfowl harvesting sites occurred within waterfowl habitat.

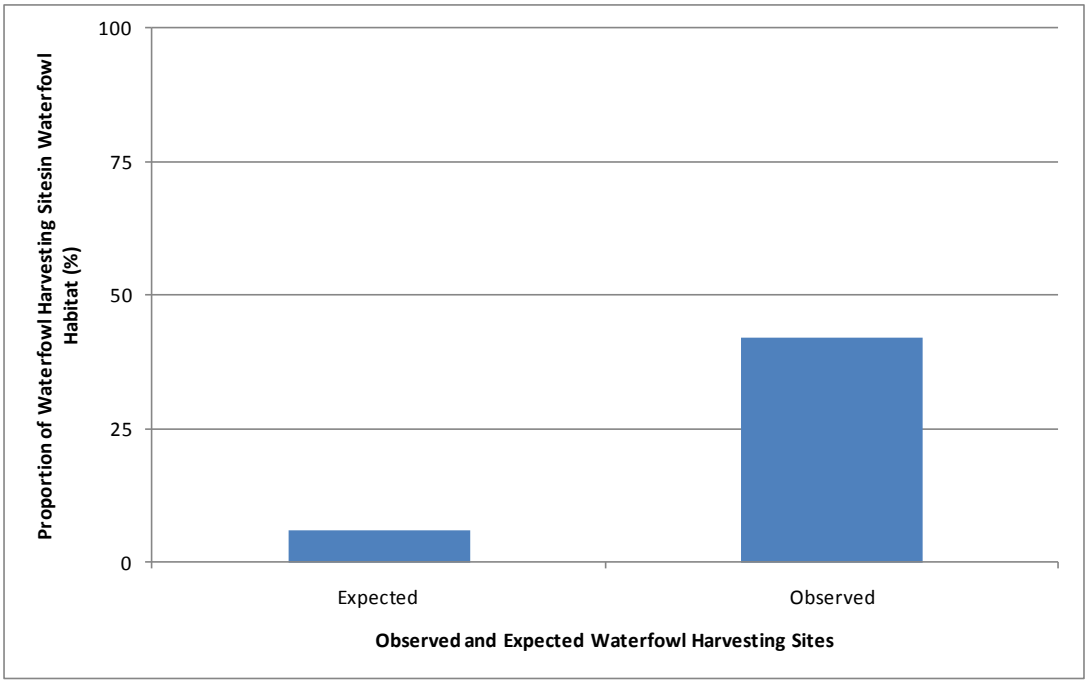


Figure 1: Waterfowl Harvesting Sites in Waterfowl Habitat

Proximity to Water Bodies to Waterfowl Harvesting Sites

A Chi square test was used to test whether waterfowl harvesting sites were predominantly located near a water body. Locations of known waterfowl harvesting sites (observed) were compared to set of random locations (expected) distributed throughout the study area. The distance of the closest water body was calculated for each point within these two datasets. The number of observed and expected harvesting sites within 11 (250, 500, 750, 1000, 1250, 1500, 1750, 2000, 2250, >2500) distance categories was compared.

It was found that the observed number of waterfowl harvesting sites decreased as distance from a water body increased (Figure 2). The observed number of waterfowl harvesting sites near a waterbody was found to be significantly different than the expected (Figure 3) number of waterfowl harvesting sites near a waterbody (Chi square, χ^2=278.83, df=10).

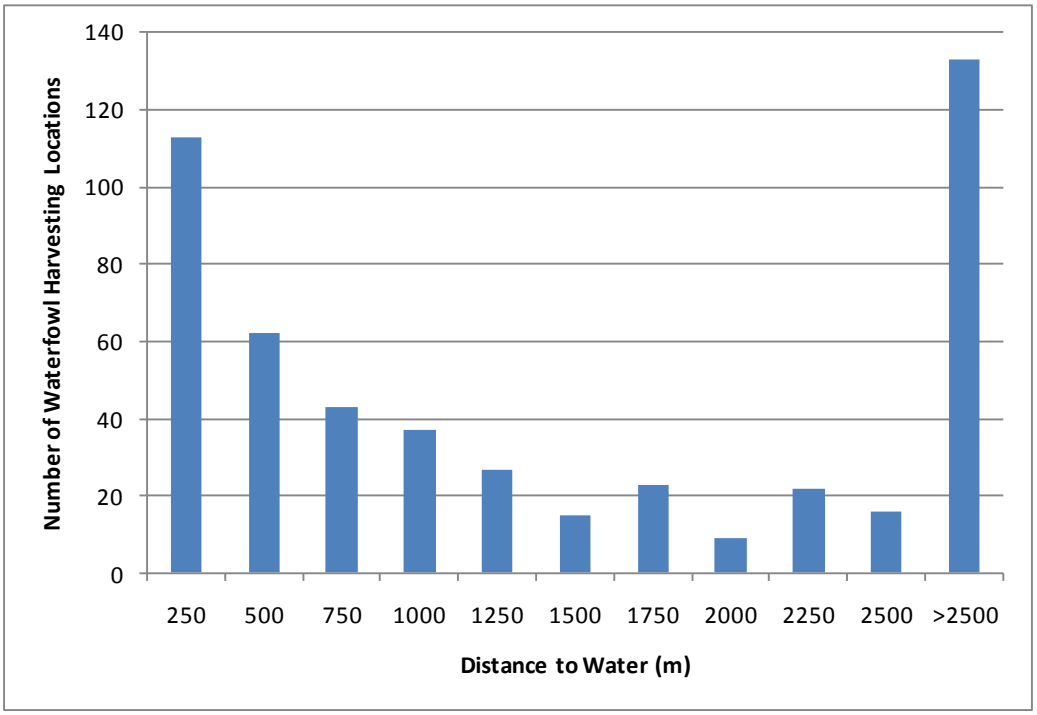


Figure 2: The observed number of waterfowl harvesting sites at increasing distance from water

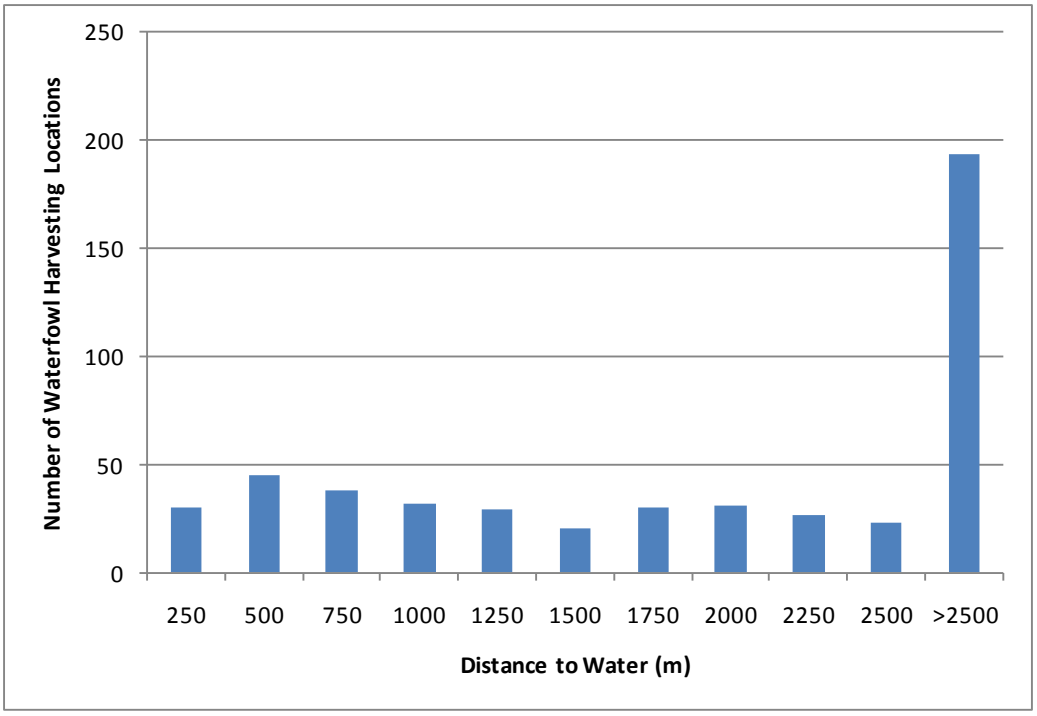


Figure 3: The expected number of waterfowl harvesting sites at increasing distance from water

Proximity of Cabins to Waterfowl Harvesting Sites

A Chi square test was used to test whether waterfowl harvesting sites were predominantly located near cabins. Locations of known waterfowl harvesting sites (observed) were compared to set of random locations (expected) distributed throughout the study area. The distance of the closest cabin was calculated for each point within these two datasets. The number of observed and expected harvesting sites within 10 (500, 750, 1000, 1250, 1500, 1750, 2000, 2250, >2500) distance categories was compared.

It was found that the observed number of waterfowl harvesting sites decreased as distance from a cabin increased (Figure 4). The observed number of waterfowl harvesting sites near a cabin was found to be significantly different than the expected (Figure 5) number of waterfowl harvesting sites near a cabin (Chi square, χ^2=5687.25, df=9).

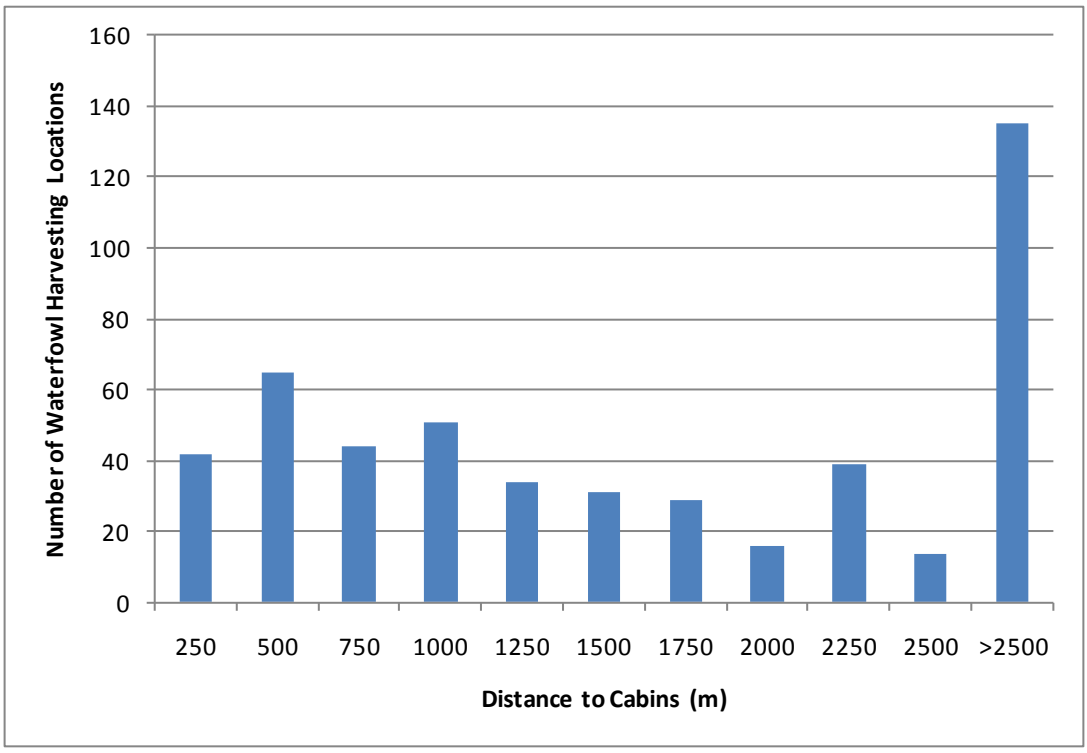


Figure 4: The observed number of waterfowl harvesting sites at increasing distance from cabins

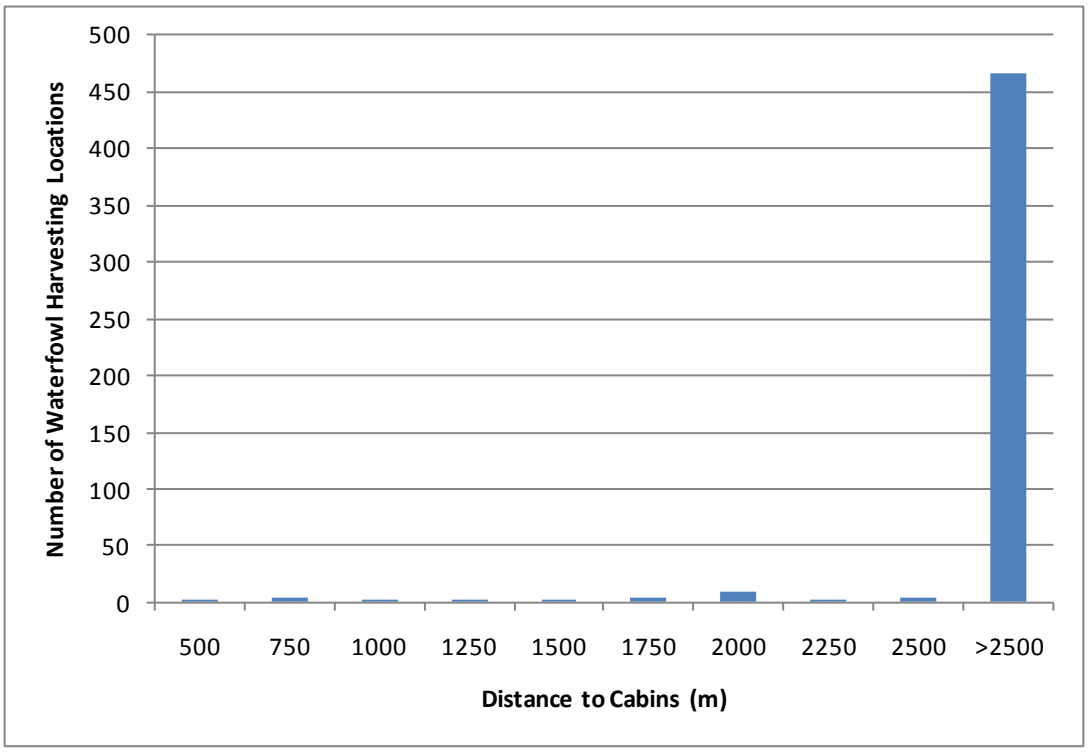


Figure 5: The expected number of waterfowl harvestings sites at increasing distance from cabins

Literature Cited

Bent, A.C., 1987. Life Histories of North American Wild Fowl; Ducks, Geese, Teals, Mergansers, Eiders, Swans, Scoters and Others. Dover Publications, New York, p. 314 + plates.

Hickie, J., 1985. Habitat Management Guidelines for Waterfowl in Ontario for Use in Timber Management. Ontario Ministry of Natural Resources, Ontario.

MSES 2007. Wildlife Impact Assessment Report for the Parsons Creek Resources Project. Part A: Wildlife Baseline. Prepared for Millenium EMS Solutions Ltd., Alberta, Canada.

OPTI-Nexen. 2006. Application for Approval of the Long Lake South Project. Submitted to Alberta Energy and Utilities Board and Alberta Environment.

Roof, J., 1999. *"Anas crecca"* (On-line), Animal Diversity Web. Accessed August 23, 2007 at http://animaldiversity.ummz.umich.edu/site/accounts/information/Anas_crecca.html.

Memo

To:	**Doug Elias**	File no:	**1010**
From:	Abbie Stewart (abbie.stewart@mses.ca)	cc:	**Petr Komers**
Tel:	(403) 701-2398		
Date:	June 1, 2010		

Subject: Considerations for Beaver for the Lower Athabasca Regional - UPDATE

Beaver Habitat

Beaver Habitat Defined

Beaver habitat was based on a habitat model previously developed for a project in the Fort McMurray region, Alberta (MSES Inc. 2007). The beaver habitat model was developed using published literature (Williams 1965, Rezendes 1999, Gallant et al. 2004, Boyle and Owens 2007) and adapted from Allen (1982). Key habitat components for beaver include the presence of adjacent tree and shrub habitat and permanent, low-gradient water bodies. Based on this information, shrub, deciduous forest, and mixedwood forest within 150 m of a water body, coniferous forest within 100 m of a water body, and permanent water were defined as beaver habitat for the analyses herein.

Harvesting Sites in Beaver Habitat

A Chi square test was used to test whether beaver harvesting sites (terry data) were predominantly located within beaver habitat (as defined above). Locations of known beaver harvesting sites (observed) were compared to set of random locations (expected) distributed throughout the study area. It was determined whether each point fell within beaver habitat or outside of beaver habitat for these two datasets. The numbers of observed and expected harvesting sites within beaver habitat and outside beaver habitat was compared.

It was found that the observed number of beaver harvesting sites was significantly different than the expected number of beaver harvesting sites (Chi square, χ^2=113.69, df=1). Figure 1 shows the observed proportion of beaver harvesting sites in beaver habitat compared to the expected proportion of beaver harvestings sites in beaver habitat. A higher proportion of observed beaver harvesting sites occurred within beaver habitat.

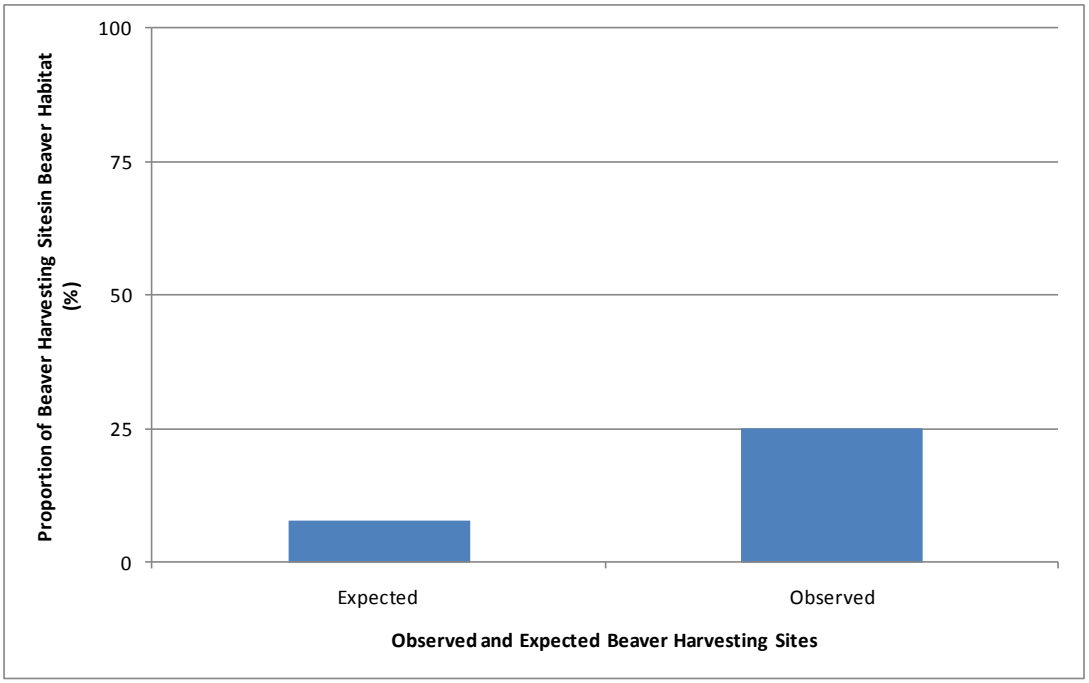


Figure 1: Beaver Harvesting Sites in Beaver Habitat

Proximity to Water Bodies to Beaver Harvesting Sites

A Chi square test was used to test whether beaver harvesting sites were predominantly located near a water body. Locations of known beaver harvesting sites (observed) were compared to set of random locations (expected) distributed throughout the study area. The distance of the closest water body was calculated for each point within these two datasets. The number of observed and expected harvesting sites within 11 (250, 500, 750, 1000, 1250, 1500, 1750, 2000, 2250, >2500) distance categories was compared.

It was found that the observed number of beaver harvesting sites decreased as distance from a water body increased (Figure 2). The observed number of beaver harvesting sites near a waterbody was found to be significantly different than the expected (Figure 3) number of beaver harvesting sites near a waterbody (Chi square, χ^2=352.12, df=10).

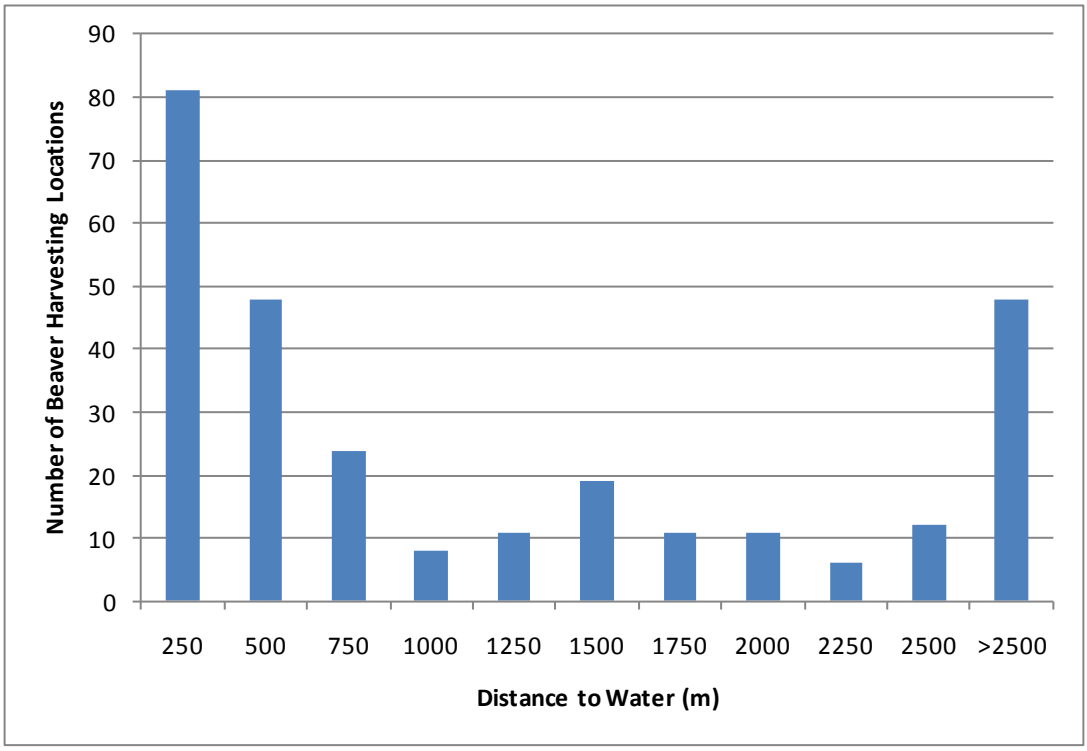


Figure 2: The observed number of beaver harvesting sites at increasing distance from water

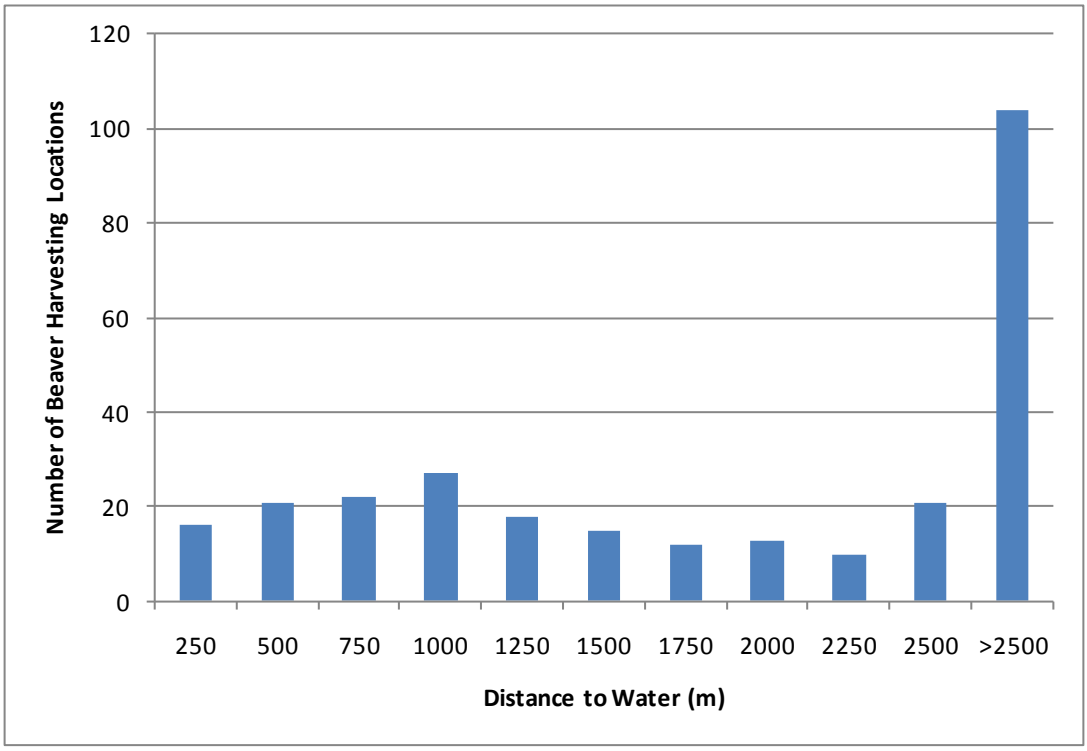


Figure 3: The expected number of beaver harvesting sites at increasing distance from water

Proximity of Cabins to Beaver Harvesting Sites

A Chi square test was used to test whether beaver harvesting sites were predominantly located near cabins. Locations of known beaver harvesting sites (observed) were compared to set of random locations (expected) distributed throughout the study area. The distance of the closest cabin was calculated for each point within these two datasets. The number of observed and expected harvesting sites within 10 (500, 750, 1000, 1250, 1500, 1750, 2000, 2250, >2500) distance categories was compared.

It was found that the observed number of beaver harvesting sites decreased as distance from a cabin increased (Figure 4). The observed number of beaver harvesting sites near a cabin was found to be significantly different than the expected (Figure 5) number of beaver harvesting sites near a cabin (Chi square, χ^2=2853.54, df=9).

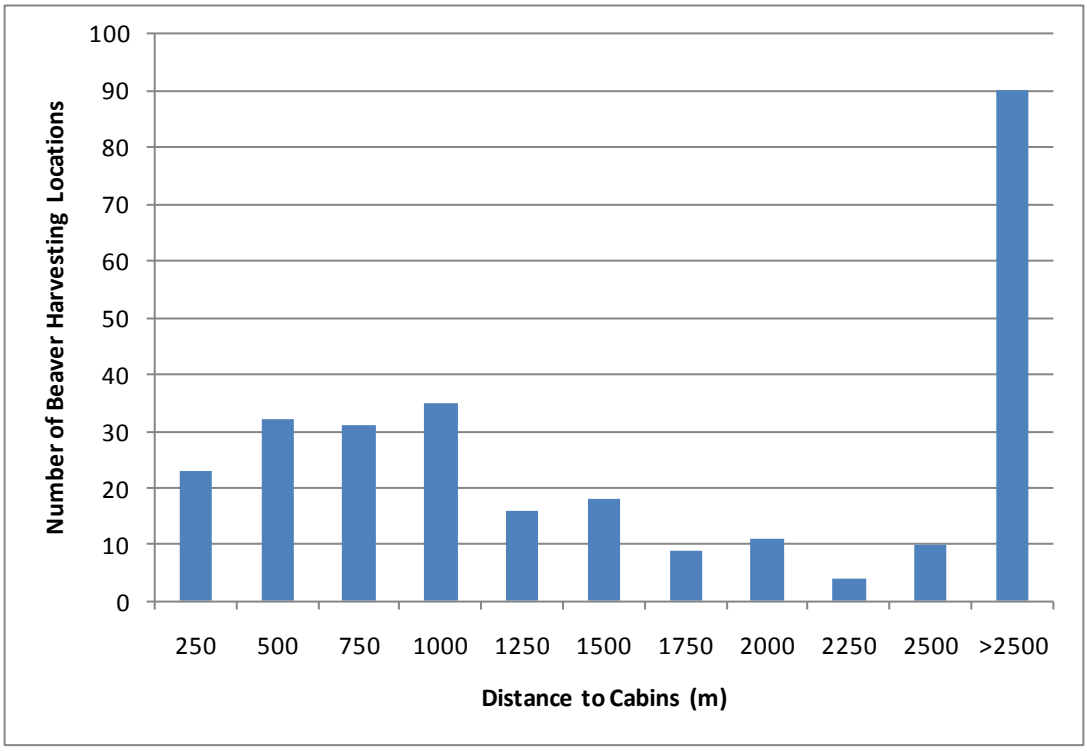


Figure 4: The observed number of beaver harvesting sites at increasing distance from cabins

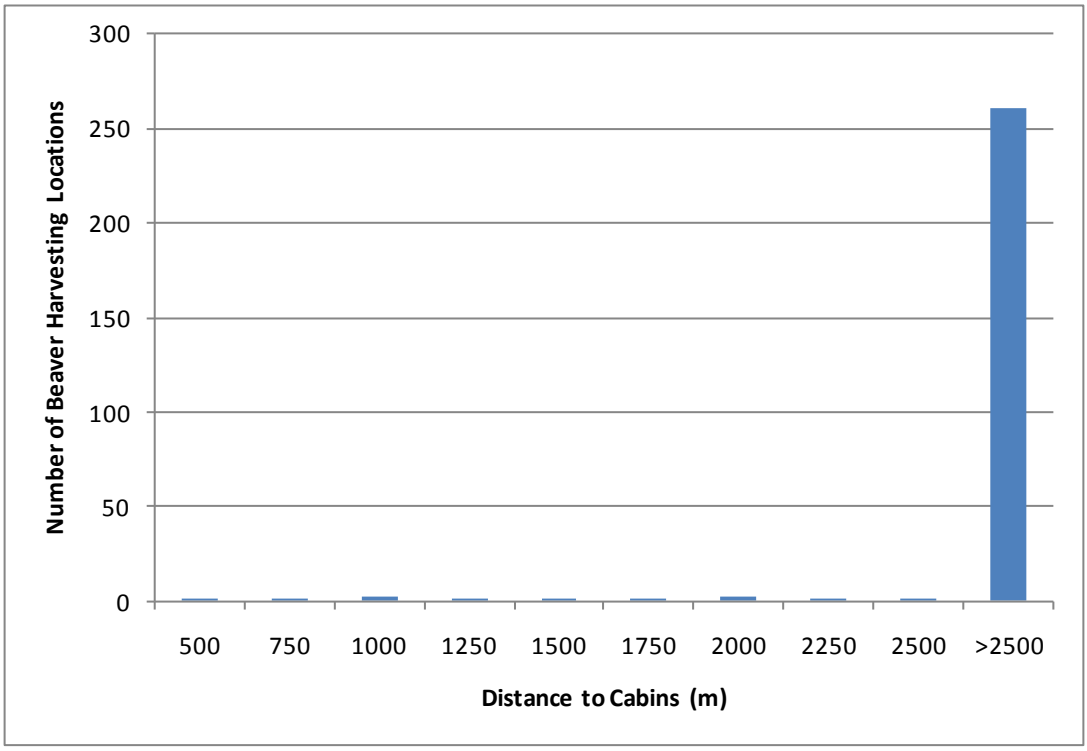


Figure 5: The expected number of beaver harvestings sites at increasing distance from cabins

Literature Cited

Allen, A.W. 1982. Habitat Suitability Index Models: Beaver. U.S. Dept. Int., Fish and Wildlife Service. FWS/OBS-82/10.30. 20 pp.

Boyle, S., and S. Owens, 2007. North American Beaver (Castor Canadensis): A Technical Conservation Assessment. Prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. Available: http://www.fs.fed.us/r2/projects/scp/assessments/northamericanbeaver.pdf [Accessed October 3, 2007].

Gallant, D., C.H. Berube, E. Tremblay, and L. Vasseur, 2004. An Extensive Study of the Foraging Ecology of Beavers (Castor Canadensis) in Relation to Habitat Quality. Canadian Journal of Zoology 82: 922-933.

MSES 2007. Wildlife Impact Assessment Report for the Parsons Creek Resources Project. Part A: Wildlife Baseline. Prepared for Millenium EMS Solutions Ltd., Alberta, Canada.

Rezendes, P., 1999. Tracking and the Art of Seeing: How to Read Animal Tracks and Sign. Firefly Books Ltd., Ontario, Canada. 336pp.

Williams, R.M., 1965. Beaver Habitat and Management. Idaho Wildl. Rev. 17(4): 3-7.

Appendix B

Appendix B is a series of documents describing Mikisew Cree First Nation's requirements for the Nation to fully participate in the benefits of managing lands and resources in their use territory.

Proposal to Develop Athabasca Chipewyan First Nation and Mikisew Cree First Nation Traditional Land and Resource Use Management Plans (TRULMP). Submitted to Government of Alberta Land Use Secretariat. 28 September 2010.

Response to Government of Alberta's Regulatory Enhancement Project (REP). Athabasca Chipewyan First Nation, Mikisew Cree First Nation, and Chipewyan Prairie Dene First Nations to Regulatory Enhancement Task Force. 15 October 2010.

Comments on the Lower Athabasca Regional Advisory Council's Advice to the Government of Alberta Regarding a Vision for the Lower Athabasca Region (the RAC document). Athabasca Chipewyan First Nation, Mikisew Cree First Nation, and Chipewyan Prairie Dene First Nations to Land Use Secretariat. 19 October 2010.

Condensed Analysis of RAC Vision Document. Athabasca Chipewyan First Nation, Mikisew Cree First Nation, and Chipewyan Prairie Dene First Nation.

Joint Submissions of the Mikisew Cree First Nation and the Chipewyan Prairie Dene First Nation on Alberta's Land Use Framework ("LUF").

Technical Reviews of Phase 2 Framework Committee Recommendations. Athabasca Chipewyan First Nation and Mikisew Cree First Nation to Alberta Environment and Department of Fisheries and Oceans Canada. 23 August 2010.

Proposed work plan for consultation on the Lower Athabasca Regional Plan (LARP). Mikisew Cree First Nation to Land-use Secretariat, Sustainable Resource Development. 19 August 2009

Mikisew Cree First Nation – Proposed Work Plan and Budget for Consultation on LARP.

Covering letter, re: Land Use Framework and the development of the Northeast Regional Plan. Mikisew Cree First Nation to Land-use Framework, Sustainable Resource and Environmental Management Alberta. 31 October 2008

Mikisew Cree First Nation Alberta Land Use Framework Review. 28 October 2008

Response to the Multi-Stakeholder Committee Phase II Proposed Options for Strategies and Actions and Submission to the Government of Alberta For the Oil Sands Strategy. Mikisew Cree First Nation to Government of Alberta. June 2007

Response to the Muskeg River Watershed Framework for Water Quantity and Quality. Mikisew Cree First Nation to Alberta Environment. December 2007

CURRICULUM VITAE

Peter Douglas Elias

P.O. Box 1103,
Black Diamond, Alberta, Canada T0L 0H0
403-933-3489
peteli@persona.ca

Education

Bachelor of Arts	University of Manitoba, 1968
Master of Arts	University of Toronto, 1969 (Anthropology/Sociology)
Doctor of Philosophy	University of Toronto, 1974 (Anthropology)
Thesis title	Metropolis and Hinterland in Northern Manitoba

Awards and research grants

1994 University of Lethbridge SSHRC grant **C** $4,000
1993 University of Lethbridge SSHRC grant **C** $4,000
1988 Private Scholar=s SSHRC grant **C** $35,000
1970 John Robarts Graduate Fellowship, University of Toronto **C** $5,500
1969 John Robarts Graduate Fellowship, University of Toronto **C** $5,500

Employment history

2000 - present Private Scholar
1999 - 2001 Adjunct Professor, Faculty of Management, University of Lethbridge, Alberta
1996 - 1999 Professor, Faculty of Management, University of Lethbridge, Alberta (retired 1999)
1991 - 1996 Associate Professor and Coordinator, BESS Program, University of Lethbridge, Alberta.
1989 - 1991 Assistant Professor, Faculty of Management, University of Lethbridge, Alberta.
1984 - 1987 Director of Research, Kaska Dena Council, Lower Post, British Columbia.
1977 - 1982 Director of Research, Dakota Association of Canada, Prince Albert, Saskatchewan.
1973 - 1977 Historic Researcher, Treaty and Aboriginal Rights Research Division, Lac La Ronge and Peter Ballantyne Bands, Saskatchewan.
1972 - 1973 Director of Public Participation, Churchill River Study Board, La Ronge, Saskatchewan. (Wintego Rapids Hydroelectric Development Proposal)
1970 - 1972 Curator of Anthropology, Manitoba Museum of Man and Nature, Winnipeg, Manitoba.

Professional history (highlights)

2009 - present Research consultant, Mikisew Cree First Nation, Alberta. (aboriginal rights in the context of hydrocarbon development)

2009 Project Director, Adams Lake Indian Band, BC. (aboriginal rights in the context of hydroelectric development)
2008 - 2009 Research Director, Big Island Lake Cree First Nation, Saskatchewan. (role of traditional land use information in forest planning and management)
2008 - 2009 Technical analyst, Joint Review Panel, Mackenzie Gas Pipeline. (socio-economic impact analysis)
2007 Research consultant, Treaty 8 First Nations, British Columbia. (treaty rights in the context of oil and gas develeopment)
2004 Research consultant, Canadian Model Forest Network. (role of traditional land use information in forest planning and management)
2001 - 2003 Research consultant, Algonquins of Barriere Lake, Quebec (integrated resource management planning in the boreal and mixedwood forest)
2000 - 2007 Research consultant, Athabasca Denesuline Negotiation Team. Prince Albert, Saskatchewan: Prince Albert Grand Council. (land and resource rights in the caribou taiga and boreal forest)
1999 Advisor, Heiltsuk First Nation, British Columbia. (northern Pacific marine and entrepreneurial development initiatives)
1998 Advisor, INCO=s Voisey=s Bay Mine Enquiry, Newfoundland and Labrador. (nickel mine impacts in the eastern boreal forest)
1997 - 2000 Research consultant. Adams Lake and Neskonlith Indian Bands, British Columbia (traditional use study in the Pacific interior)
1996 Research consultant, Prince Albert Grand Council, Saskatchewan (uranium mine impacts in the boreal forest)
1994 Expert witness in economic anthropology, British Columbia Provincial Court (resource use and subsistence in the East Kootenay region)
1988 Independent Researcher, Scott Polar Research Institute, Cambridge University, England
1988 - 1997 Research consultant, Trilateral Secretariat, Quebec (resource management planning in the boreal and mixedwood forest)
1985 Expert witness in economic anthropology, Court of Queen's Bench, Saskatchewan (resource use and subsistence in the parkland)
1984 - 2002 Research consultant, Kaska Dena Council, British Columbia. (comprehensive land claims research and planning in a mountain and boreal plain landscape)
1980 - 1988 Research consultant, Prince Albert Tribal Council, Saskatchewan (economic and ecological anthropology land claims research in the northern parkland, boreal forest and taiga)
1979 Research consultant, Peter Ballantyne Band, Saskatchewan (graphite mine impacts in the boreal forest)
1978 - 1999 Research consultant, Dakota Nations of Canada (aboriginal rights in the grasslands and parklands of Manitoba and Saskatchewan)

1977 - 1978 Research consultant, Nimpgish Kwakiulth Band, Alert Bay, British Columbia (economic development and fishing rights in the Pacific)
1977 Research consultant, Hearings of the Indian Claims Commissioner (Lloyd Barber) in Northern Saskatchewan (Wintigo Rapids hydroelectric development in the boreal forest)
1975 Research consultant, Policy Committee of Cabinet, Winnipeg, Manitoba (employment of aboriginal workers in northern resource industries)

Teaching and education development

1989 - 1999 Faculty of Management, University of Lethbridge, Alberta
Community Development
Case Studies in Development
Management Research Methods and Techniques
Traditional Aboriginal Economies
Graduate advisor to students at Lethbridge, Trent, Northern British Columbia, and Toronto
1994 - 1998 Academic advisor, Certification and Curriculum, Council for the Advancement of Native Development Officers (CANDO)
1984 - 1985 *Introductory Computers,* Northern Lights College. Lower Post, British Columbia
1983 Curriculum consultant, Montreal Lake Band, Saskatchewan.
1977 - 1981 *Introductory Native Studies,* Saskatchewan Indian Federated College, Extension Services. (lectured in - Prince Albert, North Battleford, Montreal Lake First Nation, Lac La Ronge First Nation, Pelican Narrows First Nation, Prince Albert Penitentiary.)
1972 - 1973 *Introductory Native Studies.* University of Saskatchewan, Extension Services. Lac La Ronge.
1971 - 1972 *Introductory Anthropology*. University of Winnipeg.
1969 - 1970 *Introductory Anthropology*. University of Winnipeg, Extension Services. Churchill, Manitoba.
1968 - 1969 *Anthropology of Religion.* University of Toronto.
1976 Curriculum consultant, Native Studies Division, Education Saskatchewan.
1972 Recruiter, Brandon University Northern Teacher Education Program, Manitoba.

Written work (published or made public)

2009 Secwepemc Use of Lands and Resources in the Mica 5-6 Project Area, British Columbia. Adams Lake Indian Band, Chase, British Columbia.
2004 Standards for Aboriginal Cultural Research in Forest Management Planning in Canada. Canada=s Model Forest Network, Aboriginal Strategic Initiative, Project ASI-03/04-003.
2003 Athabasca Denesuline Territory: 2,600 Years of History. Athabasca Denesuline Negotiation Team. Prince Albert, Saskatchewan: Prince Albert Grand Council.

2003 ÁStandards Development and Designing Methodologies.@ In Proceedings *Indigenous Peoples and Forest Stewardship Council Certification: Joint NAFA/FSC Canada Conference.* Ottawa: August 17-18, 2001.

2002 The Dakota in Western Canada : Lessons in Survival. Reprint. Regina: Canadian Plains Research Centre, University of Regina.

2000 The Highwood River: An Explorer=s Guide to a Rocky Mountain River Basin. Calgary: OutsideGuide.

1999 Grassland to Rockland: An Explorers= Guide to the Ecosystems of Southernmost Alberta. Calgary : Rocky Mountain Books.

1999 ÁResearch Technologies in Land Claims, Treaties, Impact Assessment, and Co-Management Strategies.@ In Proceedings *Learning From the Past : A Historical Look at Mountain Ecosystems.* Columbia Mountain Institute for Applied Ecology, Revelstoke, British Columbia. 22 April - 23 April 1999.

1999 ÁBeyond the Law: Better Uses of Aboriginal Title Research@. In Proceedings *Implementing Delgamuuk=w - Implications for Aboriginal Title Research in British Columbia.* Union of British Columbia Indian Chiefs. Vancouver, British Columbia. 01 March - 03 March 1999.

1999 ÁDirecting GIS Applications in Aboriginal Traditional Use Research@. In Proceedings *GIS›99 C GeoSolutions: Integrating Our World.* EcoTrust Canada. Vancouver, British Columbia. 03 March - 04 March 1999.

1999 Land Use Traditions of the Shuswap. Ministry of Forests, British Columbia.

1999 Land Use Traditions of the Kaska Dena. Ministry of Forests, British Columbia.

1997 Algonquin of Barriere Lake Socioeconomic Profile. Trilateral Secretariat, Quebec.

1997 ÁAlternative Development Models of Aboriginal Economies in Canada's North.@ International Journal of Social Economics 24(11):1241-1255

1996 ÁWorklessness and Social Pathologies in Aboriginal Communities.@ Human Organization 55(1):13-24.

1996 ÁThe Man Who Shot the Ram@. Political and Legal Anthropology Review 19(2):71-84. (With Peter Burns)

1995 Northern Aboriginal Communities: Economies and Development. York University: Captus University Publications.

1994 Book review. Richard Bartlett, Resource Development and Aboriginal Land Claims. In Canadian Ethnic Studies 26(2):162-163.

1994 ÁNorthern Peoples, Northern Forests and the Future.@ In *Model Forests Network Committee Meeting.* Port Alberni, British Columbia. 16 May 1994.

1993 Book review. George Lithman, Rick R. Riewe, Raymond E. Wiest and Robert E. Wrigley (eds), People and Land in Northern Manitoba. In Culture 13(1): 100-101.

1993 Book review. Rick Riewe and Jill Oakes (eds), Human Ecology: Issues in the North. In Culture 13(1): 100-101.

1993 AReport from the Round Table Rapporteur.@ In Sharing the Harvest: The Road to Self-Reliance. Report of the National Round Table on Aboriginal Economic Development and Resources. Royal Commission on Aboriginal Peoples. Ottawa: Canada Communication Group, Publishing. pp. 7-24.
1993 AAnthropology and Aboriginal Claims Research.@ In Anthropology, Public Policy and Native Peoples in Canada, Noel Dyck and James Waldram, eds. Montreal: McGill-Queen's University Press. pp. 233-270.
1991 Development of Aboriginal People's Communities. York University: Captus University Press.
1990 AWage Labour, Aboriginal Rights, and the Cree of the Churchill River Basin, Saskatchewan.@ Native Studies Review 6(2):21-42.
1989 ARights and Research: The Role of the Social Sciences in the Legal and Political Resolution of Land Claims and Questions of Aboriginal Rights.@ Canadian Native Law Reporter 1:1-43.
1989 AAboriginal Rights and Litigation: History and Future of Court Decisions in Canada.@ Polar Record 25(152):1-8.
1990 Book review. Robin Riddington, Trail to Heaven: Knowledge and Narrative in a Northern Native Community. Iowa City: University of Iowa Press, 1988. American Ethnologist 17(2):394-395.
1990 ASelf-Reliance Beyond Land Claims@. In *The Economic Bridge to Self-Reliance: Aboriginal Land Claims.* Native Investment and Trade Association (NITA). Vancouver, British Columbia. 12 May 1990.
1988 The Dakota in Western Canada : Lessons in Survival. Winnipeg: University of Manitoba Press. (republished in 2002)
1986 Kaska Dena Land Use and Occupancy in British Columbia. Kaska Dena Council, British Columbia.
1985 Kaska Dena Land Use and Occupancy in Yukon. Kaska Dena Council, British Columbia.
1985 ADakota Farmers of Manitoba.@ Horizon Canada 1(11):254-259.
1985 ADakota.@ The Canadian Encyclopaedia. James H. March, ed. Edmonton: Hurtig Publishers. (republished since.) Toronto: McClelland and Stewart
1982 AImplications of the Canada Act for household economies in the North.@ Presented at the 23rd Annual Meeting of the Western Association of Sociology and Anthropology. Saskatoon, Saskatchewan. 12 February 1982.
1981 AEconomic Self-determination for Indian People.@ In: The First Nations: Indian Government and the Canadian Constitution, Delia Opekokew, ed. Federation of Saskatchewan Indian Nations Press.
1981 Work in Northern Saskatchewan. Federation of Saskatchewan Indians.
1979 Dakota Land Rights. Saskatchewan Education.
1977 Native Employment in Northern Manitoba. Planning Secretariat of Cabinet, Manitoba.
1977 Exhibition review. University of British Columbia Museum of Anthropology. Canadian Museums Association Gazette 10(2):58-62.
1976 Aski-Puko: The Land Alone. Federation of Saskatchewan Indians. (with Peter Brook and Peter Burns)

1976 Book review. Frederic Dumas, Underwater Archaeology: A Nascent Discipline. Paris: UNESCO. Canadian Museums Association Gazette 9(3):36.

1976 Exhibition review. The Moose Jaw Western Development Museum. Canadian Museums Association Gazette 9(4):45-48.

1976 AIndian Politics in the Canadian Political System.@ In The Patterns of Amerindian Identity, Marc-Adelard Tremblay, ed. Les Presses de l'université Laval, Québec.

1975 Metropolis and Hinterland in Northern Manitoba. Winnipeg: Manitoba Museum of Man and Nature.

1973 ADoes Charlie Dysart know what he is talking about?@ The Northian 9(3):11-19.

1968 AA Key Pictograph from the Bloodvein River, Manitoba@. American Antiquity 33(4):499-501. (with John H. Steinbring)

1967 AAnimal Designs in Rock Painting@. Zoolog: Quarterly Journal of the Zoological Society of Manitoba 8(4):10-11. (with John H. Steinbring)