Opaskwayak Cree Nation Wetland Ethnoecology:

Land, Identity and Well-being in a Flooded Landscape

by

Alli N. Morrison

A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

In partial fulfillment of the requirements of the degree of

MASTER OF NATURAL RESOURCES MANAGEMENT

Natural Resources Institute

Clayton H. Riddell Faculty of Environment, Earth and Resources

University of Manitoba

Winnipeg

Copyright © 2012 by Alli N. Morrison

THE UNIVERSITY OF MANITOBA

FACULTY OF GRADUATE STUDIES

*****

COPYRIGHT PERMISSION

Opaskwayak Cree Nation Wetland Ethnoecology:

Land, Identity and Well-being in a Flooded Landscape

by

Alli N. Morrison

A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

In partial fulfillment of the requirements of the degree of

MASTER OF NATURAL RESOURCES MANAGEMENT

Copyright © 2012 by Alli N. Morrison

Permission has been granted to the Library of the University of Manitoba to lend or sell copies of this thesis/practicum, to the National Library of Canada to microfilm this thesis and to lend or sell copies of the film, and to University Microfilms Inc. to publish an abstract of this thesis/practicum.

This reproduction or copy of this thesis has been made available by authority of the copyright owner solely for the purpose of private study and research, and may only be reproduced and copied as permitted by copyright laws or with express written authorization of the copyright owner.

ABSTRACT

The Saskatchewan River Delta (SRD) is the largest freshwater inland delta in North America, covering over 950 000 hectares in central Saskatchewan and Manitoba. The wetlands in the SRD provide valuable ecosystem services and support considerable biodiversity. The Opaskwayak Cree Nation (OCN) has expressed concerns regarding the loss of wildlife in the SRD, among other ecological concerns, due to anthropogenic development. Using an ethnoecological approach, the indigenous knowledge of the OCN was documented through an analysis of wetland-based practices. A variety of methods were employed in the research including participant observation, interviews, document review and verification workshops. Interviews held with community Elders also focused on the connections between a life on the land, well-being and cultural identity. The research revealed the need for a more holistic approach to management of the sensitive wetland ecosystems located with OCN traditional territory that reflects the changing values of the community.

ACKNOWLEDGEMENTS

From the Opaskwayak Cree Nation (OCN), I would like to sincerely thank those individuals that comprised the research team including Elders Raymond Ross Lathlin, Mabel Bignell, Moses "Moe" Bignell, Stanley McGillivary, Philip Dorion and Oliver Bignell. Thank you also to all those Elders that participated in the community interviews and museum oral histories. The knowledge and experiences I have gained from these individuals is not afforded to everyone and, for that, I am tremendously grateful. More specifically, thanks to Mabel for her tireless translation work and early support of the project. Also, thank you to Raymond and Moe - I will never forget our time out on the land. Thanks to Carla Buck for sharing in many fun experiences and for her technical assistance with GIS. Thank you to Diane Ballantyne for her logistical contributions - without her, the fieldwork would not have gone as smoothly as it did.

In The Pas, thank you to Shaun Greer and Chris Woodward of Ducks Unlimited Canada for their logistical and technical support during fieldwork, as well as for allowing me to visit wetlands through means which otherwise may not have been possible. I would like to thank the Sam Waller Museum for acknowledging the importance of documenting indigenous knowledge through the act of conducting oral histories with Opaskwayak Cree Nation Elders. Thank you also to Manitoba Conservation for providing me with accommodations of the quality not typically encountered during a field season.

Thank you to my advisor, Dr. Iain Davidson-Hunt, for providing me with this remarkable experience and for the incredible guidance and insight. I would like to thank my thesis committee members consisting of Ms. Mary Head, Dr. Michael O'Flaherty and Dr. Dale Wrubleski for each contributing their own unique skills and knowledge to the outcome

of this research. Thank you also to Tamara Keedwell and Dalia Naguib for their ongoing administrative support.

Thank you to my friends and family. I would like to acknowledge my classmates at the NRI. I have thoroughly benefited from the experiences of these last two years and I attribute much of that to them. Thank you always to my parents, Ron and Judy, my brother Jem and my sister Tracy for their unwavering support. Even though there has not always been a complete understanding of the work I was doing, they were always there to offer words of encouragement.

This research was funded by Ducks Unlimited Canada through the support of Manitoba Hydro. Without these generous financial contributions, this project would not have been possible. Thank you.

Although I have many people to thank for their hard work, guidance and support that greatly contributed to the outcome of this thesis document, I alone am responsible for its shortcomings.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: INTRODUCTION

Alternative strategies to conventional resource management are required to address the global environmental crisis that has been linked to the wide spread development of natural resources (Berkes et al. 2003; Toledo 1992). Ethnoecology has been identified as having the potential to provide an understanding of the factors necessary for sustainable development through the consideration of both ecological and social elements examined through the lens of cultural diversity (Posey et al. 1984; Rist and Dahdouh-Guebas 2006). Ethnoecological research bridges disciplines and multiple knowledge systems allowing for the co-production of knowledge that is relevant to natural resource management (Rist and Dahdouh-Guebas 2006). Through the study of local forms of knowledge and perceptions towards the environment, ethnoecology has the ability to integrate Western science and indigenous knowledge for ecological sustainability (Rist and Dahdouh-Guebas 2006).

Recently, approaches to natural resource management such as the Millennium Ecosystem Assessment (MA), have indicated a relationship between ecological sustainability and human well-being (Berkes and Davidson-Hunt 2006; MA 2003). Likewise, for many local and indigenous communities, ecosystem health is closely related to well-being (Parlee et al. 2005). The traditional livelihoods of these communities are dependent on complex relationships between the natural environment, well-being and cultural identity (Adelson 2000; Parlee et al. 2005). The indigenous knowledge generated through intimate interactions with the land has the potential to contribute towards a holistic approach in achieving social-ecological sustainability (Berkes and Davidson-Hunt 2006; Parlee et al. 2005). Therefore, this thesis explores the indigenous knowledge of one of Canada's First Nations communities regarding the sensitive wetland ecosystems located within their traditional territory to better

ascertain the implications that ecological changes have had on the ability to participate in customary livelihood activities. Through this research, an improved understanding of the impacts that altered ecosystems are having on human well-being at a local level has been achieved.

1.1 Research Background and Context

1.1.1 Saskatchewan River Delta

The Saskatchewan River Delta (SRD) is the largest freshwater inland delta in North America, covering over 950 000 hectares. The SRD is located in the Mid-Boreal Lowland Ecoregion within the Saskatchewan River Basin, straddling the border of central Saskatchewan and Manitoba (DUC 2008; Figure 1.1). Approximately 81 percent of the SRD consists of a diversity of wetland ecosystems, which provide valuable ecosystem services such as carbon sequestration, water regulation, water purification, flood control and erosion reduction (DUC 2008). The area also supports a considerable amount of biodiversity including an abundance of plants, over 200 species of birds, 43 species of mammals and 48 species of fish (DUC 2011). The SRD has been recognized internationally as a Canadian Important Bird Area due to the role the delta plays in providing nesting and migration habitat for waterfowl populations (IBA Canada 2011; Lindgren 2001). In addition, extensive human activities are sustained by these water and wetland ecosystems including hunting, fishing, trapping, recreation and tourism (DUC 2008). As indicated, the SRD provides a variety of ecological, economic and cultural benefits to the region, the country and the continent.

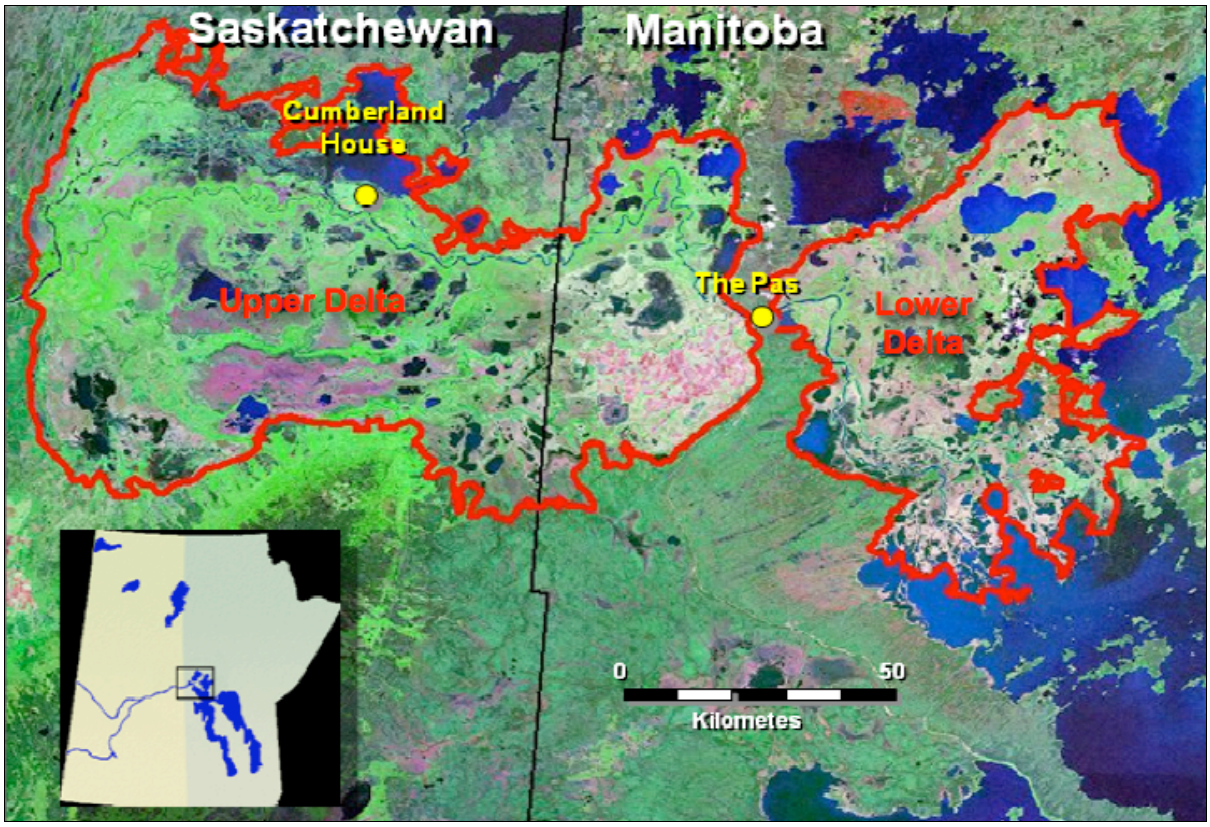

Figure 1.1 Location (inset) and extent of the Saskatchewan River Delta (red) in Saskatchewan and Manitoba (DUC 2006).

The SRD is facing various threats due to the expansion of human influence. The SRD is fed largely by the Saskatchewan River, which supports a variety of upstream activities including hydroelectric generation, petroleum production, agricultural irrigation and drinking water (DUC 2011). For example, the E. B. Campbell Dam, which formed Tobin Lake, was completed in 1963 and is located approximately 30 kilometres upstream of the SRD (Partners FOR the Saskatchewan River Basin 2009). The project has led to reduced sediment flows downstream within the SRD. As well, the Gardiner Dam and accompanying reservoir, Lake Diefenbaker, were completed upstream of the SRD on the South Saskatchewan River in 1967 and resulted in reduced peak water flows in the delta (Partners FOR the Saskatchewan River Basin 2009). Downstream developments have also had

negative impacts on the SRD. For instance, the Grand Rapids generating station that was constructed in 1964 resulted in the permanent flooding of over 100 000 hectares of the lower delta upstream of Cedar Lake (DUC 2011; Waldram 1984). Continued agricultural expansion and river diversion projects have also contributed to the deterioration of wetlands in the SRD (DUC 2011). The cumulative impacts of these upstream and downstream uses have resulted in the substantial alteration of the hydrologic regime in the SRD.

Prior to these developments, the Saskatchewan River had two annual high-water periods occurring in spring and early summer, which were important in depositing nutrients and sedimentary soils within the SRD (DUC 2011). Equally as important to the wet periods, were the natural occurrences of drought in the river, which caused wetland water levels to decrease. It has been suggested that this wet-dry cycle ensured the overall productivity and fertility of the SRD (DUC 2011). However, as a result of the aforementioned anthropogenic developments, the SRD has experienced drier conditions (Smith 2004), potentially reducing the ability of the wetlands to provide important ecosystem services and to sufficiently support wildlife populations.

Management of water levels has been occurring in the SRD since the 1930s when the provincial governments of Manitoba and Saskatchewan, the federal government and private stakeholders attempted to stabilize water levels with the hope that it would lead to an increase in muskrat populations for trapping (Baschuk 2010). Recognizing the importance of the SRD in supporting waterfowl populations, Ducks Unlimited Canada (DUC) began managing the wetlands in the 1940s using water control structures (Baschuk 2010). Initially, water management by DUC was used to stabilize water levels to provide enhanced waterfowl habitat in the summer (Baschuk 2010; Ervin 2011). However, more recent management

plans have attempted to replicate the natural wet-dry cycle that has historically occurred in the SRD (Baschuk 2010). These management efforts have had varied success due to the complex ecological interactions occurring within the wetlands of the SRD (DUC 2011).

As a consequence of the unique ecological factors of these wetland ecosystems, DUC initiated the Summerberry Marsh Research Project in 2006 to collect scientific information on the effects of water level management practices. The specific objectives of the project were to understand the effects of different water level treatments on water quality, vegetation, waterfowl and muskrats. Six wetlands in the Summerberry Marsh Complex located 25 kilometres southeast of The Pas, Manitoba were selected for the project (Figure 1.2). Using existing water control structures, three of the wetlands were partially drawn down to emulate natural water cycles while the remaining three were maintained at high-water levels. The research took place between 2007 and 2010, with the results indicating that a variety of management techniques, including partial draw down and high water, could help produce the diversity of wetland habitats required to support biodiversity in the SRD (DUC 2011).

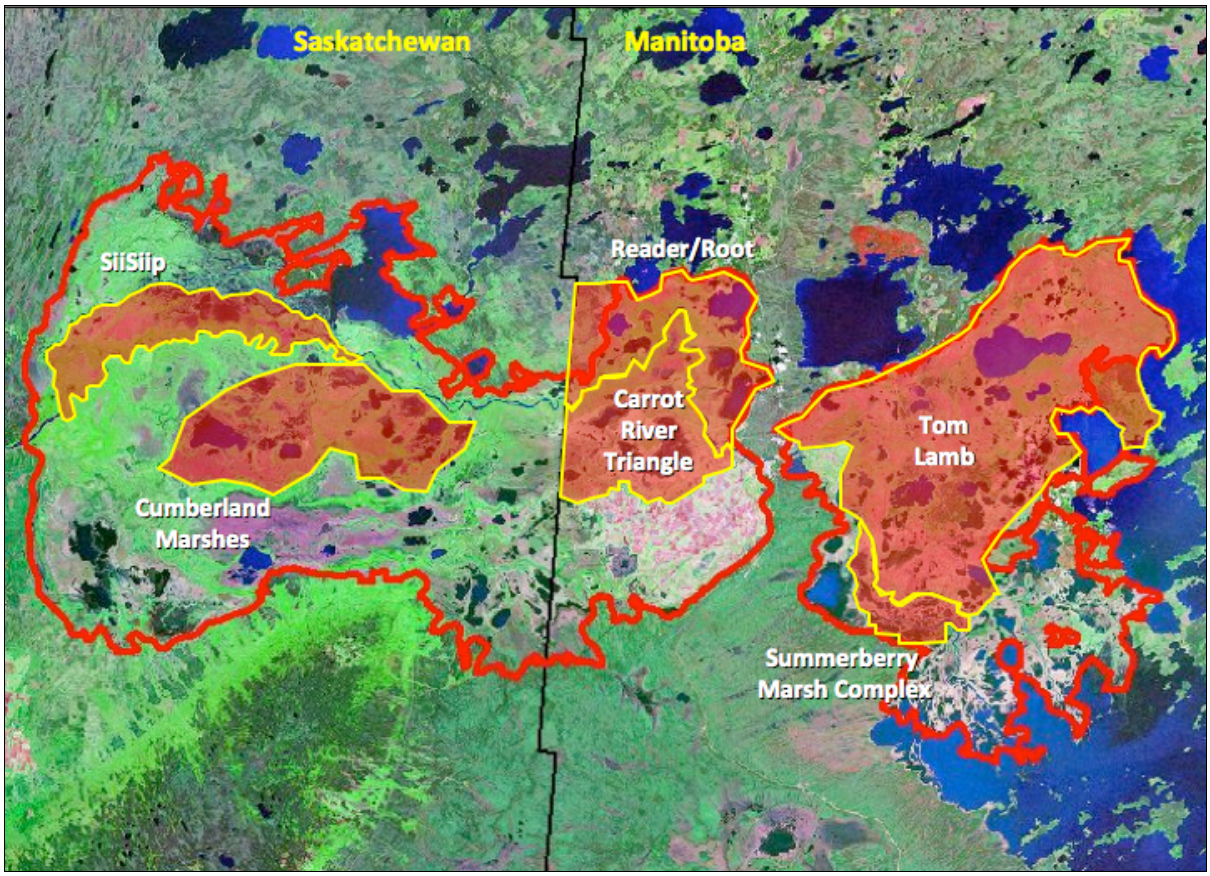

Figure 1.2 Major marsh complexes managed by Ducks Unlimited Canada within the Saskatchewan River Delta (DUC 2012a).

1.1.2 Opaskwayak Cree Nation

The Opaskwayak Cree Nation (OCN) has 5 433 registered members with 3 159 individuals living on the Reserve (INAC 2012a). The community, which has traditional territory located within the SRD, has participated actively in resource management since 1969 and signed an Agreement for the Joint Management of Natural Resources with the Government of Manitoba in February of 2007 (Government of Manitoba 2010). The focus of the Agreement has been on improving natural resource management through consultation, increased communication and information exchange (Government of Manitoba 2010). The OCN has a long history of utilizing the wetlands located in the SRD for hunting, trapping and

fishing as a source of subsistence. The wetland ecosystems are also of cultural importance to the OCN, acting as a location for families to participate in traditional activities.

The OCN and other First Nations communities living in the SRD have expressed concerns regarding loss of wildlife such as muskrat, moose and waterfowl due to impacts from anthropogenic developments in the SRD. Although research such as the Summerberry Marsh Project have provided important scientific information for wetland management in the SRD, further research is needed on the impacts of altered ecosystems on local communities such as the OCN. Insights gained from indigenous knowledge could provide natural resource managers with an increased understanding of the economic, cultural and ecological impacts resulting from the altered wetland ecosystems of the SRD.

1.2 Research Purpose and Objectives

The focus of my research was to explore indigenous knowledge as it relates to the diversity of wetlands ecosites within the SRD that are used to provide ecosystem services to the OCN. Specifically, the objectives of this research were to:

1. Document OCN indigenous knowledge of the diversity and uses of organisms found within the wetlands;
2. Record OCN indigenous knowledge on the relationships amongst the organisms of wetlands; and
3. Understand how a reduction in ecosystem services provided by wetlands is impacting the well-being of the OCN people who use the SRD.

1.3 Research Approach

Conducting qualitative and, specifically, ethnographic research is inevitably complex, which makes it difficult to determine a plan that will not deviate from its path (Nelson 1991). To counter this, my research methodology was interactive adaptive and remained flexible throughout the entire process (Nelson 1991). The specific methods of data collection included participant observation during field excursions, semi-structured and unstructured interviews, document review, and verification workshops.

The research objectives remained clear but general in order to achieve the necessary level of adaptability. Objectives 1 and 2 attempted to address the ethnoecological component of the research through an exploration of the indigenous knowledge of the wetlands located in the SRD. The ethnoecological research lent itself towards a participatory and collaborative approach of the wetland-based knowledge of OCN Elders and other community members. The purpose of Objective 3 was to understand the interactions between ecosystem services and human well-being and the effects that altered wetland ecosystems are having on the ability of the community members of the OCN to maintain their livelihood practices.

1.4 Significance of Research

Increasingly, natural resource management has seen a move towards inter- and transdisciplinary approaches in order to manage complex ecosystems while accounting for a diversity of human interests (Ewel 2001; Rist and Dahdouh-Guebas 2006). Scientists and managers have come to understand that the effects of development on ecosystems are equally as dependent on socioeconomic and demographic influences as they are on the ecological

factors of an ecosystem (Ewel 2001). My research project is unique in that it draws upon the disciplines of both ethnoecology and ecology to provide lessons for the effective management of natural resources in the SRD.

More specifically, the research provides an understanding of the relationship between ecosystem services and human well-being. Examining this relationship demonstrates the importance in maintaining ecosystem health for the important services these natural ecosystems contribute to human well-being. As ethnoecological knowledge and criteria for human well-being are context specific, research of this type tends to be conducted largely on a community-by-community basis. Consequently, the project has provided a site-specific approach for conducting research on the indigenous knowledge of the ecologically important wetlands found within the SRD.

The research has had applications for the community itself in that it involved the observation and recording of indigenous knowledge that is of cultural importance to the people of the OCN. The outcomes of the research have also contributed to the "pool of adaptive solutions" that may help to address large-scale environmental issues (Maffi 2010, 10). As well, the results have supported the safe guarding of valuable indigenous knowledge and provided a basis for future academic research. This documentation will also be as an additional step in achieving support for the OCN Natural Resource Council to further their participation in the management and decision-making process of the wetlands located within their traditional territory.

1.4.1 Limitations

Drawing upon the field of ethnoecology, an initial aim of the research was to potentially contribute towards the literature concerning indigenous classification systems at a landscape level that are formed as a result of knowledge, land practices and sociocultural beliefs. However, it became clear during fieldwork that the research team consisting of knowledgeable OCN Elders did not adhere to a clear ethnoecological classification system for the wetlands located within the SRD. Although differentiation between wetland types may have been limited as a result of environmental conditions at the time of fieldwork, including an extreme flooding event, a comparison between an indigenous classification system and a Western classification system was not an outcome of this research.

1.5 Thesis Organization

This thesis document is comprised of seven chapters. Chapter 1 has included a brief introduction to the research community and study site, as well as a general overview of the research project. Chapter 2 includes a review of the relevant literature regarding the field of ethnoecology and its origins in the ethnosciences. An analysis of the literature concerning the interactions between ecosystem services and human well-being is also included in Chapter 2. Chapter 3 is comprised of the methodological approach and individual methods employed in this research project. Chapter 4 presents a historical review of the socioeconomic, political and ecological factors that have contributed to the contemporary cultural identity of the OCN. Chapter 5 uses an ethnoecological approach to document OCN indigenous knowledge through the analysis of wetland-based practices, as well as the related social and ecological impacts that have led to a reduced participation in these culturally

important livelihood activities. The findings of this chapter are relevant to Objectives 1 and 2, which pertain to the documentation of OCN indigenous knowledge. Chapter 6 explores the local criteria for well-being to determine if the criteria are dependent on a life on the land and, therefore, the impacts that a reduction in ecosystem services as a result of degraded ecosystems are having on the OCN (Objective 3). Elements related to Objective 2 are also discussed in this chapter regarding the interrelatedness of all beings according to Cree epistemology. Chapter 7 provides a synthesis of the main results and reflects on the potential outcomes of the research.

CHAPTER 2: LITERATURE REVIEW

2.1 Ethnosciences

To achieve enhanced sustainability, natural resource management must attempt to integrate Western scientific knowledge with other forms of local or indigenous knowledge (Rist and Dahdouh-Guebas 2006). As a consequence, contemporary resource management requires an inter- and transdisciplinary approach towards knowledge production (Daily and Ehrlich 1999; Rist and Dahdouh-Guebas 2006). These approaches are important because they account for the complex socioeconomic influences that can impact the environment and acknowledge that conventional Western science can generate only a portion of the facts required to achieve sustainability (Norgaard 2004). In attempting to produce knowledge, ethnoscience and, more specifically, ethnoecology has been considered a useful tool in bridging the disciplines of the natural and social sciences while also recognizing culturally diverse worldviews (Rist and Dahdouh-Guebas 2006).

2.1.1 Indigenous Knowledge

Prior to examining ethnoecology, or the *study* of local and indigenous knowledge, an initial consideration of this form of knowledge itself is warranted. For the purposes of my research, the knowledge held by an indigenous community regarding their surrounding environment is termed *indigenous knowledge*. Indigenous knowledge, which has been used interchangeably with traditional ecological knowledge, can be defined as "a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including

humans) with one another and with their environment" (Berkes 2008, 7). As a way of knowing, indigenous knowledge is dynamic and has the potential to adapt to changes in the surrounding environment over time through experiential learning (Berkes 2008).

I chose to utilize indigenous knowledge as opposed to the concept of traditional ecological knowledge because the term *traditional* has the potential to portray this type of knowledge as irrelevant in the contemporary world (Toledo 1992). As well, the concept of tradition does not generally complement the idea of change and adaptability (Berkes 2008). I myself have heard the words 'historical' and 'traditional' used synonymously in describing indigenous ways of knowing and do not believe that these descriptors provide an adequate representation of this form of knowledge.

Notably, the term *ecological* is absent from the phrase indigenous knowledge. As the area of interest in the field of ethnoecology concerns the environment and natural resources, some authors have expressed concerns that there are disciplines of ethnoscience that do not address ecological relationships (Berkes 2008). Alternatively, I would argue that most, if not all, indigenous knowledge has roots in land-related practices, processes or content – even ethnoastronomy, for example – making mention of the term ecological superfluous. Accordingly, I believe that indigenous knowledge is effective in encapsulating the knowledge, practice or beliefs held by indigenous or local peoples that are related to the land or natural environment.

In recent years, there has been an increased recognition of the important contributions that indigenous knowledge can provide for natural resource management (MA 2005d; Reid et al. 2006). Integrating multiple knowledge systems of conventional Western science with indigenous knowledge can help achieve both ecosystem health and ensure sustainable

socioeconomic development for a variety of reasons (MA 2005e). First, individuals from local communities have an intimate knowledge of ecosystems that may be unique to their region. Second, multiscale assessments should be applicable to users at all scales including those at the local or regional level, making the inclusion of local knowledge important. Third, interdisciplinary practices can be improved with a variety of worldviews or perspectives, which can then contribute towards eliminating the separation between research and policy. Finally, local communities can be empowered by the documentation and application of their knowledge. For these reasons, the integration of multiple knowledge systems into natural resource management has become a predominant practice (MA 2005e).

2.1.1.1 Opaskwayak Cree Nation Indigenous Knowledge

The Swampy Cree people of the OCN have been in contact with Western society at least since Henry Kelsey of the Hudson Bay Company first traveled through the area in the late 17th century (OCN 2012). As a result of their extensive contact with Western civilization, OCN indigenous knowledge regarding the natural environment has been impacted over time. Even so, as Berkes (2008) notes regarding the James Bay Cree, I would argue that the community continues to embody a worldview that generates knowledge that may be relevant to natural resource management. Therefore, individuals that continue to participate or have previously participated in traditional harvesting practices will hold valuable knowledge of the ecologically important wetlands located within the SRD.

Indigenous knowledge is generated locally as determined by environmental conditions and is dependent on cultural, as well as historical factors (Hannibal-Paci 2000). Consequently, knowledge between groups of First Nations such as Cree and Anishinaabeg

will differ in terms of their knowledge. As well, indigenous knowledge within First Nations groups such as the James Bay Cree of northern Quebec and the Opaskwayak Cree of Manitoba, for example, will tend to differ as a result of different local requirements and historical factors. Thus, the knowledge of the OCN will be unique and require site-specific analysis.

Information generated through research conducted with other First Nations communities in Canada can aid in evaluating the knowledge of the OCN. Berkes (2008) discusses that, although Canada's Aboriginal communities have culturally diverse worldviews and knowledge systems, they do converge in some areas. For example, Trosper (1995) determined that there are commonalities in the way in which First Nations communities respect the natural environment. These commonalities include a sense of community associated with the concept of "community of beings" that entails socially constructed rules and norms, as well as reciprocity, connectedness, acknowledgement of future generations (i.e., sustainability) and humility (Trosper 1995). These values bear similarities with the James Bay Cree worldview (Berkes 2008) and, as will be shown in this thesis, the OCN. Research regarding indigenous knowledge can increase the understanding of these values and lead to their integration into contemporary natural resource management.

2.1.2 Historical Background

To fully comprehend the field of ethnoecology, it is useful to consider its origins in the ethnosciences. Ethnoscience attempts to "understand how humans – in spite of their fragmented and limited interactions with the world – are developing different forms of knowledge and beliefs" (Atram 1991 *in* Rist and Dahdouh-Guebas 2006, 472).

Ethnobiology, a field within the ethnosciences, seeks to integrate the study of cultures with the study of life, or biotic components (Rist and Dahdouh-Guebas 2006; Toledo 2002). Eugene Hunn (2007) discusses the history of ethnobiology as having four periods. Hunn's first phase is identified as ethnobiology I or "pre-theoretical ethnobiology," which began as early as the 16th century and extended to the 1950s. Ethnobiology I is characterized by the documentation of plant and animal uses as described by an observer (*etic*) that had the potential to provide benefits to Western researchers. Ethnobiology II or "cognitive ethnobiology" emphasized *emic,* or indigenous perspectives, regarding descriptions, cognition and linguistics. This second phase is attributed to Harold Conklin (1954) due to his detailed ethnobiological study of the Hanunoo people of the Philippines. Brent Berlin is also credited with contributing to the taxonomic theory that was characteristic of ethnobiology II (Berlin et al. 1974). Hunn's ethnobiology III, or "ethnoecology" period, was initiated in the 1970s to address the broader perspective of folk biological knowledge or indigenous knowledge. Victor Toledo (1992) is recognized with promoting the concept of ethnoecology during this period. Finally, ethnobiology IV or "indigenous ethnobiology" became prominent in the 1990s, which equated ethnobiology and the resulting study and documentation of indigenous knowledge with exploitation. Concerns regarding intellectual property rights, for example, have had implications for ethnoscientific research and contributed to the commoditization of indigenous knowledge. According to Hunn (2007), the four phases of ethnobiology do not indicate a hierarchy of methods with the most recent being superior. Instead, all four historical phases of ethnobiology should be perceived as cumulative and integrated to achieve enhanced methodological results (Hunn 2007).

2.1.3 Ethnoecology

Although Conklin coined the term ethnoecology in 1954, it was not until the 1970s and 1980s, during Hunn's ethnobiology III, that the field became prominent (Hunn 2007). Ethnoecology was developed in response to the taxonomic reductionism of ethnobiology II in order to provide a more holistic approach that addressed the broader cultural and ecological applications of ethnobiological research (Hunn 2007). Toledo (2002, 514) defines ethnoecology as "an interdisciplinary approach exploring how nature is seen by human groups through a screen of beliefs and knowledge, and how humans in terms of their images use and/or manage natural resources." Consequently, ethnoecology has placed an emphasis on the analysis of different levels of indigenous knowledge, which has been described as the knowledge-practice-belief complex (Berkes 2008).

Similarly to other authors, Toledo (1992) has also discussed the importance of focusing ethnoecological research on the belief system (*kosmos*), knowledge (*corpus*) and practice (*praxis*) to gain an improved understanding of how humans interact with nature. The *kosmos*, or worldview, is formulated through the environmental perceptions and observations of a culture, as well as the way the universe is conceived by a community (Berkes 2008). The *corpus* is defined as an 'unwritten knowledge' that is produced cognitively through the continued use of resources and transmitted through generations (Toledo 1992). As such, memory is considered to be the most important tool in contributing towards the knowledge of indigenous communities (Toledo 1992). The *kosmos* and *corpus* become a reality in the form of practice on the land (*praxis*) (Toledo 1992). In examining the interplay between these three components, an ethnoecological analysis of the methods in

which a local or indigenous community 'appropriates' their natural resources becomes possible, which, according to Toledo (1992), should be the aim of ethnoecological research.

After examining the goal of ethnoecology, it is important for researchers to understand the methodology in conducting ethnoecological research. According to Toledo (1992), ethnoecologists must evaluate four methodological components. First, the researcher must conduct a detailed description of the productive ecosystems of the study area and, second, the *corpus* of the participants must be decoded through an in-depth interview process. Third, an evaluation of the methods in which the participants appropriate the natural resources (*praxis*) in the ecosystem is necessary. Finally, researchers should perform an ecological evaluation of the *praxis* through an evaluation of the effects the extraction of natural resources has on the structure and processes of the ecosystems. In doing so, ethnoecological research attempts to keep beliefs, knowledge and practices in local context by overcoming the tendency to separate intellectual and practical components (Toledo 1992). As a result, ethnoecology becomes a holistic analysis of complex social-ecological systems addressing the "three inseparable dominions of landscape: nature, production and culture" (Toledo 1992, 10).

Rist and Dahdouh-Guebas (2006) discuss four components of ethnoecological research that are relevant in contributing towards sustainability of natural resource management. First, ethnoecology enables an inter- and transdisciplinary approach of producing knowledge. Second, ethnoecology demonstrates that concerns regarding the environment are social manifestations, which provides credibility to the contributions that local and indigenous knowledge can provide towards ecological sustainability. Third, this field of study emphasizes that knowledge generated locally can have applications for

sustainable management at a global scale. Lastly, ethnoecology bridges multiple knowledge systems stemming from a diversity of cultures for the co-production of knowledge. These elements of ethnoecological research that integrate cross-cultural perspectives can help to ensure that the finite supplies of natural resources are managed sustainably.

2.2 Ecosystem Services and Human Well-being

Human well-being is dependent on ecosystem services, which are those benefits attained by humans from natural ecosystems (Daily 1997). These benefits can include provisioning services such as food and water, regulating services including climate control and water purification, cultural services such as religion and recreation, as well as supporting services such as soil formation and nutrient cycling (MA 2005c). As the human population continues to grow, the demand on ecosystems will increase and the ability of ecosystems to function normally will be rapidly diminished, creating negative implications for human welfare (MA 2003). Accordingly, the interactions between ecosystem services and human well-being are complex and result in trade-offs between the environment and other interests (Pereira et al. 2005).

The Millennium Ecosystem Assessment (MA) was developed to explore the effects of degraded ecosystems on the interactions between ecosystem services and human well-being. The MA (2005a, V) emphasizes that "people are integral parts of ecosystems and that a dynamic interaction exists between them and other parts of ecosystems, with the changing human conditions driving, both directly and indirectly, changes in ecosystems and thereby causing changes in human well-being." The conceptual framework applied in the MA uses a multiscale approach to address interactions that occur at varying spatial and temporal scales

from the local to the global (Pereira et al. 2005).

For the purposes of the MA, human well-being was determined to have several components including basic material for a good life, health, good social relations, security, as well as freedom of choice and action (MA 2003). However, local criteria for well-being are contextual and situational as a result of the cumulative impacts of social, economic, demographic and ecological considerations (MA 2003). For the Whapmagoostui Cree of northern Quebec, for example, well-being or 'being alive well' is understood as associations between a life on the land, health and the identity of 'being Cree' (Adelson 2000). In many cultures, the translated term for 'land' is often used to describe the environment or the concept of ecosystems (Parlee et al. 2005). As a consequence, the Cree perspective of well-being is culturally related to land and dependent on the health of ecosystems. Similarly to the Whapmagoostui Cree, the Gwich'in Dene of Fort McPherson, Northwest Territories emphasize the importance of the interactions between human well-being and a healthy environment (Parlee et al. 2005). These and many other Aboriginal communities throughout Canada and the world identify the 'land' as being directly linked to human well-being (Parlee et al. 2005, Pereira et al. 2005).

2.2.1 Wetland Ecosystems

Globally, wetlands ecosystems are estimated to cover an area ranging from 5.3 to 12.8 million square kilometres (Zedler and Kercher 2005). Wetlands provide humans with various provisional and regulating ecosystem services, which include food, water, climate regulation through carbon sequestration, water regulation/purification and natural hazard regulation (MA 2005b; Zedler and Kercher 2005). As well, wetlands contribute cultural

services such as spiritual, recreational, aesthetic and educational benefits for humans (MA 2005b). Supporting ecosystem services provided by wetlands include soil formation and nutrient cycling (MA 2005b; Wardrop et al. 2011). Accordingly, wetland ecosystems are critical in contributing to human well-being (Wardrop et al. 2011).

Studies have estimated that the total economic value of ecosystem services provided by wetlands globally ranges from $200 billion per year (Schuyt and Brander 2004) to $940 billion (Costanza et al. 1997). These are conservative estimates, as various services such as genetic, medicinal, ornamental, artistic, spiritual, historic, sediment control, biological control, soil formation and nutrient cycling do not lend themselves easily to economic valuation (MA 2005c). With a high degree of certainty, unconverted wetlands have a higher economic value than those wetland converted for industry, agriculture and urban sprawl (MA 2005d).

Even so, the degradation and loss of wetlands is considered to be occurring at a faster rate than any other ecosystem (MA 2005b). The increasing human population and corresponding economic development have been the main indirect drivers responsible for the destruction of wetland ecosystems (MA 2005b). Direct drivers include development, land conversion, eutrophication, pollution, overharvesting, overexploitation and invasive species (MA 2005b). Some studies have predicted that climate change will also contribute to wetland destruction (MA 2005e). The continued loss and degradation of wetlands will likely have negative consequences on human well-being on a global scale.

2.3 Chapter Summary

As indicated in this chapter, wetlands provide a variety of important ecosystem services that contribute to well-being for many local and indigenous communities that identify with a life on the land. However, locally constructed criteria for well-being vary depending on interactions between the socioeconomic, ecological and political considerations that comprise the complex regional history for many communities including the OCN (MA 2003). As such, these criteria should be determined at a local level through an analysis of indigenous knowledge.

Ethnoecology is one tool in which to examine the indigenous knowledge of traditionally land-based communities. As discussed previously, ethnoecology attempts to integrate the social and natural sciences in order to produce information that is applicable to varying interests and worldviews (Rist and Dahdouh-Guebas 2006). Integrating both conventional Western science with the knowledge, practices and beliefs of local and indigenous communities generates both culturally and ecologically relevant outcomes that can contribute to enhanced natural resource management.

CHAPTER 3: RESEARCH METHODOLOGY

My research design consisted of a qualitative approach using a case study strategy of inquiry. Characteristics of qualitative research include producing meaning through interaction and interpretation, integrating the researchers own values into the research and applying inductive methods (Creswell 2009). The research design and methodology was also interactive adaptive in nature in order to address uncertainties and complexities that are inherent when conducting qualitative, social science research (Nelson 1991).

When conducting research, philosophical worldviews can influence the design and, as such, should be identified (Creswell 2009). My own worldview falls broadly within that of social constructivism. The intended outcome of social constructivist research is to interpret human-constructed meanings of the world, which are formed through interactions based on social and historical norms (Creswell 2009). In other words, cultural perspectives produce complex meanings of the world that tend to be varied and multiple (Creswell 2009). Social constructivists also acknowledge that their understanding of the research findings is an interpretation based on their own background and cultural experiences (Creswell 2009).

3.1 Research Strategy of Inquiry

As indicated, my research strategy of inquiry involves the case study approach (Creswell 2009). Originating in the disciplines of sociology and anthropology, the case study as a strategy of inquiry attempts to explore an issue within a system that is bounded by time and activity (Creswell 2007; 2009). Types of case studies can be determined by the size of the bounded system, as well as by the intent of the research (Creswell 2007). Stake (1995)

differentiates between instrumental or intrinsic case studies with regards to the research intent. An instrumental case study occurs when a single case is used to represent a broader issue whereas an intrinsic case study explores an issue in and of itself to learn more about the specific case without the intention of applying the research to another case or overarching issue (Stake 1995). However, Stake (1995) indicates that differentiating between intrinsic and instrumental cases may be difficult and that both types may be present within a case study. Consequently, my research could best be described as a single intrinsic case study with the potential that the findings may have applications for broader research questions.

The social constructivist worldview is represented in case study research because this strategy of inquiry lends itself to a better understanding of complex social interactions (Yin 2009). In order to address these complexities, case studies benefit from pragmatic data collection conducted using a variety of sources (Creswell 2007; 2009; Yin 2009).

3.1.1 Case Study Selection

The DUC Summerberry Marsh Research Project took place in the Summerberry Marsh Complex, which is located within the traditional use area of the Opaskwayak Cree Nation. Due to the location of the existing project, as well as through community interest, the OCN and the wetlands utilized by the community were deemed to be logical in terms of selecting a bounded case study. As a result of my research interests in the indigenous knowledge generated through a close relationship with the land and because of the low levels of participation in traditional activities by younger generations, research participants were limited to adult or Elder community members that have or continue to practice wetland-based activities.

3.2 Role of the Community

The community itself and, more specifically, the OCN Natural Resource Council played an important role in the initial stages of project development and throughout the duration of the research. Prior to fieldwork, meetings were held between members of the University of Manitoba and Mary Head, Manager of the OCN Natural Resource Council, to discuss details of the project. As well, an initial visit to The Pas in February 2011, clarified various logistical considerations pertaining to the fieldwork component of the research. The OCN Natural Resource Council was responsible for establishing the research team and providing other important community contacts. Diane Ballantyne, Administrative Assistant with the OCN Natural Resource Council, had the task of ensuring that payments for honoraria (including food per diem) and equipment rentals (e.g., boats, quads) were allocated to the research team during fieldwork. The total expenses incurred were then invoiced to the University of Manitoba upon completion of the project. The OCN Natural Resource Council also provided me with access to office space, a computer and GIS mapping software. The involvement of both Mary Head and Diane Ballantyne allowed the fieldwork component of the research to move forward both effectively and efficiently.

3.3 Research Team

The research team was comprised of Elders that were knowledgeable about the wetland ecosystems located within their traditional territory as a result of participation in hunting, fishing, trapping and/or plant gathering. For the majority of the project, the research team included Elders Raymond Ross Lathlin, Mabel Bignell and Moses Bignell. Stanley

McGillivary, Philip Dorion and Oliver Bignell also made important contributions to the research. Carla Buck, an employee of the OCN Natural Resource Council, acted as a community researcher in the months of July and August. Her involvement was important early on in the research by allowing for a relaxed work environment in which the Elders and myself could become more acquainted. Carla also benefited from the opportunity by learning invaluable cultural information under the direct tutelage of community Elders. Each individual of the research team was instrumental in the success of the research and contributed a unique set of skills and knowledge.

All members of the research team completed a letter of informed consent indicating that they would like to be identified and acknowledged. As a result, any quotes or personal communications involving the research team are accompanied by their names. The research team also consented to having their photographs presented in the thesis and publications with the caveat that they would be able to review the images beforehand.

The OCN have historically spoken a Cree dialect, however, English proficiency in the community is at a level that a dedicated translator to assist myself in the field was unnecessary. Mabel Bignell, who was previously responsible for integrating the Cree language into school curriculum, undertook any required language translation and verified the accuracy of vocabulary in Cree nomenclature.

3.4 Site Selection

Originally, I had proposed selecting five wetland sites based on specific criteria. First, sites were to be identified based on the experience and familiarity of the research team. A focus was to be placed on those sites that had actually been used by the research team

either currently or previously so the research would produce relevant information for the community. To ensure the research was applicable at a regional scale, the sites were to provide an adequate representation of the major wetland classes as described by the Canadian Wetland Classification System (Warner and Rubec 1997). As well, the sites were to show the effects of anthropogenic disturbances such as altered water levels or changes in the ecology of the area. Lastly, sites were to be selected on the basis of accessibility in order to minimize field costs and ensure access by Elders with limited mobility.

During initial meetings with the research team, it became evident that the site selection process would not be as straightforward as planned. Several issues developed that required that the research methodology adapt to the situation. Initially, the use of the word 'wetland' was a source of confusion in that my definition of the term differed from that of the research team. I wanted to visit culturally relevant sites that encompassed the five major wetland classes of the Canadian Wetland Classification System (Warner and Rubec 1997) whereas the research team began by suggesting sites that included mostly lakes and rivers. I attributed the initial emphasis by the research team on major water bodies partially to seasonality and my arrival in the month of July. During summer months, fishing is the main traditional harvesting activity, which tends to take place mostly in major water bodies such as lakes and rivers.

As I continued to suggest areas on the map that fit under *my* wetland class criteria, I soon realized the site selection process was deviating from the first and most important criteria of identifying areas based on the experience of the research team. Using the Western classification system to select sites would have produced results that were not completely relevant to the individuals and, ultimately, to the community. To alleviate this, I suggested to

the research team that we visit areas that are used in other seasons for hunting and/or trapping purposes or to areas where a specific wetland plant species may be found. Although this did increase the diversity of wetland types visited, when community members go out on the land, they do not tend to remain within one specific location, let alone one wetland type, but instead move around on the landscape, making selection of actual sites difficult. Consequently, even though the site selection process deviated from the initial plan of selecting five specific sites, the resultant information remained within the research purpose of exploring OCN indigenous knowledge related to a diversity of wetland types.

Site access was an issue at the time of my arrival to the area. According to Shaun Greer (2012) of DUC, the SRD was experiencing Saskatchewan River overbank flooding that was approximately a 1 in 100 year event in the summer of 2011. As well, unseasonably high levels of precipitation throughout the area contributed to poor site access in areas not adjacent to the Saskatchewan River. For instance, in the month of July, the amount of precipitation was 217 percent of normal (Shaun Greer 2012). As a result of these considerations, trapping, hunting and plant gathering areas located in wetlands, which would have been accessible by truck or quad in other years, were under water. Access to the DUC airboat did alleviate some of these flooding issues and allowed for site trips to culturally relevant wetlands that may not have been accessible otherwise (Figure 3.1).

Figure 3.1 Mabel Bignell, Raymond Ross Lathlin, Shaun Greer and Moses Bignell on a Ducks Unlimited Canada airboat.

3.5 Data Collection Techniques

3.5.1 Participant Observation

Participant observation acted as a primary data collection tool in my research and pertained mostly to the ethnoecological components of Objectives 1 and 2. The method is foundational in cultural anthropology and involves a researcher gaining experiential knowledge through participation (Bernard 2006). Participant observation can be used as a method on its own or in combination with other forms of data collection to increase validity through triangulation (Bernard 2006; Creswell 2009). Bernard (2006) describes various

other ways in which participant observation can increase research validity through the potential to obtain all types of data, reducing reactivity through trust building, increasing cultural sensibility regarding research questions and by gaining an improved understanding of the culture and data.

The effectiveness of participant observation as a data collection tool is dependent on producing accurate notes while in the field (Bernard 2006). Bernard (2006) discusses four types of notes including jottings, a diary, a log and field notes. In my research, I produced each of these types of notes throughout the duration of my fieldwork activities.

3.5.2 Interviews

Interviews related to case study research are most commonly open-ended in nature (Yin 2009). Accordingly, I conducted numerous informal unstructured interviews during field excursions (Dunn 2005). While out on the land, 'walking probes' were sometimes used as a form of elicitation during interviews (De Leon and Cohen 2005). Walking probes consist of visiting a site that has meaning or significance to the participant and eliciting information that pertains to the place or environment (De Leon and Cohen 2005).

Due to obvious challenges in using electronics in the field, I only audio recorded and transcribed those interviews that took place within the OCN Natural Resource Council office. The unstructured interviews performed during field excursions were recorded by hand in the form of field notes (Bernard 2006). Interviews were generally conducted several times with each of the key participants of the research team and were used to complement participant observation as a key data collection technique.

Throughout my fieldwork, I found that the most valuable information resulting from

interviews was generated while actually taking part in wetland-based practices. For example, a boat trip to a site merely for the sake of visiting it usually resulted in limited discussion, particularly early on in the fieldwork while myself and individuals of the research team were becoming acquainted. I sensed the research team would become confused as to the purpose of the site visits and, especially, the purpose of repeated trips to the same site. Instead, coupling field excursions with the activity of hunting, trapping, fishing, berry picking or medicinal plant gathering resulted in interesting conversation, leading to an enhanced relationship between members of the research team and myself as the researcher. Taking part in traditional activities (e.g., fishing) as an elicitation technique was especially important when a large amount of time was spent in boats, making walking probes and other forms of elicitation difficult.

In the event that I required more detailed information on a specific topic than could be achieved by taking notes in the field, I conducted semi-structured interviews with the research team in the OCN Natural Resource Council office. Semi-structured interviews encourage more focused responses than unstructured interviews while also allowing for increased flexibility by the interviewer to emphasize particularly interesting topics through further questioning (Dunn 2005). Topics covered during these semi-structured interviews ranged from indigenous knowledge regarding the ecology of the region, personal stories to components of well-being and cultural identity.

To my benefit, the OCN Natural Resource Council had recently conducted twenty-three structured interviews with twenty-five community adults and Elders between July 2010 and January 2011. These interviews were initiated to compile the indigenous knowledge of OCN community members as part of an assessment in the proposed Bipole III Transmission

Line route along the west side of Lake Winnipeg. Out of respect for the confidentiality and anonymity of OCN interviewees, I had access to sixteen interviews conducted with nineteen individuals. The interview schedule consisted of 164 questions covering a variety of topics including water bodies and fish, soil and landforms, forestry, birds, mammals, vegetation, heritage resources, culture, health, social connectivity, as well as income and economy. All interviews were recorded and transcribed with translation work completed by Mabel Bignell. During interviews, spatially relevant information was recorded as lines and polygons on maps using a Capturx digital pen and transferred into a GIS program to indicate culturally and ecologically important land use areas. The information generated through this interview process contributed greatly to my research. I am also of the belief that community members interviewing other community members generated richer data than would have been possible by myself temporarily entering into the community as a researcher. Within the thesis, I have used "RPxxx" to indicate when information pertaining to a Research Participant from these interviews was included.

3.5.3 Document Review

The review of documents as a data collection tool is usually relevant in all case study research (Yin 2009). Document review is generally used to verify and build upon information that has been collected using other methods such as participant observation and interviews (Yin 2009). During an initial trip to The Pas in February 2011, I visited the Sam Waller Museum and learned that eighteen oral histories had been conducted with twenty Elders from the OCN between 2007 and 2008. After returning to The Pas for fieldwork, I received electronic copies of the documents and, upon reviewing them, greatly increased my

knowledge regarding the history of the region. Topics covered in the oral histories were diverse and included experiences in residential schools, growing up on the Reserve, living off the land, disease, concerns for future generations and much more. Within the thesis document, I have used "OHxxx" to indicate when information gathered from an Oral History participant was included.

I also received a number of documents from the OCN and DUC that provided an enhanced understanding of the history of the community, as well as the ecosystem management activities that have taken place in the SRD. A variety of other academic literature was also reviewed in order to better comprehend the complex regional history that has contributed to the cultural identity of the OCN, the results of which are presented in Chapter 4.

3.5.4 Plant Surveys/Transects

Early on in the research, it was expected that the ethnoecological component of my research might require the use of ethnobotanical methods including participatory plant surveys and transects (Cotton 1996; Martin 1995). Initially, the purpose of using these methods of data collection for this research was threefold. First, these tools could be useful in evaluating plant species composition during site selection to ensure a diversity of wetland classes are chosen according to the Canadian Wetland Classification System (Martin 1995; Warner and Rubec 1997). Secondly, plant surveys and transects could assist in achieving a more comprehensive ethnoecological analysis of the culturally important plant species located in the wetlands of the SRD (Martin 1995). Lastly, there was the potential that the findings from these methods would allow for a cross-cultural comparison of an

ethnoecological classification system and a Western classification system, which may ascertain whether or not there is a relationship between culturally important wetlands in the SRD and specific wetland classes developed using conventional scientific methods. Ethnoecological classifications can help to demonstrate how an indigenous community understands interactions amongst wetland organisms, as well as other ecosystem functions (Davidson-Hunt and O'Flaherty 2006). Cross-cultural comparisons can lead to the improved management of ecosystems by attaching values to areas of land that should be conserved or restored according to the perspectives of an indigenous community (Davidson-Hunt and O'Flaherty 2006).

Upon entering the fieldwork portion of the research, it became apparent that this data collection method would not be useful in all of the ways outlined above. Due to the flooding in the SRD, determining plant species composition for the purposes of classifying the major wetland types was made more difficult. Through a data sharing agreement, I received a GIS base map of the upper and lower deltas of the SRD that displayed the wetlands in the area as determined by the major and minor classes under the Canadian Wetland Classification System (Warner and Rubec 1997). The data received was part of a larger project called the Pasquia Earth Cover Classification that took place in a 7.4 million hectare area straddling the border of Manitoba and Saskatchewan (DUC 2003b). The classification was conducted using satellite images and was classified into 38 earth cover categories, accurate to 75 +/- 5% level of variation in interpretation (DUC 2003b). The base map alleviated the issues caused by excessive water in the area. Instead of conducting plant surveys, I was able to use the GPS during field excursions to document areas visited, place names and culturally important locations. The GPS points, as well as the linear and polygonal data documented through the

OCN Bipole III Transmission Line interview process were then overlaid onto the GIS base map to demonstrate the diversity of wetlands used by the OCN differentiated by traditional harvesting practices including trapping, moose hunting, waterfowl hunting and fishing.

Informal plant surveys and transects were useful in obtaining a diversity of plant species and for elicitation in a manner similar to that of walking probes. However, due to the more general species differentiation in the Cree language, collecting every species as determined by Western science classification system was not practical. For example, the various moss species found in the peatland wetlands are covered under the Cree word *uskeyu*. Similarly to mosses, sedges and grasses tend to be grouped into a single category called *maskoseyu*.

In the initial months of fieldwork, I would inquire as to the names the research team would use to describe a particular wetland type. I also made note when the English words for wetlands such as marsh, bog and swamp were used by the research team and found that there were many inconsistencies and that these Western classification categories were not always clear to them, which may have been exacerbated by the flooding event that year. Consequently, I determined that a cross-cultural comparison of wetland classifications was not entirely relevant at the time of my fieldwork. This led me to conclude that plant surveys and transects would not contribute to determining if there was a relationship between an ethnoecological classification scheme and a Western classification scheme. Although a comparison of wetland categories was not explicitly stated as an objective, I had hoped to be able to contribute to the literature regarding cross-cultural landscape classification systems.

3.5.5 Verification Workshops

The information gathered during site visits regarding the uses and diversity of wetland organisms was cross-referenced with species inventories found within the different wetland classes of the Canadian Wetland Classification System (Warner and Rubec 1997). As field excursions included visits to upland habitats present within the Mid-Boreal Lowland Ecoregion that the SRD is situated in, species not typically found within wetlands were also included in this research. Due to seasonality, some species were absent during site visits. As a consequence, photographs of missing species were presented to the research team of Raymond Ross Lathlin, Mabel Bignell and Moses Bignell during verification workshops (Figure 3.2). Discussions were initiated to determine if Cree nomenclature exists for those species and to obtain any associated ethnoecological knowledge. These workshops also ensured the information gathered during the field was accurate regarding species names.

These meetings produced interesting data and became an integral part of the research. Each of the three members of the research team that took part in these workshops had unique and diverse knowledge that complemented the knowledge of the other two. As was admitted by the individuals themselves, they tended to have more success in naming a plant, for example, through discussion in a group setting rather than when alone.

The verification workshops also presented learning opportunities for myself as a researcher. Initially, the photographs I showed the research team had the English names of the species attached which presented an issue in terms of the data being collected because if the Cree name or species itself was unknown, then names tended to be generated based on the English names. This practice presented a problem because I wanted to collect indigenous knowledge as opposed to information generated through Western science. After coming to

this realization, when possible, I omitted the English names of species from the exercise and if a name for a plant, bird, fish or mammal could not be determined, I accepted this and moved on. As with the plant surveys, these workshops further reinforced the fact that a more general species differentiation tends to occur within the Cree language than when compared to the species classification system used in Western science.

In late January 2012, I visited the community for a final results verification workshop. I presented the information that had been generated during data analysis to receive any additional feedback from the research team while ensuring the accuracy and validity of the results through member checking. I also included any quotations or personal communications that I planned to present within the thesis document that had the names of the Elders attached to ensure the information was not sensitive in nature and could be published within the public domain. As indicated previously, the letter of informed consent required that permission be obtained prior to including photographs of the research team within the thesis document. Therefore, the workshop also acted as an opportunity to present any photographs portraying people that I considered appropriate to be included within the thesis and receive permission for their use.

Figure 3.2 Raymond Ross Lathlin, Moses Bignell and Mabel Bignell at the Opaskwayak Cree Nation Natural Resource Council office for a verification workshop.

3.5.6 Summary of Data Collection Methods

Objective	Data Collection Method	Examples of Data
1. Document OCN indigenous knowledge of the diversity and uses of organisms found within the wetlands.	- Participant observation - Interviews - Document review - Plant surveys - Verification workshops	- Knowledge associated with harvesting practices in wetlands and potential impacts to these activities, plant and animal species taxonomy, plant composition, resource distribution and seasonality
2. Record OCN indigenous knowledge on the relationships amongst the organisms of wetlands.	- Participant observation - Interviews - Document review - Verification workshops	- Information pertaining to the knowledge associated with the relationships amongst biotic (plant, animals) organisms and between biotic and abiotic (water) components of the wetland ecosystems
3. Understand how a reduction in ecosystem services in wetlands is impacting the well-being of the OCN people who use the SRD.	- Interviews - Document review - Verification workshops	- Determine if the livelihoods or well-being of those community members that have or continue to take part in traditional harvesting practices have been impacted by a reduction in ecosystem services

3.6 Data Analysis and Validity

Data analysis in qualitative research is an iterative process that was ongoing throughout all stages of my research (Creswell 2009). I began analyzing data while still in the field and continued with analysis upon my return to the University of Manitoba. Initial steps in data analysis included inserting field notes and transcribed interviews into a word processing program. This was followed by the process of coding, which organizes the data into manageable sections with the purpose of generating descriptions and themes (Creswell 2009). Analysis and coding was supported with the use of a computer assisted qualitative data analysis software (CAQDAS) called Text Analysis Markup System (TAMS) Analyzer, which is an open-source qualitative data analysis tool. Interpretation was the final step in the data analysis process, which produced meaning from the material (Creswell 2009).

The validity of my research was achieved using a variety of strategies. First, I ensured data triangulation through the use of multiple sources of data collection, which is an important characteristic of case study research (Creswell 2009; Stake 1995; Yin 2009). Case studies employing multiple sources of data collection generally have an increased validity when compared with those case studies that make use of only one source (Yin 2009). Second, member checking through the verification workshops achieved accuracy by allowing participants to verify spelling, species names and gaps in data. Member checking also allowed the research team to comment on the accuracy of the descriptions and themes generated during data analysis (Creswell 2009). Third, I generated detailed and descriptive field notes, which were instrumental in achieving validity within research that is interactive adaptive in nature (Nelson 1991). Lastly, I acknowledged the inherent researcher bias that may shape data interpretation in qualitative research (Creswell 2009).

3.7 Dissemination

Dissemination will include the submission of copies of the completed thesis document to the OCN Natural Resource Council along with transcriptions, if requested. All photos collected during the fieldwork will be copied onto a CD and provided to the OCN Natural Resource Council. Another outcome of the research is a contribution towards the completion of a community wetland guide. The indigenous knowledge data collected through my research, in combination with data compiled by Ducks Unlimited Canada, will provide the OCN with an educational curriculum tool on the wetlands located within the SRD.

3.8 Working with the Opaskwayak Cree Nation

Through a review of the literature, I became more aware of the dynamic and adaptive processes that embody indigenous knowledge and which tend to be neglected through the research process of documentation (Agrawal 1995; 2002). As a result, through the lens of the dominant society, indigenous knowledge becomes a snapshot in time as opposed to one that changes and develops through social learning (Agrawal 1995; 2002). Early on in the research process, I struggled with the task ahead of merely 'documenting' indigenous knowledge. However, through discussions with my advisor and classmates, I came to realize that in my role as an initial researcher working with the OCN, knowledge documentation is an important exercise. The outcome of documentation may also prove to be useful to OCN in their efforts to establish community-based natural resource management.

I also recognized that the relationship between indigenous societies and researchers has not always been mutually beneficial. In the words of Adelson (2000, 16) and which perfectly align with my own views, "what right do I have to walk, however cautiously, in the footsteps of those who for so long simply reproduced the colonial order?" With that in mind, I have come to realize that I will always be an outsider when working with indigenous communities, which is a consideration that I will grapple with throughout my participation in ethnoecological research. As a consequence, I emphasize that the results of this project reflect my own perspective and worldview through an interpretation of the information provided by community members. In this research, I do not pretend to be a voice for the people of the OCN but believe that my perspective along with a variety of other perspectives can contribute to a greater understanding of indigenous knowledge as it relates to natural resource management.

Due in part to my upbringing in a household that emphasized gender equality, I am acutely aware of gender roles. I had initial concerns that my being a female might allow me to capture only the female perspective. However, as an outside researcher, I was able to take part in practices that have traditionally been male dominated. As a result, I was able to witness a wide array of perspectives and my gender did not limit and, in fact, may have enhanced my exposure to a variety of invaluable experiences.

Almost immediately upon commencing my work with the OCN Elders, I realized the importance of laughter in their lives. I took it as a compliment to be laughed at while attempting a skill for the first time because it indicated that the Elders were comfortable enough around me to do so. As I met other friends and family of the research team, it almost

became a form of initiation to see how I would react to the teasing. Relationships were built upon whether I was able to laugh at myself or not – and I always was.

3.9 Chapter Summary

This chapter outlined the methodological approach used in conducting this qualitative study through the use of the case study as a strategy of inquiry. To achieve the research purpose and objectives, a variety of methods were employed to ensure the validity of the data collected. The methods included participant observation, interviews, document review, verification workshops, as well as informal plant surveys used to elicit valuable information. The OCN community, the OCN Natural Resource Council and especially the individuals comprising the research team played an important role throughout the project, without which the research would not have been possible. In carrying out the study through collaboration with the OCN, I was able to reflect on my own role in ethnoecological research.

CHAPTER 4: OPASKWAYAK CREE NATION

4.1 Historical Context

To explore the indigenous knowledge and cultural identity of Canada's First Nations people it is important to understand the extensive history of colonialism that these communities have experienced (Adelson 2000). Each First Nations community has their own unique regional history that has contributed to their contemporary reality. Like many other indigenous communities in Canada, the OCN has felt the repercussions of contact with the 'whiteman' since at least the early 17th century (Thistle 1986). A review of the history of the OCN and their traditional territory is warranted in order to come to a better understanding of the community's cultural identity. The following analysis includes a variety of economic, cultural, political and ecological considerations that have contributed to the complex regional history and made the OCN community what it is today.

4.1.1 Fur Trade (1690 - 1840)

The fur trade had a major impact on First Nations culture in North America and many scholars have analyzed these effects. One such scholar is Paul C. Thistle (1986), who has written extensively regarding the fur trade between Europeans and First Nations prior to 1840. Thistle's work was specifically concerned with the lower Saskatchewan River Region with an emphasis on First Nations perspectives during that time. To come to a conceptual understanding of the trade relations between Europeans and First Nations in the area, Thistle (1986) adopts the contact stages originally suggested by Charles Bishop and Arthur J. Ray in 1976. According to Bishop and Ray (1976), the contact stages included the Prehistoric,

Protohistoric and Historic Periods. The Prehistoric Period was characterized by the isolation of First Nations from European contact, followed by the Protohistoric Period, which included infrequent initial interactions between the two parties (Thistle 1986). Bishop and Ray (1976) divide the Historic Period into the Early Fur Trade Era, Competitive Trade Era followed by the Trading Post Dependency Era, each of which will be discussed in more detail below as they relate to the lower Saskatchewan River region.

The following summary is derived primarily from the work conducted by Thistle (1986) through his analysis of the Hudson's Bay Company Archives, unless otherwise noted. In his analysis, the author combines historical documentation with other ethnographic approaches to alleviate the lack of documentation from the First Nations perspective. The result of which is a more fair and realistic portrayal of the role that Canada's First Nations people played in the fur trade.

The Early Fur Trade Era in Canada took place from approximately 1611 to 1773. However, records indicate that initial European contact in The Pas area occurred in 1690 when Henry Kelsey of the Hudson's Bay Company was guided inland by a group of Cree or Assiniboine people. This initial contact marked the beginning of European influence in the area, which was later enhanced with the construction of the first Fort Paskoyac on the southwestern portion of Cedar Lake in 1743. After abandonment and reoccupation, this trading post was later renamed Fort Bourbon. As European interests began moving further west, the second Fort Paskoyac was constructed and occupied in 1750 near where the Pasquia, Carrot and Saskatchewan Rivers meet in the location of the present day The Pas. Even with these structures in place, from initial contact up until the middle of the eighteenth century, European presence within the lower Saskatchewan River region was typically

inconsistent and intermittent. The Cree tended to act as middle men traveling to York Factory, spending as little as a week every one or two years in the northern Manitoba trading post. The limited contact allowed the Cree people of the lower Saskatchewan River area to retain their livelihood practice of subsistence hunters as opposed to trappers. As a consequence, the Early Fur Trade Era had a limited impact on Cree culture and identity in the lower Saskatchewan River area. Contrary to conclusions reached by other fur trade historiographers, the Cree in The Pas area remained independent of the European traders for survival during this period (Thistle 1986).

The construction of the Hudson's Bay Company's first permanent inland post at Cumberland House, Saskatchewan in 1774 marked the second phase in the Historic Period termed the Competitive Trade Era. The post was established in response to requests made by the Cree themselves and in response to the increased inland activity of the North West Company. After the establishment of the post, the Cree retained control of the trade relations in the area due to the dependence of the Europeans on the indigenous groups' ability to provide wild game for food. In fact, First Nations peoples would arrive at Cumberland House more for the purposes of trading meat as opposed to furs. During this period, the Cree were able to continue, if not increase, their traditional practices of big game hunting.

The First Nations camped in The Pas region were also able to successfully exploit the competitiveness in the fur trade between the North West Company and the Hudson's Bay Company. Traders from the North West Company were trading closer to The Pas area than Cumberland House, which supported the Cree "principle of least effort" in response to the fur trade industry. Gifts from the Hudson's Bay Company in the form of liquor and tobacco,

as well as an increase in wages were required to convince the Cree to continue to move the furs farther away to Cumberland House.

The smallpox epidemic of 1781 to 1782 was one event over which the Cree people in The Pas area had little control. The outbreak of smallpox had an impact on the role of the Cree in the fur trade. Some scholars have attributed these epidemics to a cultural shift from one of spiritual animism to overexploitation of animal populations due to the First Nations taking vengeance upon those species that were thought to be the carrier of disease (Martin 1978). However, archival material suggests that beaver populations were already exhibiting the effects of overharvesting as early as 1767, prior to the smallpox outbreak. As well, the continued spiritual importance of beaver to the Cree culture was being recorded post-epidemic as late as 1827.

Following the smallpox epidemic, and into the 1790s, the Cree became aware that although a permanent post was located in their region, a regular supply of items was not always ensured due to external factors. Any scarcity of goods at Cumberland House was typically followed by a refusal on the part of the Cree to trade their furs or provisional food until the shortage was alleviated, indicating a continued independence from the European fur trade. In fact, historical records indicate that alcohol supplied by the trading companies was more instrumental in retaining the continued participation of the Cree in trade as opposed to a reliance on the economic system surrounding the fur trade.

Although the role of the fur trade in Cumberland House and The Pas had begun to decline in the late 1790s and into the 1800s, the creation of a third trading competitor, XY Company, sparked an increase in competition in the region. Fur producers comprised of former North West Company employees, as well as Iroquois trappers also began to move

into the area. Elevated trading company competition and an increased number of fur producers contributed to a diminished control of the Cree in trade practices. Continued declines in Cree control were also demonstrated by the "Rough Justice" exercised by the North West Company in the late 1790s towards First Nations accused of crimes. These tougher sanctions would not have occurred in earlier years for fear of retaliation. Furthermore, by the early 1800s, Cumberland House had achieved an increased independence from Cree food provisions through the development of increased infrastructure including gardens, agricultural fields and a fishery.

By 1818, records corroborated earlier documents by demonstrating that Cree control over trade had become diminished. Even so, records indicated that their dependence on the industry was not entirely complete. The Cree continued to be an asset to the trading companies through food and labour provisioning, as well as through guiding. The Cree fur producers also retained their ability to exploit their wares for liquor and other goods. Furthermore, the First Nations in the area sometimes chose to withdraw from the practice of trapping entirely. These considerations indicated that the Cree were not completely dependent on the European trade industry. As an aside, but one that applies to this research, is the mention in the records from the year 1818 that a shift from beavers to muskrat as the important commodity in the fur trade industry in the region had occurred. Apparent overharvesting had eliminated the beaver in the lower Saskatchewan River region by the early 19th century.

In 1821, the North West Company had merged into the Hudson's Bay Company, marking the beginning of the fur trade monopoly. Contrary to popular belief, Cree independence remained relatively intact under the Hudson's Bay Company. A symbiotic

relationship remained between the Cree and fur traders in the Cumberland House – The Pas area. Despite the traders' decreased dependence on the food provided by the Cree through the development of a farming operation, records indicate that the Cree supplied meat to the Cumberland House post up until 1840. The Cree trappers also continued to exercise their ability to pull out of the trade industry at any time. As well, traditional subsistence harvesting methods were still practiced throughout this period. According to information provided in the Hudson's Bay Company Archives regarding relations between the European fur traders and the Cree people located in the Cumberland House – The Pas region, Thistle (1986) indicates that the Trading Post Dependency Era does not adequately describe the period of time from initial contact up until 1840.

European influence did undoubtedly have an impact on the traditional livelihoods of the Cree in the region and influenced contemporary Cree identity. For instance, in response to animal scarcity, the Cree people tended to move to a different area of higher abundance, which aligned with "the principle of least effort." The practice of mobility in times of scarcity has reinforced the perception that First Nations were not historically active in conservation. Due to attempts made by the Hudson's Bay Company to allocate specific areas for each trapper and through the discouragement of movement that was central to Cree survival strategies, First Nations cultural practices were altered. The restricted movement of the Cree could potentially have led to the adoption of a conservation practice that was documented in the early 1820s involving Cree initiated summer trapping restrictions in an attempt to increase population abundance for the fall hunting period. In addition to limits in mobility, the trading company also opposed gatherings that involved feasts and dancing with

the hopes of increasing trapping efforts, which may have contributed to diminished cultural practices.

Thistle (1986) concludes his analysis of European and First Nations contact related to the fur trade industry in the year 1840. At that time, the exclusive contact attributed to trade ended with the arrival of the Church Missionary Society in The Pas. The introduction of Christianity was an added factor of influence in contributing to the cultural shift occurring to Cree populations in the area.

4.1.2 Henry Budd and the Church Missionary Society (1840 - 1875)

A Masters thesis by Katherine Pettipas (1972), which is summarized in this section, provides an ethnohistorical analysis of the arrival of Reverend Henry Budd and the Church Missionary Society to The Pas in 1840, as well as the resulting cultural impacts on First Nations in the area. The Church Missionary Society was the first Anglican organization that was "devoted solely to the evangelization of the heathen" (Pettipas 1972, 12). The expansion of the Society's proselytizing efforts throughout Canada was due, in part, to the threat of competition from the Roman Catholic Church in the area. As a consequence, the Church Missionary Society was established in Cumberland House, Saskatchewan. However, soon after the initial establishment, the Society was relocated to The Pas following a hostile reception at the Cumberland House trading post.

The mission was headed by Henry Budd, a Swampy Cree from Norway House, who had been recruited to the Red River Settlement at the age of eight to be trained in Christianity. During the period of 1840 to 1875, Budd's arrival had a considerable impact in the region. The First Nations Reverend was fluent in both Cree and English, which was

pivotal in the translation and propagation of the teachings of Christianity. As well, the duration of time spent by Budd in the area increased his empathy towards the Cree that was not necessarily demonstrated by other missionaries that arrived to the region. Although varied in success, the efforts made by Budd in the conversion of the Cree to Christianity contributed to the further acculturation of the First Nations people into the twentieth century.

Upon arriving in the region, Budd, acting as an agent of the Church Missionary Society, believed that attempts at proselytizing would be improved by encouraging the settlement of the semi-nomadic Cree through a transition from trapping and hunting to an agricultural economic base. However, the approach to civilize First Nations through cultivation in The Pas was fraught with complications due to environmental factors, as well as the influence of the fur trading industry, both of which had tended to support a more nomadic lifestyle. The conversion of the regional economy to cultivation had limited success with the reality consisting of a combination of hunting and trapping with mediocre agricultural practices. This economic pattern was evident into the early twentieth century.

Although the agricultural scheme of the Church Missionary Society had varied results, the acculturation efforts of the Society did have impacts on traditional Cree practices in the region. The traditional belief system held by the First Nations became degraded through the influence of Christianity. The establishment of the Cree syllabic system further contributed to the diminished oral transfer of indigenous knowledge that was responsible for perpetuating cultural norms and values. Even so, by the 1870s, the Church Missionary Society was unable to produce a self-reliant First Nations Christian Church in The Pas region due mostly to the unwavering belief that civilization would only be reached through the formation of an agricultural economic base.

4.1.3 Treaty Five and the Post-Treaty Reserve Economy (1875 - 1930)

4.1.3.1 Treaty Five

Treaty negotiations for the The Pas region commenced in 1875, having been initiated by both the First Nations people themselves, as well as by the federal government (Coates and Morrison 1986). The First Nations wished to be afforded similar agreements that had been previously granted to other indigenous communities in Canada whereas the government was motivated by the allocation of the area for the purposes of development and settlement (Coates and Morrison 1986). The results of negotiations under Treaty Five included the distribution of 160 acres to each family of five with an annual payment of five dollars per person with the First Nations maintaining the ability to hunt, trap and fish for subsistence purposes (Coates and Morrison 1986). These remunerations were lower than those that had been afforded to the First Nations people under Treaty Three and Four due to belief of the government that the marginal agricultural land in the region had limited potential for development (Coates and Morrison 1986).

The OCN, formerly known as The Pas band, signed Treaty Five on September 7, 1876 (OCN 2011). Although a permanent settlement existed in the location of The Pas as a result of the efforts of the Church Missionary Society, the Treaty process further contributed to the increased settlement of the indigenous people within an area with discrete boundaries. These boundaries failed to support an economic base consistent with the more nomadic lifestyle of hunting and trapping (Tough 1996). Similarly to other Treaty agreements, there has been a debate over whether or not the First Nations people fully understood that they were yielding sovereignty of the lands located in their traditional territory (Coates and Morrison 1986). The indigenous people were, however, aware that changes to their way of

life were imminent in the latter half of the nineteenth century (Coates and Morrison 1986). There was an understanding by Canada's indigenous groups that assistance from the federal government would be required to alleviate the changing economic structure from hunting and trapping livelihood practices to one that supported the increasing settlement of white people in the area. For this reason, the First Nations communities included under Treaty Five and the federal government were able to "agree on the same document, though for rather different purposes and expectations" (Coates and Morrison 1986, 43).

4.1.3.2 Agriculture

Enhanced development in infrastructure occurring on the OCN Reserve in the form of improved roads and housing at the beginning of the twentieth century indicated changes between the pre and post-Treaty community (Tough 1996). Agriculture also became a more prominent practice after the Treaty was signed due to the continued decline in big game populations and fur-bearing animals as a result of intensive levels of harvesting (Tough 1996). By the early 1880s, the OCN Reserve had approximately sixty individual gardens, as well as a communal barley field (Tough 1996).

Tough (1996) acknowledges several limitations to agricultural development that emerged in the late 1880s and into the early twentieth century. First, cultivation efforts tended to decrease as the number of game animals increased which did, in fact, occur throughout the region in the late nineteenth century. Secondly, there was a continued influence of the fur trade over subsistence agricultural practices with the conflict between the two especially evident during muskrat harvesting in the spring. The First Nations would trap a large number of muskrat and were then expected to cultivate small gardens that would not

yield enough to prevent starvation in the winter months. A quote that further emphasizes the conflict between the two economic bases comes from Indian Agent Bray of the OCN region who stated that, "it appears to me to be futile to expect that these Indians, who can easily supply their wants by fishing, shooting and trapping, should devote much attention to farming" (Tough 1996, 169). Another important challenge to First Nations agriculture in the post-Treaty era was the incapacity of these communities to move from subsistence cultivation to commercial production as a result of restrictions enforced by the federal government regarding the export of surplus produce (Tough 1996). In the early twentieth century, it was noted that the people of the OCN had only a limited presence on the Reserve of four to five months due to participation in traditional livelihood practices outside of the Reserve boundaries that remained more productive than cultivation (Tough 1996).

In The Pas area, there was an emphasis on stock-raising cattle as the main form of agriculture in the Reserve transition period between 1875 and 1915 (Tough 1996). However, fluctuations in water levels along the Saskatchewan River coupled with distance from the markets and the ability to harvest wild meat tended to make cattle-raising an economic base with minimal benefits (Tough 1996). As has been indicated, OCN Reserve agricultural production of both crops and cattle tended to develop at a slower pace when compared to the actual settlement of the Reserve itself.

4.1.3.3 Fur Trade

Contrary to the belief that the fur trade was halted after the signing of the treaties, the traditional mercantile economy remained important to First Nations communities (Tough 1996). Even so, changes occurred to the fur trade following the signing of Treaty Five and

especially after 1900. The Hudson's Bay Company monopoly was diminished through the increase in small-scale competitors while the London fur market collapsed and a North American market was formed (Tough 1996). These changes, coupled with economic variability regarding fur prices and supply, led to the instability in the trade of furs in the first quarter of the twentieth century (Tough 1996). The First World War also impacted the fur trade through a decrease in demand, which was followed by a peak in fur prices in the years of 1919 and 1920 (Tough 1996). The effects of external markets greatly impacted the fur trade industry following the return of the competitive fur trade post-Treaty (Tough 1996).

The fluctuations in fur prices, as well as in the supply of fur-bearing animals had implications on First Nations communities in the post-Treaty period. In strong economic market years, trappers were able to benefit from an improved quality of life. However, the majority of the financial benefits obtained during a 'good year' were accumulated in the major trade centers and not necessarily within local trapping communities (Tough 1996). Years of low fur prices and limited external demand left First Nations communities especially vulnerable, as evidenced during the 1930s international depression (Tough 1996). As well, the introduction of the railway to the north during the 1930s also led to increased white trappers and prospectors in the north, which directly increased competition on the First Nations trappers while decreasing the resource supply (Tough 1996).

4.1.3.4 Fisheries

In the post-Treaty period, commercial fishing became an important industry in northern Manitoba (Tough 1996). In the pre-Treaty era, fish were a very important subsistence food source for both First Nations people, as well as for the fur trade industry as

it moved farther inland. For example, the first inland Hudson's Bay Company trading post located at Cumberland House was constructed near a fishery (Tough 1996). Although fisheries were important to the fur trade, First Nations considered the resource to be common property (Tough 1996). Immediately following the signing of Treaty Five, First Nations communities were able to alleviate the issue of overexploited wild game populations by more intensively harvesting fish (Tough 1996).

Although commercial fishing was present during the fur trade prior to the Treaty, large-scale outfits were not viable until the railway was developed post-Treaty, in the 1880s, opening up the export market for fish to the United States (Tough 1996). The expansion of the commercial fishing companies led to the diminished ability of First Nations communities to meet their own subsistence needs (Tough 1996). As a result, there was strong opposition to commercial fisheries coming from the Cree people themselves as fish stocks became depleted (Tough 1996). Unequal competition between First Nations fisheries and the heavily financed fishing companies led to a political dispute over subsistence harvesting rights (Tough 1996).

Due to the high levels of harvesting in the fisheries, in 1882, the OCN band requested that certain areas be made exclusive to the small-scale fishermen including Clearwater Lake (Tough 1996). The band was willing to share the resource with others including white fishermen but also wanted to retain control by excluding large-scale companies (Tough 1996). Even with these appeals, fish harvesting continued to increase between 1890 to 1915 due to American capital investments and industry consolidation (Tough 1996). Not surprisingly, this resulted in an increase in catch effort and led to a major crash in populations of whitefish, pickerel and, most notably, sturgeon (Tough 1996). Government

regulations were ineffective in preventing these fisheries collapses and only served to further highlight the inequalities in resource competition between commercial and subsistence harvesting (Tough 1996).

4.1.3.5 Economic Diversification

Although traditional harvesting practices remained important to the community of the OCN, economic diversification helped to alleviate the community's dependence on these forms of livelihoods in times of scarce resource supplies. Economic diversification was made possible by the improved transportation of raw materials. For instance, the Hudson's Bay Company introduced steamboats in 1880 with vessels being launched in The Pas area during the early twentieth century (Tough 1996). This form of transportation remained important up to the late 1930s due to the importance of the river system in the transport of raw materials (Tough 1996). As well, construction of the railway to The Pas was completed in 1908. Although it did not entirely replace steamboats as the main form of transportation, the railway was an important factor in the diversification of the economic base in Manitoba (Tough 1996).

At the time that steamboats were introduced to The Pas, the lumber industry, commercial fishing, mining and other resource extraction activities also commenced in the area using the rivers as transportation routes (Tough 1996). Upon the completion of the rail system from The Pas to Churchill in the 1920s a more pronounced shift from water to a land-based resource transportation system became evident (Tough 1996). This enhanced infrastructure signified The Pas substituting Norway House as the transportation hub in northern Manitoba (Tough 1996).

The improved land-based transport system, followed by the influence of other resource extraction activities, created an altered economic base in the region that had an impact on the First Nations economic well-being (Tough 1996). For instance, First Nations trappers faced increased competition from the influx of white trappers in the north, as a result of the construction of the railway, effectively eradicated fur-bearing animal populations (Tough 1996). The depression of the 1930s was especially difficult for the OCN band with records from the Hudson's Bay Company stating that "the present period of depression seems to have hit The Pas harder than most places in the country coming as it did after a period of boom conditions due to intensive mining activities in Northern Manitoba" (Tough 1996, 297). As a consequence, many people began receiving government relief at this time (Tough 1996). According to Tough (1996), by the 1960s, the region's economic base was one of both traditional and modern economies.

4.1.4 Residential Schools

The residential school system in Canada officially began in 1879 and continued until the last school closures in the late 1980s (Milloy 1999). By 1939, 9027 Aboriginal children were enrolled in seventy-nine residential schools across Canada (Milloy 1999). The schools were initially under Anglican authority but the Roman Catholic, Presbyterian and United Church denominations also became involved in administering such schools (Milloy 1999). The system was initiated as a partnership between the church and the state, with the church responsible for the actual care of the children and the government providing the majority of the funding (Milloy 1999). However, in effect, the school system was the product of the

federal government's response to the British North America Act of 1867, which outlined the state's responsibility for Canada's Aboriginal peoples (Milloy 1999).

Throughout its existence, the residential school system, as well as the overall assimilation policy of the federal government, suffered from insufficient funding resulting in "quality of care and education [that] remained far below acceptable standards" (Milloy 1999, xv). As a result of these fiscal challenges, attendees of these facilities endured overcrowding, inadequate nutrition and poor hygiene, which led to increased prevalence of diseases such as tuberculosis (Milloy 1999). The children attending these facilities experienced excessive discipline and other physical abuses, which produced adults "incapable of leading healthy lives" or contributing positively to their communities (Milloy 1999, xvii). Canada's residential school system had a negative impact on the health and well-being of thousands of individuals and resulted in the acculturation of entire generations of First Nations people.

The lasting deleterious effects of these facilities are very apparent within the community of the OCN with most of the Elders contributing to this research having attended a residential school at some point in their youth. Three schools, in particular, were highlighted as being most frequented by children from the OCN. First, various individuals discussed Elkhorn Residential School which was located in southwestern Manitoba near the Saskatchewan-Manitoba border and operated from 1888 to 1919 (AFN 2012a). Upon the Elkhorn facility ceasing operations, many children were transferred to the Prince Albert Residential School in Saskatchewan, which was in use from 1865 to 1964 (AFN 2012c). As well, several individuals indicated that they had attended the McKay-Dauphin Residential School located near Dauphin, Manitoba, which was operational from 1915 to 1933 (AFN

2012b). All three facilities were Anglican in denomination, indicating the Protestant influence in The Pas region as opposed to the Roman Catholic faith.

Similarly to the atrocities suffered by residential school attendees across Canada, OCN community members recall the attempts at cultural assimilation, physical abuse and high occurrence of disease. Through these faith-based establishments, the teachings of Christianity became ingrained into the lives of a large portion of the community. As a result of these factors, these facilities have contributed to the contemporary context of the cultural identity of the OCN.

4.1.5 Ecological Changes to the Saskatchewan River Delta (1930 - present)

4.1.5.1 Anthropogenic Impacts

As introduced in Chapter 1, a variety of anthropogenic influences in the twentieth century have had an impact on the ecology of the SRD and, therefore, on the ability of First Nations communities in the region to practice traditional harvesting activities. Large-scale hydroelectric developments, in particular, have contributed to an altered hydrologic cycle in the SRD. The E. B. Campbell Dam and Tobin Lake reservoir located upstream of the SRD impound a large amount of the sediment from the river, creating enlarged downstream channels and reduced nutrient flows within the wetlands of the delta (Partners FOR the Saskatchewan River Basin 2009). Lake Diefenbaker reservoir, formed as a result of the Gardiner Dam, can store more water than the combined capacity of all reservoirs in Alberta and has resulted in reduced downstream water flows during peak periods (Partners FOR the Saskatchewan River Basin 2009). The suppression of peak flows has reduced the occurrence of overbank flooding which are important events in replenishing water and nutrients within

the SRD (Partners FOR the Saskatchewan River Basin 2009). Due to the size of Lake Diefenbaker, evaporative losses are also considered a major consumptive water use and contribute to diminished water flows within the delta (Partners FOR the Saskatchewan River Basin 2009).

Another hydroelectric project that had negative ecological impacts on the SRD was the Grand Rapids Generating Station, which was officially announced in January of 1960 with construction completed in 1964 (Waldram 1988). The project was constructed downstream of the SRD on the Saskatchewan River where Cedar Lake meets Lake Winnipeg (Manitoba Hydro 2010). The dam resulted in the flooding of over 100 000 hectares of the SRD (DUC 2011) with Cedar Lake becoming a large forebay reservoir (Waldram 1984). As a result of the flooding, the economic base of several First Nations communities including the OCN was adversely affected (Loney 1987). Hunting and trapping activities were reduced in an area that had previously been rich in natural resources, leading to a loss of employment opportunities for local communities (Loney 1987). The reduced participation in livelihood activities contributed to extreme social consequences including declining health conditions, increased alcohol abuse and an increased dependency on welfare (Loney 1987). The construction of the dam led to severe cultural degradation due to the loss of a traditional way of life for the affected communities (Loney 1987).

Agricultural interests have also resulted in the deterioration of wetlands within the SRD. More than 30 000 hectares of wetlands in the Carrot River Triangle were reclaimed for agricultural purposes in the 1950s and an additional 7 000 hectares of wetlands were lost in the Helldiver area when the Pasquia River was diverted into Carrot River (Uchtmann 1983). The loss of these wetlands, coupled with flooding from hydroelectric developments, as well

as other consumptive uses, have altered the hydrologic regime within the SRD and likely impacted the ability of these important ecosystems to support plant and wildlife populations. As a consequence, the traditional livelihoods and cultural identity of the OCN band have also been altered.

4.1.5.2 Wetland Management

Partly to alleviate the impacts of the international depression and scarce resource base of fur-bearing animals on the communities in the region, the federal and provincial governments undertook a habitat development project to increase the muskrat populations in the SRD in the 1930s (Uchtmann 2008). The Summerberry Fur Rehabilitation Block was modeled after the 21 000 hectare area managed privately by Tom Lamb in 1932 for the same purpose and which involved the alteration of water levels through the development of canals and water control structures (Uchtmann 2008). Lamb's management system had success in increasing muskrat numbers within two years (Uchtmann 2008). Similarly, the government project was initially successful. However, the benefits of the project began to diminish by the 1950s and especially after the effects of the development of hydroelectric dams in the 1960s (Uchtmann 2008).

Management practices in the SRD have been carried out by DUC since the 1940s for the main purpose of enhancing waterfowl habitat in the area (Partners FOR the Saskatchewan River Basin 2009). DUC currently manages approximately 200 000 hectares of the SRD with the use of 75 water control structures (DUC 2011). Initially, DUC management in the area attempted to stabilize summer water levels to achieve more ideal conditions for waterfowl populations while also removing excess water (DUC 2011). However, as more

information became available about the importance of the wet-dry cycle to the wetland ecosystems in the SRD, management techniques in recent years have involved attempts at replicating naturally variable water levels (DUC 2011).

4.2 Contemporary Context

The effects of contact between First Nations communities and the dominant society are still being felt today, the results of which may be positive or negative, with some communities coping better than others (Adelson 2000). As indicated in this chapter, the people of the OCN have experienced historical changes that have contributed to their identity as Cree people. A discussion on the contemporary context of the OCN can also be an important exercise in understanding the indigenous knowledge of the land located within the SRD.

The term Opaskwayak refers to the elevated land of a forest or hills along the river or "high bush country" (Moses Bignell 2011). The OCN is comprised of 21 Reserve parcels with an area of 15 600 hectares that extends into both Saskatchewan and Manitoba (INAC 2012a). The community is one of eight First Nations belonging to the Swampy Cree Tribal Council located in northwest central Manitoba (SCTC 2012).

Economic development on the Reserve was limited from the years following the signing of Treaty 5 in 1876 up until the 1960s (OCN 2012). Since then, the OCN has moved towards enhanced self-government and autonomy in terms of Reserve management, as well as the local economy (OCN 2012). For instance, the Otineka Shopping Mall was opened in 1975, the McGillivary Care Home was completed in 1982 and the Kikiwak Inn was constructed in 1996 (OCN 2012). As well, Joe A. Ross School was opened in 1991 and

Oscar Lathlin Collegiate was recently constructed to alleviate concerns of overcrowding. Today, the OCN is the second largest employer in the region (The Pas 2012).

The traditional language of the OCN is a dialect of Swampy Cree, which is an Algonquian language. As of 2006, only about 28 percent of the registered population of the OCN had knowledge of their Aboriginal language (INAC 2012a). The limited traditional language retention rate is likely indicative of the community's long history of colonization.

Today, livelihood opportunities on the Reserve remain diverse with traditional activities such as commercial fishing, hunting and berry picking pursued by a small proportion of the population. Very few individuals take part in trapping due to the limited market for furs and scarce number of muskrats in the area. By far, most community members participate in the wage economy in areas such as health, education, sales, service and trades (INAC 2012a). According to the 2006 census, 24 percent of the population was dependent on government transfer payments at the time (INAC 2012a).

As indicated by this review of OCN history, colonialism has had an impact on the people of the OCN. In spite of the various processes of colonialism, traditional beliefs and practices remain an integral aspect of the Cree identity in the area. There is also an enduring interest in the knowledge held by Elders and their involvement in the activities of the community to support cultural continuity between the past and the future of OCN.

4.3 'Being Cree'

Undoubtedly, the extensive regional history discussed in this chapter has played a role in shaping the cultural identity of the people of the OCN. Interpretations of being a Cree person tend to be varied and diverse as Adelson (2000, 13) explains:

> Through all the changes, influences and threats, each generation continues to learn, embody and envision the myriad of ways of being Cree. For some, being Cree means a life of trapping, fishing and hunting; for others, it means running a wholly Cree-owned logging company, gas station or video store. For some, being Cree includes adopting the ways of the Anglican or evangelical Christian church; for others, native spirituality is the truest and only form of religious expression; for still others, any overt religious affiliation is simply more evidence of oppression and assimilation. There is no one way to 'be Cree' – there is no single way to live or express oneself as a Cree person.

Similarly for the OCN, there are a diversity of ways by which to identify oneself as being Cree in these contemporary times. However, due to my own interest in applying ethnoecology towards enhanced natural resource management, this research focuses on the indigenous knowledge held by those individuals that have or continue to be involved in traditional activities carried out on the land. As a consequence, these individuals, who tend to be adults or Elders within the OCN, identify themselves as being Cree through an intimate relationship with the land.

4.4 Chapter Summary

It is difficult, if not impossible, to separate identity from the extensive history of colonialism and neo-colonialism that Canada's First Nations communities have endured. As a consequence, this chapter has examined both the historical and contemporary factors that have contributed in some way to the cultural identity of being Cree for the people of the OCN today. The result of which, can be expressed in innumerable ways.

For many First Nations people, cultural identity remains strongly connected to the traditional practices taking place within the natural environment. Participation in these activities has helped to shape the indigenous knowledge of these communities. Therefore, to

better understand a life on the land and the resulting indigenous knowledge (Chapter 5), a contextual analysis of the cultural identity has been warranted.

As Adelson (2000) has indicated, there is a relationship between a life on the land, cultural identity and well-being for many First Nations communities. The local criteria for well-being are contextual and based on past considerations of the socioeconomic, political and ecological setting of a region. Chapter 6 examines these criteria to determine if they are related to the identity of being Cree that involves taking part in traditional harvesting activities in the natural environment. As a result, an enhanced understanding of the negative impacts resulting from degraded ecosystems on communities such as the OCN can be achieved.

CHAPTER 5: A LIFE ON THE LAND

The purpose of this chapter is to describe the social-ecological relationships between the people of the OCN and their natural environment. The chapter achieves an enhanced understanding of OCN indigenous knowledge of the diversity and uses of organisms found within wetlands (Objective 1). Data were collected through the analysis of traditional activities that take place within water and wetland ecosystems of the SRD that provide important ecosystem services to local communities. Unfortunately, environmental degradation of these ecologically sensitive habitats within the SRD has resulted in a reduction or change in ecosystem services. At a local level, altered ecosystems with the diminished ability to support plant and wildlife populations have resulted in reduced resources available for harvest by the OCN in their traditional activities.

Another outcome of the ethnoecological component of the research discussed in this Chapter was to gain an increased understanding of OCN indigenous knowledge regarding the relationships amongst wetland organisms (Objective 2). The data indicated that community members emphasized the interconnectedness between all plants and wildlife in terms of food chains. Management implications pertaining to this concept include the need to manage ecosystems in a more holistic manner. Chapter 6 further enhances the discussion regarding interconnectedness and relatedness between all life according to Cree epistemology.

5.1 Water and Wetland Ecosystems

As indicated in Chapter 1, approximately 81 percent of the SRD consists of a diversity of wetland types (DUC 2008). The five major wetland classes within the Canadian

Wetland Classification System include bog, fens, swamps, marshes and shallow open water. All five of these wetland types are found within the SRD and provide important ecosystem services. Through the cross-cultural transmission of knowledge, many community members have adopted the names of these major wetland classes to describe wetland areas, albeit inconsistently and without a clear pattern (to me). Even with the inconsistencies, the knowledge held by these individuals regarding wetland types under Western classification systems is culturally important and has ecological applications towards resource management. As such, I have included information from community members related to major wetland classes under the Canadian Wetland Classification System (Warner and Rubec 1997) in the ethnoecological component of the research.

The Canadian Wetland Classification System describes bogs and fens as organic/peatland wetlands with an accumulated layer of poorly decomposed organic material, known as peat, of greater than forty centimeters (Smith et al. 2007). The peat in these wetlands is typically made up of weakly decomposed *Sphagnum* mosses, as well as other moss and sedge species (Smith et al. 2007). Bogs are nutrient poor wetlands and can be treed, shrubby or open. When compared to other wetland types, bogs generally have a low diversity of species (Smith et al. 2007). Fens can be rich or poor due to variations in the amount of peat, hydrologic factors and nutrient availability (Smith et al. 2007). Both rich and poor fens can be either treed, shrubby or graminoid in terms of vegetation composition (Smith et al. 2007). These organic/peatland wetland types, in particular, are important in carbon sequestration and the moderation of climate change due to the storage of carbon in the accumulated peat (DUC 2012b).

For the OCN, the term muskeg is more commonly used to refer to bogs and fens. Several community members acknowledged the importance of muskegs in various ways including water purification (OH008[1]; Raymond Ross Lathlin 2011; RP010[2]). OH018 explains the impacts that environmental degradation has had on the ability of muskegs to purify drinking water:

> We used to have lots of little muskeg water coming out on the muskeg and that used to be really good water coming from the muskeg. You can still see them but they're not – they're very messy now, polluted. But we used to drink that muskeg water when we used to walk this way. My Dad used to give us a cup of water from there. That's how pure the water was long ago from here. That muskeg water, eh? There's still lots of little creeks. You can see them. You can still see them along the way here. But we don't drink from them anymore.

The peat found in muskegs was also traditionally dried and used for absorbing liquid in diapers (OH008; OH010; OH014; Raymond Ross Lathlin 2011; RP003; RP006), as well as for insulation purposes in homes (RP003; RP006). Plant gathering was another important activity that took place within fens and bogs, which will be discussed further in Section 5.3.

Swamps, marshes and shallow open water, as defined by Canadian Wetland Classification System, are generally mineral wetlands with less than forty centimeters of organic matter (Smith et al. 2007). Swamps are typically mineral-based in terms of soil type but can also occur with peat soils. The peat found in swamps is well decomposed and woodier in composition than the other peatland wetlands of bogs and fens (Smith et al. 2007). Swamps are diverse in vegetation and can be either treed or shrubby (DUC 2012b). Marshes are the most biologically diverse, albeit rare, wetland type found within the Boreal Plains Ecozone. However, these wetlands can cover large tracts of land within nutrient-rich

[1] OHxxx indicates a museum Oral History participant.

[2] RPxxx indicates an OCN community interview Research Participant.

areas including the SRD (Smith et al. 2007). Marshes provide habitat for many culturally important animal species harvested by the OCN including waterfowl, moose and muskrat (DUC 2012b). Water levels within shallow open water wetlands are less than two meters in depth and do not allow for the establishment of emergent vegetation such as cattails and sedges (DUC 2012b). As has been indicated, swamps, marshes and shallow open water have a variety of ecological benefits and are productive for a considerable diversity of wildlife and plants (Smith et al. 2007).

The ecosystem service provided by water and wetland ecosystems that was most often discussed by OCN community members falls within the provisioning category, which includes providing 'reservoirs of biodiversity' for the mammals, birds, fish and plants harvested for food and other uses through traditional activities (Ramsar 2012). In describing the importance of water in sustaining life, RP006 explained:

> All water bodies have food for different species of animals – beavers, muskrats, moose, deer, rabbits, all animals and also human life. The rivers are also important, they feed the bodies of water to keep them alive. Without water, nothing lives.

A second Elder (RP018) also indicated the role of water in the traditional harvesting practices of the community:

> The Saskatchewan River feeds all – the water into the lakes and the creeks within our areas, traditional areas and that's why the Saskatchewan River is important to all – fishermen, trappers, hunters, whatever. The water goes into these inland lakes, creeks or this way the wildlife survive and what I mean is moose, fur-bearing animals, muskrats and all that.

RP013 discussed the significance of water in providing habitat for the plants harvested for use in traditional medicines:

> We get lots of medicines from all over. They are all good as long as nobody picks or bothers them, especially in the water. There are a lot of medicines that nobody, that people haven't dealt with yet – that's what the old people used all the time. Water is the main ingredient… There are a lot of medicines in the water. Again, you pretty

> much have to not let [hydro] bother the water. There are a lot of medicines in the water, the river, the lakes and creeks… Everything – all the trees, the leaves – they are all in water. Water is the most powerful thing in medicines. It provides everything.

The wetlands and other water bodies within the SRD have also acted as important travel and transportation routes for the OCN (RP006). As indicated by one Elder (RP017), "our rivers were our highways. That is why there is always a river or a lake around communities." Moses Bignell (2011) also described these routes as 'water highways' and equated the interconnected system of rivers and creeks to the veins in the human body carrying life into surrounding areas. However, due to human development in the form of dams (RP004) and water control structures (Moses Bignell 2011), these important interconnected waterways have been altered, perhaps irrevocably.

More generally, some community members indicated the importance of "bringing the delta back" (Philip Dorion 2012), which could be interpreted as the need to return the delta to its natural state as had been shaped by Mother Earth or the Creator prior to any major human development. Several individuals believe that if anthropogenic structures were removed, then the wetlands and waterways within the SRD will once again become thriving ecosystems. For example, RP006 indicated that, "if they take all the dams out, the earth won't take so long to replenish itself." RP006 also suggested that any external interference might have negative consequences on the SRD:

> All water bodies are important within my traditional lands. They should be kept in their natural state. The ecosystem should not be disturbed by lack of water or too high [of] levels. These are man-made disturbances.

These considerations acknowledge the belief that there can be no improving upon what the Creator has provided.

5.2 Wetland-based Practices

As indicated previously, wetland-based practices relate mostly to acts of resource harvesting, which are captured within provisioning ecosystem services. For local and indigenous communities, the act of going out on the land to harvest food also has spiritual or recreational elements, which falls within the category of cultural ecosystem services. Although other categories of ecosystem services attained from wetlands such as regulating and supporting should not be discounted, issues related to traditional harvesting practices are very important to the OCN. The health of the animals and plants that comprise Cree food are commonly used as a measure of environmental health.

Trapping, moose hunting, waterfowl hunting and the gathering of particular plant species take place within those wetland types described by the Canadian Wetland Classification System (Warner and Rubec 1997) and, as such, were within the scope of this research project. However, as indicated in Chapter 3, the definition of wetlands by the dominant society tended to differ from what the research participants understood a wetland to be. As a consequence, a large number of the field excursions occurred within lakes and rivers while taking part in activities related to fish harvesting. These major waterways play an important role in the lives of OCN community members, acting as means to practice livelihood activities, as well as essential transportation routes. Due to this importance, I have included fish harvesting in the ethnoecological study of wetlands even though the activity does not typically occur within the narrower definition of these ecosystems as determined by Western science classification systems. Wetland habitats also contribute to fish populations through the provision of vital spawning grounds. Therefore, an analysis of fishing activities

in a project concerning wetlands within the SRD is warranted and provides relevant information pertaining to the OCN community.

Figure 5.1 represents the seasonality of the wetland-based practices that have been or continue to be practiced by people from the OCN over a twelve-month period. Individuals tended to indicate temporality through the use of the calendar months, as well as by environmental conditions. For example, Raymond Ross Lathlin (2011) indicated that spring trapping terminates around the middle of May or when the ice begins to melt. Due to changes from year to year in terms of snowfall and when freeze up occurs, for instance, the temporal boundaries of the traditional harvesting activities should not be considered fixed. This visual tool represents the approximate time of year wetland-based activities have traditionally been carried out, according to a select group of community members.

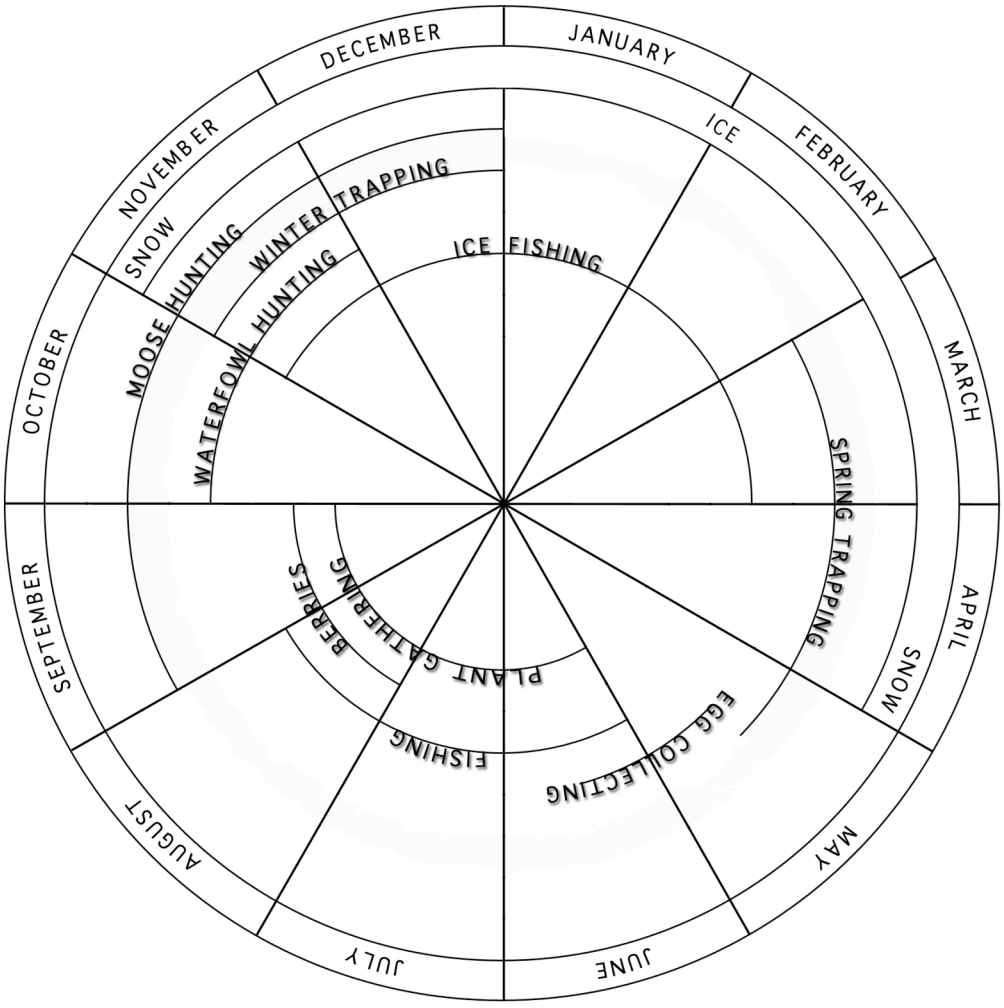

Figure 5.1 Seasonal calendar representing the approximate time of year wetland-based activities are carried out by the Opaskwayak Cree Nation.

5.2.1 Trapping

For this research, the majority of data related to trapping comes from experiences in the first half of the twentieth century, when people were more actively taking part in the livelihood practice. Either the research participants themselves would go trapping in their youth, or their knowledge stems from the trapping practices of their fathers or grandfathers.

As well, the individuals included in this ethnoecological study are typically of an age where getting out on the land is no longer an easy task. Consequently, the activities related to trapping are generally historical in nature or a reflection of the past.

Trapping predominantly takes place over two seasons in the year. First, winter trapping commences when ice has formed on the water and consists in the harvesting of 'fine fur' animals including mink, marten, fisher and weasels (OH007; Raymond Ross Lathlin 2011). The fur of these animals deteriorates as the winter continues so the practice is typically suspended in January. Second, spring trapping takes place from March until around the middle of May before the spring melt and involves the harvesting of beaver and muskrat (OH007; OH010; Raymond Ross Lathlin 2011). According to former trappers, muskrats begin to mate in May, which leads to altercations amongst the animals resulting in diminished fur quality (OH015; RP001). Concerns over harvesting animals during the mating season and while the young are being reared also tended to dictate the end of spring trapping (RP001). Discussions pertaining to spring trapping occur more often than winter trapping due to the importance of the muskrat and beaver to the OCN as totems, sources of food and in medicinal applications.

Beginning in the late 1930s, the government initiated a program to alleviate the lack of employment in the area (OH015; Uchtmann 2008). The program consisted of setting a yearly quota for the number of muskrat that each trapper could harvest. The quotas would vary from year to year but according to information provided by community members, tended to range from three hundred to five hundred muskrats per trapper (OH008; OH015). After the muskrats were harvested and furs turned over to government officials, each trapper would initially receive 25 dollars and then another 25 dollars per month for the remainder of

the year if the full quota were harvested (OH008; OH010). Transport to trap lines would sometimes be provided, as well as necessary equipment including traps and fur stretchers (Uchtmann 2008). According to RP001, the government initiated trapping program was terminated in 1964, although some individuals continued to trap and sell their furs directly to other people known to distribute furs.

Trap lines consisted of an area of land that varied in size with one individual estimating their trap line to have consisted of four to five square miles (OH007). Uchtmann (2008) indicated that the government distributed land within the Summerberry Fur Rehabilitation Block, which consisted of the entire lower delta downriver from The Pas with the exception of Tom Lamb's management area. In relation to the Reserve or The Pas, OH015 also explained that the majority of the trap lines were located to the east or downriver. A limited number of trap lines were located in the Saskeram area upstream of the community (Uchtmann 2008).

Trap lines were either held by one family or shared by several families. For instance, OH009 noted that, "each man would get a different area and they would go to it. He doesn't go in somebody else's area." However, on the other hand, OH008 explained:

> Well, there was a group of people. In many case, in my case, in our case, I think there was four or five families. Shared it. Shared that area. And that was their area so nobody else would go there unless they were invited. So if they were invited then fine but if not then they wouldn't go.

Several individuals mentioned that all members of the family would accompany the male trapper to the trap line during the harvesting seasons. For instance, one female Elder (OH010) explained:

> In the fall we moved to the bush where he was trapping, long before I had my first baby. In the following year, I had my first baby with me. And we were there, I think four winters we were in the bush.

Other community members recollect that, at times, their fathers alone would participate in the actual process of harvesting the furs on the trap line while themselves and their families would remain on the Reserve (OH019). Even when these individuals maintained their residence away from the trap line, the activity of trapping remained an important and nostalgic component of their childhood as demonstrated by one community Elder (OH015):

> Once in awhile he'd come home and every Christmastime he'd have his pelts and he'd have his money and do a little celebration. And then in the wintertime, he would – don't forget that the fur industry when they were trapping come this January, nothing really moves. You know, you can't really kill minks or…I guess you could probably kill beaver but everything slows down. So there's a period there, say January and February, sort of – everything is sort of down. And this is where I guess they do other things eh? And then they start getting ready for the, in them days, Trapper's Festival. They go for their dogs and stuff. And then by March, they would start thinking of muskrats. They would start talking muskrats. Around March 15th, they'd start heading out to the trap lines, going and get their traps ready, get prepared.

Trapping was an important source of livelihood and culturally important in many different capacities for individual families, the entire community and the surrounding region.

The length of time needed to harvest the limit or quota varied from only one week (OH008) to four or five weeks (OH010). Upon reaching the harvesting quota, trappers would sometimes help others to reach the muskrat limit (OH010). According to OH015, one method of muskrat harvesting would involve the trapper looking for an elevated muskrat 'house' or 'pushup' where the animal lives and has access to oxygen. To determine if a muskrat is using the house, the trapper would puncture a hole through the mound using a pointed spear-like implement. If the spear was able to pierce the pushup then the house was not frozen and a muskrat was potentially occupying it. A metal trap would then be inserted into the pushup. Some trappers would have as many as three-dozen traps out at any one time

with each trap being checked on a regular basis. Each harvested animal was skinned prior to submission to the government (OH015).

Trapping was the one activity that I was unable to observe during my fieldwork due to the time of year. Therefore, I planned to conduct my final results verification workshop in January 2012 in order to observe the end of winter trapping. Upon returning to The Pas, I accompanied Raymond Ross Lathlin and his nephew while they set traps in their trap lines in North and South Raven's Nest located downriver from the Reserve. For the fine fur animals harvested during winter trapping, a box was used with a baited trap inside (Figure 5.2). Raymond and his nephew also demonstrated the methods for the culturally important spring trapping. As has been discussed, spring trapping primarily resulted in the harvesting of muskrats in the past. However, due to the low abundance of muskrats in the region, contemporary spring trapping typically involves the harvesting of beavers. Beaver traps were set under water near lodges after determining water depth and locating the beaver runs (Figure 5.3).

Figure 5.2 Baited trap used to harvest fine fur animals during winter trapping.

Figure 5.3 Raymond Ross Lathlin setting a beaver trap.

5.2.1.1 Impacts on Trapping Practices

The practice of trapping today does not have the same cultural significance as it did in the past and very few OCN community members continue to take part in the activity. There is some discrepancy within the data on the actual number of people that have maintained trapping as a source of livelihood in the community. For instance, one Elder (OH008) suggested that no one makes their living as a trapper anymore but that some individuals may trap as a hobby. A second community member echoed this observation by explaining that trapping has become more of a recreational activity as opposed to a required livelihood practice (RP015). When questioned regarding the number of trappers in the community, other individuals would reply with "not too many now" (RP011) or that "some are still trapping" (OH012). Another Elder (RP015) suggested that the number of active trappers in the community is unknown and could range anywhere from ten to two hundred and acknowledged that this would be useful information to gather. Regardless of the number of active trappers today, it evidently does not compare to the number of individuals that have historically taken part in the activity.

According to community members, the limited participation in trapping is attributed to a variety of factors. First, external factors such as the reduced demand for furs in the market has created a lack of incentive to continue to practice the activity (RP011). Consequently, this lack of monetary return from trapping fails to encourage younger generations to participate in the livelihood activity (RP007; RP011). Second, the increased amount of human settlement in the area has reduced the amount of land available to successfully trap. As OH007 explains, "there wasn't that many people like there is now, eh, so there was a lot of land for trap lines and they made a living at it." Lastly, there is the

concern that there are simply no animals (i.e., muskrat) inhabiting the region anymore (OH004; RP001; RP004; RP014), which is attributed to various environmental impacts. For instance, several individuals mentioned water contamination as a contributing force to the muskrats relocating to other areas (RP007). Also, water levels appear to have had an impact on muskrat populations (RP003). For instance, if water levels are too low, then the muskrats will freeze during the winter (RP011) and if they are too high then the animals will drown (Raymond Ross Lathlin 2011; RP009; RP011). Factors identified as contributing to the diminished muskrat populations resulting from a variable water regime in the area include hydroelectric developments (RP007; RP008), DUC water management activities (R006; RP009), as well as ecological manipulation in the form of dams by overabundant beaver populations (RP011). The diminished habitat as a result of agricultural expansion in the SRD was also deemed detrimental to muskrat populations (RP008).

5.2.2 Moose Hunting

As indicated in Chapter 4, the traditional economy of the Cree people located in the region prior to European contact was highly dependent on big game hunting for subsistence purposes (Thistle 1986). Although the majority of community members included in this research are relatively elderly, several of these individuals still continue to participate in hunting practices today. In contrast to trapping, big game hunting and, more specifically, moose hunting is more highly valued by younger generations, which I witnessed myself in the field when hunting parties were encountered on numerous occasions. The cultural significance of the practice remains undeniably strong for the people of the OCN.

I had the opportunity to participate in several moose hunting excursions in the latter part of my fieldwork with one in particular standing out. Over a five-day period in late September, Raymond Ross Lathlin, Moses Bignell, Mabel Bignell and myself stayed at a camp down river that is the property of Raymond and his brother, Philip Dorion. At the time, a group of relatives and friends were also staying at the camp with the hopes of making a moose kill. The presence of this group allowed me to observe the hunting practices of a younger generation and determine whether some of the cultural traditions surrounding the activity are being perpetuated. This hunting party was, in fact, successful in harvesting a large bull moose with the kill shot being taken by Philip Dorion's son. Although I was not present for the actual kill, I was able to observe the activities after an animal has been successfully harvested. Consequently, I have included my observations surrounding this event as they relate to discussions regarding moose hunting.

By far the most popular big game species harvested by the community is moose. Other large ungulate species found in the region (e.g., elk, caribou, deer), along with black bears, are also harvested but to a lesser extent. Some people attribute this preference in big game to regional differences in the food available to these animals, which in turn affects the taste of the meat (Raymond Ross Lathlin 2011). For instance, the deer in southern Manitoba have more agricultural crops to feed on and, as a result, some people are of the opinion that they have better tasting meat than the deer located in the SRD. Moose, on the other hand, have rich amounts of feed in the SRD due to abundance of shrubs, new growth from deciduous trees and aquatic plants (Pattie and Fisher 1999), making their meat preferable for human consumption when compared to other ungulate species (Raymond Ross Lathlin 2011).

Big game hunting by the community is typically carried out in the fall (RP001; RP003; RP011) with people going out individually or in small groups (RP009). In the past, people would go out hunting with the use of canoes, dog team or by foot (RP012) and tended to remain out in the bush for longer periods of time (OH017; OH018; RP009). Upon making a kill, camp would be set up and the entire meat processing activities would take place at the site. Meat preservation consisted of smoking strips of meat over a fire or producing pemmican (OH017). Pemmican consists of thin pieces of meat that are dried over a fire and pounded into the consistency of a powder (OH017). Similarly to trapping, entire families would sometimes go out in the bush for the hunt with women playing an important role in meat preservation activities as explained by OH012:

> Whenever he killed a moose, that's where we stopped. That's where we spent the nights [and] days while my Mother was doing the work on getting the dry meat out of that moose, which my Dad killed.

Due to technological advances in methods of transportation, the introduction of motorboats, quads and skidoos have altered hunting practices and made the activity less physically demanding than had traditionally been the case (OH017; RP015). Today, there is no longer the necessity to preserve the meat out in the field because returning to the Reserve to process the animal can occur prior to spoilage. With the advent of grocery stores, subsistence hunting as a source of livelihood is no longer required. However, the recreational aspect of big game hunting plays an important role in perpetuating the practice for the community (RP015) and the activity remains culturally important to the OCN. As in the past, a hunter today who makes a kill enjoys a certain amount of respect from peers along with an improved reputation as a skilled hunter (Morrison field notes, September 24, 2011).

Although modern conveniences have changed some of the traditional customs and practices surrounding moose hunting, community Elders continue to hold the knowledge of these important cultural practices. For instance, on the hunting trip the Elders were gifted one of the moose's hindquarters and there was concern amongst the younger people about the meat spoiling because the Elders and myself were to remain at camp for several days more. However, under Raymond Ross Lathlin's tutelage, we prepared and preserved the meat by smoking it over a fire with the aid of a 'tripod' structure as had commonly been used in the past (Figure 5.4; Figure 5.5). The others at the camp were exposed to this long-standing traditional practice and, thus, knowledge was transmitted to younger generations.

Figure 5.4 Moses Bignell, Mabel Bignell and Raymond Ross Lathlin preparing a moose hindquarter for smoking.

Figure 5.5 Smoking moose meat.

5.2.2.1 Impacts on Moose Hunting

Estimates on the current relative abundance of moose in the area varies from person to person and at times can be a highly contested debate. However, the vast majority of people acknowledge that moose populations in the area are in decline. For instance, Raymond Ross Lathlin (2011) mentioned that the number of moose in the region has been reduced since the late 1950s. Many other community members have also expressed their concerns in the declining presence of moose in certain areas (RP006; RP015; RP016; RP018).

Individuals have attributed this decline in the number of moose in the area to two main issues. First, intensive harvesting was considered by many to be an important factor in

negatively impacting moose populations. High levels of harvesting does not appear to be a result of an increase in the number of hunters because most of the individuals that contributed to this project acknowledged that there are fewer hunters today than in the past (RP007; RP011; RP018). That being said, several community members recognized that although there may be a decline in the number of hunters, there are still too many hunters to maintain stable moose populations. RP016 explained that, "there are too many hunters. Some of our band members do not comply with these things like the one who took eighteen moose and there are others who [have] done this." Improved methods of transportation may also have contributed to the increase in the number of moose kills. For instance, RP016 indicated that, "[there are] lots of young moose hunters [but they] are mostly road warriors. They don't go out the way we used to by boat into creeks, no camping."

Second, various individuals indicated that environmental factors have contributed to the declining moose numbers in their traditional territory. For instance, habitat loss was a concern echoed by several community members as a result of industrial expansion activities such as deforestation by Tolko (RP013) or flooding caused by hydroelectric developments (RP014; RP019). Other OCN Elders have noted an increase in the occurrence of disease in moose that have been harvested due to pollution (RP009; RP013). Raymond Ross Lathlin (2011) along with various community members (RP008; RP015; RP018) have also attributed the decline to overabundant wolf populations. Both human influenced and natural considerations pertaining to the environment are considered by many as contributing to the diminished presence of moose in the area.

The need to protect moose populations is recognized by many individuals (RP009; RP012; RP016; RP018). In contrast to the muskrat, community members have indicated that

there is still the potential to conserve moose populations for the sustainable harvest by future generations through improved management activities. A suggestion made by one individual (RP016) was to put a moratorium on moose hunting in the area for all hunters, however, he recognized that OCN band members would still be able to harvest them. As a consequence, community members also acknowledged the need for improved self-government and individual accountability in ensuring that moose continue to populate the SRD well into the future.

5.2.3 Waterfowl Hunting

Waterfowl hunting is another important traditional activity practiced by the OCN that tends to take place in lakes, rivers and a variety of wetlands types. Much of the waterfowl hunting in the region consists in the harvesting of migratory birds such as ducks (e.g., mallards, pintails, blue-winged teal) and geese (Canada geese, snow geese) (RP002; RP003). According to Raymond Ross Lathlin (2011) and other individuals (RP002; RP003; RP004; RP008), the majority of waterfowl hunting occurs in the fall after the pinfeathers have fallen out. Other community members have also indicated that some waterfowl hunting takes place in the spring after the birds have returned from their migration (RP010; RP016).

Waterfowl hunting is widespread throughout the region but certain areas are frequented more than others. For instance, lakes such as First Reader, Second Reader, Saskeram, Bignell, Lake 36, Rocky, Root, Little Kelsey, Helldiver, as well as the Saskatchewan River were noted as being good waterfowl hunting areas (RP004; RP007; RP015). However, hunting locations with an abundance of bird populations may differ from year to year depending on a variety of environmental conditions. As such, community

members tend to use personal experience or 'word of mouth' to determine the best waterfowl hunting locations from year to year (Morrison field notes, September 11, 2011).

The birds are primarily harvested for food but traditionally the feathers were also used as stuffing to make insulated blankets (RP010). Hunting typically takes place from boats and can be done in pairs or alone (Figure 5.6; RP007). The harvested waterfowl are then plucked of their feathers, cleaned, cut up and, most commonly, made into a soup. In the past, collecting the eggs of waterfowl such as coots was also a culturally important activity occurring in the spring (RP004; RP015).

As with moose meat, the sharing of harvested ducks with other community members was a common practice in the past. In my fieldwork, I observed that the act of sharing is still occurring but mostly amongst Elders. For instance, when I was making bannock one day at Mabel and Moses Bignell's house on the Reserve, I helped pluck ducks that another Elder had gifted them (Figure 5.7). RP016 indicated that he had distributed harvested waterfowl to non-hunters within the community, as well as to Elders living nearby.

Figure 5.6 Raymond Ross Lathlin after waterfowl hunting.

Figure 5.7 Alli Morrison, Raymond Ross Lathlin, Mabel Bignell and Oliver Bignell preparing harvested waterfowl.

5.2.3.1 Impacts on Waterfowl Hunting

The majority of the community members that contributed to this research acknowledge that there has been a discernible decrease in waterfowl populations in their traditional territory. When asked if there has been a change in the amount of birds harvested in the area, RP004 replied by saying that, "there were lots of them, now we don't know when they leave. Long ago, it took them three days when they fly over and there were so many back then." Another community Elder (RP009) explained:

> There's been a change in my lifetime, never mind my grandparents. One time there were thousands and thousands. You can go out and harvest, you can go and harvest two hundred ducks and not even make a dent. There were still thousands and thousands. Now we are lucky if you get twenty, if you can even find twenty.

Community members provided a variety of reasons for the decline in bird populations. Similarly to the declines in muskrat and moose, various environmental considerations were noted with the majority of these factors attributed to human influence. Habitat loss as a result of continued human settlement has been an important component affecting ecologically sensitive areas. For example, the construction of the dike in the Carrot River Triangle in the 1950s for the purposes of agricultural expansion resulted in the alteration and degradation of valuable waterfowl habitat (RP015; Uchtmann 1983). The management efforts of DUC are typically thought to have negatively impacted the habitat of these migratory bird populations (RP009; RP016). Another factor that has been observed by individuals is the increased occurrence of disease resulting from elevated levels of pollution (RP003). Contaminated water was provided as yet another reason for the decline or simply as to why the birds no longer choose to inhabit the area (RP007). Perhaps due to the cumulative effects of the aforementioned factors, a change in migration route was also

deemed an important explanation as to the declining waterfowl populations in the area (RP002; RP006; RP011).

Surprisingly, high levels of harvesting was not considered to be an important issue although one individual (RP019) did mention that the American tourists that arrive in the SRD to hunt are wasting the harvested birds by discarding any unwanted carcasses. As well, RP009 mentioned seeing garbage bags full of geese at the dump, which could be an indication of excessive harvesting.

5.2.4 Fishing

Like the other traditional harvesting practices that have been discussed, fishing as a source of livelihood has declined in recent years. Even so, fishing remains an important component of the cultural identity of the OCN with both domestic and commercial fishing continuing to be practiced today (Figure 5.8; Figure 5.9; OH004; OH012). In fact, commercial fishing is one of the few areas where an adequate income can still be generated (RP003).

Fishing by community members occurs throughout most of the year from June to October, as well as November to April (Lindgren 2001; OH019). However, the majority of commercial fishing is conducted when the lakes and waterways are free of ice with the use of gillnets (OH020). Commercial fishing under ice in the winter is conducted with the assistance of a jigger (Morrison field notes, January 31, 2012). Domestic and commercial fishermen from the community commonly frequent various major lakes and waterways throughout the SRD in order to harvest fish (Lindgren 2001). Several individuals mentioned that most commercial fishing is conducted on the Saskatchewan River, both upstream and

downstream from the Reserve (RP010; RP016). The fish are then sold to a Freshwater Fish Marketing Corporation office in The Pas, which is responsible for processing and marketing the fish for sale throughout Alberta, Manitoba and the Northwest Territories (FFMC 2012; Raymond Ross Lathlin 2011).

Fishing for subsistence purposes has not been required on the Reserve for decades (RP003). However, in the past, fish were harvested using nets, filleted and then smoked in order to preserve the meat for long periods of time (RP003). Fish made up a considerable portion of the diet for many individuals as indicated by OH019:

> And then you get your fish again. Fish would be year round too but they have to use a net, you know. And that's the way we ate because I remember my brother said, "boy that one summer I was tired of fish!" He said, "fish everyday. Fish everyday." 'Cause my mom used to have a net and she used to go and check her net every morning. And then she'd take the fish and cook it up.

Fish in the area tend to be more abundant during spawning periods, which differs amongst species but typically occurs either in the spring or fall (RP001; RP002; RP004; RP006; RP007; RP011; RP016). Northern pike, lake sturgeon, suckers, goldeyes and walleye spawn in the spring while the whitefish spawn in the fall (RP007). According to RP001, the majority of spawning occurs in areas where "the rivers branch out from the lakes." During the summer months, fish tend to seek out deeper and colder water to escape the heat (RP001; RP003).

Figure 5.8 Philip Dorion fishing for domestic purposes.

Figure 5.9 Raymond Ross Lathlin ice fishing for domestic purposes.

5.2.4.1 Impacts on Fishing

Many individuals within the community acknowledged a population decline in various species of fish in the region over time (RP001; RP002; RP004; RP009; RP011; RP014; RP016; RP018). Specifically, discussions surrounding the diminished sturgeon abundance in the area are common due to the cultural significance of the large fish to the community. However, there is an understanding that fish populations in general are on the path of continued decline in the area.

Community members highlighted several reasons for the reduced numbers in fish populations. First, the alteration of aquatic habitat has negatively impacted fish abundance in

the region. For instance, the hydroelectric developments that were constructed in the 1960s have altered the flow of water in the SRD (OH008; OH020; RP016; RP019). Some individuals also acknowledged that the DUC water control structures have negatively impacted fish reproduction and survival (OH020; RP002). As well, the draining of water for agricultural purposes has reduced the amount of fish habitat in the SRD (OH020). According to community members, the above factors in combination with non-anthropogenic factors such as beaver dams (RP002) have resulted in a change in the hydrologic regime in the region and contributed to the reduction in fish species abundance.

A second concern among community members regarding fish decline was the increased levels of pollution and higher occurrences of disease in fish. For example, several individuals acknowledged that they have refrained from consuming fish from the river due to high levels of pollution (OH013; RP013; RP016). Other community members indicated that disease in the form of spots (Mabel Bignell 2011; RP013) or worms (Raymond Ross Lathlin 2011; RP003) have been discovered on some fish, potentially as a result of contaminated water. Garbage and other debris in the river were also noted as contributing to the declining health of fish populations (RP011; RP019).

Similarly to waterfowl hunting, intensive harvesting levels were not discussed as an important concern in declining fish populations. However, one individual did acknowledge that fish harvesters themselves might be partially responsible for the decreased abundance in the area (RP016). For instance, RP016 explained:

> All the other areas are fished out now. I tried fishing at Landry Lake two summers ago but there is nothing left there. They clean it right out and that used to be one of the best fishing areas.

Regarding the decline in the sturgeon population specifically, RP016 describes poor fish management practices:

> The sturgeon – something has to be done. Like this summer I was watching people pulling out the small ones and keeping them. They are not even ready. And then I saw the big ones, the breeding ones, they were pulling them out and selling them. As long as they do that there will be no fish. They are not allowing them to lay their eggs. Some of the sturgeons were a good five feet and keeping them and selling them to the communities. The people are selling the sturgeons all over the place. Those ones will be lost like the whitefish.

As has been demonstrated, a combination of habitat loss, pollution, disease and intensive harvesting has been considered by community members as contributing to the overall decline in fish populations in the SRD.

5.2.5 Plant Gathering

Plant gathering has traditionally been an important wetland-based activity for the people of the OCN. There are a wide variety of plants that have historically been harvested in wetlands for medicinal purposes, as well as for food. Due to the sensitive nature of medicinal plants resulting from issues surrounding intellectual properties rights, this research focuses only on plants that are relatively well known within academic literature. As well, traditional medicines typically consist of a mixture of several plant species so a discussion surrounding individual plants will limit the exposure of these medicines to the public domain.

5.2.5.1 Sweet Flag / *wekās*

Sweet flag (*Acorus calamus*) or *wekās* is an aquatic perennial that grows along swamps, marshes or other slow moving waterways throughout the boreal forest (Johnson et

al. 1995; Lahring 2003; Marles et al. 2008). Locally, the plant is more commonly known as 'ratroot' due to the role the thick aromatic rhizome (Figure 5.10) plays in the diet of muskrats (Lahring 2003; Marles et al. 2008). Flowers are clustered into a single cylindrical spike that is located on 'sword-shaped' leaves (Figure 5.11).

Marles et al. (2008) suggest that *wekās* is the most commonly known and used plant by indigenous peoples in their traditional medicine. Similarly, *wekās* was by far the most often discussed plant encountered during fieldwork, indicating the cultural importance of the plant to the community. As well, unlike many other plants used in traditional medicine, *wekās* continues to be gathered and used by OCN Elders (RP006; Stanley McGillivary 2011). The rhizome is typically harvested, dried and used as a panacea to treat a variety of ailments including colds, sore throats, toothaches, upset stomachs and arthritis (Johnson et al. 1995; Lahring 2003; Marles et al. 2008; Stanley McGillivary 2011). Distribution patterns of *wekās* indicate that indigenous groups may have been responsible for introducing the plant to some areas (Marles et al. 2008). Accordingly, Stanley McGillivary (2011) indicated that he had cultivated the plant in certain areas to increase the amount of rhizomes that could be harvested annually.

Figure 5.10 Rhizome of sweet flag (*Acorus calamus*) or *wekās.*

Figure 5.11 Sweet flag (*Acorus calamus*) or *wekās.*

5.2.5.2 Laborador Tea / *muskākopakwu*

Laborador tea (*Rhododendrum groenlandicum*) or *muskākopakwu* is a stout, woody shrub with leathery, evergreen leaves that are dark green on top with white to rust-coloured hairs below with edges rolled under (Figure 5.12; Johnson et al. 1995; Lahring 2003; Marles et al. 2008). Flowers consist of white clusters in an umbrella-like formation at branch tips (Johnson et al. 1995). The plant is typically found in bogs, fens, swamps or moisture-rich coniferous forests and is distributed throughout the boreal forest (Johnson et al. 1995).

Many indigenous groups including the OCN have traditionally boiled the leaves of *muskākopakwu* to make a medicinal beverage or, more specifically, a tea (Johnson et al. 1995; RP009). Similarly to *wekās*, the tea can be used as a generalized medicine to treat various illnesses such as colds, fevers, stomach ailments or headaches (Johnson et al. 1995). One community Elder (RP009) described the importance of *muskākopakwu* in preventing illness:

> There are medicines out there that you can use to prevent getting sick, so you don't get sick if you use them all the time, like that muskeg tea. If you drink that muskeg tea all the time, at least once a day, you will never have kidney trouble. Your kidneys will always be healthy. Because that's what it does, it cleans your system out. It is just tea, it's not scary medicine or anything, it's tea. They call it Labrador tea.

As the leaves remain on the plant throughout the entire year, the popular medicine can be accessed even in winter months (Drieger 2006).

Figure 5.12 Laborador tea (*Rhododendrum groenlandicum*) or *muskākopakwu*.

5.2.5.3 Small Yellow Pond Lily / *astakwanaskwak*

Small yellow pond lily (*Nuphar variegatum*) or *astakwanaskwak* is commonly found throughout the boreal forest in ponds, lakes and other slow-moving water bodies (Johnson et al. 1995). The plant is an aquatic perennial with floating heart-shaped leaves and a single cup-shaped yellow flower (Johnson et al. 1995; Lahring 2003). *Astakwanaskwak* has a thick underwater rhizome, which is an important food source for muskrat, beavers and moose (Johnson et al. 1995; Lahring 2003).

The rhizome or *watape* has traditionally been used as a medicine for indigenous peoples in North America (Marles et al. 2008). *Watape* is better known locally as 'pineapple

root' due to the pattern on the rhizome that resembles the skin of a pineapple (Figure 5.13; Raymond Ross Lathlin 2011). The rhizomes are harvested and dried prior to use (Marles et al. 2008). The dried rhizomes can then be chewed or boiled into a tea to relieve headaches, swelling, arthritis or joint pain (Johnson et al. 1995; Marles et al. 2008).

Figure 5.13 Rhizome or *watape* of small yellow pond lily (*Nuphar variegatum*) or *astakwanaskwak.*

5.2.5.4 Cranberries

Three main species of cranberries were encountered during fieldwork with two of the species being commonly found in wetlands. Small bog cranberry (*Oxycoccus microcarpus*) is widely distributed throughout the boreal forest in bogs, swamps and fens (Figure 5.14; Johnson et al. 1995). Bog cranberry (*Vaccinium vitus-idaea*) can survive in slightly drier habitats than small bog cranberry and, as the name suggests, is commonly found in bogs (Figure 5.15; Johnson et al. 1995). The two species are very similar morphologically with

both plants consisting of an evergreen shrub with leathery, elliptical to egg-shaped leaves and each producing berries approximately 5 to 10 mm in size (Johnson et al. 1995). The OCN Elders I worked with did not differentiate between the two species with both having the Cree name *maskākomenu*, which can be translated into English as 'muskeg berry'. A third species of cranberry found in the SRD is high bush cranberry (*Viburnum opulus*) or *nepemenanu* (Figure 5.16). Although this species is not typically found in wetlands as defined under the Canadian Wetland Classification System (Warner and Rubec 1997), it has been included when discussing cranberries due to their being frequently encountered during fieldwork. The plant is a tall shrub with leaves consisting of three pointed lobes that change from green to red in the fall (Johnson et al. 1995). The fruit consists of orange to red berries clustered at the tips of branches (Johnson et al. 1995).

All three species of cranberries are harvested for food to be eaten fresh or made into a jam (Johnson et al. 1995; Mabel Bignell 2011). Medicinally, the leaves and roots of small bog cranberry could be made into a tea to treat bladder infections and bog cranberry was traditionally used to treat fevers, sore throats or stomach ailments (Johnson et al. 1995). The bark of high bush cranberry was boiled into a medicinal tea to be used as a diuretic (Marles et al. 2008) or to treat menstrual cramps (Johnson et al. 1995). The berries of these three cranberry species could also be used as a dye (Johnson et al. 1995; Mabel Bignell 2011).

Figure 5.14 Small bog cranberry (*Oxycoccus microcarpus*) or *maskākomenu.*

Figure 5.15 Bog cranberry (*Vaccinium vitus-idaea*) or *maskākomenu*.

Figure 5.16 Moses Bignell harvesting high bush cranberry (*Viburnum opulus*) or *nepemenanu.*

5.2.5.5 Impacts on Plant Gathering

Numerous OCN community members indicated that there has been a reduction in the abundance or quality of plants within their traditional territory. For the most part, the decline was attributed to increased human influence in the area resulting in diminished habitat quality and/or quantity (RP009; RP010; RP016), increased pollution levels (RP009; RP013), water level fluctuations (RP009; RP016; Stanley McGillivary 2011) or intensive harvesting (RP002; RP016). An Elder (RP009) knowledgeable in medicinal plants explained the impacts of anthropogenic influence:

> There's too much pollution out there. There's too many people misusing things out there. There are a lot of things that we need to look at when we are talking about land

> use, especially when you're talking about forests. Because our ecosystem is fragile. Especially our waterways and I know you guys brought me here because I go collect medicine all the time and one of the things I am noticing is when there is a high traffic on certain areas and they use power boats, mostly power boats, it does a lot of damage to plants and some of these plants are really important to the health and well-being of people.
>
> You know, all these things, they drive these things far in the land, they plow over, they flood our land, they dry out our land. They don't realize that they are destroying [medicinal plants] out there.

As a result of these factors, individuals have had to travel increased distances in order to harvest plants that are adequate in both quality and quantity.

There are also cultural reasons for the decline in plant use in the area and, specifically, for the decline in medicinal plant use. For instance, the knowledge concerning the application of these plants is held by only a select group of community members as indicated by RP009:

> You leave them alone. Unless you know what you're doing. Unless you're given the right to take that medicine, then you shouldn't bother it. That right has to come from old people. You trained all your life to get that medicine, because that medicine is dangerous. It could kill, cripple and it can do a lot of damage.

Due to the specialized training and period of time required to invest in learning how to safely apply these plants on humans, there is limited interest by the younger generations to become familiar with the extensive plant knowledge. Consequently, as medicine men and women in the community pass away, the knowledge held by those individuals becomes lost (RP016). As well, the introduction of 'whiteman's medicine' has caused a decline in the teachings surrounding traditional medicines. Accordingly, RP003 explained that, "they still used traditional medicine but now we are going towards the whiteman's way of life lots." RP010 also described the decline in applications of traditional medicine: "they don't make medicinal drinks anymore, they rely on doctors." As illustrated by OH020, several individuals

indicated that previous governments had discouraged the use of traditional medicine in the past:

> Well, they used to practice Indian medicine and they were successful with it. But then the doctors, politicians I guess, kind of stopped that. If you were caught with it, you'd be punished or jailed. So the old people that used to practice the Indian medicine were kind of scared so they didn't – they practiced it a little but they have to know that you wouldn't say nothing, eh? The only way they would – but they wouldn't take on new people or anything that that they don't know. And they didn't share their knowledge, so that's lost quite a bit too.

The combined effects of these ecological and cultural factors have led to an overall decline in community plant knowledge and medicinal usage.

5.3 Cree Vocabulary Lists

During fieldwork and through participation in traditional harvesting activities, a variety of wildlife and vegetation were encountered or discussed. As a result, Cree language vocabulary lists were generated of various plants, mammals, birds and fish commonly found in the SRD, not limited to wetlands (Tables 5.1 to 5.4). The exercise of producing these vocabulary lists initiated discussions on impacts to the organisms and elicited personal experiences from the research team of being out on the land. A list of biogeophysical landforms was also completed due to the importance of landscape features in ethnoecological research (Table 5.5). These lists will likely represent an important reference for future research, as well as for use in educational tools within the community regarding Cree nomenclature.

Table 5.1 Plant species present within the Saskatchewan River Delta and associated uses.

Cree (Syllabics)	Cree (Roman)	English (Common)	Scientific	Use Category*
ᐱᓯᒥᓇᑎᐠ	pesemenatek	White Spruce	*Picea glauca*	Medicine, Building Material
ᒥᓇᔨᑎᐠ	menayetek	Black Spruce	*Picea mariana*	Medicine, Building Material
ᐊᐧᐹᓇᑎᐠ	wakenatek	Tamarack	*Larix laricina*	Medicine, Building Material
ᐅᐢᑲᑎᐠ	oskatek	Jack Pine	*Pinus banksiana*	Medicine, Building Material
ᐊᐃᓵᐢᐠ	uchapask	American Elm	*Ulmus americana*	Medicine
ᓯᑲᐊᐧᑎᐠ	sokawatek	Manitoba Maple	*Acer negundo*	Food
ᓇᓵᑭᓯᑕᐧ ᒥᔑᐢ	nupukeseta metos	Balsam Poplar	*Populus balsamifera*	Medicine, Building Material
ᒥᔑᐢ	metos	Trembling Aspen	*Populus tremuloides*	Medicine
ᒪᐢᑭᑭᐢ	maskekes	Eastern White Cedar	*Thuja occidentalis*	Medicine, Tool, Building Material
ᐊᐧᐢᑲᐧᔭᑎᐠ	waskwayatek	White Birch	*Betula papyrifera*	Medicine, Building Material
ᐊᐢᑭᒋᔨ ᐊᔑᐢᐱ	usketakose atospe	Green Alder	*Alnus crispa*	Tool
ᔨᐱ ᐊᔑᐢᐱ	sepe atospe	River Alder	*Alnus rugosa*	Tool
ᓂᐱᔨ	nepese	Willow	*Salix spp.*	Medicine
ᒥᑲᐧᐯᑲᒪᑎᐠ	mekwapākamatek	Red-osier Dogwood / Red Willow	*Cornus stolonifera*	Medicine, Tool
ᑭᓴᐱᐧᔨᓇᑎᐠ	kenāpekomenatek	Canada Buffaloberry	*Shepherdia canadensis*	Medicine
ᒥᔑᐢᑲᑐᓇᓀ	mesaskatomena	Saskatoon	*Amelanchier alnifolia*	Food, Medicine, Craft
ᐅᑭᓂᐧᐱᑲᐧᓂ	okenewapekwane	Prickly Rose Flower	*Rosa acicularis*	Food, Medicine
ᐅᑭᓂᐧᑭᐧᑎᐠ	okenewatek	Prickly Rose Stem	*Rosa acicularis*	
ᑲᐢᑭᑌᒥᓀ	kusketāmena	Northern Black Currant	*Ribes hudsonianum*	Food, Craft
ᒥᐧᔨᑲᐧᔨᓀ	mekosekakomena	Wild Red Currant	*Ribes triste*	Food, Craft
ᒧᔨᒥᓀᓀ / ᐃᐧᐦᑭᒥᓀ	mosomenana / wesakemena	Low Bush-Cranberry	*Viburnum edule*	Food, Craft
ᓂᐱᒥᓀᓄ	nepemenanu	High Bush-Cranberry	*Vibumum opulus*	Food, Craft
ᔨᐱᐧᔨᒥᓄ	sepekomenu	Common Blueberry	*Vaccinium myrtilloides*	Food, Craft
ᒪᐢᑫᐧᔨᐸᑲᐧ	muskākopakwu	Labrador Tea	*Rhododendrum groenlandicum*	Medicine, Beverage
ᒪᐢᑫᐧᔨᒥᓄ	maskākomenu	Small Bog Cranberry	*Oxycoccus microcarpus*	Food, Beverage
ᒪᐢᑫᐧᔨᒥᓄ	maskākomenu	Bog Cranberry	*Vaccinium vitis-idaea*	Food, Beverage
ᒪᐢᔨᒥᓄ	muskomenu	Common Bearberry	*Arctostaphylos uva-ursi*	Medicine, Animal*
ᑲᑲᑭᒥᓀᑎᐠ	kakakemenatek	Common Juniper	*Juniperus communis*	Craft
ᐊᔭᒥᓀ"ᐊᑎᐠ	asāmenahatek	Creeping Juniper	*Juniperus horizontalis*	

Cree (Syllabics)	Cree (Roman)	English (Common)	Scientific	Use Category*
ᓴᐅ·ᓀᑲᐣ ᐊ·ᐱᑲ·ᓂ	sāwonakan wapekwane	Fairybells	*Disporum trachycarpum*	
ᓯᓯᐃ·ᐸᑲ·	sosowepukwa	Star-Flowered False Solomon's Seal	*Smilacina stellata*	
ᒥᐢᑭᐢᑯᓇ	meskesekomenu	Dewberry	*Rubus pubescens*	Food, Craft
ᐅᑌᒥᐣ	otāmen	Wild Strawberry	*Fragaria virginiana*	Food
ᐃᐢᑯᑌ ᐊ·ᐱᑲ·ᓂ	eskotā wapekwane	Fireweed	*Epilobium angustifolium*	
ᓯᓯᐯᑲᐊ·ᐱᑲ·ᓂ	sosopākawapekwane	Common Red Paintbrush	*Castilleja miniata*	
ᑲᒥᓀᑲᓯ	kumenakuse	Canada Thistle	*Cirsium arvense*	
ᒥᐢᑦᐢᑭᐊ·ᐢᐠ	mestaskewusk	Aster	*Aster spp.*	
ᒪᓴᐣ	masan	Stinging Nettle	*Urtica dioica*	Medicine
ᐱᓐᐃᐣᒥᐣ	penāwemen	Bunchberry	*Cornus canadensis*	Food
ᐃ·ᐣᒋᕿᐢ	wenchekās	Seneca Snakeroot	*Polygala senega*	Medicine
ᐃ·ᑲᐢᐠ	wekask	Wild Ginger	*Asarum canadensis*	Medicine
ᐅᓴᑭᒥᐁᐢᓯᐩᐠ	osakemewāsewak	Bulrush	*Scirpus lacustris ssp. validus*	Food, Animal
ᐅᓴᕿᒣᓯᐩᐠ	osakāmāsewak	Giant Bur-reed	*Sparganium eurycarpum*	
ᐸᓴᑲᓀᐠ	pasākanak	Common Cattail	*Typha latifolia*	Tool
ᐃ·ᕿᐢ	wekās	Sweet Flag / Ratroot	*Acorus calamus*	Medicine, Animal
ᒪᑭ ᒪᐢᓯᓂᐦ	mache maskoseya	Hornwort / Coontail	*Ceratophyllum demersum*	
ᐊᐢᑦᑲᑲ·ᓀᐢᑲ·ᐠ	astakwanaskwak	Small Yellow Pond Lily	*Nuphar variegatum*	
ᐊᑦᑦᐃᐱ	watape	Small Yellow Pond Lily Root		Medicine
ᒪᐢᓯᓂᐦ	maskoseyu	Sedges	*Carex spp.*	
ᒪᐢᓯᓂᐦ	maskoseyu	Grass		
ᒪᐢᓯᓂᐦ	maskoseyu	Blue Joint / Marsh Reed Grass	*Calamagrostis canadensis*	
ᒪᐢᓯᓂᐦ	maskoseyu	Common Reed Grass	*Phragmites australis*	
ᒪᐢᓯᓂᐢᑯᓇ	muskosemenu	Northern Wild Rice	*Zizania palustris*	Food
ᑲᑲᕿᓀᑎᐠ	kukukāmenatek	Fern		
ᒥᐢᑦᑎᒧᓂ:	mestatemosoy	Horsetail	*Equisetum spp.*	
ᐊᐢᐯᐦ	uskeyu	Moss		Tool
ᐊᑎᓯᑎᑎᐃ·ᐣ	atekomechewen	Reindeer Lichen	*Cladina rangifera*	Animal

* Used by animals for food

Table 5.2 Mammal species present within the Saskatchewan River Delta.

Cree (Syllabics)	Cree (Roman)	English (Common)	Scientific
ᐊᐢᐱᓯᓰᐢᐣ	apesemosos	White-tailed Deer	*Odocoileus virginianus*
ᓭᐦ	mosa	Moose	*Alces alces*
ᐊᑎᑊ	atek	Caribou	*Rangifer tarandus*
ᐱᐢᐤ	pesew	Lynx	*Lynx canadensis*
ᐱᑲᐧᑭ ᐳᐢᐣ	pekwache poses	Bobcat	*Lynx rufus*
ᐢᑲᑊ	sekak	Striped Skunk	*Mephitis mephitis*
ᐊᐧᐱᐣᓴᓂᐣ	wapeschanes	American Marten	*Martes americana*
ᐅᐦᑎ	ochāk	Fisher	*Martes pennanti*
ᐢᑯᐢᐣ	sekoses	Weasel	*Mustela spp.*
ᓴᖬᐧᐢᐤ	sakwāsew	American Mink	*Neovison vison*
ᓂᑭᑊ	nekek	Northern River Otter	*Lontra canadensis*
ᐃᐧᓂᐸᓴᑊ	wenepachap	Common Racoon	*Procyon lotor*
ᑳᐣᑭᑌ ᒪᐣᑲᐧ	kusketā muskwa	Black Bear	*Ursus americanus*
ᒣᐣᓰᓴᑲᓂᐣ	māschuchakunes	Coyote	*Canis latrans*
ᒪᐢᑲᔭ	mayekan	Grey Wolf	*Canis lupus*
ᒪᖬᐢᐣ	makāses	Red Fox	*Vulpes vulpes*
ᑲᑲᐧ	kakwa	Porcupine	*Erethizon dorsatum*
ᐊᑉᐸᐢᐢᐣ	apukoses	Mouse	
ᐊᐧᒌᐣᑊ	wuchusk	Muskrat	*Ondatra zibethicus*
ᐊᒥᐣᑊ	umesk	American Beaver	*Castor canadensis*
ᓴᓴᑲᐊᐧᐱᓂᐣ	sasakuwapeskos	Eastern Chipmunk	*Tamias striatus*
ᐃᐧᓄᐣᑊ	wenusk	Woodchuck	*Marmota monax*
ᒥᐢᓂ ᐊᓂᑲᐧᒌᓴ	mekone unekwachas	Red Squirrel	*Tamiasciurus hudsonicus*
ᑕᖻᓂᑲᐧᒌᓴ	tusākunekwuchas	Northern Flying Squirrel	*Glaucomys sarbinus*
ᐊᐧᐳᐣ	wapos	Rabbit	*Lepus americanus*
ᐊᐧᐱᑲᐧᓄᒼᐣ	wapekwanaches	Northern Bat	*Myotis septentrionalis*
ᐊᒋᐟᐯᑊ ᐊᑉᐸᐢᐢᐣ	utampāk apakoses	Water Shrew	*Sorex palustris*

Table 5.3 Bird species present within the Saskatchewan River Delta.

Cree (Syllabics)	Cree (Roman)	English (Common)	Scientific
ᒧᑲ·	mokwu	Common Loon	*Gavina immer*
ᓴᖁᔨᔪ	chukākoses	Grebe	
ᐅᓰᓬᑭᐤ	ochachakew	American White Pelican	*Pelecanus erythrorhynchos*
ᑳᖁᑭᔨ'	kakākesep	Double-crested Cormorant	*Phalacrocorax auritus*
ᒧᔪᑲᐅᔨᐤ	moska-osew	American Bittern	*Botarus lentiginosus*
ᒥᔪᑎᒧᔪᑲᐅᔨᔪ	mestemoska-osew	Great Blue Heron	*Ardea herodias*
ᓂᔪᑲ	nesku	Canada Goose	*Branta canadensis*
ᐁ·ᐁ·Δ·ᐤ	wāwāwew	Snow Goose	*Chen caerulescens*
ᐸᐟᐦᐸᓴᐤ	papachāpasāw	Laugher	
Δᓂᓂᔨ'	enenesep	Mallard	*Anas platyrhynchos*
ᕿᓄᖁᖁᔨ'	kenokākekāsep	Northern Pintail	*Anas acuta*
ᐊ·ᐱᔪᕆᔨ'	wapeskechāsep	American Wigeon	*Anas americana*
ᒥᔪᕈᔨ'	meschekosep	Common Goldeneye	*Bucephala clangula*
ᓂᕈᔨᐱᔪ	nekesepes	Bufflehead	*Bucephala albeola*
ᐅᓄᕈᓀᔨᔪ	onochenāses	Osprey	*Pandion haliaetus*
ᐱᔪ`	pesk	Sparrowhawk	*Accipiter spp.*
ᐊ·ᐱᔪᑎᑲ·ᓀΔ· ᒥᕿᔨᐤ	wapestekwanāwe mekesew	Bald Eagle	*Haliaeetus leucocephalus*
ᐅᓴᐃ·ᔨᓭᔨ ᒥᕿᔨᐤ	osawesenaso mekesew	Golden Eagle	*Aquila chrysaetos*
ᐅᓄᕈᓀᔨᐤ	onochenāsew	Falcon	*Falco spp.*
ᐊᒉᔪᑯ	akasko	Ruffed Grouse	*Bonasa umbellus*
ᓴᖁ`	chukāk	American Coot / Mudhen	*Fulica americana*
ᐅᕈᒍ`	ochechak	Sandhill Crane	*Grus canadensis*
ᒍᐱᔪᑲᑲᓀᔨᔪ	chapeskakanāses	Killdeer	*Charadrius vociferus*
ᐅᕈᒧᓭᖁᔨᔪ	okemonakāses	Sandpiper	*Calidris spp.*
ᕈᔦᔪ`	keyask	Gulls	*Larus spp.*
ᑲᔪᕈᑌᐊ·ᑎᓴ`	kusketāwachasuk	Terns	*Sterna spp.*
ᒥᔪᑎ ᑯᑯᑲᐅ	meste kokoka-o	Great Horned Owl	*Bubo virginianus*
ᐊ·ᐱᒉᓄ	wapekano	Snowy Owl	*Nyctea scandiaca*
ᒥᔪᑎ ᑯᑯᑲᐅ	meste kokoka-o	Great Grey Owl	*Strix nebulosa*
ᐱᔪ`	pesk	Common Nighthawk	*Chordeiles minor*
ᐅᕈᔪᕈᒪᓀᔨᐤ	okeskemanāsew	Belted Kingfisher	*Ceryle alcyon*

Cree (Syllabics)	Cree (Roman)	English (Common)	Scientific
ᓵᓵᐟᑭᐤ	papaschew	Woodpecker	
ᑭ·ᑭ·ᓯᐤ	kwekwesew	Gray Jay	*Perisoreus canadensis*
ᐊᒋᐟᑎᑲᑭᐤ	apeschekakakew	Magpie	*Pica hudsonia*
ᐊᒋᐊᓯᐤ	aasew	American Crow	*Corvus brachyrhynchos*
ᑲᑲᑭᐤ	kakakew	Common Raven	*Corvus corax*
ᐊᒋᐟᐅᔨᑲᓂ ᐱᓱᓯᐟᓂ	waskayekane penāses	Swallow	
ᑭᐟᒉᑲᓱᓯᐟᓂ	kechekanāses	Chickadee	*Poecile spp.*
ᐱᐱᒉᐤ	pepechew	American Robin	*Turdus migratorius*
ᐱᐱᑭᓯᐟᓂ	pepekeses	Sparrow	
ᒥᑯᒐᒐᓇᓄ	mekochachakano	Red-winged Blackbird	*Agelaius phoeniceus*

Table 5.4 Fish species present within the Saskatchewan River Delta.

Cree (Syllabics)	Cree (Roman)	English (Common)	Scientific
ᐅᑲᐤ	okaw	Walleye/Pickerel	*Sander vitreus*
ᐃᓀᐧᐩ ᑭᓄᓴᐤ	enato kenosāw	Northern Pike	*Esox lucius*
ᐅᑲᓯᓴᐠ	okasesuk	Yellow Perch	*Perca flavescens*
ᓀᒣᑯᓂ	numākos	Lake Trout	*Salvelinus namaycush*
ᓀᒣᐤ	numāw	Lake Sturgeon	*Acipenser fulvescens*
ᐃ·ᐱᑭᓯᓂ	wepecheses	Goldeye	*Hiodon alosoides*
ᓀᒣᐱᐧᐃ	namāpen	Sucker	*Catostomidae* spp.
ᒥᓀᐧ·	menay	Burbot	*Lota lota*
ᐊᒋᑎᒣᐠ	atekamāk	Lake Whitefish	*Coregonus clupeaformis*
ᐅᔨᓀᐱᓂ	ochonapes	Cisco / Tullibee	*Coregonus artedi*
ᑭᓄᓴᓯᐠ	kenosāsesak	Minnows	*Cyprinidae spp.*

Table 5.5 Biogeophysical landforms.

Cree (Syllabics)	Cree (Roman)	English (Common)
ᓴᐩᔨᐩᓀᐣ	sakayekan	Lake
ᒥᓂᙆᑎᐟ	menestek	Island
ᐃᙆᐟᒪᑎᐩᓭᐤ	espamatenaw	Hill
ᐩᓄᐩᔦᐟ	kanāyak	Point
ᓴᐩᐤ	sakaw	Forest
ᓯᐱ	sepe	River
ᒥᓯᐟᔨᙆᑎᐟ	mesepayestek	Rapids
ᐊᐧᐊᐧᑭᐊᐧᐣ	wawachewan	Eddy
ᓯᐱᓯᙆ	sepeses	Creek
ᑭᙆᒪᑎᐩᓭᐊᐧ	keskumatenawa	Cliffs
ᐩᓯᒋᙆᐧᐣᔦᐟ	Kasetaskwāyak	Against the lake along the shore
ᐃᑐᙆᐣᐩᐟ	etostokak	Floating Bog
ᒪᙆᐧᐣ	muskāk	Fen / Bog / Muskeg
ᐃᑐᙆᐩᓀᐟ	etostokachuk	Swamp
ᐃᓴᑭᒋᐊᐧᔦᐟ	esaketawayak	Outlet
ᐃᐱᑭᒋᐊᐧᐟ	epechetawak	Inlet
ᐩᓯᐟᙆᐧᐣᔦᐟ	kasepaskwāyak	Narrows
ᓯᐱᐩᓀᐣ	sepekan	Channel
ᓯᒋᐩᓂᐊᐧᓀᐤ	setakanewachaw	Salt deposits
ᐩᓯᒋᙆᐧᐣᔦᓯᐟ	kasetaskwāyasek	End of a lake against the shore / A passage or narrows
ᐱᓯᙆᑭᐊᐧᐟ ᒥᑎᓯ ᐊᙆᑭ	peseskewak mecheso uske	Pasture land / Community pasture
ᐃᐊᐧᓴᔦᐟ	ewasāyak	Bay
ᐃᒪᒧᐃᐧᔨᐟ	emamawekopak	Groves
ᐃᒥᓭᔦᔨᙆᐩᐟ	emenayekoskak	Spruce grove
ᐃᐧᓴᑭᒥᓂᔨᙆᐩ'	wesakemenekoskap	Cranberry Patch
ᒥᔨᐯᐩᒥᓂᔨᙆᐱᙆᐩᐟ	mekopākamekoskapeskasek	Red Willow Patch
ᐩ ᐸᙆᔨᓯᐊᐧᐩᐟ ᐊᙆᑭ	ka paskosewakak uske	Grassless Area
ᐸᑭᑭᐊᐧᐃᐧᓭ ᐊᙆᑭ	paketawawena uske	Fishing Area
ᐃᓭᑭᐯᐧᓂᑎᐃᐧᐣ ᐊᙆᑭ	enatawānechekāwen uske	Hunting Area
ᐃᒥᓂᙆᔨᐧᙆᐧᐣᐴᐟ	emenestokwaskāyak	Island Bluff

5.4 The Diversity of Wetlands used by the Opaskwayak Cree Nation

As discussed in Chapter 3, spatial data collected with a GPS device during field excursions and interviews were compiled in GIS format and overlaid with the base map provided by DUC (2003a) consisting of the major wetland classes of bogs, fens, swamps and marshes. The data were differentiated according to wetland-based practices including trapping, moose hunting, waterfowl hunting and fishing (Figures 5.17 to 5.20). The shallow open water wetland class was not distinguished from water bodies of greater than two meters on the base map and are included within the 'open water' category on the figures. A map of the locations of important plant harvesting areas was not produced to maintain the anonymity of these culturally sensitive areas.

The figures demonstrate that a diversity of wetland types are used in the traditional harvesting practices of the OCN. Not surprisingly, important fishing locations include the Saskatchewan River and the deeper open water of major lakes. Waterfowl hunting also takes place mostly in areas of open water due to the tendency to hunt from boats. However, some wetlands including swamps, marshes and fens are also important bird harvesting locations. Areas used for trapping and moose hunting purposes tend to overlap and occur in wetlands consisting of marshes, swamps and fens, as well as in open water. Due to observations in the field and because of the importance of these wetlands in providing habitat for fur-bearing animals, moose and waterfowl, marshes appeared to be the most frequented wetland types by the OCN in their traditional activities.

Although not demonstrated in a figure, plant gathering occurs within all five wetland types found within the SRD due to the varying nutrient regimes and hydrologic requirements of the plant species that have traditionally been harvested. As indicated in Section 5.3.5,

sweet flag or *wekās* inhabits marshes, swamps and other slow-moving water bodies while small yellow pond lily or *astakwanaskwak* is found most commonly in shallow open water. Labrador tea or *muskākopakwa* and wetland cranberries or *maskākomena* are found in bogs, fens and swamps. The gathering of these culturally important plants occurs within a diversity of wetland types.

According to the figures, the use of bogs in traditional harvesting practices of the OCN was minimal. The limited biological diversity supported by these wetland types could explain the low rates of visitation. However, the low usage of bogs by the OCN is more likely a result of the lower occurrence of this wetland type in the areas of the SRD most commonly used by the community in resource harvesting activities. Poor access to these wetlands could also contribute to their limited use because the majority of bogs appear to be located in areas away from the major transportation routes of rivers and lakes.

These observations could have management implications for the SRD in ensuring that a diversity of wetland types are maintained in order to support both the biodiversity that inhabits the region and the traditional livelihood activities of the community. An abundance of healthy wetland ecosystems will help to ensure that future generations will have the opportunity to take part in culturally important activities.

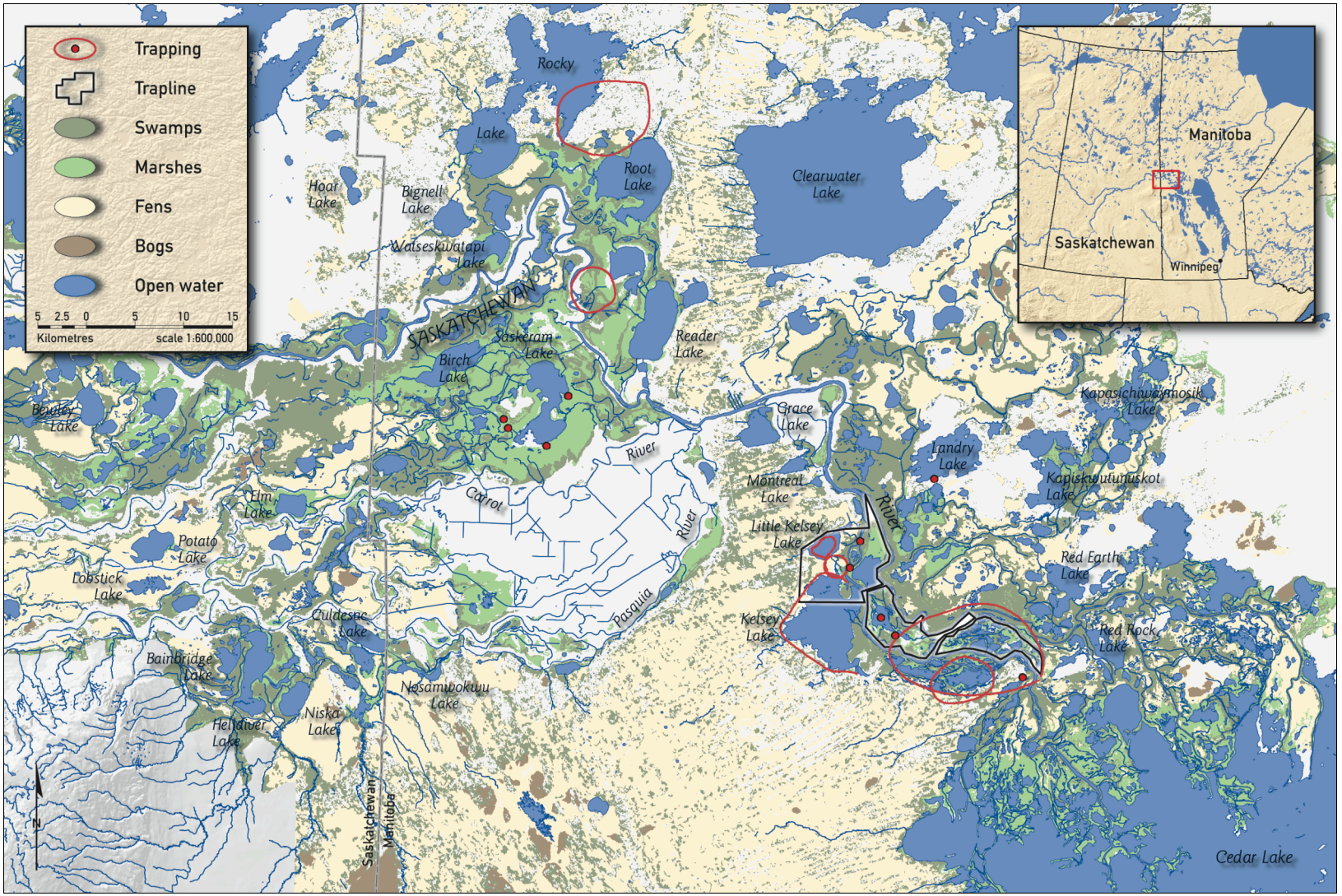

Figure 5.17 Trapping locations of the Opaskwayak Cree Nation (Base map modified from DUC 2003a; OCN 2010, 2011).

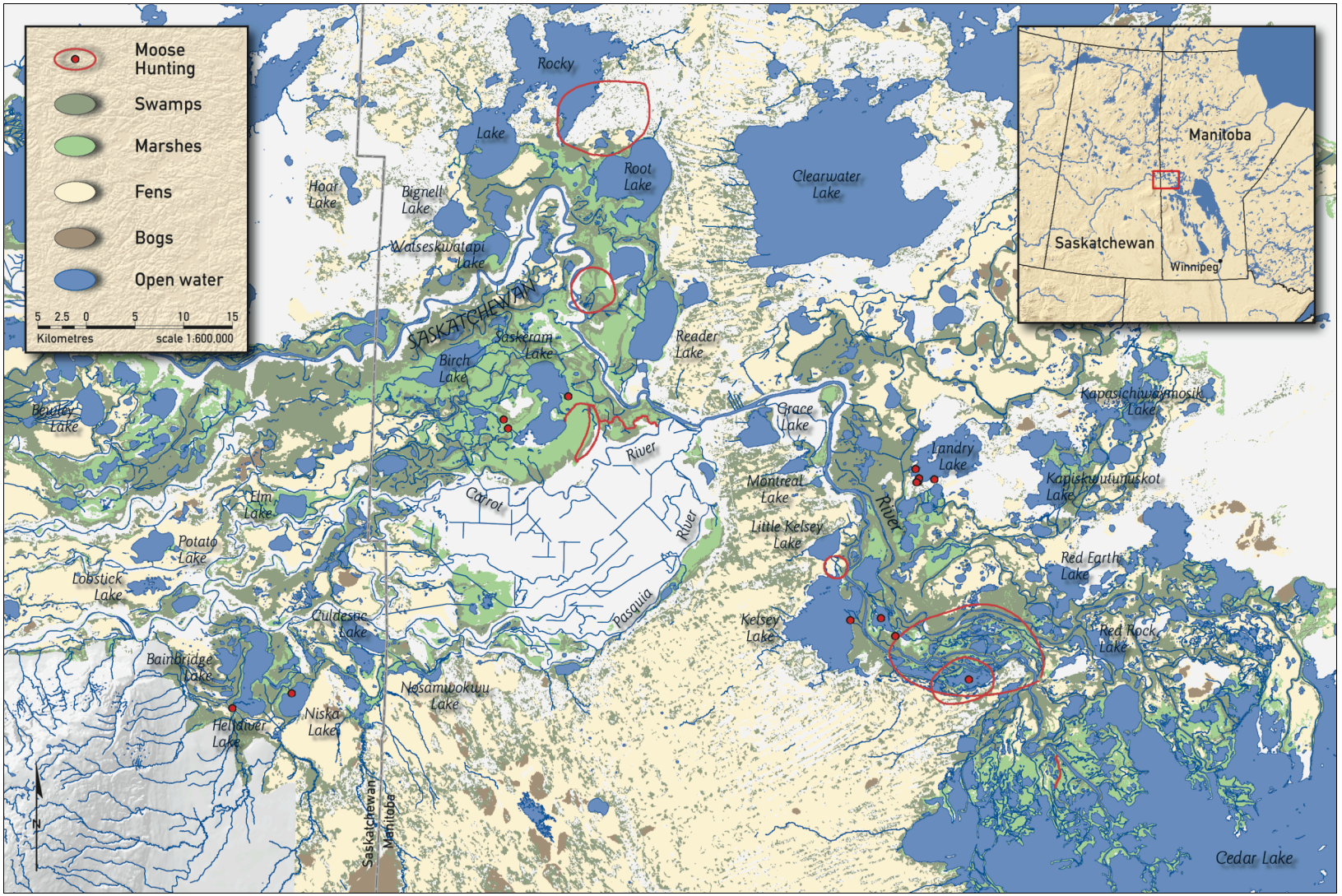

Figure 5.18 Moose hunting locations of the Opaskwayak Cree Nation (Base map modified from DUC 2003a; OCN 2010, 2011).

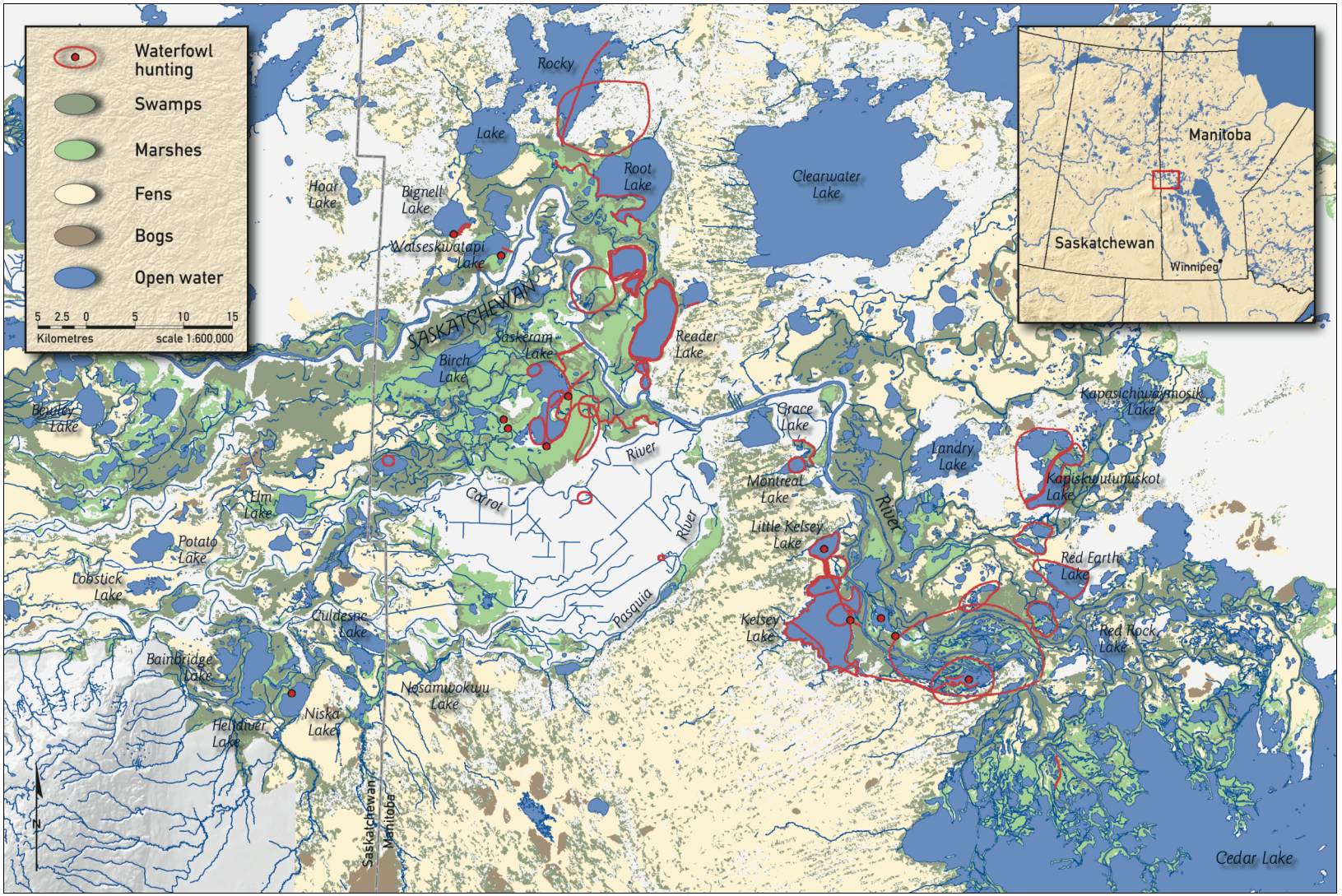

Figure 5.19 Waterfowl hunting locations of the Opaskwayak Cree Nation (Base map modified from DUC 2003a; OCN 2010, 2011).

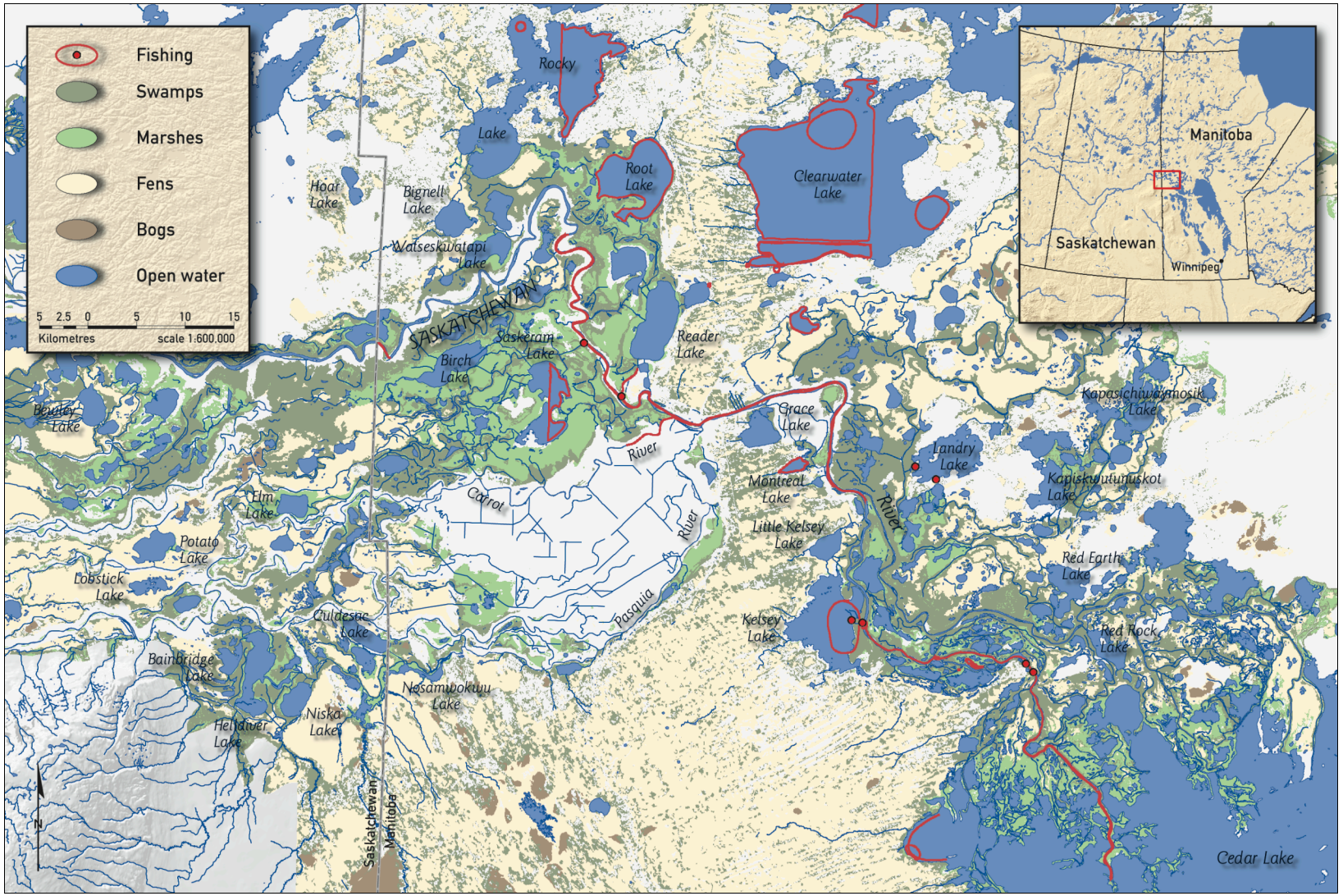

Figure 5.20 Fishing locations of the Opaskwayak Cree Nation (Base map modified from DUC 2003a; OCN 2010, 2011)

5.5 A Life on the Land Being Lost

Discussions surrounding the ability to live off the land are typically in reference to the past. Historically, community members could sustain themselves by living off the land due to a rich supply of natural resources coupled with limited human development and positive reinforcements from external factors (e.g., strong fur market). As a consequence, various community members emphasized the previous importance of traditional harvesting practices to the community. For instance, OH006 demonstrated the significance of trapping in the past: "all the kids knew how to trap early. You know, they had to – that's where their main source of livelihood [was] back then for native people." Similarly, OH007 indicated, "that's where they made their living. Like they followed their trap lines." Survival was also a major consideration in the past as described by one community Elder (OH012):

> So we were never home in the summertime. I was quite small but I remember some places where my Dad was paddling along looking for moose, duck, anything to survive… And that's how we survived in the bush, in the wilderness. We survived on wild meat.

However, due in part to the impacts to wetland-based practices that have been outlined in this chapter, there has been a reduced participation in traditional activities.

While references to living off the land are situated in the past or through previous generations, discussions surrounding the loss of a traditional life on the land are typically in reference to current or future generations within the community. For instance, RP009 explains:

> I think the people have a fierce need to want to hang on to the land. They want to belong to the land but they just don't know how anymore. They don't know how it will benefit them anymore. Especially the young ones, they don't know how to benefit from it – it's a generational thing. Like us guys, we survived out there for long periods of time, you know, we understand this land and how it important it is to us. We tell our young people but they don't completely understand, because they

> have never been there. They've always lived in a comfortable house, TVs, video games, all that stuff, they never really actually go out there to survive to live. They are kind of losing touch with the land. You know, with the environment because of that. But they still have the fierce need to keep that land, for some reason they want to keep that land. And they don't know why but they want to keep it. They know it's important to them.

The above quote emphasizes the relationship between the identity of being a Cree person and a life on the land. However, due to a loss in the transfer of knowledge resulting from the historical context of the cultural, economic, political and ecological factors outlined in Chapter 4 and the impacts to wetland-based practices discussed in this chapter, the OCN community has experienced a shift away from a life on the land to one with high rates of unemployment and dependency on government transfer payments.

5.6 "Everything is Connected"

The research team and many other community members emphasized important interactions between organisms on a regular basis. However, the concepts tended to be discussed in more general terms as opposed to the interactions between specific species. Various individuals indicated the way in which all species, regardless of size or significance, are connected through the food chain (OH008; OH015; RP002; RP006; RP008; RP015; RP016; RP017; RP018). For instance, RP015 explained the importance of all species including less charismatic organisms such as insects, amphibians, reptiles and crustaceans:

> They're part of the food chain, everybody eats everybody. The snakes eat the frogs, frog's eat the mosquitoes. They're part of the system, they're part of the universe. They were given life here to survive, they all rely on one another.

Accordingly, negative impacts related to ecological degradation can be felt at all levels of the food chain. For example, RP017 indicated that, "when one is affected in the plant and tree

kingdom, the insects are affected and if insects are affected the animals will be affected and so on." Not surprisingly, discussions regarding the food chain also included humans, as described by OH015:

> You know, we all have our differences and we're all put in this world as a people, I guess, and nobody's inferior to anybody. Including the birds, they have their role. The birds, even the frog he's got a role, the fish, so who are we—you know—to say, "well, I'm better than anybody." We all, we all have to depend on one another.

Community members indicated that all species contribute to the ability of the ecosystem to function properly. RP016 explained that all organisms contribute to the "balance of nature" in providing food for other animals and, as such, should not be neglected. This consideration was reflected in the comments of other individuals in indicating that no one species should be protected but all species. For example, RP018 indicated that, "all fish should be protected, not just one species." Considerations such as these perhaps emphasize OCN community perspectives regarding the need for a more holistic ecosystem approach to natural resource management of the wetlands located within their traditional territory.

5.7 Chapter Summary

The purpose of this chapter was to discuss wetland ethnoecology as understood by community members from the OCN, which was undertaken through the analysis of traditional wetland-based practices. The activities discussed in this chapter are highly dependent on the ability of the wetland ecosystems to provide important goods and services. Many of the impacts that have been outlined in this chapter have contributed to the decreased participation in wetland-based practices within the OCN community, which has, ultimately, altered the cultural identity of the community. Chapter 6 will examine the local criteria for

well-being to determine if the shift away from a life on the land due, in part, to a reduction in the services provided by wetland ecosystems has had a negative impact on the well-being of the people of the OCN.

Another purpose of this chapter was to understand community perspectives regarding the way in which organisms located within wetlands interact with each other. Many individuals acknowledged that all plants and animals are connected through the food chain with all having important roles in creating a balance. The negative impacts resulting from development, intensive harvesting or pollution that are experienced within lower levels of the hierarchical system will have repercussions for species at all other levels. According to individuals from the OCN, maintaining healthy ecosystems holistically can help to ensure a supply of the natural resources most valued by the community.

CHAPTER 6: *MENOYAWENEK* - 'A GOOD WAY OF LIVING'

This chapter considers in more detail how altered wetland habitats are impacting the ecosystem services that have traditionally been available to the OCN (Objective 3). As indicated previously, ecosystem services are the benefits accrued by humans and which can directly contribute to human well-being (Daily 1997). As a result of the degradation of natural ecosystems, there can be deleterious effects on well-being. In understanding the impacts that altered wetland ecosystems are having on the OCN, the approach taken was that of examining the local criteria for well-being. The purpose of which was to determine whether the criteria are linked to those benefits attained through interactions with the natural environment and if well-being was, in fact, being impacted by a reduction in ecosystem services that has been demonstrated in Chapter 5.

For Cree people, a cyclical relationship exists between a life on the land, Cree identity and health (Adelson 1998). For the OCN, the Cree word that most closely represents 'health' is *menoyawenek*. *Meno* translates into 'good' or 'well' while *yawenek* means 'living', 'alive' or 'being'. As a consequence, I have chosen to translate *menoyawenek* into 'a good way of living'. *Menoyawenek* does more than merely describe health in terms of the absence of disease but rather embodies an overall sense of leading a good life in all aspects (Adelson 2000).

Factors contributing to well-being can differ greatly depending on the local context (MA 2003). In my research, I encountered similar criteria that were generated by Adelson (2000) in her work with the Whapmagoostui Cree of northern Quebec. These elements included Cree food, in particular, but also physical activity (as opposed to physical strength encountered by Adelson) and the ability to stay warm (Adelson 2000). In addition to these

elements, knowledge of the Cree language was discussed repeatedly as an important consideration in achieving 'a good way of living.' Community members indicated several other factors that are also necessary in achieving *menoyawenek* such as spirituality, education or following Christian doctrine, which should not be discounted. However, a continued emphasis was placed on the four factors of Cree food, physical activity, warmth and language, each of which will be discussed further in this chapter.

6.1 Cree Food

> Keeping it away from commercial things and also show the respect of what you consider important for the future generations as First Nations people. A lot of people will say that it is just a piece of land and nobody is using it, but that's not so. There's animals there. Because in everything else it's a chain, everything is linked to the other, none is irrelevant to the next. That is a very important concept. In order to survive we have to protect and nurture the things that were provided for us. In order to survive we must protect what we have. Young people need to know that. This is part of our language that connects with nature. If one goes moose hunting the respect is not to overkill but also leave something that is part of the moose that you hang up and you toss something without looking. Those are things we do but nobody knows why. We as First Nations people are the keepers of Mother Earth so we need to start taking the responsibility (RP017).

Cree food consists of all those products that come from the land, water or sky for the purposes of human consumption (Adelson 2000). These foods consist of all the wildlife harvested through the wetland-based practices discussed in Chapter 5 including muskrat, beaver, moose, waterfowl and fish, as well as plant products such as berries and medicines. Some other products such as flour, sugar and lard introduced as a result of early contact with European traders have also been adopted as traditional Cree food for use in bannock, for example (Adelson 2000). Tea was considered to be a beverage of choice amongst the individuals with whom I worked most closely. In the past, the drink would have been made

from the boiled leaves of Labrador tea or in combination with other plants found within the traditional territory (Johnson et al. 1995; RP009). However, store-bought Red Rose orange pekoe tea has long since replaced local plants for use in the traditional beverage for the people of the OCN (Morrison field notes, September 23, 2011).

Discussions surrounding Cree food, in particular, demonstrated the important connection between identity, land and achieving *menoyawenek*. As a consequence, various concepts emerged with regards to wild food products that are important in understanding what it means to be Cree for many people that have a strong relationship to a life on the land. These concepts included gender roles, community/social connectivity, respect and the nutritional value of Cree food. These topics will be discussed in further detail below.

6.1.1 Gender Roles

In the past, gender has traditionally played an important role in the harvest and preparation of Cree food. Males in the community were mainly responsible for the actual harvesting practices that yielded meat. Even so, women were allowed to participate in some limited aspects of the meat harvesting practices. For example, one woman (OH002) discussed how she used to kill muskrats with a .22 rifle while another woman (RP003) explained that her responsibility had been to fish when she used to go out on the land with her husband.

Aside from limited participation in meat harvesting, food preparation was the main role of Cree women. One female Elder (OH019) explained the responsibilities of women after animals were harvested:

> Then my Dad had a dog team and whenever he came in from his trapping, and that you know, he'd just walk in, dump his stuff on the floor, and I had to go out and un-harness the dogs, take them to their houses and feed them. And then my Mom had to fix up whatever he brought home. The men had it easy [laughs]! The women did all the work, because [the men] were supposed to be the hunters only, you know the providers?

Post-harvest activities carried out by women also included the skinning and processing of muskrat furs, as well as the tanning of moose hides (RP003).

Aside from meat and fish harvesting, other traditional activities also illustrate the gendered tasks surrounding Cree food. For instance, women were mainly responsible for harvesting berries and preparing them into jam or for other uses (Mabel Bignell 2011; RP003). During fieldwork, I observed the role of females in berry harvesting when Mabel Bignell walked through the bush collecting various berries or was responsible for directing us where to pick high bush cranberries from the boat along the river (Morrison field notes, September 24, 2011). Bannock making was also typically reserved for the female Elders in the community (Figure 6.1; Mabel Bignell 2011).

Figure 6.1 Alli Morrison and Mabel Bignell making bannock with an open fire.

6.1.2 Community/Social Connectivity

Another important concept that emerged through discussions regarding Cree food was that of a sense of community or social connectivity. In the past, when a group of hunters went out with the aim of harvesting a moose, the entire community would contribute:

> A long time ago, our people used to plan a hunt. They used to plan it and they go out there for a long time. They would do everything out there and just bring back the meat. Everything was planned. It was a community effort almost to go out there and hunt (RP009).

If the hunt had been successful, the harvesters would distribute the meat throughout the community. OH015 describes the reciprocity and meat distribution that had been common amongst members of the OCN:

> Like say you go cut a log, that's say eight inches across or twelve inches across. One man couldn't handle that so maybe three or four guys would do it. And they would load it up and they would build the house. That's the way it was done. And nobody really expected anything. The return was, "okay, I help you, you help me." And it was an honour thing. The community flourished like that. Same thing with food. Like okay, you kill a moose? Okay, here's the meat and it makes sense too – if you didn't have electricity so they couldn't preserve the meat so they gave it away. Everybody had a piece. And then the ones they couldn't eat, they dried and made pemmican.

Traditionally, hunters would exchange meat for other provisions as indicated by RP010:

> They did help each other long ago. Even in gardening, they all went together and pretty soon they tilled the black dirt. When a hunter comes home with meat, they went over there and exchanged something for meat. This could be lard, tea or bannock. It didn't take long for the meat to be all handed out. Fish, coal oil was exchanged as well.

OH017 explains the exchange of moose meat after a successful hunt in his youth:

> Yeah, people – like old folks will go and wait at the riverbank. Waiting for us. 'Cause one guy would be out there waiting for us, like a look-out guy like, "oh, they're coming." And they come back and bring the news and the old people would come down the river with their pound of tea just to trade. Tea and sugar, whatever they have… And that was hard, pushing your meat. "Oh, two pounds of sugar? We can give you this much to trade." I was just a young guy, about nineteen years old. And me and my brother, he was five years older than I. We were both good hunters. We were good providers, I guess, for the village. People used to – along the shore – used to sit around, you know, looking at us unloading. This is how much we need. Put the meat here. I'll take that. Take this tea.

In recent years, the exchange of wild meat does not occur as frequently. For instance,

RP004 discusses the past distribution of harvested animals:

> They also did a lot of sharing with their food and sometimes they exchange for others. My father used to go hunting fowl lots, which he gave away to the people. Today none of this is happening.

OH018 also explains the lack of trading and sharing of meat within the community today:

> [Trading] is one of the traditions that our people have lost now. There is no such thing as doing that anymore. And, you know, today you're going to have to go out and buy it yourself, maybe five dollars worth of moose meat, you know? There's no such thing as sharing in the kill when you get it. You lose – we lost a lot of traditions like that.

A small number of Elders and other community members continue to practice the exchange of meat today. For instance, OH018 did concede that meat exchange is still occurring amongst the older community members. I was able to observe sharing in my fieldwork when another Elder provided Mabel and Moses Bignell with several harvested ducks. I also observed the act of sharing on the hunting trip that took place in late September when the Elders benefited from the distribution of the moose meat.

6.1.3 Respect

Respect emerged as an important concept in the data with regards to Cree food, which lends itself to discussions surrounding the Cree worldview. Traditionally, in Cree ideology, respect for animals comes from the spiritual belief of interrelatedness between humans and all other forms of life (Tanner 1979). Similarly to the Whapmagoostui Cree of northern Quebec, the majority of people within the OCN have replaced this underlying belief system with a general understanding of respect for animals as a result of teachings from their Elders (Adelson 2000).

The importance of respecting animals and the environment was mentioned by various individuals (OH017; OH018; RP001; RP015; RP017) and emerged throughout my fieldwork. Traditionally, after a moose had been killed, offerings were made to thank the animal out of respect for its sacrifice. These offerings could include a small piece of the moose itself (RP017) or, more commonly, tobacco (Mabel Bignell 2011). Although this act of giving back to the land by harvesters has declined in recent years, the hunting group that was

successful in harvesting a bull moose during my fieldwork mentioned that tobacco had been left at the kill site.

In the past, there was the understanding that a lack of respect for animals during hunting activities could have repercussions for the hunter and his family. For example, wounding a moose was considered disrespectful due to the unnecessary suffering caused to the animal. OH015 explains:

> But moose hunting was usually for the older people. 'Cause they didn't want young people wounding the animals. It was very much a no-no to wound an animal. If the old people wounded the animal, they'd prepare and go after the animal so the animal wouldn't suffer. And sometimes it would take them days to get the animal, but they would. It was a no-no to wound an animal and leave it out there to die. That was one of the things that was really impressed upon you as a young boy by the older people because it was said that if you left a wounded animals to die, to suffer, that you, yourself, would pay for it and your offspring.

Wastefulness by community members is also considered a very disrespectful act within the OCN. RP009 explains his frustrations regarding wasting harvested animals:

> There are too many hunters now. I find they don't respect what they are doing and they don't respect the animals. They shoot for nothing. They kill everything in sight. Even our own people are at fault for this. If you don't need ten moose, why kill ten moose? Why do that? Why kill a cow when she is heavy with calf? The thing that makes me mad is the guys that hunt for horns. We never hunted for horns, we hunted for food, not horns. They take horns all over the place – that's not right, that's wrong.

Ensuring that all parts of a harvested animal were used was also an important consideration in avoiding wasteful practices. For instance, OH013 recollects:

> There was never anything much left out of one moose because they had everything for a purpose. Even the bones, they had a purpose for all. Everything. They did not waste anything.

Several other individuals have also affirmed the 'waste nothing' principal (OH017; RP009) and this important concept was frequently discussed with Elders while out in the field.

Aside from the actual harvesting of animals, food preparation by women also emphasized the need for proper care of the meat. One female Elder (OH001) indicated that, "we had to prepare the food in different ways and to respect the food and that's one thing my aunt taught us." Wastefulness by women while preparing food from an animal also went against cultural norms. OH012 explains:

> Never got tired of it because my Mom, my late Mother, knew how to take care of food, not to be wasted. Even when she cooked bones, she had to cook them twice over again and, boy, she used to make really good soup out of it. I don't know what she did but everything that she did was never wasted.

Respect and the belief of relations between humans and all life including animals is a result of a hierarchy that is ultimately the product of the work of the Creator (Adelson 2000). For the people of the OCN, the Creator may reflect Christian dogma, traditional Cree doctrine or some combination of the two depending on the belief system of the individual (Morrison field notes, September 10, 2011). OH018 explains one such perspective and the importance of respecting all that has been provided by the Creator and, in this case, Mother Earth:

> 'Cause the thing with my parents is learning how to respect what's given to you. 'Cause, you know, we know there's a Creator that provides everything for us and we know there is Mother Earth that provides everything for us. That's why we give thanks to earth when they – because they look at it as the Mother. A mother provides for the children and that's the way earth is, provides for the children, provides everything. And it's all up to you how you want to use what Mother Earth has given to you and how you want to show that respect for what's given to you. But you learn it, you learn it from your parents and grandparents. 'Cause everything is learned from generation to generation. And you pass it on to your children yourself and that's one of the things we were always told is to respect everything that's given to you. Some people that you, that you come across with regardless if they, if you don't receive the same respect you still give them respect. Because that's one of the things that our parents always taught us and that's one of the things I always taught my children was how to respect people and other things that are given to them. Yeah, that's – I think that's the utmost thing for Native people is the mutual respect they have for each other. And that's the thing that we learned, that I learned from, from my parents and my grandparents. And the food, too. The food is very sacred to people. You can't –

> always try and pass it on to young people. Learn to respect what's given to you, just like moose meat, ducks. You don't fool around with them. You don't just throw them out, you know. Learn how to give thanks about that, and all that. But it has to do all with respecting the food as given to you by the, by Mother Earth and also by the Creator. And that's the thing that we learned and I try to pass it on to children. And that's one of the things that's the utmost in our way anyway, in our lives.

Relatedness was of particular importance to the community members regarding the necessity of respecting wildlife. There was an acknowledgement of the sacrifice that animals make in contributing to Cree food and, ultimately, in the survival of the community. OH001 explains the concept of relatedness:

> When you go to gatherings, when people pray, when they say, "all my relations," they are not referring only to human beings. They are referring to everything that was created by God. That's what they are referring to. It could be the winged, it could be the four-leggeds, it could be the ones that crawl, it could be the ones in the water. So that's what they're referring to when they say, "all my relations" is what they're talking about.

In one interview, I repeatedly attempted to bring the conversation back to human well-being but the Elders of the research team continued to discuss the animals that comprise Cree food. In explaining this trend of human-animal interconnectedness, Raymond Ross Lathlin (2011) indicated that, "'our health includes our species. What we eat. The air we breathe. It all comes in one." This observation parallels the perspective of the Whapmagoostui Cree recorded by Adelson (2000) in the statement, "if the land is not healthy then how can we be?"

In recent years, there has been a discernible decrease in awareness by younger generations about the traditional teachings of the connection between people, the land and the animals harvested for food. The loss of the connection between the people of the OCN and the land has contributed to the resulting diminished respect for wildlife. For instance, in

response to inquiries regarding the change in traditional livelihood practices, usage of animals and, ultimately, in First Nations culture in his lifetime, RP009 indicated:

> I think it changed in the way when the young people that go out there and they don't respect the animals. They lost that connection with the animal and the land. It's changed that way… Our younger people have lost the respect for the land, they don't understand, they don't understand the wildlife.

6.1.4 Nutritional Value of Cree Food

The nutritional value of Cree food was an important concept in discussions on human health and well-being with the general consensus that, "long ago people were healthy for they ate only wild stuff" (RP004). The OCN Elders today are of a generation that has seen a dramatic change in diet over their lifetime. For example, one individual (OH008) explains:

> So I don't know what else I can say but there's a lot of changes. Not only in the lifestyles and the way people do but the diet itself. You know, the diet – I lived on smoked fish and meat and ducks and birds.

During one interview, Raymond Ross Lathlin (2011) expressed a connection with a life on the land as a trapper or hunter and "not stuffing yourself with junk food." Moses Bignell (2011) also echoed this sentiment of being 'out there' and eating well:

> It's a real meat and that's the health, the healthy foods. The food that we eat out there doesn't contain additives like what you eat in the canned foods, like sodium and all that stuff. There's nothing like that. It's just straight protein – wild meat.

Not surprisingly, the increased occurrence of physiological ailments such as diabetes and heart disease were used as common indicators by individuals as to the effects a change in diet has had on the community (RP010; RP016). OH008 explains this perspective:

> [Diabetes is] one of the biggest problems and to me it has to do with our diet, the way, the way we eat and all that. Too much stuff is prepared too, uh. Gather around the house, you don't even know what's in [the food] anymore.

Another Elder (RP009) indicated his belief in the nutritional value of Cree food:

> You can't get rid of sugar diabetes because of this – you got to eat. Sugar diabetes is going to be there forever. The only way to get rid of sugar diabetes is to go completely back to the old way and live in the bush for two or three months. Don't eat nothing from a store and take that medicine and the sugar diabetes will go away. But you come back five years later it will come back again too because you will be eating stuff again.

Moses Bignell (2011) used the bears that feed at the Reserve dump as an example to illustrate the effects that a change in diet has on the health of the community. According to him, the countless bears that feed on the 'fast food' at the dump starve to death during hibernation because the human waste they consume does not have the same nutritional value as 'wild food'. Raymond Ross Lathlin (2011) provided an interesting addition to this story in saying that even in years of low supplies of natural foods such as berries, wild bears can still survive through different means found in nature including roots and other vegetation. Dump bears, on the other hand, have a lower chance of survival even with an abundance of food, albeit nutritionally inadequate.

Some individuals explained that Cree foods might contain medicinal properties from which humans can benefit. For example, as the diet of muskrat consists of *wekās*, consuming muskrat meat would have a similar effect as the important traditional medicine (OH020; RP015). Moses Bignell (2011) also emphasized the importance of consuming muskrat meat for its medicinal properties:

> See everything that the muskrat eats is very, very clean and that's why it's very, I would say it's a medicated meat. It's free of disease. It's just what he eats is all medicine.

Alternatively, Cree food can also be detrimental to human health as a result of environmental degradation. As indicated in Chapter 5, several individuals indicated the significance of the food chain, which conveys the concept of interconnectedness or

relatedness. Accordingly, RP015 indicated that all forms of life are important including amphibians and crustaceans:

> They're part of the food chain. Everybody eats everybody. Like the snakes eat the frogs, frogs eat the mosquitoes… They're part of the system, they're part of the universe. They were given life here to survive. They all rely on one another.

Consequently, if species in lower levels of the food chain are negatively impacted by environmental considerations then the implications will be felt in humans through food consumption. The belief in the impacts felt through the food chain is so strong that some individuals are under the assumption that one can get cancer merely from consuming an infected animal (RP007).

6.2 Physical Activity

In contrast to Adelson's (2000) category of physical ability related to individual strength and endurance, community members from the OCN tended to emphasize physical activity as contributing to *menoyawenek*. As with Cree food, comparisons of levels of physical activity between past and present generations were used to illustrate the concept. Overall, the consensus was that people in the past worked physically harder in order to survive. RP009 explains:

> Well, you know when I was a young kid, everybody worked, nobody sat still. Everybody had to work, even us little kids, we had to work. You had to work in order to sustain your life whether you were going out there or your going off to work for somebody. But you always worked. If you didn't work, you just didn't make it. Now you don't have to work. You can just sit there and do absolutely nothing. And you will still be looked after. When I was a kid, I had to work, I had to work all the time. That's on top of going to school, I had to work. If I didn't, I'd starve, that was that.

The concept of hard physical work was typically in reference to a life on the land. Mabel Bignell (2011) indicated that, "you're more physically worked. You work physically when you're out there." RP016 also explained the importance of physical activity in contributing to health, "people don't live as healthy [now]. They were always on the move, helping each other out, living off the land."

Due to the relationship between a life on the land and Cree food, physical activity was linked to the harvesting of food. OH010 illustrates this concept by stating that, "they did everything to survive. It wasn't easy, no. If you were lazy there was nothing for to eat if you're lazy." Moses Bignell (2011) also explained the direct link between physical activity and Cree food in contributing to *menoyawenek*, "you go out there, around the bush and that's exercising and what you eat in the bush is way better than what you eat and in the community like ours."

Various individuals attributed increased technology related to transportation to the diminished physical activity in recent years (RP001; RP005; RP006; RP007; RP012). RP013 explains:

> Yes, I used to hear they walked many miles to get all this stuff and hunt. They didn't have nothing to use. They walked, they carried what they killed, they never used anything, they had sweet soil they used to survive. They camped, like, sections. They went where the food were. They carried a moose six to seven miles – I know they did that, my grandpa did that. That's what they did.

There has been an evident shift from walking, paddling a canoe or using dog sleds to traveling by snowmobile, motorboat or truck in harvesting practices. The enhanced technology is not a unique trend to the OCN or indigenous communities in general, but a reality throughout North America. The research participants indicated that technological

advances in mode of transportation, among other considerations, have resulted in today's generation achieving less physical activity and, therefore, diminished *menoyawenek*.

6.3 Warmth

The ability to keep warm is a concern that is common throughout Canada's north. Consequently, the concept of keeping warm while out in the land was an important topic of discussion throughout my fieldwork. Many times, the discussion was in regards to my own warmth due to concern given by the Elders. For instance, on one occasion following a two-hour period sitting outside on a chilly fall evening listening for moose, Moses Bignell came to the OCN Natural Resource Council office with a flyer in hand. My level of discomfort from the low temperatures the night before must have been obvious because the flyer advertisements were for warm camouflage gear, which Moses insisted I needed. With that, we went out shopping for clothes more appropriate for me to participate in wetland-based practices. Prior to heading out on field excursions, the Elders would also routinely ensure that I had enough warm clothing. I appreciated their concern but was also aware of my being an outsider to the area and uneducated on the proper requirements in participating in outdoor pursuits in northern Manitoba.

In the interviews and oral histories, the importance of keeping warm was mentioned most often through the important task of harvesting wood for fires. For example, OH020 indicated that when not fishing or practicing other traditional activities that they were typically hauling and selling wood. Various other research participants also indicated that collecting wood was a primary chore in their youth (OH002; OH014; OH019; RP015; RP017).

Among these participants, there was a strong relationship between harvesting wood for warmth and physical activity. RP017 explains:

> We had to do everything. In the summertime we get up with the sun and the men went to work, so do we. Our day we did lots. In the summertime, the men and even the youth went to cut wood, bringing it in, hauling it in, chopping it up and get ready for winter. There was piles and piles of wood.

As indicated by this quote, discussions surrounding warmth and harvesting wood tended to be related to winter preparation. OH008 also emphasized that, "we had to have everything that we needed around us, you know. So it was spending our time preparing, preparing for tomorrow, preparing for winter, preparing."

The act of harvesting wood for warmth was also directly related to achieving *menoyawenek*. For instance, RP015 indicated:

> They were dependent on it. When they didn't have wood, they did not have heat. It was a requirement, it was a necessity. You don't go camp when there is no wood. You got to make sure there is lots of wood around.

RP001 also explained the purpose of going out on the land to harvest wood for warmth in relation to well-being by stating that, "it is called survival. You can go to harvest wood; you can get the wood ready, anything like that to survive. You don't go there for nothing. You go there for your own health."

The majority of the discussions surrounding warmth, harvesting wood and preparing for winter are in reference to a time prior to the introduction of central heating systems. However, discussions pertaining to fires and keeping warm continue to be mentioned today regarding traditional activities taking place while out on the land. For instance, the Elders I worked most closely with had various stories regarding the dangers of getting cold while out on the land. Raymond Ross Lathlin (2011) told me of the occasion when his snowmobile broke through the ice into cold water during a hunting trip. Moses Bignell (2011) discussed

one winter hunting trip during which he misplaced his gloves for a short period of time. He also declared that the first task after making a moose kill in the winter is to light a fire with birch bark to make tea and to keep warm. Another Elder (RP002) explained that fires were used, "when I go checking my traps, to dry my clothes and to be warm at night." For the people of the OCN, keeping warm while out on the land is an important criterion in being able to attain *menoyawenek*.

6.4 Cree Language

In her research with the Whapmagoostui Cree of northern Quebec, Adelson (2000) did not appear to encounter the concept of language in contributing to overall human well-being. In contrast, the importance of retaining the Cree language for the OCN was repeatedly discussed in my fieldwork, community interviews and oral histories. Perhaps this difference can be attributed to the proportion of the population with knowledge of the traditional language as of 2006 being 94 percent for the Whapmagoostui Cree (INAC 2012b) as opposed to only 28 percent for the OCN (INAC 2012a). The reality of permanent language loss is much more evident for the people of the OCN and, as such, is an important concern within the community.

Although various First Nations communities throughout Canada speak the Cree language, the OCN dialect is unique to their region and, in fact, there can be differences between nearby communities. For example, OH014 indicated the differences in accents between adjacent communities or ones within only hours of one another:

> If I talk Cree in The Pas and there were a bunch of Moose Lakers over there, I'd know where they're from without even looking at them. And if there's a bunch of Grand Rapids' people over there, I don't have to look at them. I know they're from

> Grand Rapids. Even Cumberland. They're all different sounds that they have but they've got the same Cree.

As has been demonstrated, one's own unique identity and cultural heritage in the region can be differentiated by speech. Due to differences in dialect, as well as a low rate of knowledge of the language, OCN community members are well aware of the potential of their own unique language being lost in what could be mere generations.

The low level of language retention within the OCN is likely a result of the regional history. For instance, the OCN has experienced extensive and sustained contact with English speaking colonizers as discussed in Chapter 4. Most notably in regards to considerations of language transmission, many OCN community members (OH003; OH006; OH008; OH009; OH018; RP006) have indicated that the language policies of residential schools were a major reason for the limited amount of the Cree language being passed down to younger generations. One Elder (OH003) explains:

> When I started school, I remember being told I couldn't talk Cree. We grew up speaking Cree all the time and when we started school, we were told we couldn't speak Cree anymore. We were going to be learning the English language. And then it took awhile to adjust to that and being that young and we were told not to do those things.

Another community member (OH008) indicated that there were punishments for speaking Cree at school:

> When I spoke my language, they used to take me to the washroom and they'd make me eat soap. I had to take a bite out of it and I didn't know why. But later on it was – to take away my language.

As a result of former language policies in residential schools, an entire generation of First Nations was taught to be ashamed of their traditional language. According to various individuals, these policies created a break in the transmission of the language to the generations that followed, which is very apparent today (OH002; OH008; OH009; OH010;

RP001; RP008; RP018). For instance, one OCN Elder (OH018) chose not to speak to her children in the traditional language due to the lasting effects of residential school policies:

> But the only thing that we didn't speak Cree to is our kids. 'Cause we were experiencing so much negative stuff when we went to school, so when my husband and I started having kids, we said, "Well, we'll bring them up with English." So that's what we did. Now we never hear the end of it when the kids tell us, "You should have taught us Cree. You should have spoke to us in Cree." You know, we tried but we're not that successful in speaking it. I mean, they sound different. They still try but they're not as fluent as we were, yeah.

Aside from residential schools, other factors have also contributed to the reduced language retention within the OCN. For instance, there is an ease of mobility into and out of the community due to transportation infrastructure in the form of well-developed highways that are open throughout the year. As such, community members can choose to travel or live within larger city centers where knowledge of their traditional language is unnecessary and, in some instances, a hindrance. As well, some individuals are of the opinion that English has become a necessity in receiving an adequate education as explained by one Elder (OH014) in stating that, "my dream was that [my children] wanted an education. Talk English. That's what I wanted for them." Another Elder (RP018) affirms this consideration:

> Well, my part as First Nations, nothing much change in my culture but the young people, they change lots because of this school system because they're taught the whiteman's way education. That's important for them, you can't say it isn't but it is. Without education, you can't go nowhere nowadays and that's how I see it. The young people now are losing their culture – they can't even speak Cree.

The establishment of residential schools coupled with various other considerations has led to a reduced knowledge of the community's traditional language.

Many individuals acknowledge that the loss in their language will likely have negative repercussions on the well-being of OCN community members. Mabel Bignell explains:

> It's important for the Cree culture because they say that without language, then, you know, you're not a full Cree person… You need to have your language and your culture together and that makes you a whole person. So the ones who are sitting around here, we're whole persons because we have our language and we have our culture still intact… We might be the last generation of whole Cree people unless we do something drastic, you know.

Daniels-Fiss (2008), a Cree scholar, also affirms that without knowledge of the Cree language, one cannot truly speak from a Cree worldview and is, therefore, not a whole person.

An understanding of the translation of *menoyawenek* to 'a good way of living' embodies more than the physiological considerations that can be associated with Cree food, physical activity and warmth. Interpretations of the English translation relate also to living a life appropriate to Cree doctrine, which, like many community members have alluded to, includes retention of the Cree language. As such, for the OCN, the traditional language has been included as an important criterion in contributing to human well-being and lends itself to a demonstration of the connections between *menoyawenek* and identity.

Similarly to the other criteria for well-being discussed previously, language is also connected to the cultural identity related to a life on the land for OCN community members although the relationship is perhaps less direct than the other components of well-being. The data did not indicate obvious interactions between land and language but instead community members indicated that the two components tend to run parallel with both being important contributors to cultural identity and achieving *menoyawenek*. For instance, when asked in what direction they would like to see the OCN community head in the future, OH008 indicated:

> Well, what I'd like to see is that they learn their language, they learn who they are, their identity. So they can find out who they are. And also to be able to take care of

> the environment. The environment, because [if] we don't take care of the environment, you're not really yourself.

For OH008, both language and a healthy environment that can support the resources valued by the OCN contribute to cultural identity. Mabel Bignell (2011) indicated the need for maintaining Cree culture through participation in traditional harvesting practices, as well as through language, in discussions related to "whole Cree people." Similarly, RP017 describes the importance of language and a life on the land in maintaining Cree culture.

Daniels-Fiss (2008: 238) effectively describes the relationship between land and language through a discussion on Cree epistemology or ways of knowing:

> According to First Nations' traditional knowledge, the "people of Turtle Island" have inhabited the regions now called Canada for hundreds of thousands of years. They lived their lives within the means of the environment, acknowledging its abundance and its worth. They called the land their mother, or Mother-earth. The Cree word for "land" is *okâwîmâwaskiy*, comprising *okâwîmâw* (mother) and *askiy* (land, country, earth, or world); and *okâwîmâwaskiy* provided everything people needed for their health and well-being, and the people thanked Mother-earth daily through prayer, rituals and ceremonies using the language *kisê manitôw*, [the Creator], gave to them. Their language, *nehiyawewin*, became known to the newcomers as Cree. Although the language is seen as a gift to the people from *kisê manitôw*, its lexicon comes from *okâwîmâwaskiy*. Just as the land is sacred in the Cree culture, so too is the language. These two, the land and language, work in unison, creating an ever-deepening relation between the speaker and the environment.

As the above quote indicates, attaining the traditional Cree way of life that is reflected by a life on the land also requires language (Daniels-Fiss 2008). Similarly for the OCN, cultural identity and the ability to achieve *menoyawenek* require both retention of the Cree language and interactions with the natural environment.

6.5 Chapter Summary

The purpose of this chapter was to understand how a reduction in ecosystem services as a result of altered ecosystems has impacted the well-being of the OCN. In order to achieve this, the criteria for well-being were determined according to those community members that have a relationship with the land. According to these individuals, interactions with the natural environment through the practice of traditional harvesting activities contribute to well-being. Whether it be the increased nutritional value of the wild food products or the physical activity required to harvest these natural resources, community members indicated that the ability to achieve 'a good way of living' were dependent on the services provided by healthy ecosystems. As indicated in this chapter, a life on the land in combination with retention of the Cree language contributes to the cultural identity of the OCN and enhances well-being.

Although not the only reason for the diminished participation in wetland-based livelihood activities, the impacts outlined in Chapter 5 have led to the reduction in the participation of traditional harvesting practices that contribute to the cultural identity of the OCN. Altered ecosystems have resulted in a decrease in the quality and quantity of the wildlife and plants most valued by the OCN. Degraded wetland ecosystems, in combination with the various socioeconomic and political considerations highlighted in Chapter 4, have contributed to a reduced participation in these customary practices. In other words, a reduction in the capacity of these sensitive habitats to provide important ecosystem goods and services has, at least according to the community members that have contributed to this research, contributed to a reduced ability to meet those criteria necessary in achieving *menoyawenek*.

CHAPTER 7: DISCUSSION AND CONCLUSIONS

The purpose of this research was to enhance the overall understanding of the wetlands located within the SRD through documentation of the indigenous knowledge held by OCN community members. Due to the general research focus and in keeping with the aim of ethnoecological research, I approached the study through an analysis of the traditional practices taking place within these sensitive wetland ecosystems. Participating in or discussing these activities resulted in a rich amount of data concerning livelihood practices applicable and of interest to the research participants. The approach also acted to bound the study into a reasonable project which otherwise could have been an overwhelming task.

The first objective was to document OCN indigenous knowledge of the diversity and uses of organisms found within the wetlands located in the SRD. In Chapter 5, discussions surrounding traditional harvesting practices that take place within wetlands allowed this objective to be achieved. Within First Nations communities such as the OCN, knowledge pertaining to particular livelihood activities is held with certain individuals. Although there has been a decline in participation of traditional activities for the OCN, community members that have taken part in these activities in the past continue to hold the knowledge and skills required to live off the land.

The documentation of indigenous knowledge can be problematic because the information is constantly adapting and shifting in response to various external factors (Agrawal 1995; 2002). Even so, documenting indigenous knowledge remains a critical task as the number of individuals holding the culturally and ecologically relevant knowledge becomes reduced over time. As well, recording indigenous knowledge can provide a platform for the transmission of both ecologically and cultural relevant information to

younger generations.

The second objective of this research was to collect indigenous knowledge pertaining to the relationships amongst organisms of the wetlands. Data related to this objective was discussed in Chapter 5 through the use of ecological food chains and the understanding that "everything is connected." According to community members, all wetland organisms are required to maintain healthy ecosystems with no single organism being more important than the next. Future studies may provide more specific ecological information regarding the relationships amongst organisms.

Information provided by individuals related to the Cree worldview in Chapter 6 also offered some lessons pertaining to Objective 2. My initial methodological approach was to consider the relationships between biotic organisms as well as between biotic and abiotic factors. However, Cree epistemology differentiates between living and non-living entities in ways that do not always coincide with that of Western ideologies. Instead, Cree ways of knowing tend to understand animate and less-animate divisions (Daniels-Fiss 2008). Under this assumption, everything on earth has some characteristic that may exhibit life including biotic or living organisms (i.e., plants, animals), as well as those less obvious entities such as rocks, rivers and lakes that would otherwise be considered abiotic or non-living according to conventional Western science (Cajete 2000).

The concept of animism can help to explain the belief in relatedness that was repeatedly encountered throughout my research. According to indigenous ways of knowing, the human body is merely one expression of life. With death comes the return of the physical manifestation back to the earth with the spirit contributing to a "living landscape" that may include all biotic and abiotic entities (Cajete 2000). As a consequence, the spirit of one's

ancestors may live on in the surrounding plants, animals, soils, water bodies or even the air (Cajete 2000). Through this understanding of indigenous epistemology, a sense of respect for all relations is emphasized in the Aboriginal teachings that have been passed down for thousands of years.

Similarly for the OCN, the relationship amongst organisms or other entities within wetlands is that of relatedness, interconnectedness and respect which emerged through discussions regarding wetland-based practices and the Cree food that is produced through these traditional activities. Ecological degradation as a result of development has resulted in reduced plant and wildlife populations due, for instance, to an altered hydrologic regime or increased levels of pollution. The deleterious effects of intensive levels of harvesting are also very apparent to OCN community members. The coinciding "ethno-stress" within the community is a product of the diminished ability to live off the land, which also contributes to an overall loss in cultural continuity (Cajete 1999).

The first and second objectives encouraged discussions surrounding wetland-based practices and the ecological changes that have occurred within the traditional territory of the OCN over time. Community members provided accounts of the corresponding impacts these altered ecosystems have had on the plants, animals and, therefore, livelihood practices of the OCN. Most of these individuals have witnessed ecological changes within their lifetime and, as such, hold information that conventional Western science-based techniques may neglect or fail to consider. This thesis document acts as a tool where those voices with an intimate understanding of water and wetland ecosystems can be heard and an avenue in which indigenous knowledge can be integrated into future management decisions regarding the SRD.

The goal of the third research objective was to come to an improved understanding of how altered wetland functions are impacting the ecosystem services available to the OCN. According to the Millennium Ecosystem Assessment (2003), ecosystem services directly contribute to components of human well-being. Consequently, I chose to approach this objective by determining the locally constructed criteria for well-being for those individuals with a close connection to the land to ascertain if healthy ecosystems are necessary to achieve 'a good way of living.' As was indicated in Chapter 6, the local criteria for well-being are closely related to interactions with the land that occur while participating in traditional activities. As such, the reduced ability of sensitive wetland ecosystems to adequately provide important provisioning services has contributed to a decreased ability to live off the land for community members. In other words, decreased wildlife populations due to diminished ecosystem health have had a negative impact on the well-being of the OCN community, this according to those individuals that most closely identify with the natural environment.

Not all of the reduced participation in wetland-based practices and corresponding reduction in well-being can be attributed to ecological considerations such as reduced ecosystem services. Indigenous peoples in Canada have experienced a complex political and socioeconomic history that has contributed to an altered way of life for these communities. For the OCN, this cultural shift has manifested itself in livelihoods increasingly dependent on the wage economy and, in many cases, on government transfer payments.

Both the complex regional history, in combination with ecological degradation, have contributed to the shift from an identity that has traditionally been based on a life on the land to one with that may be expressed in innumerable ways in these contemporary times. This

cultural shift can be considered a form of adaptation to changes over time, which is also reflected in a change in the indigenous knowledge of the community (Davidson-Hunt 2006). Maffi (2010, 9) argues that this change in knowledge can result in the:

> External exploitation of traditional lands and resources or loss over such lands and resources, displacement, out-migration, impoverishment, forced or induced assimilation, loss of cultural identity and acculturation to a dominant way of life, shift from local languages to majority languages, integration into a market economy, and loss of local decision-making capacity and self-sufficiency.

Through change, factors contributing to human health and well-being can be negatively impacted (Maffi 2010). For instance, a study conducted by Chandler and Lalonde (1998) demonstrated that health and well-being tends to increase in First Nations communities that have both their language and culture intact or have reconstructed a relationship with the land. Accordingly, in recent years, there has been an increased interest in maintaining cultural diversity and, with it, the diversity of indigenous knowledge.

Cultural diversity is intimately related to the diversity of life on earth (Maffi 2010). As a result, there has been an increased interest in maintaining cultural diversity, not only to increase the well-being of local and indigenous communities, but also to understand connections to overall biological diversity (Maffi 2010). There are complex interactions between cultural diversity and the natural environment, which has been termed *biocultural diversity* (Maffi 2010). Maffi (2010, 5) has defined biocultural diversity as the "diversity of life in all its manifestations – biological, cultural and linguistic – which are interrelated (and likely co-evolved) within a complex socio-ecological adaptive system." The concept emphasizes humans in nature and the role that social systems have played in altering the natural environment in order to meet our material and non-material requirements while also adapting to the surrounding ecology in the process (Maffi 2010).

The field of biocultural diversity demonstrates strong correlations between cultural diversity, biological diversity and human well-being at global and regional scales. Similarly, this thesis presents linkages between well-being, healthy ecosystems and maintaining cultural identity at a local level through the capacity to participate in traditional harvesting practices. Therefore, the ability of the natural environment to maintain biological diversity and provide important ecosystem services can help to perpetuate cultural diversity and lead to the enhanced well-being of local communities. Although the continued colonialization and acculturation of indigenous groups in Canada may be difficult to contend with, achieving a reduction in ecological degradation is an area in which natural resource managers can ensure that a diversity of indigenous knowledge is maintained through participation in the traditional practices that are so important to the cultural identity and well-being of many indigenous communities.

7.1 Methodological Lessons

Methodological lessons learned during initial site selection may have applications towards future ethnoecological research of wetlands. Selecting specific sites in relation to wetland types determined through Western science classification systems was not a successful practice during fieldwork due to semantic considerations. Many traditional harvesting activities of the OCN tended to take place within rivers and lakes that are not typically considered wetlands under the Canadian Wetland Classification System (Warner and Rubec 1997). Due to differing cultural understandings of the term wetland, more general descriptions such as ‘aquatic’ or ‘water’ ecosystems could instead be used to minimize confusion. The change in wording would also then encompass all traditional practices

pertaining to water-dependent habitats that are important to the OCN. As well, the act of simply going out on the land to a variety of areas that have traditionally been used for harvesting purposes as opposed to predetermined sites produced data that was more relevant for the community. An improved understanding of the connectivity between important harvesting areas in terms of travel routes, for example, as opposed to select sites may also be an important consideration in future studies. Ensuring that a diversity of wetland ecosites was captured in the research occurred indirectly due to the tendency of individuals to move about on the landscape while taking part in traditional harvesting activities.

Considerations regarding cross-cultural comparisons of landscape classification systems may also contribute to the research methodology pertaining to further studies in the area. Although this research established that there were inconsistencies in the way in which the research team classified wetland types by name, there was no evidence to conclude that community members do not, in fact, differentiate between habitats. Instead, semantic categories in Cree may exist but encompass a broader set of wetland types and, as such, do not entirely align with other ecological systems of classification. For example, the term *muskāk* in Cree tends to include peatland wetlands such as fens and bogs. It appears that the Cree do not differentiate to the same extent as Western classification systems and may understand a place due to its function or use as opposed to a category of classification. As well, the relatively long-term exposure of the community to Western science classification nomenclature coupled with historical socioeconomic considerations may have modified the way in which community members classify the environment. Further studies that explicitly attempt to clarify these linguistic concepts regarding the indigenous classification of the landscape may be warranted.

7.2 Community-based Management

The data represented within this thesis document indicates the importance of managing for healthy wetland ecosystems within the SRD to maintain and, potentially, increase the level of participation in traditional harvesting activities by the OCN. In doing so, 'a good way of living' can be achieved through the continued expression of a cultural identity that embodies a life on the land. More specifically, lessons learned from the information discussed in this document can be applied towards successful community-based management of the natural resources within the traditional territory of the OCN.

7.2.1 Reflections on Management Options

Prior to making resource management decisions within OCN traditional territory, the nature of the relevant issues should be outlined and differentiated. In doing so, conservation efforts can become more relevant to the cultural, ecological and economic values of the community. The concerns addressed in this thesis relate to the reduced populations of muskrat, moose, waterfowl, fish and vegetation harvested through traditional wetland-based practices at a local scale. Reflections on OCN indigenous knowledge as it pertains to the management of these resources are offered below.

The low abundance of muskrat in the area potentially due, in part, to ecological degradation resulting from development projects may be more of a compensation issue for the community at this point in time. Although there are both cultural and ecological benefits

related to the increased presence of muskrat in the SRD, the practice of trapping within the community would likely remain negligible even if populations rebound due to the low market value for furs. The limited feasibility of successfully earning an income from trapping coupled with changing community values limits the success of increasing muskrat populations to enhance trapping practices. That being said, muskrat trapping has been a culturally important activity to the community since initial contact with European colonizers as both a source of food and for medicinal purposes, which is a consideration that should not be discounted when developing a management plan.

Although participation by OCN community members in wetland-based practices such as moose hunting, waterfowl hunting and fishing has been diminished, it appears that a greater number of individuals continue to take part in these activities today when compared with trapping. With regards to moose, there is a general consensus amongst OCN community members that population abundance in the region is low and requires immediate action. Manitoba Conservation conducted an aerial survey in the SRD in January of 2012 to determine more accurate numbers on the abundance of moose in the region. The results of the survey indicated that there are 317 moose located in the region (Mary Head 2012). According to Manitoba Conservation, the number represents a minimum viable population with severe consequences for the moose in the area if numbers were to fall below the January animal count (Mary Head 2012). Similar to the actions taken in nearby regions, a moratorium on moose hunting in the area could be put in place for the upcoming hunting seasons to allow populations to recover. However, First Nations hunters in the region retain the right to harvest moose for subsistence purposes. As a consequence, the OCN may want to consider levels of subsistence harvesting that would allow moose populations to recover

and maintain healthy populations. Philip Dorion (2012) has indicated that a voluntary moratorium for the OCN may be a reality in the near future. Instruments to achieve increased accountability within the OCN community may also be required to help alleviate pressures on moose populations. Recommendations on how to achieve this should come from the community itself but could include increased monitoring in combination with fines for excessive levels of harvesting. The OCN have a long history of big game hunting in the region and, as such, there are important cultural implications in ensuring that moose populations can support sustainable levels of subsistence harvesting.

Waterfowl hunting remains an important and culturally relevant practice for individuals from the community. Concerns related to diminished waterfowl populations within the SRD are very real although not as pronounced as other wildlife concerns. This could be due to the fact that although numbers are reduced, there is still a relatively strong presence of these birds within the traditional territory of the OCN when compared with muskrat and moose populations.

According to observations in the field and from the data collected, both domestic and commercial fishing are activities that have relatively high participation rates. Unlike many of the other traditional harvesting activities, commercial fishing provides a source of income to individuals within the community and, as such, managing for fish populations may be an important component in a resource management plan. Similarly to moose populations, increased regulations and accountability within the OCN community may be required to minimize overharvesting of fish species such as sturgeon, in particular.

With regards to traditional medicines, consultation with knowledgeable community members should take place to determine if there are any traditional harvesting areas that have

a high cultural value and which may require that access be limited to plant harvesters. The continued local cultivation of species such as *wekās* could contribute to increasing the presence and, perhaps, use of culturally important medicines. Although the abundance in the region may have been reduced, the species discussed in this thesis along with other important plants used in traditional medicines remain available for harvest. Monitoring of these populations should be initiated to ensure that the quality of these plant species has not been diminished as a result of development activities.

The decline in wildlife and plant populations has largely been attributed to reduced habitat quality and quantity as a result of development in the region that has largely been out of the control of the community. With that in mind, financial investments and compensation from interests within industry and the government may be required to assist in conservation efforts. With adequate financial capital, community-based management efforts have an improved capacity to contribute to the ecological enhancement of the SRD.

These reflections on management options are based on the approximate levels of participation in activities as contributed by individuals through qualitative means. Determining the actual numbers of people who are taking part in traditional activities, as well as which wetland-based practices are the most commonly practiced may be a valuable exercise for the community. To ascertain accurate numbers, the OCN Natural Resource Council could administer a household survey of a randomly selected group of the community population regarding inquiries as to the frequency of their participation in a variety of traditional practices. The results of the survey would provide the OCN with quantifiable data as to where efforts should be focused regarding natural resource management activities.

7.2.2 Holistic Approach to Management

Although ecological issues related to specific species have been outlined in this document, community perspectives regarding the management of the ecosystems also tended to emphasize the need for a more holistic approach at a larger scale. For instance, increasing overall water movement in the SRD through the decommissioning of water control structures or alleviating the impacts of road construction through the use of culverts could improve habitat quality for a diversity of wetland organisms. Further studies on the importance of water flow in the SRD for fur-bearing animals, moose populations, spawning grounds and plant communities could provide important information towards ecosystem management. As well, the OCN could become involved in water sampling events conducted at regular intervals to measure for levels of potential contaminants and turbidity. Information such as this could contribute to the quantifiable data regarding the overall health of the wetland ecosystems within the SRD.

The shift towards an ecosystem-based or holistic approach to resource management inevitably encounters increasingly complex issues pertaining to scale. The effects of cumulative upstream impacts within the larger watershed remain largely out of the control of local land managers due to jurisdictional considerations across provincial boundaries. For example, water consumption in Alberta for the purposes of petroleum production and refining will likely continue indefinitely much to the detriment of downstream environments. To counter this and other issues of scale, nested systems of governance may be required to successfully manage for the health of water and wetland ecosystems within the SRD.

Along with considerations of scale and governance, establishing new relationships and fostering current partnerships between First Nations groups, local communities,

government entities and private organizations at all levels could also contribute to enhancing the health of the SRD (Philip Dorion 2012). Through these collaborations, innovative methods to resource management could contribute to returning the delta to a reservoir of biodiversity and support the important cultural practices of communities such as the OCN.

Educating community members on the overall importance of wetlands in the area could be an important tool in achieving enhanced environmental stewardship. Increased exposure of younger generations to traditional practices taking place in the natural environment through field trips and other avenues can lead to an increased awareness of the ecological and cultural significance of the wetlands located within the SRD. Through increased exposure to traditional teachings, cultural continuity can be enhanced and potentially result in a feedback loop leading to improved stewardship of the sensitive wetland ecosystems located within OCN traditional territory.

LITERATURE CITED

Adelson, N. 1998. Health beliefs and the politics of Cree well-being. *Health* 2:5-22.

Adelson, N. 2000. *Being alive well: Health and the politics of Cree well-being*. Toronto, ON: University of Toronto Press.

Agrawal, A. 1995. Dismantling the divide between indigenous and scientific knowledge. *Development and Change* 26:413-439.

Agrawal, A. 2002. Indigenous knowledge and the politics of classification. *International Social Science Journal* 173:287-297.

Assembly of First Nations [AFN]. 2012a. *Indian Residential Schools Community Site, Elkhorn*. <www.afn-irs.ca>. Accessed 17 February 2012.

Assembly of First Nations [AFN]. 2012b. *Indian Residential Schools Community Site, McKay-Dauphin*. <http://www.afn-irs.ca>. Accessed 17 February 2012.

Assembly of First Nations [AFN]. 2012c. *Indian Residential Schools Community Site, Prince Alberta*. <http://www.afn-irs.ca>. Accessed 17 February 2012.

Atram, S. 1991. Ethnoscience today. *Social Science Information Sur Les Sciences Sociales* 30:595-662.

Baschuk, M. 2010. *Effects of water-level management on the abundance and habitat use of waterfowl and marsh birds in the Saskatchewan River Delta, Manitoba, Canada*. Masters Thesis. Winnipeg, MB: University of Manitoba.

Berkes, F. 2008. *Sacred ecology*. New York, NY: Routledge.

Berkes, F. and I. J. Davidson-Hunt. 2006. Biodiversity, traditional management systems, and cultural landscapes: Examples from the boreal forest of Canada. *International Social Science Journal* 187:35-47.

Berkes, F., J. Colding, and C. Folke. 2003. *Navigating social-ecological systems: Building resilience for complexity and change.* Cambridge, UK: Cambridge University Press.

Berlin, B., D. E. Breedlove, and P. H. Raven. 1974. *Principles of Tzeltal plant classification: An introduction to the botanical ethnography of a Mayan-speaking community of Highland Chiapas*. New York, NY: Academic Press.

Bernard, H. R. 2006. *Research methods in anthropology: Qualitative and quantitative approaches*. Lanham, MD: AltaMira Press.

Bignell, Mabel. 2011. Personal Communications / Interview. Opaskwayak Cree Nation.

Bignell, Moses. 2011. Personal Communications / Interview. Opaskwayak Cree Nation.

Bishop, C. A. and A. J. Ray. 1976. Ethnohistorical research in the central Subarctic: Some conceptual and methodological problems. *Western Canadian Journal of Anthropology* 7:116-144.

Cajete, G. 1999. *A people's ecology: Explorations in sustainable living*. Santa Fe, NM: Clear Light Publishers.

Cajete, G. 2000. *Native science: Natural laws of interdependence*. Santa Fe, NM: Clear Light Publishers.

Chandler, M. J. and C. Lalonde. 1998. Cultural continuity as a hedge against suicide in Canada's First Nations. *Transcultural Psychiatry* 35:191-219.

Coates, K. S. and W. R. Morrison. 1986. *Treaty Research Report: Treaty 5 (1875)*. Ottawa, ON: Treaty and Historical Research Centre, Indian and Northern Affairs Canada.

Conklin, H. C. 1954. The relation of Hanunoo culture to the plant world. PhD Dissertation. New Haven, CT: Yale University.

Costanza, R., R. D'Arge, R. S. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R. V. O'Neill, J. Paruelo, R. G. Raskin, P. Sutton, and M. van den Belt. 1997. The value of the world's ecosystem services and natural capital. *Nature* 387:253-260.

Cotton, C. M. 1996. *Ethnobotany: Principles and applications*. London, UK: John Wiley.

Creswell, J. W. 2007. *Qualitative inquiry and research design: Choosing among five approaches.* Thousand Oaks, CA: Sage Publications.

Creswell, J. W. 2009. *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.

Daniels-Fiss, B. 2008. Learning to be a *nehiyaw* (Cree) through language. Diaspora, indigenous and minority education 2:233-245.

Daily, G. C. 1997. *Nature's services: Societal dependence on natural ecosystems.* Washington, DC: Island Press.

Daily, G. C. and P. R. Ehrlich. 1999. Managing earth's ecosystems: An interdisciplinary challenge. *Ecosystems* 2:277-280.

Davidson-Hunt, I. J. 2006. Adaptive learning networks: Developing resource management knowledge through social learning forums. *Human Ecology* 34:593-614.

Davidson-Hunt, I. J. and R. M. O'Flaherty. 2006. *Scoping exercise for indigenous ecological classification of wetlands in the Athabasca oil sands region.* Proposal to CEMA Wetlands and Aquatics Subgroup.

De Leon, J. P. and J. H. Cohen. 2005. Object and walking probes in ethnographic interviewing. *Field Methods* 17:200-204.

Dorion, Philip. 2012. Personal Communications / Interview. Opaskwayak Cree Nation.

Drieger, C. J. 2006. *A journey of a thousand miles begins with a single blueberry: Learning journeys of the Whitefeather Forest, Pikangikum First Nation, Ontario*. Masters Thesis. Winnipeg, MB: University of Manitoba.

Ducks Unlimited Canada [DUC]. 2003a. *Enhanced wetland classification inventory of the Saskatchewan River Delta*. Unpublished Map.

Ducks Unlimited Canada [DUC]. 2003b. *Pasquia earth cover classification (Manitoba/Saskatchewan) user's guide*. Unpublished Document.

Ducks Unlimited Canada [DUC]. 2006. *Location and extent of the Saskatchewan River Delta in Saskatchewan and Manitoba*. Ducks Unlimited Canada Unpublished Map.

Ducks Unlimited Canada [DUC]. 2008. *Saskatchewan River Delta: Overview, biodiversity, wetlands, land-use, risks and threats*. Unpublished Document.

Ducks Unlimited Canada [DUC]. 2011. *Summerberry Marsh*. Research Report.

Ducks Unlimited Canada [DUC]. 2012a. *Major marsh complexes managed by Ducks Unlimited Canada within the Saskatchewan River Delta*. Ducks Unlimited Canada Unpublished Map.

Ducks Unlimited Canada [DUC]. 2012b. *Boreal Wetland Fact Sheets*. < www.ducks.ca>. Accessed 26 March 2012.

Dunn, K. M. 2005. Interviewing. In *Qualitative research methods in human geography*, ed. I. Hay, 79-105. Toronto, ON: Oxford University Press.

Ervin, M. 2011. *Population characteristics and habitat selection of muskrats (Ondatra zibethicus) in response to water level management at the Summerberry Marsh Complex, The Pas, Manitoba, Canada.* Masters Thesis. Ames, IA: Iowa State University.

Ewel, K. C. 2001. Natural resource management: The need for interdisciplinary collaboration. *Ecosystems* 4:716-722.

Freshwater Fish Marketing Corporation [FFMC]. 2012. *About us*.

<www.freshwaterfish.com>. Accessed May 2012.

Government of Manitoba. 2010. *Aboriginal relations branch: Goals, objectives and initiatives*. <www.gov.mb.ca/conservation/arb/goals/index.html>. Accessed 29 April 2011.

Greer, Shaun. 2012. Personal Communications. Ducks Unlimited Canada.

Hannibal-Paci, C. J. 2000. *'His knowledge and my knowledge': Cree and Ojibwe traditional environmental knowledge and sturgeon co-management in Manitoba*. PhD Dissertation. Winnipeg, MB: University of Manitoba.

Head, Mary. 2012. Personal Communications. Opaskwayak Cree Nation.

Hunn, E. 2007. Ethnobiology in four phases. *Journal of Ethnobiology* 27:1-10.

Hyde, K. 2007. *Transcript files 5.9*. Sam Waller Museum Fonds. The Pas, MB: Sam Waller Museum.

Hyde, K. 2008. *Transcript files 5.9*. Sam Waller Museum Fonds. The Pas, MB: Sam Waller Museum.

IBA Canada. 2011. *Important bird areas: Saskatchewan River Delta*. <www.ibacanada.com>. Accessed 29 April 2011.

Indian and Northern Affairs Canada [INAC]. 2012a. *Opaskwayak Cree Nation*. <www.ainc-inac.gc.ca>. Accessed 12 March 2012.

Indian and Northern Affairs Canada [INAC]. 2012b. *Premiere nation de Whapmagoostui*. <www.ainc-inac.gc.ca>. Accessed 31 January 2012.

Johnson, D., L. Kershaw, A. MacKinnon and J. Pojar. 1995. *Plants of the western Boreal Forest and Aspen Parkland*. Edmonton, AB: Lone Pine Publishing and the Canadian Forest Service.

Lahring, H. 2003. *Water and wetland plants of the prairie provinces*. Regina, SK: Canadian Plains Research Center, University of Regina.

Lathlin, Raymond Ross. Personal Communications / Interview. Opaskwayak Cree Nation.

Lindgren, C. 2001. *Community conservation plan for The Pas – Saskatchewan River Delta*. Winnipeg, MB: BirdLife International and the Manitoba Naturalists Society.

Loney, M. 1987. The construction of dependency: The case of the Grand Rapids Hydro Project. *The Canadian Journal of Native Studies* 1: 57-78.

Maffi, L. 2010. What is biocultural diversity? In *Biocultural diversity conservation*, eds. L. Maffi and E. Woodley, 3-11. London, UK: Earthscan.

Manitoba Historical Society. 2011. *Historical tour: The Pas, Manitoba*. http://www.mhs.mb.ca/docs/mb_history/15/thepas.shtml. Accessed 6 Dec 2011.

Manitoba Hydro. 2011. *Grand Rapids Generating Station*. <http://www.hydro.mb.ca/corporate/facilities/gs_grand_rapids.shtml>. Accessed 1 Dec 2011.

Marles, R. J., C. Clavelle, L. Monteleone, N. Tays, and D. Burns. 2008. *Aboriginal plant use in Canada's northwest boreal forest*. Edmonton, AB: Natural Resources Canada, Canadian Forest Service.

Martin, C. 1978. *Keepers of the game: Indian-animal relationships and the fur trade*. Berkeley, CA: University of California Press.

Martin, G. J. 1995. *Ethnobotany: A methods manual*. London, UK: Chapman and Hall.

McGillivary, Stanley. 2011. Personal Communications / Interview. Opaskwayak Cree Nation.

Millennium Ecosystem Assessment [MA]. 2003. *Ecosystems and human well-being: A framework for assessment*. Washington, DC: Island Press.

Millennium Ecosystem Assessment [MA]. 2005a. *Ecosystems and human well-being: Synthesis*. Washington, DC: Island Press.

Millennium Ecosystem Assessment [MA]. 2005b. *Ecosystems and human well-being: Wetlands and water synthesis*. Washington, DC: World Resources Institute.

Millennium Ecosystem Assessment [MA]. 2005c. *Ecosystems and human well-being: Current state and trends, Volume 1*. Global Assessment Reports. Washington, DC: Island Press.

Millennium Ecosystem Assessment [MA]. 2005d. *Ecosystems and human well-being: Policy responses, Volume 3*. Global Assessment Reports. Washington, DC: Island Press.

Millennium Ecosystem Assessment [MA]. 2005e. *Ecosystems and human well-being: Multiscale assessments, Volume 4*. Sub-global Assessment Reports. Washington, DC: Island Press.

Milloy, J. S. *A national crime: The Canadian government and the residential school system, 1879 to 1986*. Winnipeg, MB: The University of Manitoba Press.

Nelson, J. G. 1991. Research in human ecology and planning: an interactive, adaptive

approach. *The Canadian Geographer* 35:114-127.

Norgaard, R. B. 2004. Learning and knowing collectively. *Ecological Economics* 49:231-241.

Opaskwayak Cree Nation [OCN]. 2012. *History of the Opaskwayak Cree Nation.* <http://www.opaskwayak.ca>. Accessed 5 March 2012.

Pattie, D. and C. Fisher. 1999. *Mammals of Alberta*. Edmonton, AB: Lone Pine Publishing.

Parlee, B., F. Berkes, and the Teetl'it Gwich'in Renewable Resources Council. 2005. Health of the land, health of the people: A case study on Gwich'in berry harvesting in northern Canada. *EcoHealth* 2:127-137.

Partners FOR the Saskatchewan River Basin. 2009. *From the mountains to the sea*. Research Report.

Pereira, E., C. Queiroz, H. M. Pereira, and L. Vicente. 2005. Ecosystem services and human well-being: A participatory study in a mountain community in Portugal. *Ecology and Society* 10:14-36.

Pettipas, K. 1972. *A history of the work of the Reverend Henry Budd conducted under the auspices of the Church Missionary Society*. Masters Thesis. Winnipeg, MB: University of Manitoba.

Posey, D. A., J. Frechione, J. Eddins, L. F. Da Silva, D. Myers, D. Case, and P. MacBeath. Ethnoecology as applied anthropology in Amazonian development. *Human Organization* 43:95-107.

Reid, W. V., F. Berkes, T. J. Wilbanks, and D. Capistrano. (Eds.) 2006. *Bridging scales and knowledge systems: Concepts and applications in ecosystem assessment*. Washington, DC: Island Press.

Rist, S. and F. Dahdouh-Guebas. 2006. Ethnosciences: A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. *Environment, Development and Sustainability* 8:467-493.

Schuyt, K. and L. Brander. 2004. *The economic value of the world's wetlands*. Gland, Switzerland: WWF Living Waters.

Smith, C. E. 2004. *Pasquia project 1985-1999 earth cover change detection*. Addendum to the Earth Cover Classification Final Report.

Smith, K. B., C. E. Smith, S. F. Forest and A. J. Richard. 2007. *A field guide to the wetlands of the Boreal Plains ecozone of Canada.* Version 1.0. Edmonton, AB: Ducks Unlimited Canada (www.ducks.ca/conserve/programs/boreal/pdf/fieldguide.pdf).

Stake, R. E. 1995. *The art of case study research*. Thousand Oaks, CA: Sage Publications.

Swampy Cree Tribal Council [SCTC]. 2012. *Home*. <www.swampycree.com>. Accessed 5 March 2012.

Tanner, A. 1979. *Bringing home animals: Religious ideology and mode of production of the Mistassini Cree hunters*. St. John's, NL: Memorial University of Newfoundland, Social and Economic Studies No. 23.

The Pas. 2012. *Communities*. <www.whatsupinthepas.com>. Accessed 5 March 2012.

The Ramsar Convention on Wetlands [Ramsar]. 2012. *Wetland ecosystem services factsheets*. <www.ramsar.org>. Accessed 10 January 2012.

Thistle, P. C. 1986. *Indian-European Trade Relations in the Lower Saskatchewan River Region to 1840*. Winnipeg, MB: The University of Manitoba Press.

Toledo, V. M. 1992. What is ethnoecology? Origins, scope and implications of a rising discipline. *Etnoecologia* 1:5-19.

Toledo, V. M. 2002. Ethnoecology: A conceptual framework for the study of indigenous knowledge for nature. In *Ethnobiology and biocultural diversity*, eds. J. R. Stepp, F. S. Wyndham, and R. K. Zarger, 511-522. Athens, GA: University of Georgia Press.

Tough, F. 1996. *'As their natural resources fail': Native peoples and the economic history of Northern Manitoba, 1870-1930*. Vancouver, BC: University of British Columbia Press.

Trosper, R. L. 1995. Traditional American Indian economic policy. *American Indian Culture and Research Journal* 19:65-95.

Uchtmann, R. H. 1983. *Summary of resource use in the Saskatchewan River Delta System*. Manitoba Conservation Report.

Uchtmann, R. H. 2008. *Historical management of muskrat management and muskrat trapping in the SRD/floodplain with Manitoba*. Manitoba Conservation Symposium.

Waldram, J. 1984. Hydroelectric development and the process of negotiation in northern Manitoba, 1960-1977. *The Canadian Journal of Native Studies* 2:205-239.

Wardrop, D. H., A. K. Glasmeier, J. Peterson-Smith, D. Eckles, H. Ingram and R. P. Brooks. 2011. Wetland ecosystem services and coupled socioeconomic benefits through conservation practices in the Appalachian region. *Ecological Applications* 21:93-115.

Warner, B. G. and C. D. A. Rubec. (Eds.) 1997. *The Canadian Wetland Classification*

System. Waterloo, ON: Wetlands Research Team, University of Waterloo.

Yin, R. K. 2009. *Case study research: Design and methods.* Thousand Oaks, CA: Sage Publications.

Zedler, J. B. and S. Kercher. 2005. Wetland resources: Status, trends, ecosystem services and restorability. *Annual Review of Environment and Resources* 30:39-74.

APPENDIX A: ETHICS APPROVAL

UNIVERSITY OF MANITOBA | Ethics
Office of the Vice-President (Research)

CTC Building
208 - 194 Dafoe Road
Winnipeg, MB R3T 2N2
Fax (204) 269-7173
www.umanitoba.ca/research

APPROVAL CERTIFICATE

June 17, 2011

TO: **Alli Morrison** (Advisor I. Davidson-Hunt)
Principal Investigator

FROM: **Wayne Taylor, Chair**
Joint-Faculty Research Ethics Board (JFREB)

Re: **Protocol #J2011:066**
"Exploring Wetland Indigenous Knowledge of the Opaskwayak Cree Nation in the Saskatchewan River Delta, Manitoba"

Please be advised that your above-referenced protocol has received human ethics approval by the **Joint-Faculty Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement (2). This approval is valid for one year only.

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

Please note:

- **If you have funds pending human ethics approval, the auditor requires that you submit a copy of this Approval Certificate to the Office of Research Services, fax 261-0325 - please include the name of the funding agency and your UM Project number. This must be faxed before your account can be accessed.**

- **if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval; otherwise the account will be locked.**

The Research Quality Management Office may request to review research documentation from this project to demonstrate compliance with this approved protocol and the University of Manitoba Ethics of Research Involving Humans.

The Research Ethics Board requests a final report for your study (available at: http://umanitoba.ca/research/ors/ethics/ors_ethics_human_REB_forms_guidelines.html) **in order to be in compliance with Tri-Council Guidelines.**

Bringing Research to Life

APPENDIX B: LETTER OF INFORMED CONSENT

UNIVERSITY OF MANITOBA

Natural Resources Institute
70 Dysart Road
Winnipeg, Manitoba
Canada R3T 2N2
General Office (204) 474-7170
Fax: (204) 261-0038
http://www.umanitoba.ca/academic/institutes/natural_resources

Research Project Title: Opaskwayak Cree Nation wetland ethnoecology: Land, identity and well-being in a flooded landscape

Researcher: Alli Morrison

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

The Opaskwayak Cree Nation (OCN) and other First Nations communities living in the Saskatchewan River Delta (SRD) have expressed concerns regarding loss of wildlife such as muskrat, moose and waterfowl due to impacts from anthropogenic developments. The OCN has a long history of utilizing the wetlands located in the SRD for hunting, trapping and fishing as a source of subsistence. The wetland ecosystems are also of cultural importance to the OCN, acting as a location for families to participate in traditional activities. Insights gained from the indigenous knowledge of the OCN could provide natural resource managers with an increased understanding of the economic, cultural and ecological impacts resulting from the altered wetland ecosystems of the SRD. Consequently, the general focus of my research will be to explore indigenous knowledge as it relates to the diversity of wetland types within the SRD that are used to provide ecosystem services or benefits to the OCN.

From July to October 2011, I will be working with various community members from the OCN. This work includes my participation and observation of knowledgeable individuals taking part in land-based activities within the wetlands of the SRD. I will also be also carrying out individual interviews with Elders and other key participants. These interviews are conversations taking approximately one hour and may be audio recorded.

If for any reason you do not wish to be recorded please let me know and I will not use the audio recorder. Also, if you do not wish to be personally identified in this research, please inform the researcher and your anonymity will be ensured through the use of unique codes. All information obtained during this research project will remain confidential and the data will be kept in a secure location. The data will be destroyed two years following the completion of the graduate thesis or by August 2014. This research presents minimal risks to research participants, however, please be aware that the general results of this research will be presented in a final verification workshop. If the results of this research intend to be

published, they will first be presented to the OCN Natural Resource Council before information is shared in the public domain. If you personally wish to receive a copy of the final research document, the researcher can send this to you.

Financial compensation for your time is available in order to facilitate your participation in this study. This compensation is set by the research agreement between the OCN and the University of Manitoba. The Elders will receive $75 / full day for their participation in this research project.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

In case of any questions or concerns, you can contact myself or my advisor:

Alli Morrison	Iain Davidson-Hunt
204-998-6194	204-474-8680
alli.morrison@gmail.com	davidso4@cc.umanitoba.ca

The University of Manitoba Research Ethics Board(s) and a representative(s) of the University of Manitoba Research Quality Management / Assurance office may also require access to your research records for safety and quality assurance purposes.

This research has been approved by University of Manitoba Human Ethics Review Committee. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator at 204-474-7122. A copy of this consent form has been given to you to keep for your records and reference.

I would like my name to be withheld from information provided _____

I give my permission for photos of myself to be used in presenting research results and publications. I understand that I will be given the opportunity to review the document in which the photo will appear and ask for it to be withdrawn.

_____
Participant's printed name

_____
Participant's Signature Date

_____
Researcher and/or Delegate's Signature Date