MÉTIS KNOWLEDGE, LAND USE AND OCCUPANCY STUDY FOR THE LAKE ST. MARTIN AND LAKE MANITOBA PERMANENT OUTLET CHANNELS PROJECT

Manitoba Metis Federation

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DEFINITION OF TERMS

Country Foods: Foods from wild animals or plants, also called wild foods, on which the citizens of the Métis Nation's Manitoba Métis Community rely for subsistence.

Land Use: Defined generally as hunting, fishing, and gathering, and the use of sites and resources for cultural and ceremonial purposes by the Métis Nation's Manitoba Métis Community.

Map Biography: The methodology for this TKLUS is based on the best practice map biography technique pioneered by Terry Tobias in his manual *Living Proof: The Essential Data-Collection Guide for Indigenous Use and Occupancy Map Surveys* (2009). The map biography is the standard data collection method for land use and occupancy studies. A map biography is an interview process in which a person provides an account of their life on the land and water, including places they have travelled, stayed, and gathered resources. In some cases, as with some of the TEK data provided in this TKLUS, participants in map biographies may indicate places that they have not used personally, but about which they have knowledge from family or other members of the community (Tobias, 2009).

Métis Ecological Knowledge (MEK): The knowledge and information by which people come to understand the ecology of their surrounding environment through years of first-hand experience and inherent cultural understanding of the relationships between humans, animals, lands, and waters. People also come to understand the ecology of their environment through teachings that have been passed down through relations or within a community.

Métis Knowledge or Métis Traditional Knowledge (MK or MTK): The body of knowledge and information shared by the Metis Nation's Manitoba Métis Community, as a part of the Métis Nation, and held by and transmitted between Métis people, which supports traditional land use for the benefit and well-being of Métis peoples. Métis Traditional Knowledge can be considered a distinct type of Traditional Knowledge.

Occupancy: Defined generally as the settlements, movements, and sites associated with a distinct group of peoples, in this context with the Métis Nation's Manitoba Métis Community.

Oral History: For the purposes of this Study, Oral History refers to the participant's qualitative land use and occupancy knowledge about a particular area or activity. It could include details about the social, economic, cultural, or environmental importance of a location, species, or land-based activity, as well as legends and stories that have been passed down. Oral History is used to bring depth to land use and occupancy research and increase shared understanding about the values of the participants. It is commonly collected as complementary material to a map biography as it doesn't lend itself as well to being recorded on a map.

Study Area: The Study Area refers to the local assessment area for traditional land and resource use identified by Manitoba Infrastructure in their Environmental Assessment, which was also used for the purpose of this Study.

EXECUTIVE SUMMARY

Background

Flooding in the Lake St. Martin region has been an ongoing challenge for residents, land-users, businesses, and municipalities, all of which include members of the Métis Nation's Manitoba Métis Community. To address flooding in the region and develop a permanent flood control system, Manitoba Infrastructure (MI) has proposed the construction of two permanent outlet channels to facilitate the diversion of water through Lake St. Martin and into Lake Winnipeg. The Lake Manitoba Outlet Channel is proposed to connect Lake Manitoba to Lake St. Martin, while the Lake St. Martin Outlet Channel is proposed to connect Lake St. Martin to Lake Winnipeg.

The Project is undergoing a federal Environmental Assessment under the Canadian Environmental Assessment Act (CEAA, 2012). Guidelines for the preparation of the EIS were shared by the Canadian Environmental Assessment Agency on May 15, 2018. In addition to the federal EA, the Project is simultaneously undergoing an application for a Class 3 application under The Environment Act of Manitoba. Several provincial and federal permits, including work permits, quarry permits, burn permits, etc. will also be required for construction and operation phases of the Project.

Métis Nation citizens have and continue to use and occupy the lands and waters throughout this region, including areas directly within and around the proposed outlet channels. To understand how Métis rights, claims, and interests may be impacted by the proposed Project, the MMF undertook a Métis Knowledge, Land Use and Occupancy Study (MKLUOS) to document where, and how, Métis Nation citizens use and hold knowledge of the area.

Study Findings

A total of 12 map biography and oral history interviews were conducted with Métis Nation citizens for this MKLUOS. The research team used the local assessment area identified by MI for traditional land and resource use. Participants were asked about their knowledge and use of this area however they were not limited from mapping their use and knowledge of other areas. The data collected through this MKLUOS is not an exhaustive representation of Métis Nation citizens' knowledge, use and occupancy of the Study Area.

Interview participants mapped 138 features within the Study Area. This data was combined with land use and occupancy data collected by the MMF for other studies (referred to as the MMF Data Catalogue), which identified an additional 46 sites mapped within the Study Area. Data from the MMF Data Catalogue includes information collected and reported on in specific geographic areas related to past projects, as well as data outside of these areas. While the data from the MMF Catalogue was used to provide additional context, the majority of data presented in this report is taken from the 12 interviews conducted specifically for the purpose of this study.

Combined, these locations include the following categories and features:

Access

- 2 boat launches or landings
- 1 water route
- 1 other access feature

Changes

- 1 change to access
- 1 change to the shoreline environment
- 1 change to water
- 4 changes to water quality

Commercial Harvesting

- 3 commercial fishing locations
- 3 commercial trapping and snaring locations

Cultural and overnight sites

- 1 recreational area
- 6 temporary structures

Personal Harvesting

- 32 personal fishing locations
- 4 plant harvesting locations
- 12 personal hunting locations
- 1 personal trapping and snaring location

Métis Ecological Knowledge

- 5 areas of bird habitat
- 18 fish spawning areas
- 6 places where invasive species were observed
- 1 place where species at risk was observed
- 13 areas of mammal habitat

- 2 areas of plant habitat
- 9 areas of reptile and amphibian habitat
- 1 other important habitat
- 2 locations for spring water

As part of this Study, the MMF will also be conducting ground-truthing and field interviews, and the data collected will be added to this record.

Study Conclusions

The results of this MKLUOS demonstrate that Métis Nation citizens both use and occupy the lands and waters within and surrounding the Study Area. This evidence also suggests that any adverse environmental impacts resulting from the proposed outlet channels, such as impacts to fish, wildlife, water, and more, have the potential to impact the rights, claims, and interests of the Manitoba Métis.

This Study has identified a number of outstanding issues of concern related to the proposed Project which have not been adequately addressed by Manitoba Infrastructure, or through the Environmental Assessment process to date. Issues identified through the MMF's review of the EIS found in Appendix A are supported by the findings of this Study, including concerns related to:

- Invasive species
- Impacts to fish and waterways
- Impacts to wildlife and wildlife habitat
- Impacts to Métis culture and land use
- Management of the outlet channels
- Consultation with the Manitoba Métis

Recommendations

Based on the results of this study and the conclusions outlined here, the MMF recommend the following:

- Manitoba Infrastructure must formally and functionally acknowledge MMF jurisdiction, sovereignty, rights, claims, and interests and the related requirements for consultation and engagement moving forward with the proposed Project. This must be done within Manitoba Infrastructure's Environmental Assessment documentation.
- Manitoba should commit to meaningful consultation with the MMF and involvement of the MMF in future planning, decision making, licensing, and monitoring of developments that are enabled by the Project.

- Manitoba should establish a forum and process with the MMF where issues regarding the Project can be brought forward, discussed, and addressed throughout the life of the Project. This forum/process can facilitate the involvement of the MMF in ongoing permitting and approvals related to the Project and should include the provision of capacity funding to MMF to support this process.

- To increase understanding of how the Manitoba Métis have been or will be impacted by the proposed Project, further study, including field interviews and ground-truthing areas with Métis land users, is required. This will ensure the most appropriate site-specific mitigation and accommodation measures can be developed for these areas. As mentioned, the MMF plan to undertake these activities in the coming months. Manitoba Infrastructure must engage with the MMF to evaluate how this information will be incorporated into the Project to inform mitigation, management, and compensation measures.

- Manitoba Infrastructure should continue to engage the MMF about the issues of concern expressed by the Manitoba Métis outlined in Section 5.0 of this document, as there remain unanswered questions and unaddressed concerns. Meaningful ongoing engagement and consultation with the MMF may also help to reduce concerns.

- Manitoba Infrastructure should work with Métis citizen scientists and harvesters, including commercial fishers, to collect baseline data surrounding the existing conditions of Lake Manitoba, Lake St. Martin, and Lake Winnipeg. Through the life of the proposed Project, Manitoba Infrastructure should work with these groups to monitor conditions and impacts on an ongoing basis and report the findings to the MMF at regular intervals.

- Manitoba Infrastructure and the MMF should negotiate agreements to address impacts of the Project on the rights, claims and interests of the Manitoba Métis, and to support the MMF's participation in environmental and cultural monitoring throughout the life of the Project. Components of this agreement should include (but not be limited to):

    - Funding for Métis Ecological Knowledge (MEK) and ground-truthing studies

    - Hiring and training of MMF environmental and cultural monitors for all phases of the Project

- Annual reporting to the MMF on results of monitoring and any adaptive management measures being implemented

- Manitoba Infrastructure should provide Métis citizens, through consultation with the MMF, with economic opportunities related to the proposed Project including:

    - A procurement target for goods and services to be provided by Métis businesses

    - Employment targets for Métis citizens

1.0 INTRODUCTION

The Manitoba Metis Federation (MMF) hired Shared Value Solutions (SVS) to conduct a Métis Knowledge, Land Use and Occupancy Study (the Study) focusing on the lands and waters around the proposed Lake St. Martin and Lake Manitoba Permanent Outlet Channels. The study results have provided us with evidence of current and historic land use by the Métis Nation's Manitoba Métis Community in this geographic area. Due to ongoing issues and the lack of consultation by the Province of Manitoba, the MMF has self-funded this Study.

This report includes sensitive information shared with the MMF by members of the Métis Nation's Manitoba Métis Community (also known as Métis Nation citizens) with the understanding that it would be kept confidential, individuals would not be specifically identified, and the information would not be disclosed other than by the MMF. Métis Nation citizens have entrusted the MMF, as their democratically elected Métis Government, to safeguard and appropriately use this information on their behalf. The information provided in this report is the property of the MMF and cannot be duplicated or distributed without the MMF's prior written consent.

1.1 BACKGROUND AND CONTEXT

Flooding in the Lake St. Martin region has been an ongoing challenge for residents, land-users, businesses, and municipalities, all of which include members of the Métis Nation's Manitoba Métis Community. Flooding in 2011 resulted in the long-term evacuation of several communities and the construction of the Emergency Outlet Channel, which is slated to be replaced by the current Project. The total economic costs of the 2011 flood have been estimated at $1.2 billion (Manitoba Infrastructure, 2020). To develop a permanent flood control system, Manitoba Infrastructure ("MI" or "the Proponent") has proposed to develop two new permanent outlet channels which would be used to divert water during periods of flood. The purpose of these is to facilitate the transfer of water through Lake St. Martin and into Lake Winnipeg. The Project location and layout is displayed in Figure 1 below.

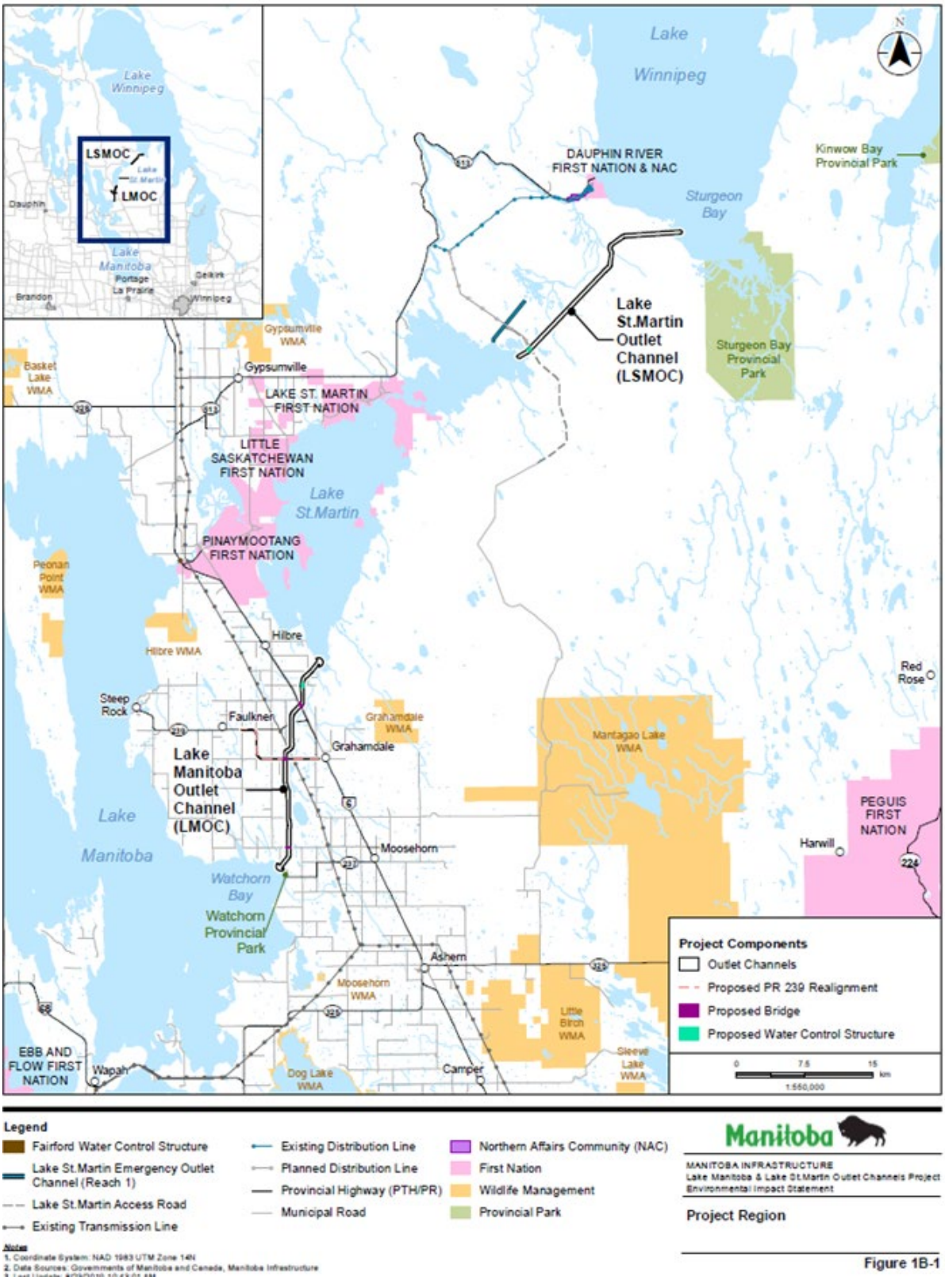


Figure 1: Project location and layout (Manitoba Infrastructure, 2020)

The flows of water in Manitoba are shown in Figure 2 below. Flood waters on the Assiniboine River are currently diverted away from Winnipeg by the diversion channel at Portage La Prairie, which is depicted as a dotted line. This channel diverts flood waters into Lake Manitoba. Water from Lake Manitoba already flows into Lake St. Martin via the Fairford River. The Fairford River is strictly controlled by a water control structure at the outlet of Lake Manitoba. Water from Lake St. Martin also already flows out to Lake Winnipeg via the Dauphin River and the Emergency Outlet Channel.

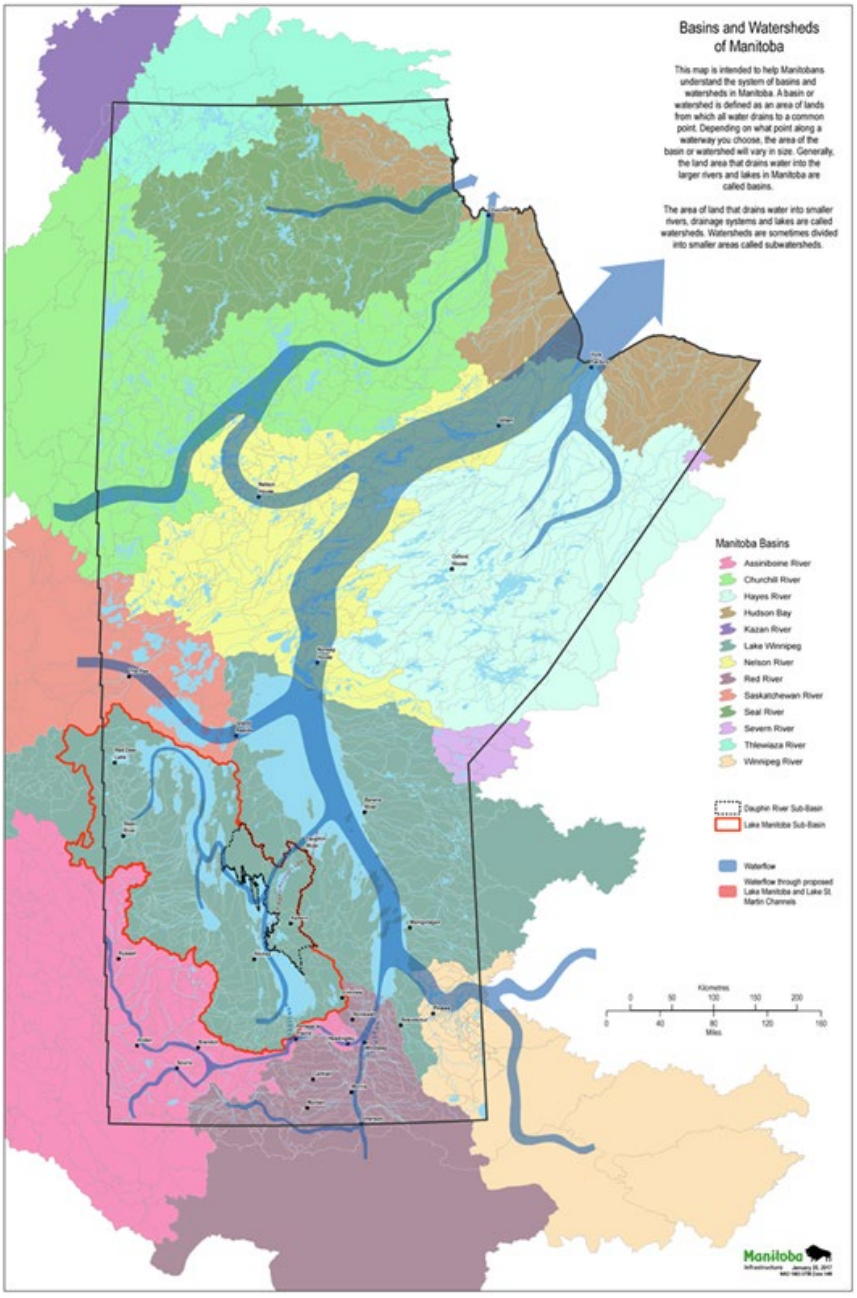


Figure 2: Manitoba river basins and water flows (Manitoba Infrastructure, 2021).

According to Manitoba Infrastructure, the Permanent Outlet Channels project is based on recommendations from the *Assiniboine River and Lake Manitoba Basins Flood Mitigation Study* (2016), which "recommended that the Lake Manitoba outlet channel be constructed to accommodate flows of 7,500 cubic feet per second (cfs); and the Lake St. Martin Emergency Outlet Channel be made permanent and enhanced to accommodate flows up to 11,500 cfs" (Manitoba Infrastructure, 2021).

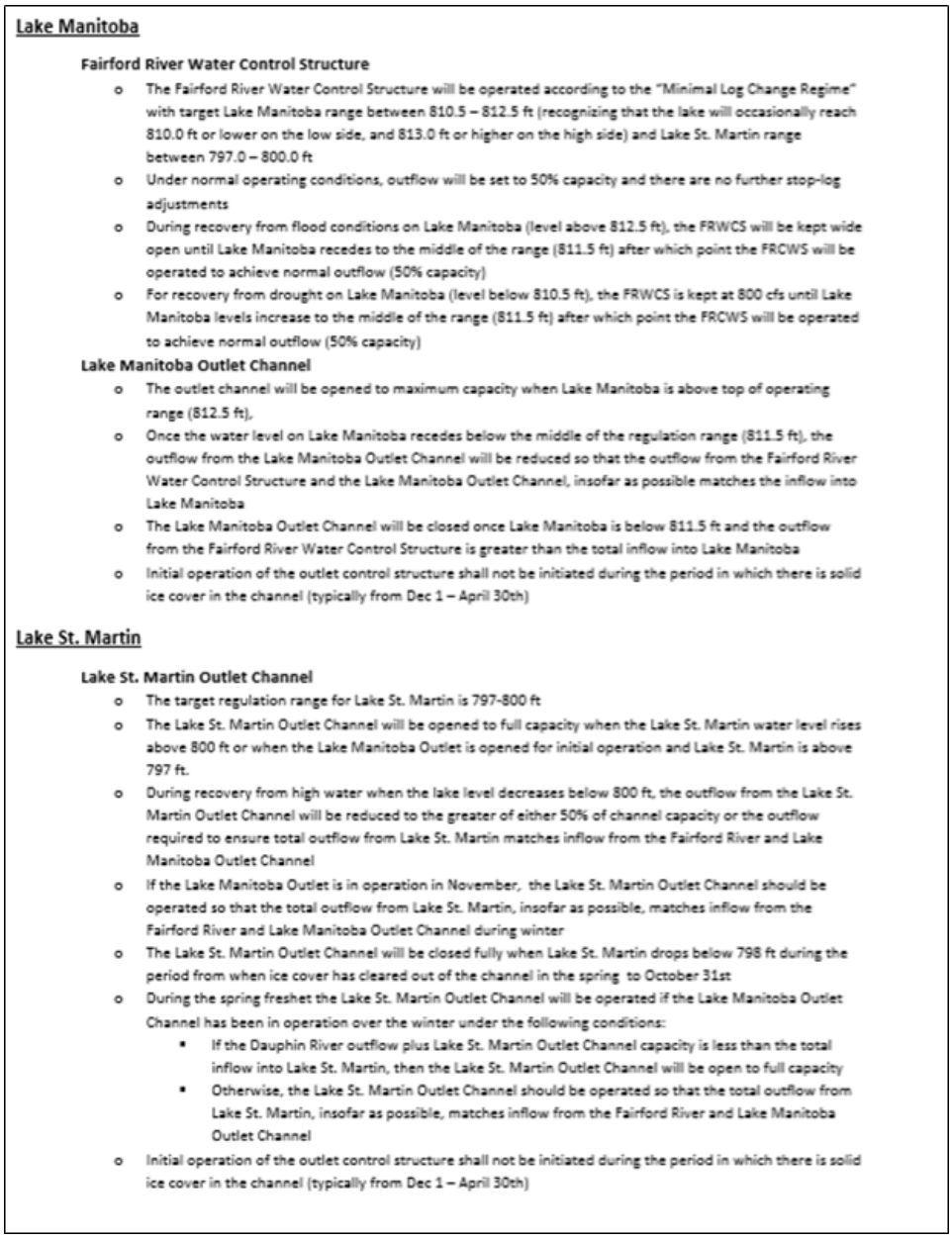
A detailed planning and design process was used to evaluate several alternative route alignments and designs, culminating in the current preferred option.

The Lake Manitoba Outlet Channel was originally proposed to be a 24.1 km, 100 m wide channel that would connect Lake Manitoba to Lake St. Martin. The Lake St. Martin Outlet Channel was originally proposed to be a 23.8 km long, 120 m wide channel that would connect Lake St. Martin to Sturgeon Bay on Lake Winnipeg (Manitoba Infrastructure, 2018). Base widths and depths have been refined by Manitoba Infrastructure through the regulatory process, and base widths and depths reported within Manitoba Infrastructure's Environmental Impact Statement (EIS) (Manitoba Infrastructure, 2020) for the project are now proposed to be:

OUTLET CHANNEL	BASE WIDTH	BASE DEPTH
Lake Manitoba Outlet Channel	8-13 metres	6-12 metres
Lake St. Martin Outlet Channel	44 metres	Not reported

Each outlet channel would be operated using a water control system that is operated at the upstream end, which would allow water to enter the floodways under flood conditions, as established by guidelines prepared by the Lake Manitoba and Lake St. Martin Regulation Review Committee. The estimated total cost of the Project is $540 million, which will be shared between the Province of Manitoba and the Government of Canada. Associated with the project are combined bridge and water control structures for each channel, the realignment of Provincial Road 239, three bridges over the LMOC, drop structures at the downstream end of the LSMOC and other associated works including quarries, work camps, construction laydown areas, and transmission lines.

The ultimate operating guidelines for the channels in Lake Manitoba and Lake St. Martin have not yet been set, although a proposed set of guidelines has been released by Manitoba Infrastructure and is shown in Figure 3.



Lake Manitoba

Fairford River Water Control Structure

- The Fairford River Water Control Structure will be operated according to the "Minimal Log Change Regime" with target Lake Manitoba range between 810.5 – 812.5 ft (recognizing that the lake will occasionally reach 810.0 ft or lower on the low side, and 813.0 ft or higher on the high side) and Lake St. Martin range between 797.0 – 800.0 ft
- Under normal operating conditions, outflow will be set to 50% capacity and there are no further stop-log adjustments
- During recovery from flood conditions on Lake Manitoba (level above 812.5 ft), the FRWCS will be kept wide open until Lake Manitoba recedes to the middle of the range (811.5 ft) after which point the FRCWS will be operated to achieve normal outflow (50% capacity)
- For recovery from drought on Lake Manitoba (level below 810.5 ft), the FRWCS is kept at 800 cfs until Lake Manitoba levels increase to the middle of the range (811.5 ft) after which point the FRCWS will be operated to achieve normal outflow (50% capacity)

Lake Manitoba Outlet Channel

- The outlet channel will be opened to maximum capacity when Lake Manitoba is above top of operating range (812.5 ft),
- Once the water level on Lake Manitoba recedes below the middle of the regulation range (811.5 ft), the outflow from the Lake Manitoba Outlet Channel will be reduced so that the outflow from the Fairford River Water Control Structure and the Lake Manitoba Outlet Channel, insofar as possible matches the inflow into Lake Manitoba
- The Lake Manitoba Outlet Channel will be closed once Lake Manitoba is below 811.5 ft and the outflow from the Fairford River Water Control Structure is greater than the total inflow into Lake Manitoba
- Initial operation of the outlet control structure shall not be initiated during the period in which there is solid ice cover in the channel (typically from Dec 1 – April 30th)

Lake St. Martin

Lake St. Martin Outlet Channel

- The target regulation range for Lake St. Martin is 797-800 ft
- The Lake St. Martin Outlet Channel will be opened to full capacity when the Lake St. Martin water level rises above 800 ft or when the Lake Manitoba Outlet is opened for initial operation and Lake St. Martin is above 797 ft.
- During recovery from high water when the lake level decreases below 800 ft, the outflow from the Lake St. Martin Outlet Channel will be reduced to the greater of either 50% of channel capacity or the outflow required to ensure total outflow from Lake St. Martin matches inflow from the Fairford River and Lake Manitoba Outlet Channel
- If the Lake Manitoba Outlet is in operation in November, the Lake St. Martin Outlet Channel should be operated so that the total outflow from Lake St. Martin, insofar as possible, matches inflow from the Fairford River and Lake Manitoba Outlet Channel during winter
- The Lake St. Martin Outlet Channel will be closed fully when Lake St. Martin drops below 798 ft during the period from when ice cover has cleared out of the channel in the spring to October 31st
- During the spring freshet the Lake St. Martin Outlet Channel will be operated if the Lake Manitoba Outlet Channel has been in operation over the winter under the following conditions:
  - If the Dauphin River outflow plus Lake St. Martin Outlet Channel capacity is less than the total inflow into Lake St. Martin, then the Lake St. Martin Outlet Channel will be open to full capacity
  - Otherwise, the Lake St. Martin Outlet Channel should be operated so that the total outflow from Lake St. Martin, insofar as possible, matches inflow from the Fairford River and Lake Manitoba Outlet Channel
- Initial operation of the outlet control structure shall not be initiated during the period in which there is solid ice cover in the channel (typically from Dec 1 – April 30th)

Figure 3: Proposed operating guidelines for Lake Manitoba and Lake St. Martin based on construction and operation of the Permanent Outlet Channels project (Manitoba Infrastructure, 2021).

The Project is undergoing a federal Environmental Assessment under the Canadian Environmental Assessment Act (CEAA, 2012). Guidelines for the preparation of the EIS were shared by the Canadian Environmental Assessment Agency on May 15, 2018. In addition to the federal EA, the Project is simultaneously undergoing an application for a Class 3 application under *The Environment Act* of Manitoba. Several provincial and federal permits, including work permits, quarry permits, burn permits, etc. will also be required for construction and operation phases of the Project.

1.2 STUDY OBJECTIVES

The Study documented where and how Métis Nation citizens in Manitoba use the lands and waters, with a focus on those who had the most use around the proposed Lake St. Martin and Lake Manitoba Permanent Outlet Channels. Participants were asked to focus on the lands and waters in this area and to map their occupancy and use of the area and share their knowledge and experiences of the recent flood issues. Participants were also asked to map use and occupancy beyond this area, but only the information mapped near to the Study Area has been reported on. The Study objectives are as follows:

1. Document evidentiary information that shows places where Métis Nation citizens use and occupy the lands and waters around the Project Study Area, including:
    - Métis Ecological Knowledge
    - Personal harvesting locations
    - Commercial harvesting and guiding locations
    - Cultural and historic sites
    - Overnight locations
    - Routes and trails
2. Understand participant's thoughts and perceptions of the Project
3. Assess how Métis rights and interests may be impacted by the Project, and provide recommendations for mitigation and accommodation measures

1.3 STUDY SCOPE

1.3.1 GEOGRAPHIC SCOPE

Researchers asked participants to focus on the area around the Project site but did not limit participants from mapping their land use in other areas. To understand the impacts of the Project on Métis Nation citizens, a Study Area encompassing the Project development area was used as shown in Figure 4. This area was consistent with the local assessment area used by Manitoba Infrastructure to assess traditional land and resource use (Manitoba, 2020).

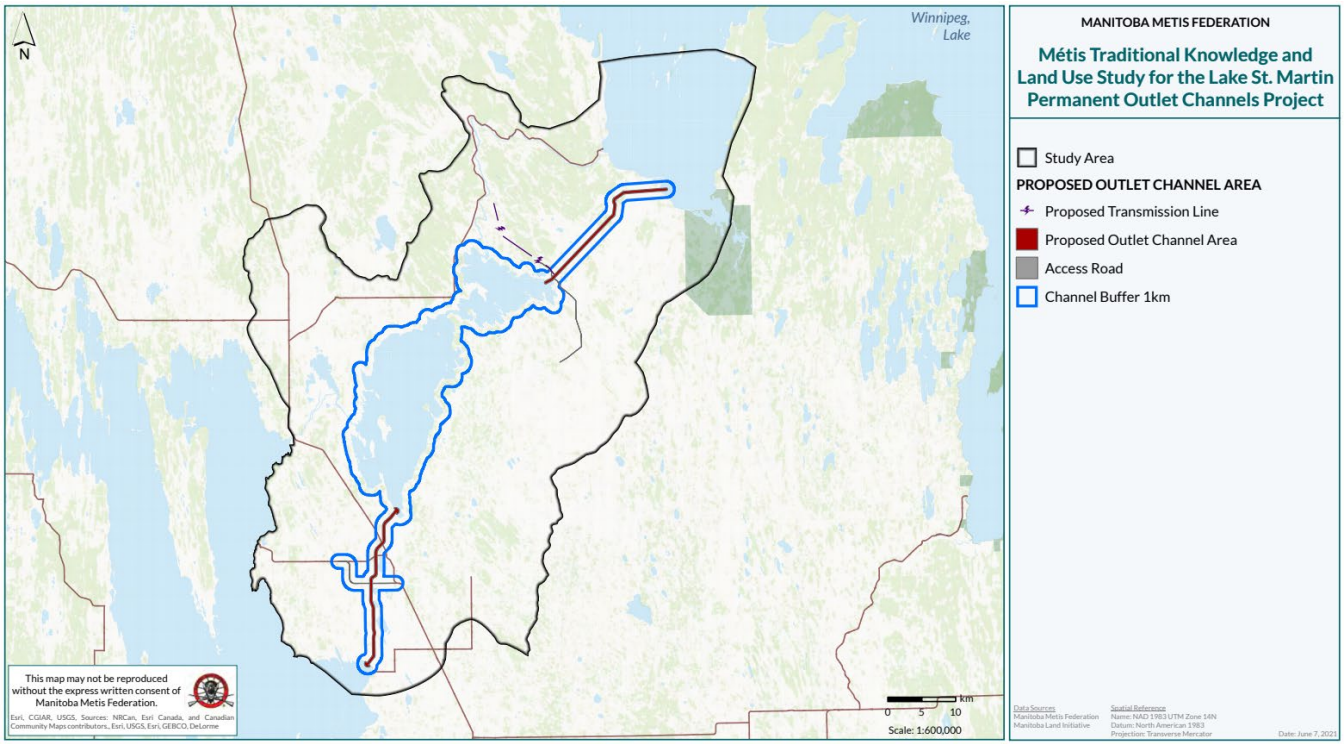


Figure 4: Map of the Study Area used for the MMKLUO

1.3.2 TEMPORAL SCOPE

Researchers followed land use and occupancy study best practices. This includes the use of two temporal scopes. The first is current use, which includes anything that happened within the participant's lifetime. The second is historic use of sites that the participants know about through teaching or knowledge transfer from past generations, including Oral History or Traditional Knowledge about Métis harvesting and gathering practices and sites of cultural or other significance. For current use, researchers asked participants whether a certain activity happened within the last 10 years, prior to the last 10 years, or if it was an ongoing activity both within and prior to the last 10 years.

1.3.3 INTERPRETING THE MAPS AND TABLES

The MMF has conducted multiple map biography and Oral History interviews for various projects or studies. The data presented in this report includes all data collected by the MMF, including the data collected specifically for this Project, as well as information from other projects or reports relevant to this Study.

SVS worked with three datasets to develop the maps for this report. The first was collected between 2003 and 2009. This data has been included on the maps, but attribute data was not available in a

form that allowed for categorization. This data has been included to add to the information of where citizens of the Métis Nation in Manitoba have identified land use and occupancy sites. The second dataset is from 2009 onward and includes the land use and occupancy data that has been collected for other studies and is referred to as the MMF Data Catalogue. The third dataset is from interviews conducted specifically for this Project. The second and third datasets have been combined and are displayed on the maps and in the tables as specific land use and occupancy categories. These datasets contain in-depth attribute data, including species, season, activity, and the time period in which the activity happened.

Data from the MMF Data Catalogue includes information collected and reported on in specific geographic areas related to past projects, as well as data outside of these areas. While the data from the MMF Catalogue was used to provide additional context, the majority of data presented in this report is taken from the 12 interviews conducted specifically for the purpose of this study.

2.0 THE MÉTIS NATION'S MANITOBA MÉTIS COMMUNITY

2.1 HISTORY AND IDENTITY

The Métis Nation—as a distinct Indigenous people—evolved out of relations between European men and First Nations women who were brought together as a result of the early fur trade in the Northwest. In the eighteenth century, both the Hudson Bay Company and the Northwest Company created a series of trading posts that stretched across the upper Great Lakes, through the western plains, and into the northern boreal forest. These posts and fur trade activities brought European and Indigenous peoples into contact. Inevitably, unions between European men—explorers, fur traders, and pioneers—and Indigenous women were consummated. The children of these families developed their own collective identity and political community so that "[w]thin a few generations, the descendants of these unions developed a culture distinct from their European and Indian forebears" and the Métis Nation was born—a new people, indigenous to the western territories *(Alberta (Aboriginal Affairs and Northern Development) v. Cunningham*, [2011] 2 SCR 670 at para. 5; 2008 MBPC *R. v. Goodon*, 59 at para. 25; *Manitoba Metis Federation Inc. v. Canada (Attorney General)*, [2013] 1 SCR 623 at para. 2).

The Métis led a mixed way of life. "In early times, the Métis were mostly nomadic. Later, they established permanent settlements centered on hunting, trading and agriculture" (*Alberta v. Cunningham*, at para. 5). The Métis were employed by both of the fur trades' major players, the Hudson's Bay and Northwest companies. By the early 19th century, they had become a major component of both firms' workforces. At the same time, however, the Métis became extensively involved in the buffalo hunt. As a people, their economy was diverse; combining as it did, living off the land in the Aboriginal fashion with wage labour (*MMF Inc. v. Canada*, at para. 29).

It was on the Red River, in reaction to a new wave of European immigration, that the Métis Nation first came into its own. Since the early 1800s, the Métis Nation's Manitoba Métis Community—as a part of the larger Métis Nation—has asserted itself as a distinct Indigenous collective with rights and interests in its Homeland. The Métis Nation's Manitoba Métis Community shares a language

(Michif), national symbols (infinity flags), culture (i.e., music, dance, dress, crafts), as well as a special relationship with its territory that is centered in Manitoba and extends beyond the present-day provincial boundaries.

The Métis Nation's Manitoba Métis Community has been recognized by the courts as being a distinctive Indigenous community, with rights that are recognized and affirmed in section 35 of the *Constitution Act, 1982*. In *Goodon*, the Manitoba court held that:

The Métis community of Western Canada has its own distinctive identity [...] the Métis created a large inter-related community that included numerous settlements located in present-day southwestern Manitoba, into Saskatchewan and including the northern Midwest United States. This area was one community [...] The Métis community today in Manitoba is a well-organized and vibrant community (paras. 46-47; 52).

This proud independent Métis population constituted a historic rights-bearing community in present day Manitoba and beyond, which encompassed "all of the area within the present boundaries of southern Manitoba from the present-day City of Winnipeg and extending south to the United States" (*R. v. Goodon*, at para. 48).

The heart of the historic rights-bearing Métis community in southern Manitoba was the Red River Settlement; however, the Métis Nation's Manitoba Métis Community also developed other settlements and relied on various locations along strategic fur trade routes. During the early part of the 19th century, these included various posts of varying size and scale spanning the Northwest Company and the Hudson Bay Company collection and distribution networks.

More specifically, in relation to the emergence of the Métis—as a distinct Aboriginal group in Manitoba—the Supreme Court of Canada wrote the following in the *MMF Inc. v. Canada* case:

[21] The story begins with the Aboriginal peoples who inhabited what is now the province of Manitoba—the Cree and other less populous nations. In the late 17th century, European adventurers and explorers passed through. The lands were claimed nominally by England which granted the Hudson's Bay Company, a company of fur traders' operation of out London, control over a vast territory called Rupert's Land, which included modern Manitoba. Aboriginal peoples continued to occupy the territory. In addition to the original First Nations, a new Aboriginal group, the Métis, arose—people descended from early unions between European adventurers and traders, and Aboriginal women. In the early days, the descendants of English-speaking parents were referred to as half-breeds, while those with French roots were called Métis.

[22] A large—by the standards of the time—settlement developed at the forks of the Red and Assiniboine Rivers on land granted to Lord Selkirk by the Hudson's Bay Company in 1811. By 1869, the settlement consisted of 12,000 people, under the governance of Hudson's Bay Company.

[23] In 1869, the Red River Settlement was a vibrant community, with a free enterprise system and established judicial and civic institutions, centred on the retail stores, hotels, trading undertakings and saloons of what is now downtown Winnipeg. The Métis were the dominant demographic

group in the Settlement, comprising around 85 percent of the population [approximately 10,000 Métis], and held leadership positions in business, church and government.

The fur trade was vital to the ethnogenesis of the Métis and was active in Manitoba from at least the late 1770s, and numerous posts and outposts were established along cart trails and waterways throughout the province. These trails and waterways were crucial transportation networks for the fur trade (Jones 2014; Figure 3) and were the foundation of the Métis Nation's Manitoba Métis Community's extensive use of the lands and waters throughout the province. In the early 20th century, the Métis Nation's Manitoba Métis Community continued to significantly participate in the commercial fisheries and in trapping activities, which is well documented in Provincial government records.

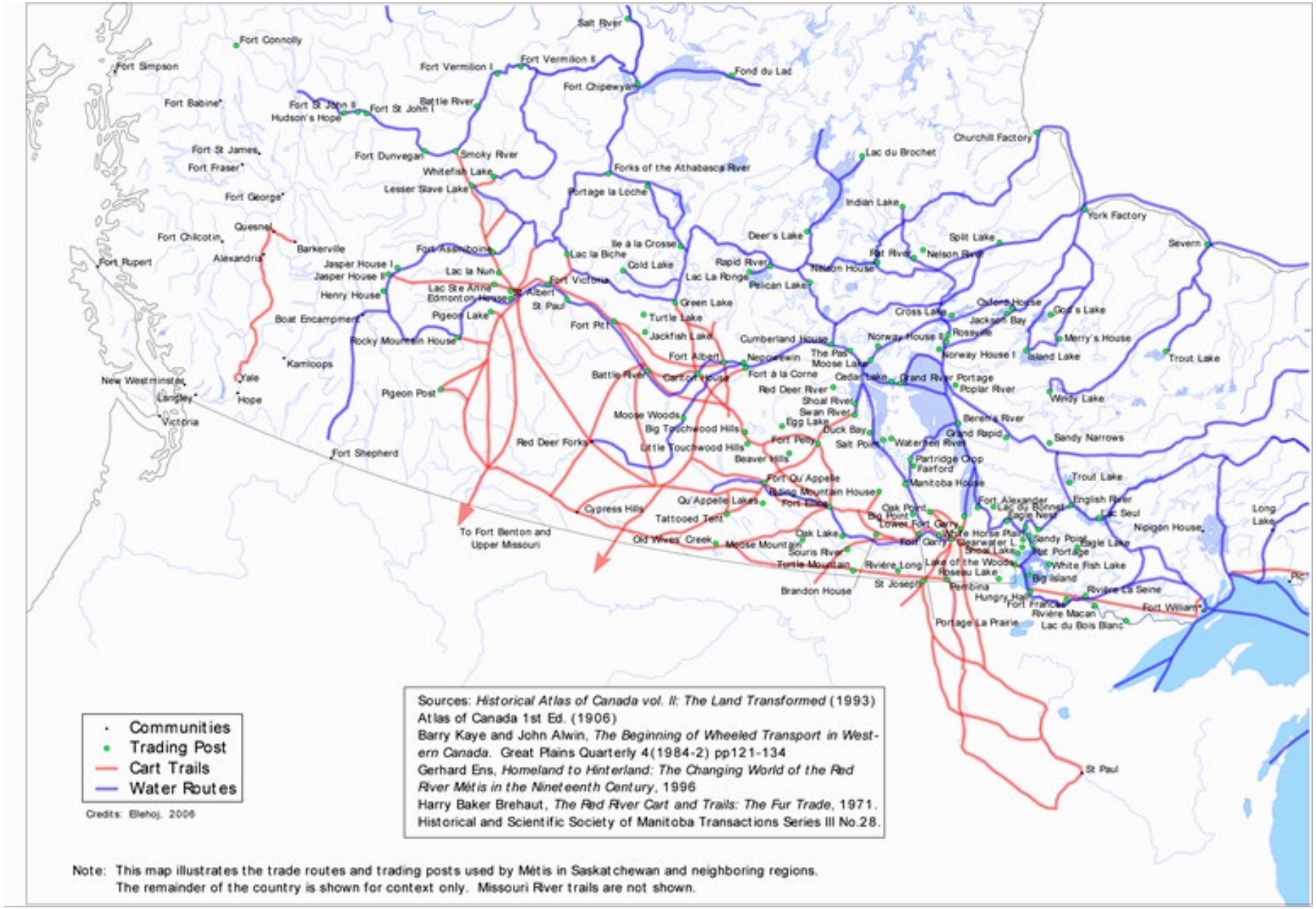


Figure 5: The Fur Trade Network: Routes and Posts prior to 1870

2.2 MANITOBA METIS FEDERATION

The MMF is the democratically elected government of the Métis Nation's Métis Nation's Manitoba Métis Community. The MMF is duly authorized by the Citizens of the Métis Nation's Manitoba Métis Community for the purposes of dealing with their collective Métis rights, claims, and interests, including conducting consultations and negotiating accommodations (as per MMF Resolution No. 8). While the MMF was initially formed in 1967, its origins lie in the 18th century with the birth of the Métis Nation's Manitoba Métis Community and in the legal and political structures that developed with it. Since the birth of the Métis people in the Red River Valley, the Métis Nation's Manitoba Métis Community—as a part of the larger Métis Nation—has asserted and exercised its inherent right of self-government. The expression of this self-government right has changed over time to continue to meet the needs of the Métis Nation's Manitoba Métis Community. For the last 50 years, the MMF has represented the Métis Nation's Manitoba Métis Community at the provincial and national levels.

During this same period, the MMF has built a sophisticated, democratic, and effective Métis governance structure that represents the Métis Nation's Manitoba Métis Community at the local, regional, and provincial levels throughout Manitoba. The MMF was created to be the self-government representative of the Métis Nation's Manitoba Métis Community—as reflected in the Preamble of the MMF's Constitution (also known as the MMF Bylaws):

WHEREAS, the Manitoba Metis Federation Inc. has been created to be the democratic and self-governing representative body of the Métis Nation's Manitoba Métis Community.

In addition, the purpose "to provide responsible and accountable governance on behalf of the Métis Nation's Manitoba Métis Community using the constitutional authorities delegated by its citizens" is embedded within the MMF's objectives, as set out in the MMF Constitution as follows:

I. To promote and instill pride in the history and culture of the Métis people.
II. To educate members with respect to their legal, political, social and other rights.
III. To promote the participation and representation of the Métis people in key political and economic bodies and organizations.
IV. To promote the political, legal, social and economic interests and rights of its citizens.
V. To provide responsible and accountable governance on behalf of the Manitoba Métis community using the constitutional authorities delegated by its members.

The MMF is organized and operated based on centralized democratic principles, some key aspects of which are described below.

President: The President is the Chief Executive Officer, leader, and spokesperson of the MMF. The President is elected in a province-wide ballot-box election every four years and is responsible for overseeing the day-to-day operations of the MMF.

Board of Directors: The MMF Board of Directors, or MMF Cabinet leads, manages, and guides the policies, objectives, and strategic direction of the MMF and its subsidiaries. All 23 individuals are democratically elected by the citizens.

Regions: The MMF is organized into seven regional associations or "Regions" throughout the province (Figure 6): The Southeast Region, the Winnipeg Region, the Southwest Region, the Interlake Region, the Northwest Region, the Pas Region, and the Thompson Region. Each Region is administered by a Vice-President and two executive officers, all of whom sit on the MMF's Cabinet. Each Region has an office which delivers programs and services to their specific geographic area.

Locals: Within each Region are various area-specific "Locals" which are administered by a chairperson, a vice-chairperson and a secretary-treasurer. Locals must have at least nine citizens and meet at least four times a year to remain active. There are approximately 140 MMF Locals across Manitoba.

While the MMF has created an effective governance structure to represent the Métis Nation's Manitoba Métis Community at the local, regional, and provincial levels, it is important to bear in mind that there is only one large, geographically dispersed, Métis Nation's Manitoba Métis Community. Citizens of the Métis Nation's Manitoba Métis Community live, work and exercise their s. 35 rights throughout and beyond the province of Manitoba

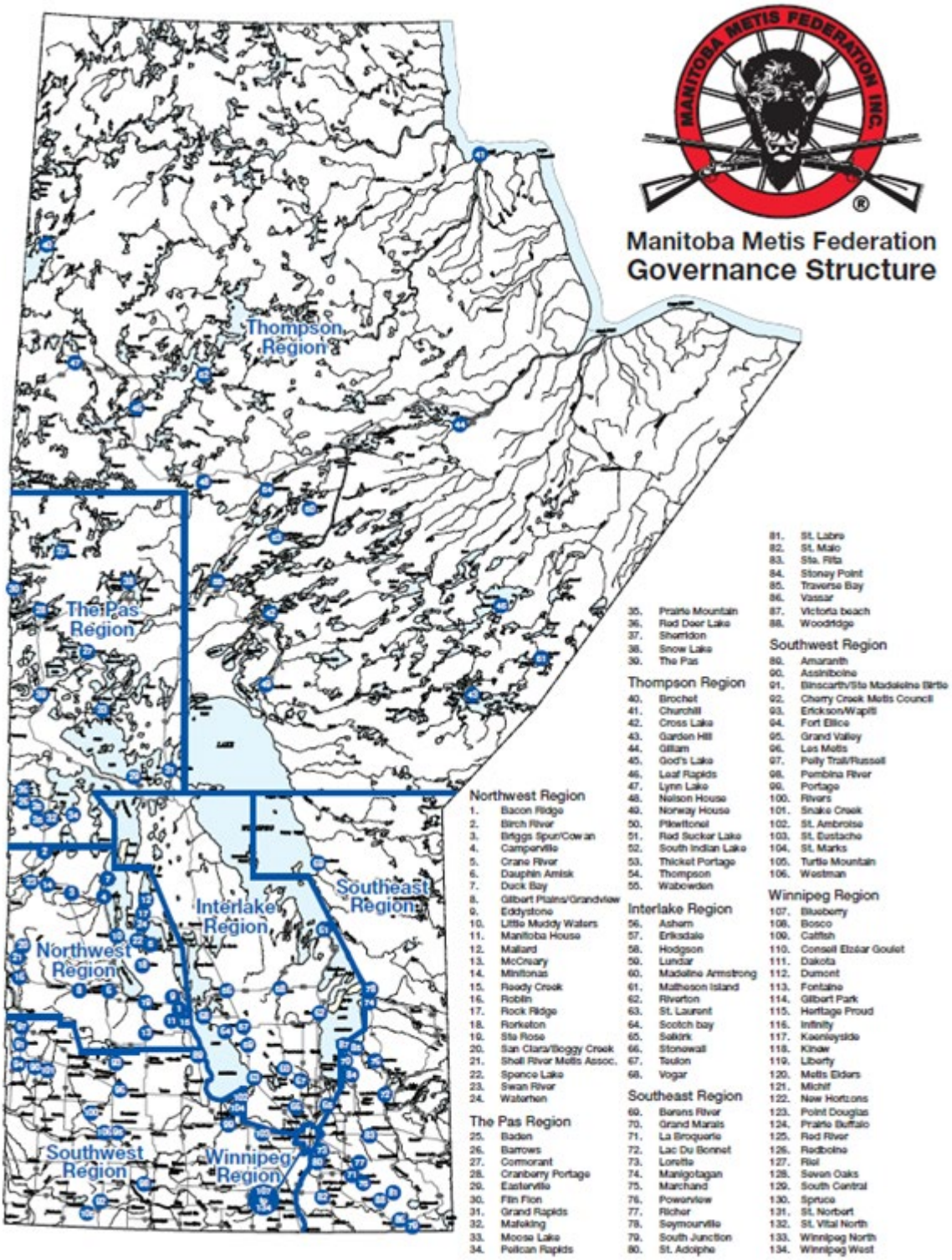


Figure 6: Manitoba Metis Federation (MMF) Regions

2.3 MMF RESOLUTION NO. 8

Among its many responsibilities, the MMF is authorized to protect the Aboriginal rights, claims, and interests of the Métis Nation's Manitoba Métis Community, including as related to harvesting, traditional culture, and economic development, among others.

In 2007, the MMF Annual General Assembly unanimously adopted Resolution No. 8 that sets out the framework for engagement, consultation, and accommodation to be followed by Federal and Provincial governments, industry, and others when making decisions and developing plans and Projects that may impact the Métis Nation's Manitoba Métis Community. Under MMF Resolution No. 8, direction has been provided by the Métis Nation's Manitoba Métis Community for the MMF Home Office to take the lead and be the main contact on all consultation undertaken with the Métis Nation's Manitoba Métis Community. Resolution No. 8 reads, in part that:

…this assembly continue[s] to give the direction to the Provincial Home Office to take the lead and be the main contact on all consultations affecting the Métis community and to work closely with the Regions and Locals to ensure governments and industry abide by environmental and constitutional obligations to the Métis…

The MMF Home Office works closely with the Regions and Locals to ensure the rights, interests, and perspective of the Métis Nation's Manitoba Métis Community are effectively represented in matters related to consultation and accommodation.

Resolution No. 8 has five phases:

Phase 1: Notice and Response

Phase 2: Funding and Capacity

Phase 3: Engagement or Consultation

Phase 4: Partnership and Accommodation

Phase 5: Implementation

Each phase is an integral part of the Resolution No. 8 framework and proceeds logically through the stages of consultation.

2.4 MÉTIS NATION'S MANITOBA MÉTIS COMMUNITY RIGHTS, CLAIMS, AND INTERESTS

The Métis Nation's Manitoba Métis Community possesses Aboriginal rights, including pre-existing Aboriginal collective rights and interests in lands recognized and affirmed by section 35 of the *Constitution Act, 1982*, throughout Manitoba. The Manitoba court recognized these pre-existing, collectively held Métis rights in *R. v. Goodon* (at paras. 58; 72):

> *I conclude that there remains a contemporary community in southwest Manitoba that continues many of the traditional practices and customs of the Métis people.*
>
> *I have determined that the rights-bearing community is an area of southwestern Manitoba that includes the City of Winnipeg south to the U.S. border and west to the Saskatchewan border.*

As affirmed by the Supreme Court of Canada, such rights are "recognize[d] as part of the special aboriginal relationship to the land" (*R. v. Powley,* 2003 SCC 43, at para. 50) and are grounded on a "communal Aboriginal interest in the land that is integral to the nature of the Métis distinctive community and their relationship to the land" (*MMF Inc. v. Canada*, at para. 5). Importantly, courts have also recognized that Métis harvesting rights may not be limited to Unoccupied Crown Lands (*R. v. Kelley*, 2007 ABQB 41, para. 65).

The Crown, as represented by the Manitoba government, has recognized some aspects of the Métis Nation's Manitoba Métis Community's harvesting rights through a negotiated agreement: The *MMF-Manitoba Points of Agreement on Métis Harvesting* (2012) (the *MMF-Manitoba Harvesting Agreement*). This Agreement was signed at the MMF's 44th Annual General Assembly and "recognizes that collectively-held Métis Harvesting Rights, within the meaning of s. 35 of the *Constitution Act, 1982*, exist within the [Recognized Métis Harvesting Zone], and that these rights may be exercised by Métis Rights Holders consistent with Métis customs, practices and traditions…" (*MMF-Manitoba Harvesting Agreement*, section 1). In particular, the *MMF-Manitoba Harvesting Agreement* recognizes that Métis rights include "hunting, trapping, fishing and gathering for food and domestic use, including for social and ceremonial purposes and for greater certainty, Métis harvesting includes the harvest of timber for domestic purposes" throughout an area spanning approximately 169,584 km^2 (the "Métis Recognized Harvesting Area") (*MMF-Manitoba Harvesting Agreement*, section 2; Figure 5 below). The MMF further asserts rights and interests beyond this area, which require consultation and accommodation as well.

Beyond those rights already established through litigation and recognized by agreements, the Métis Nation's Manitoba Métis Community claims commercial and trade-related rights. Courts have noted that Métis claims to commercial rights remain outstanding (*R. v. Kelley* at para. 65). These claims are strong and well-founded in the historical record and the customs, practices, and traditions of the Métis Nation's Manitoba Métis Community, and it is incumbent on the Crown and Proponents to take them seriously.

As noted above, the Métis Nation's Manitoba Métis Community has its roots in the western fur trade (*R. v. Blais*, 2003 SCC 44 at para. 9 [*Blais*]; *R. v. Goodon* at para. 25). The Métis in Manitoba are descendants of early unions between Aboriginal women and European traders (*MMF Inc. v. Canada* at para. 21). As a distinct Métis culture developed, the Métis took up trade as a key aspect of their way of life (*R. v. Powley* at para. 10). Many Métis became independent traders, acting as middlemen between First Nations and Europeans (*R. v. Goodon* at para. 30). Others ensured their subsistence and prosperity by trading resources they themselves hunted and gathered (*R.*

v. Goodon at para. 31, 33, & 71). By the mid-19th century, the Métis in Manitoba had developed the collective feeling that "the soil, the trade and the Government of the country [were] their birth rights." (*R. v. Goodon* at para. 69(f)). Commerce and trade are, and always have been, integral to the distinctive culture of the Métis Nation's Manitoba Métis Community. Today, the Manitoba Métis have an Aboriginal, constitutionally protected right to continue this trading tradition in modern ways to ensure that their distinct community will not only survive, but also flourish.

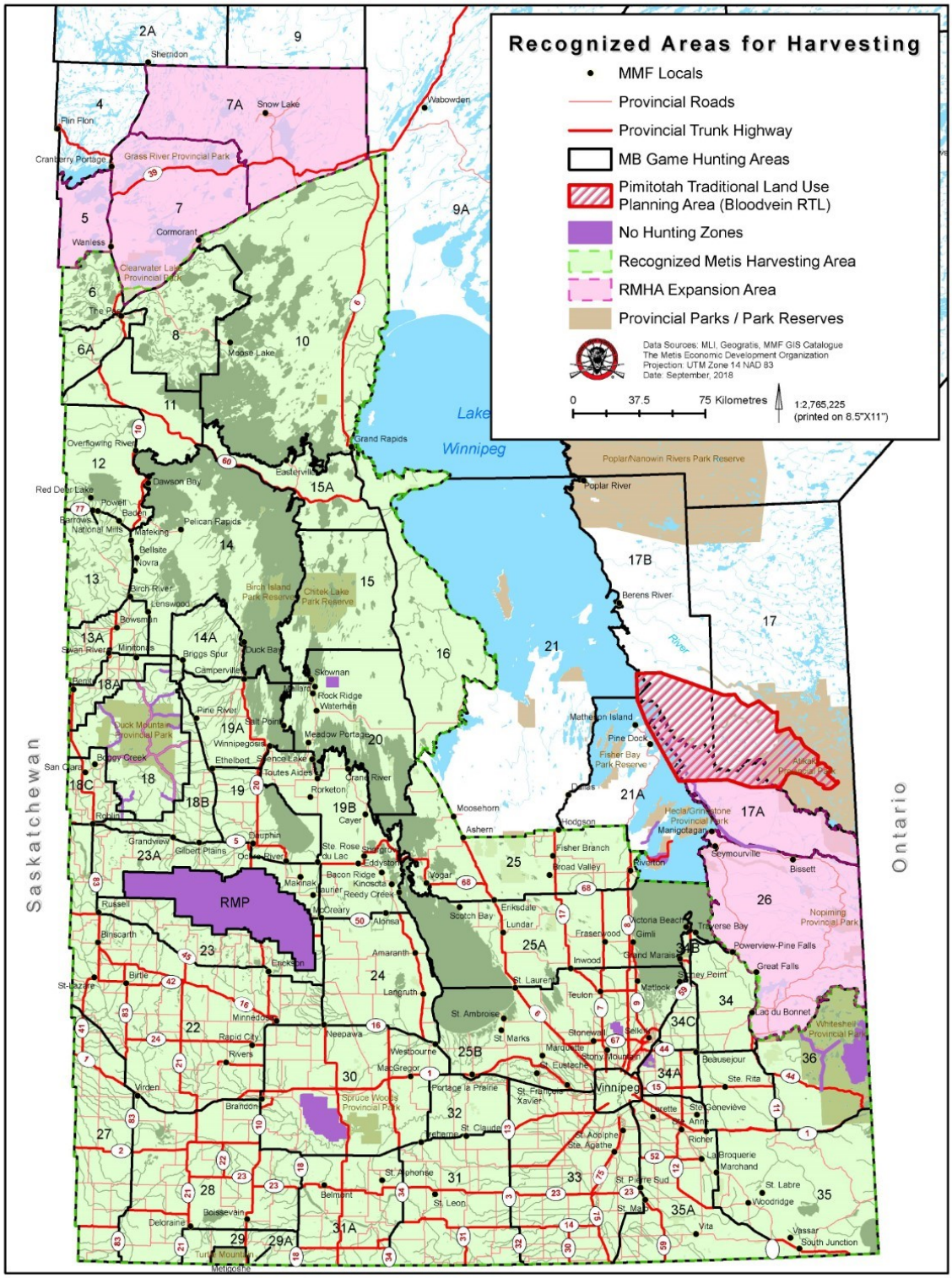


Figure 7: MMF-Manitoba Harvesting Agreement Recognized Manitoba Métis Harvesting Zones

Unlike First Nations in Manitoba, whose commercial rights were converted and modified by treaties and the *Natural Resources Transfer Agreement* (*NRTA)* (*R. v. Horseman*, [1990] 1 SCR 901), the Métis' pre-existing customs, practices, and traditions—including as they relate to commerce and trade—were not affected by the *NRTA* (*R. v. Blais*) and continue to exist and be protected as Aboriginal rights. First Nations' treaty rights in Manitoba are, for example, inherently limited by the Crown's power to take up lands (*Mikisew Cree First Nation v Canada* (*Minister of Canadian Heritage*), [2005] 3 SCR 388 at para 56). Métis rights, in contrast, are not tempered by the "taking up" clauses found in historic treaties with First Nations. Métis rights must be respected as they are, distinct from First Nations' rights and unmodified by legislation or agreements.

In addition to the abovementioned rights to land use that preserve the Métis culture and way of life, the Métis Nation's Manitoba Métis Community has other outstanding land related claims and interests with respect to lands. Specifically, these claims relate to the federal Crown's constitutional promise to all Aboriginal peoples, including Manitoba Métis, as set out in the Order of Her Majesty in Council Admitting Rupert's Land and the North-Western Territory into the Union (the "1870 Order") which provides

that, upon the transference of the territories in question to the Canadian Government, the claims of the Indian tribes to compensation for lands required for purposes of settlement will be considered and settled in conformity with the equitable principles which have uniformly governed the British Crown in its dealings with the aborigines.

The manner in which the federal Crown implemented this constitutional promise owing to the Manitoba Métis—through the *Dominion Lands Act* and the resulting Métis scrip system—effectively defeated the purpose of the commitment. Accordingly, the MMF claims these federal Crown actions constituted a breach of the honour of the Crown, which demand negotiations and just settlement outside of the 'old postage stamp province' within Manitoba as well.

The MMF also claims that the *Dominion Lands Act* and the resulting Métis scrip system were incapable of extinguishing collectively held Métis title in specific locations where the Métis Nation's Manitoba Métis Community is able to meet the legal test for Aboriginal title as set out by the Supreme Court of Canada. These areas in the province, which the Manitoba Métis exclusively occupied—as an Indigenous people—prior to the assertion of sovereignty, establish a pre-existing Métis ownership interest in these lands.

The Métis Nation's Manitoba Métis Community also has an outstanding legal claim within what was the 'old postage stamp province' of Manitoba relating to the 1.4 million acres of land promised to the children of the Métis living in the Red River Valley, as enshrined in s. 31 of the *Manitoba Act, 1870* (*MMF Inc. v. Canada* at para 154).

This land promised was a nation-building, constitutional compact that was meant to secure a "lasting place in the new province [of Manitoba]" for future generations of the Métis people (*MMF Inc. v. Canada* at para 5). This "lasting place" was to have been achieved by providing the Métis Nation's Manitoba Métis Community a "head start" in securing lands in the heart of the new province (*MMF Inc. v. Canada* at paras 5-6).

Instead, the federal Crown was not diligent in its implementation of s. 31, which effectively defeated the purpose of the constitutional compact.

In March 2013, the Supreme Court of Canada found that the federal Crown failed to diligently and purposefully implement the Métis land grand provision set out in s. 31 of the *Manitoba Act, 1870* (*MMF Inc. v. Canada* at para 154). This constituted a breach of the honour of the Crown. In arriving at this legal conclusion, the Court wrote:

What is at issue is a constitutional grievance going back almost a century and a half. So long as the issue remains outstanding, the goal of reconciliation and constitutional harmony, recognized in s. 35 of the Constitution Act, 1982 and underlying s. 31 of the Manitoba Act, remains unachieved. The ongoing rift in the national fabric that s. 31 was adopted to cure remains unremedied. The unfinished business of reconciliation of the Métis people with Canadian sovereignty is a matter of national and constitutional import. (*MMF Inc. v. Canada* at para 140)

This constitutional breach is an outstanding Métis claim flowing from a judicially recognized common law obligation which burdens the federal Crown (*MMF Inc. v. Canada* at paras 156; 212). It can only be resolved through good faith negotiations and a just settlement with the MMF (see for example: *R v Sparrow*, [1990] 1 SCR 1075 at paras 51–53; *R v Van der Peet*, [1996] 2 SCR 507 at paras 229, 253; *Haida* at para 20; *Carrier Sekani* at para 32). Lands both within the 'old postage stamp province' as well as in other parts of Manitoba—since little Crown lands remain within the 'old postage stamp province'—may need to be considered as part of any future negotiations and settlement in fulfillment of the promise of 1.4 million acres, together with appropriate compensation.

On November 15, 2016, the MMF and Canada concluded a *Framework Agreement for Advancing Reconciliation* (the "Framework Agreement"). The Framework Agreement established a negotiation process aimed, among other things, at finding a shared solution regarding the Supreme Court of Canada's decision in *MMF Inc. v. Canada* and advancing the process of reconciliation between the Crown and the Métis Nation's Manitoba Métis Community. It provides for negotiations on various topics including, but not limited to, the "quantum, selection and management of potential settlement lands." Negotiations under the Framework Agreement are active and ongoing.

3.0 STUDY METHODOLOGY AND APPROACH

This section provides an overview of the methods and tools used to complete the MKLUO interviews and the approaches researchers used to ensure data confidentiality.

3.1 MAP BIOGRAPHY AND ORAL HISTORY INTERVIEWS

The focus of the map biography and Oral History interviews was on the collection of standard land use and occupancy categories collected for all MMF MKLUO studies. The information collected includes:

- Current and childhood residences, and Métis ancestry
- Traditional Ecological Knowledge, including locations of fish spawning areas, seasonal mammal habitat and migration routes, bird habitat, reptile and amphibian habitat, salt or mineral licks, plant habitat, species at risk, spring water locations, and other important ecological features or habitat
- Hunting and trapping sites, including species and temporal scope of hunting and trapping activity
- Fishing locations, including species and temporal scope of fishing activity
- Gathering of plants and other natural materials for food, medicine, crafts or other purposes, including the type of plant collected and temporal scope of gathering activity
- Commercial fishing, trapping, and other land uses for income
- Cultural and heritage areas including burial sites, sacred or ceremonial sites, historical village sites, trails, and significant locations, contemporary gathering places, recreation areas, and other culturally significant locations
- Locations of overnight sites including cabins, other types of structures, and campsites
- Land and water access routes
- Any observed changes to the environment or any of the above items
- Perspectives on being Métis in Manitoba, thoughts and perceptions of the Project, and cumulative effects from industry and development

3.1.1 PARTICIPANTS

Participants were identified by the MMF through outreach to harvesters and knowledge holders.

To participate in the study, participants were required to:

- Be Métis Nation citizens based on the current definition of Métis Nation citizens in the MMF Constitution
- Have historic and/or current connection to the Study Area
- Be hunters, fishers, trappers, plant harvesters, knowledge holders and other land users (e.g., for education, personal employment, sustenance, etc.)
- Be from a variety of age groups and genders

SVS scheduled all interviews with participants. Due to the COVID-19 pandemic, all interviews took place via video conferencing on Microsoft Teams. A total of 12 individuals took part in map biography and Oral History interviews between April 20, 2021 and April 30, 2021. All interviewees were male. One participant did not complete a map biography study and only took part in the Oral

History interview. All other participants completed the map biography and Oral History part of the interview. Six participants had completed map biography interviews for past studies. In these instances, they were given the same PIN that was used for their data in previous studies, and all their collected land use and occupancy data has been included in this Study. To supplement the data collected from these interviews, information from the MMF Data Catalogue was also drawn on.

3.1.2 RESEARCH TOOLS

Researchers use a variety of tools to complete the interviews. All tools were used in every interview to ensure consistency. To inform participants about the Project, researchers created a Project description that was provided to participants through email prior to the interview. Researchers also reviewed the Project description with each participant before the start of the interview to ensure they understood the Project. Participants were also provided a copy of the permission form, a pared-down interview guide, and a species-at-risk guide. Researchers reviewed the permission form prior to the interview and received consent from each participant prior to any recording.

Researchers used Microsoft Teams to conduct the interviews so that COVID-19 safety protocols could be followed. Participants were provided with instructions on how to download and use Microsoft Teams prior to the interview, and test runs were done to ensure there were no technological issues. Microsoft Teams allowed researchers to share their screens so that participants could see the map and what was being recorded, and it also provided a function that allowed participants to take control of the map with their mouse and show researchers specific areas. The interviews were audio and video recorded using the record function on Teams. Participants were in control of whether they had their own videos on or off.

Geographic locations were recorded using the ArcGIS Online Web App and attribute data was collected using Survey 123.

3.1.3 PROCEDURE

The methodology for the map biography and Oral History interviews was adapted by SVS from the work of Terry Tobias (2009) and was informed by discussions with MMF staff about the specific needs for this Study. It is in line with the standard approach that SVS uses for all research conducted for the MMF.

Map biography interviews were completed with one individual at a time and conducted on Microsoft Teams. At the beginning of each interview, the Study team briefed the participant on the Project, the Study's objectives, and how the data would be used. The Study team then reviewed the permission form with the participants and, if the participant agreed, invited them to provide their written consent to being recorded on audio and video and to allow their information to be used for the purposes of this Study.

Interview teams consisted of SVS staff members. The interviewers followed an interview guide to maintain consistency in the map biography process with each participant.

The Study team also asked Oral History questions related to Métis identity, family stories of land use, relationship to the land and waters, perceptions of current harvesting areas, and perspectives on cumulative effects of development and changes to the environment and land use activities.

During the map biography, one interviewer would input locations of features (points, lines, and polygons) identified by participants on the map directly into a computer using Esri ArcGIS Web App (Geographical Information System software). Descriptive data for each feature (point, line, or polygon) was recorded into a customized Survey123 database that was developed for this Study. Microsoft Teams has a record function that was used to record the interview. This was done only when consent was given by the participant.

The Study team also asked Oral History questions related to Métis identity, family stories of land use, relationship to the land and waters, perceptions of current harvesting areas, and perspectives on cumulative effects of development and changes to the environment and land use activities. This portion of the interview also allowed participants time to provide their thoughts on the Project.

All participants received a $150 honorarium which was administered by the MMF.

SVS team members took measures during data gathering, back-up, and analysis to assure proper quality. Team members followed best practices in social science research methodology and the SVS methodological approach for gathering data during the map biography and Oral History. SVS staff conducted quality assurance on collected data from each interview section to ensure there were no missing data or errors in recording descriptions. Senior SVS staff reviewed all research tools and deliverables.

Geographic data was processed to create maps that depict the land use and knowledge of the participants. These maps have been used throughout the report. The raw data and information used in this Study remains the property of the MMF and will be returned to the MMF.

3.1.4 CONFIDENTIALITY AND INFORMED CONSENT

To ensure confidentiality and informed consent of the participants, SVS researchers took all reasonable measures to safeguard personal and confidential information. Some of these measures included not disclosing the identity of Study participants to other MMF Citizens, using PIN numbers to represent participants instead of their names, and storing data in a safe and secure location. Confidentiality measures and informed consent requests were communicated to the Study participants in writing through the permission forms and verbally by researchers prior to each interview. No names, identifiers, or other forms of personal information are used in this report.

3.1.5 STUDY LIMITATIONS

3.1.5.1 SAMPLE SIZE

Twelve Métis Nation citizens took part in interviews for this Study, with a focus on citizens who have used the lands and waters around the Study Area. This is a relatively small sample size and cannot be taken to reflect the total Métis population that has used and occupied the land in this area.

Due to the limited scope and short duration of the Study, participants were strategically selected by the MMF to provide a cross-section of the Métis population that has specifically used and/or lived in the Study's geographic area. Despite the limitations, the MMF and SVS believe that the Study provides a snapshot of the Métis Nation's Manitoba Métis Community's patterns of land use and occupancy within the Study Area.

The Study is not, however, a statistically representative sample of the population of Métis land users across the Province of Manitoba or within the Study Areas and cannot be relied upon as such.

3.1.5.2 MAPPING AND DATA COLLECTION CONSISTENCY ISSUES

SVS researchers displayed the map by sharing their screen on Microsoft Teams. Through their own computers, participants could see the map and identify the location(s) of land use and occupancy sites related to each interview question. Most of the participants were able to recall specific locations, direct the interviewer to those locations on the map, and verify that the interviewer recorded the location correctly. In some instances, participants had trouble seeing the map because of the limitations of the computer monitor size and interviewers accommodated this by scrolling in very close to certain locations.

Some participants had technological issues. For example, one participant did not have a microphone or camera on their computer but could still see the interviewer and their screen. In this instance the participant was able to phone into the Microsoft Teams meeting and continue with the interview because they could still see the map. In another instance a participant was having trouble connecting to Microsoft Teams and an Oral History interview was completed over the phone instead.

3.1.6 INTERVIEWER, PARTICIPANT AND STUDY BIASES

Both interviewers and participants have inherent biases that can affect a research study. This is true for all studies and interviews conducted, no matter the context or circumstance. Interview bias can stem from the social setting of the interview, perceived power imbalances between the interviewer and participant, comfort levels of the interviewer or participant, or the physical location of the interview. SVS and MMF took the following steps to decrease interviewer and participant bias and mitigate the effects that it may have had on the Study:

- MMF staff conducted interview scheduling and explained Study objectives to MMF Citizens in advance
- Informed participants of the interview process again at the beginning of the interview
- Provided opportunity for questions to be asked and answered
- Made conscious choices to use plain language in the wording of the questions and used a standard interview methodology and questionnaire
- Limited the use of leading questions or statements
- Took breaks when needed to ensure interviewer and interviewee stayed alert and focused

In addition to the strategies above, SVS also applied the methodologies of Terry Tobias (2009). An important aspect of the Tobias approach relevant to study bias is the Data Diamond. The Data Diamond is a mapping approach that ensures the map biography survey focuses on facts. To ensure that mapping data is as accurate as possible, a total of four use-and-occupancy facts need to be collected for the areas mapped (Tobias, 2009, p. 47). These facts are:

1. By a participant and/or others (Who)
2. Engaged in an activity (What)
3. At some point in time (When)
4. At a specific location (Where)

The Data Diamond can be used to improve map accuracy by helping participants recall as many details as possible. SVS used detailed maps to help participants orient themselves, be more accurate with their mapping data, and to support participant recall.

3.1.7 DATA VALIDATION

After the interviews, researchers transcribed the interviews and produced individual maps for each participant that identified everything that they shared in the interview. Each participant received a copy of their transcript and map through email and were provided with instructions on how to review the information. Beyond a few place name spelling corrections, there were no changes made to the documents.

3.2 COMMUNITY MEETING

Researchers were invited by the MMF to attend a community meeting that was focused on the Project. It was conducted over Zoom to ensure COVID-19 safety protocols were followed. Researchers provided an overview of the Project and presented on the preliminary findings of the Study. There were 52 Métis Nation citizens in attendance and many MMF Ministers.

Those who attended were provided the opportunity to ask questions and to comment on their experience with the Project Area and the past flooding events that had occurred.

3.3 FIELD INTERVIEWS

The MMF will be conducting a series of ground-truthing and field interviews with Métis land users based on the data collected through this Study. These interviews are anticipated to be completed by the MMF in the coming months, and the data collected will be added to this report.

4.0 STUDY RESULTS

This section provides an overview of results from the MKLUOS, including a list of features mapped within the Study Area, thematic maps of their location, as well as more detailed qualitative information that emerged from the map biography and oral history interviews.

This section will be updated with further information upon the completion of ground-truthing and field interviews.

4.1 FEATURES IN THE STUDY AREA

In total, 138 features were mapped within the Study Area. Interviewees who participated in this MKLUOS mapped a total of 92 features within the Study Area. Information collected from these interviewees was combined with a catalogue of past data collected by the MMF, which provided an additional 46 features within the Study Area These datasets were combined to create the composite map shown in Figure 8 below.

Table 1 provides further information surrounding the features mapped within the identified Study Area. The first column indicates the category of the mapped feature, the second column provides further information surrounding the type, and the third column provides the number of each type of feature mapped. The fourth column provides further detail surrounding the species mapped for each feature, if applicable. It is the intention that this table will be updated with further detail, integrating the data collected through field interviews, which the MMF will be conducting in the coming months.

The table includes a blank column titled *Mitigation or Accommodation Measure*. Once completed, the table can be used as a tool by the MMF and Manitoba Infrastructure to support the next steps in developing appropriate mitigation and accommodation measures.

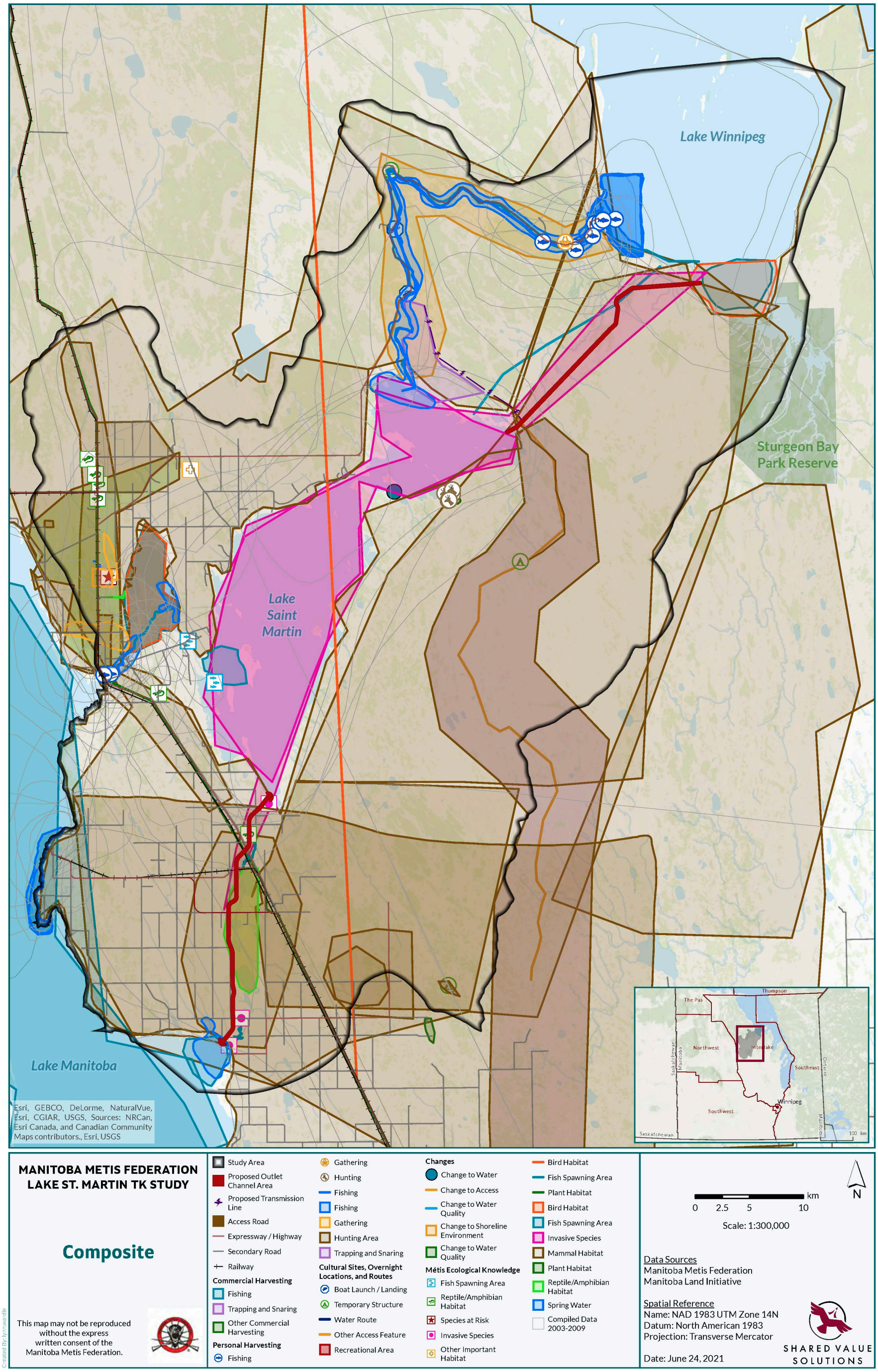


Figure 8: Composite map of all features mapped within the study area

Table 1: Features mapped within the Study Area

CATEGORY	TYPE	COUNT OF CATEGORY	SPECIES (IF APPLICABLE)	MITIGATION OR ACCOMODATION MEASURE
Access	Boat Launch/Landing	2		
	Other Access Feature	1		
	Water Route	1		
Change	to Access	1		
	to Shoreline Environment	1		
	to Water	1		
	to Water Quality	4		
Commercial Harvesting	Commercial Fishing	3	Baitfish, carp, burbot, goldeye, jackfish/northern pike, lake whitefish, mooneye, pickerel, sauger, sucker, tullibee, yellow perch, catfish, bass	
	Commercial Trapping and Snaring	3	Beaver, coyote, fisher, fox, lynx, marten, muskrat, squirrel, weasel, wolf	
Cultural	Recreational Area	1		
Overnight Location	Temporary Structure (Tent, Lean-To, etc.)	6		
Personal Harvesting	Fishing	32	Jackfish/northern pike, pickerel, perch, suckers, sauger, yellow perch, lake whitefish, burbot	
	Gathering	4	Roots, nuts, chaga, tamarack, and firewood	

CATEGORY	TYPE	COUNT OF CATEGORY	SPECIES (IF APPLICABLE)	MITIGATION OR ACCOMODATION MEASURE
Métis Ecological Knowledge	Hunting	12	Duck, goose, grouse, partridge, moose, elk, deer	
	Trapping and Snaring	1	Hare	
	Bird Habitat	5	Duck, goose, grouse, and partridge	
	Fish Spawning Area	18	Baitfish, burbot, pickerel, sauger, jackfish/northern pike, tullibee, yellow perch, sucker, lake whitefish, carp,	
	Observed Invasive Species	6	Carp and zebra mussels	
	Mammal Habitat	13	Moose, elk, bear, coyote, deer, wolf, muskrat, beaver	
	Other Important Habitat	1		
	Plant Habitat	2	Wild rice and small white lady slipper	
	Reptile/Amphibian Habitat	9	Snake and frog	
	Observed Species at Risk	1	Whippoorwill	
	Spring Water	2		

This section details the qualitative and mapped data that emerged from the map biography and Oral History interviews, and assesses the potential for impacts to Métis rights, interests, and claims related to the proposed Project.

4.2 POTENTIAL IMPACTS TO RIGHTS AND INTERESTS

This section details the qualitative and mapped data that emerged from the map biography and Oral History interviews, and assesses the potential for impacts to Métis rights, interests, and claims related to the proposed Project. It will also provide additional detail and context to the features identified in Section 4.1 above and highlight participant knowledge through thematic maps and direct quotations.

4.2.1 PERSONAL HARVESTING

Participating in harvesting activities is a Métis right protected by Section 35 of the *Constitution Act, 1982*. Interview participants mapped personal harvesting areas throughout the Lake Manitoba and Lake St. Martin region, demonstrating that Métis Nation citizens exercise their rights within the Study Area. Personal harvesting activities include hunting, fishing, trapping, snaring, and gathering plants and other natural materials. One participant noted that harvesting practices are part of the Métis identity, an identity that was hidden for decades. Métis Nation citizens exercising their right to harvest is a celebration of that identity.

> *You don't live off the land, but you basically, you do subsidize a lot by, especially wild game and your fish and your berries and your maple syrup [….] You save yourself a lot of money even through you're not selling any of that for cash, right […] you're not making any profit at all off it, not even gas money. But you're saving so much money. […] You get, like, [name removed] got a moose, so it's probably 450 pounds of meat, we got, well, probably about 180–190 pounds of hamburger, or grounded moose, right. And […] if you had buy that in the store that's six or eight bucks a pound. [….] And there you don't know what you're buying, you know, is that full of chemical, is it full of needles, is it, anyway, so. [….] I'm babbling along here, but it just a way of living out here, and Métis culture I call it, Métis way. The way we grew up and proud of who we are and, so. We used to hide it and kind of keep quiet and try to keep it in quiet, not really shame, but not supposed to be doing stuff like that, and whatever, and now it's, we don't care, we're proud of who we are and what we do.*

Figure 9, below, shows the personal harvesting locations, including hunting, fishing, gathering, trapping and snaring, mapped by interview participants within the Study Area. Interview participants fish in close proximity to the proposed outlet channels to the north and west of Lake St. Martin, and in Lake Manitoba at what would be the mouth of the proposed outlet channel.

Interview participants also hunt immediately south and west of Lake St. Martin, as well as within the Study Area to the east near Lake Manitoba.

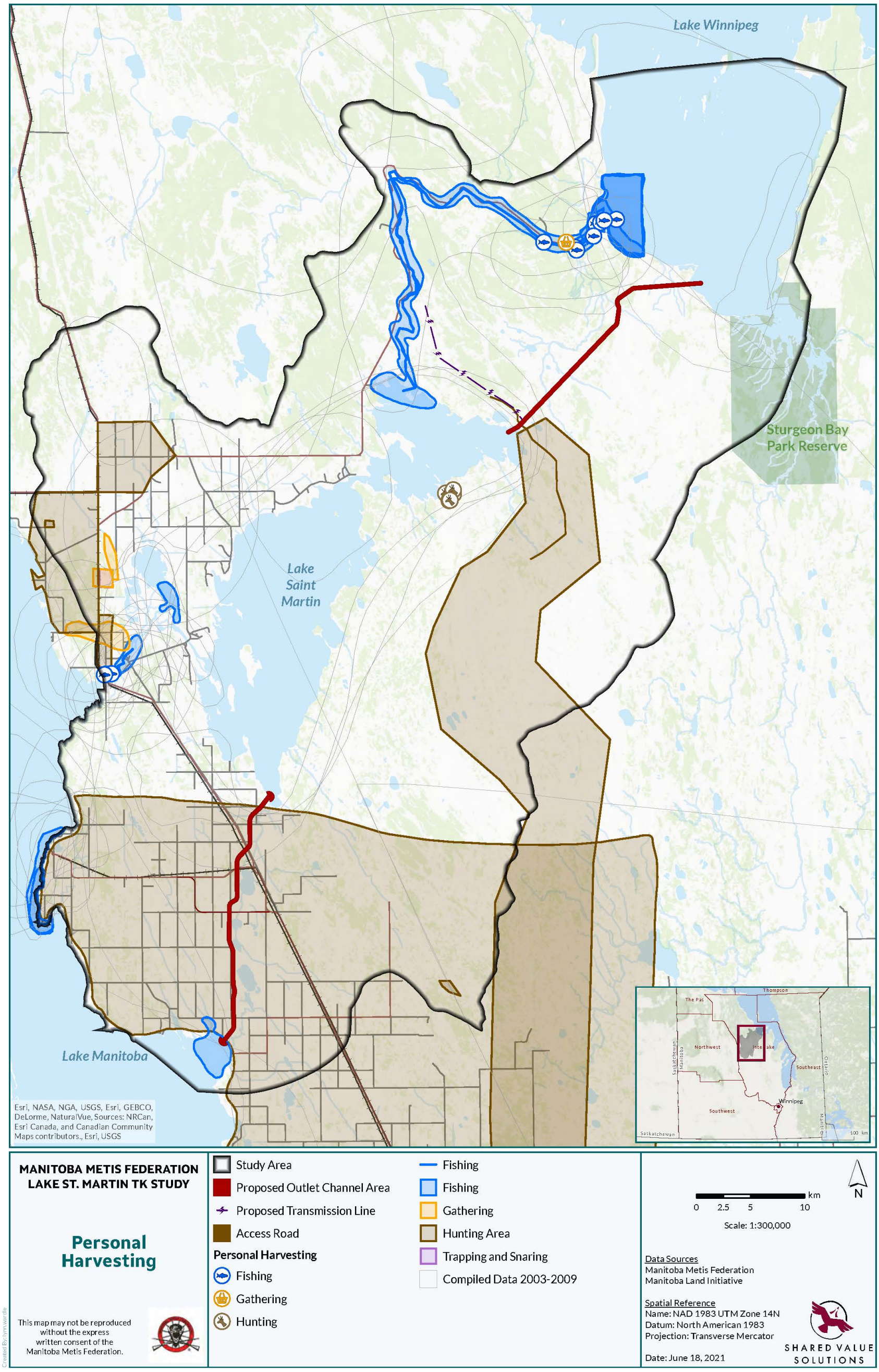


Figure 9: Personal harvesting locations mapped within the Study Area

Data collected through this Study, and that from the MMF's data catalogue show 12 hunting locations within the Study Area, including areas where Métis citizens reported hunting duck, goose, grouse, partridge, moose, elk and deer. During a map biography interview, one participant described their experience growing up hunting and learning harvesting skills from family members, such as how to prepare and preserve wild game. For this Métis Nation citizen, hunting provided an important source of food. When preserved properly, an animal as large as a deer could sustain a family for months.

> *My dad would go out and shoot a deer and bring it home, and they would cut this meat into strips, because we had no fridge, we had no hydro or anything. So he would dry that meat. I remember him building a rack in the bush. First he'd build a fire, and when the coals got low, he'd put this rack over the coals, and he hung up all this meat on this rack. And it took about three days to dry this meat. It ended up just like leather—it was black. But you put some homemade butter on that and was that ever great. That was the only way we could keep meat. If you shot a deer, you might have fresh meat for a couple of days, because he had an icehouse he built. He packed that with ice he cut in the springtime, and blocks, and he'd pack it in there, and he'd put sawdust, because we sawed wood. And it would last probably till maybe August or so.*

Another participant shared how proximity to nature and the ability to hunt shaped their childhood, demonstrating that hunting is a Métis way of life.

> *Right in the fall I'd ride my bike, I'd ride my bike to the lake. We're only half a mile from the lake. So I'd, I'd shoot a few ducks there and then I'd have to race back to make sure and get on the bus. So sometimes I'd go to school with wet feet and stuff. As long as I got to go hunting in the morning first. But back then too, if one of my friends was coming over or if I was going over to their place, we would just take our shotgun apart and put it in our duffel bag and take it to school like that. And then go to the other one's place.*

Hunting is an important harvesting right exercised by the Métis Nation citizens in Manitoba. Any changes to wildlife populations or habitat could impact this right.

Fishing

Interview participants mapped 32 fishing locations within the Study Area. The species mapped include jackfish/northern pike, pickerel, perch, suckers, sauger, yellow perch, lake whitefish, and burbot. The participants fish as part of a subsistence lifestyle, to feed their families and to exercise their harvesting rights.

> *'Cause they come right into shore. Into the shallows. It's all kinda sandy bottom in there and everything, so. Me and my uncle just took a boat out last weekend and we wanted to get some fish for the family. And we stuck two nets out there. We caught over 300 pickerel.*

Some interview participants who fished also described the importance of feeding their community. When they catch more than they need, it is common practice for some fishers to share with Elders

and other Métis friends and family. This is one of the ways in which Métis harvesting rights are interwoven with cultural and social practices that maintain connections between community members and families.

> *Well, personally for me because I go with a, like I say, I go and help the, like, I go and, like, I got some fish already about a month ago there, eh. But and what I do is I go with a [buddy] of mine, I call them, and then they commercial fish and they'll give me a call when, because they're done selling fish when their quotas are done, then you do personal fishing. […] So I go with them for the netting and that. And then keep whatever fish I want, right. Then I do a lot of fish cleaning and then […] a lot of, I know somebody had asked me before like how many, how many pounds of fish a year I catch, and like fillets, and probably 500 pounds, at least. Maybe more, probably more. But I don't sell them even, eh, I give it to the Elders […] and there's a lot of them, a lot of people. And not, for the last few years it's not just the Elders, but the single mothers and single families and poor […] try to help them along.*

Interview participants discussed the fishing techniques that support their practice. Fishing techniques are borne from a unique knowledge of the waters and fishing conditions from years of use, or else passed down by family members.

> *There's, what you do when you're netting you go with a different, different, what would we call, different, different reefs all through there and different water depths and that. So, when you go netting you kind of know and you find those areas, 'cause you don't want to go set nets in the, well it's almost impossible like 30-40-50 feet of water, right, so […] set your nets anywhere from say 8 to 16 feet of water, so. And you usually set them along wherever there's, you can see where the reefs and the little islands and stuff are, then that's where you, there's nice slopes or like, from that little island down to the south there, that would be almost all the same depth of water and that, eh, and that's where you'd set your nets, so.*

Any changes to fish quality or population would impact subsistence harvesting by Métis harvesters, and could impact personal economies and social networks.

Personal Trapping and Snaring

One participant mapped a personal trapping and snaring location within the Study Area for hare. Métis harvesters also reported trapping and snaring other species in the region outside of the Study Area. Trapping and snaring are important land-based activities that have historically been, and continue to be, undertaken by the Métis Nation's Manitoba Métis Community. One participant described snaring as part of their daily routine growing up, consistent with a Métis way of life.

> *I couldn't wait for recess 'cause, to go outside. And I had, I'd go check my snares. I was snaring gophers out in the playground. So I couldn't wait for recess or lunchtime so I could go check my snares, see how many gophers I had. So I started to love the trapping at a young age. And then my mom never knew where the heck I was. Soon as I'd get off the bus, I'd grab my pack sack and my traps, and I was gone every day. Soon as it was*

fall. I had to go take off catching squirrels and weasels and stuff. And I'd go to the lake, catch the odd muskrat and mink.

Another participant described good environmental conditions for trapping. Harvesting from the land has given many Métis Nation citizens a deep understanding of their environments.

It's lower land, and across the lake from me, it's called Captain's Point, along Lake Manitoba. And you'll see there's a creek running there, a pretty big swamp that goes north. It also goes right across the highway that runs from St. Martin to Gypsumville. It's all connected in there, and it was good trapping in there, lots of room. But then around where I was raised at Sandy Point, there was some swamps there you could go trapping in.

Plant Harvesting

Interview participants mapped four plant-harvesting locations within the Study Area. The mapped species include roots, nuts, chaga, tamarack and firewood. Métis land users also reported harvesting other species within the region outside of the Study Area. These species are gathered either for subsistence or for medicinal purposes.

Harvesting plants and other natural materials is another way in which Manitoba Métis Nation citizens exercise their rights throughout the area. Harvesting plants and natural materials provides harvesters a cultural connection to the land, as well as an opportunity for intergenerational knowledge transfer. Knowledge of how and when to gather is passed down through generations of family members. A participant explained how they learned to harvest on the land with their family.

One thing I learned to harvest out there ironically and there's plenty of it around here was, was chaga mushroom because there was several areas out there were some really nice healthy relatively older growth birch and stuff like that. I remember my dad pointing that out to and me him telling me that "my mom always made me go and climb the trees to cut that down" so we went out there and of course I climbed up the tree and ripped a chunk of it off and everything and that was my first experience with that.

Chaga specifically was harvested by several interview participants for use in traditional medicine. A participant explained that chaga cleanses toxins from the body.

Chaga is a traditional medicine, and it cleans out your livers, your kidneys, your blood, it, it's, they're finding out now, scientists and doctors and that, that it's a very, I don't know, a very good medicine for a lot of things. Like, I say, it cleans your, I don't know whether it's called antitoxins, the bad stuff that's in your blood and stuff, so.

One participant also shared how they make traditional medicines with black poplar buds.

And the black poplar buds, like right now there's some starting to come out, but they usually come out nice and big and sticky, and that's when you pick them in the

springtime [...] and they're for healing of open wounds and sores and cuts and stuff like that.

The plants most mentioned by interview participants were sweetgrass and Seneca root. A participant shared how they locate sweetgrass by its sweet smell.

"I usually pick my spots by scent. If I'm going through an area and I can smell [the sweetgrass] really good, then that's the spot I go to."

Another participant shared the medicinal use of Seneca root, knowledge passed down by their father, and how it is being commercialized today beyond traditional uses.

"I just drink [seneca root] as a tea, I dry it. It saves well you can keep it forever. And I just have it as a tea but it's for your sore throats and stuff like that. And you can sell it to somewhere in the US and they will buy it from you and stick it in cough lozenges. I'm not sure what it's all in but my dad used it a lot and I just follow the tradition right. Can't say my wife is in love with it but I don't mind."

The data presented here demonstrate that Métis Nation citizens use the Study Area as shown in Figure 9 to exercise their Section 35 rights. Additionally, the quotations detailed throughout this section have highlighted the importance of these practices both within the Study Area and throughout the province of Manitoba to preserving the Métis way of life. Given the potential of the Project to impact the lands and waters throughout which Métis Nation citizens hunt, fish, trap, and gather natural materials, the Project may also impact their ability to exercise these Section 35 rights.

4.2.2 COMMERCIAL HARVESTING

In addition to personal harvesting, some participants identified places where they harvest commercially. Commercial harvesting supports the economy and livelihoods of Métis citizens who participate, and it promotes a traditional source of income. Commercial harvesting activities mapped within the Lake Manitoba, Lake St. Martin and Lake Winnipeg regions include fishing, hunting and trapping.

Figure 10 below shows the locations where interview participants mapped commercial harvesting locations, including areas where they fish, hunt, trap and snare. Interview participants mapped three commercial fishing locations within the Study Area, as well as a number of commercial fishing locations adjacent to the Study Area, and they reported fishing for species including baitfish, carp, burbot, goldeye, jackfish/northern pike, lake whitefish, mooneye, pickerel, sauger, sucker, tullibee, yellow perch, catfish, and bass.

Interview participants also mapped three commercial trapping and snaring locations, and reported trapping and snaring for species including beaver, coyote, fisher, fox, lynx, marten, muskrat, squirrel, weasel, wolf. To demonstrate the extent of Métis commercial harvesting in proximity to the proposed outlet channels, Figure 10 below shows commercial harvesting areas both within and outside of the Study Area. Métis Nation citizens fish commercially throughout both Lake Manitoba

and Lake Winnipeg in various locations, some of which are directly adjacent to the proposed outlet channels.

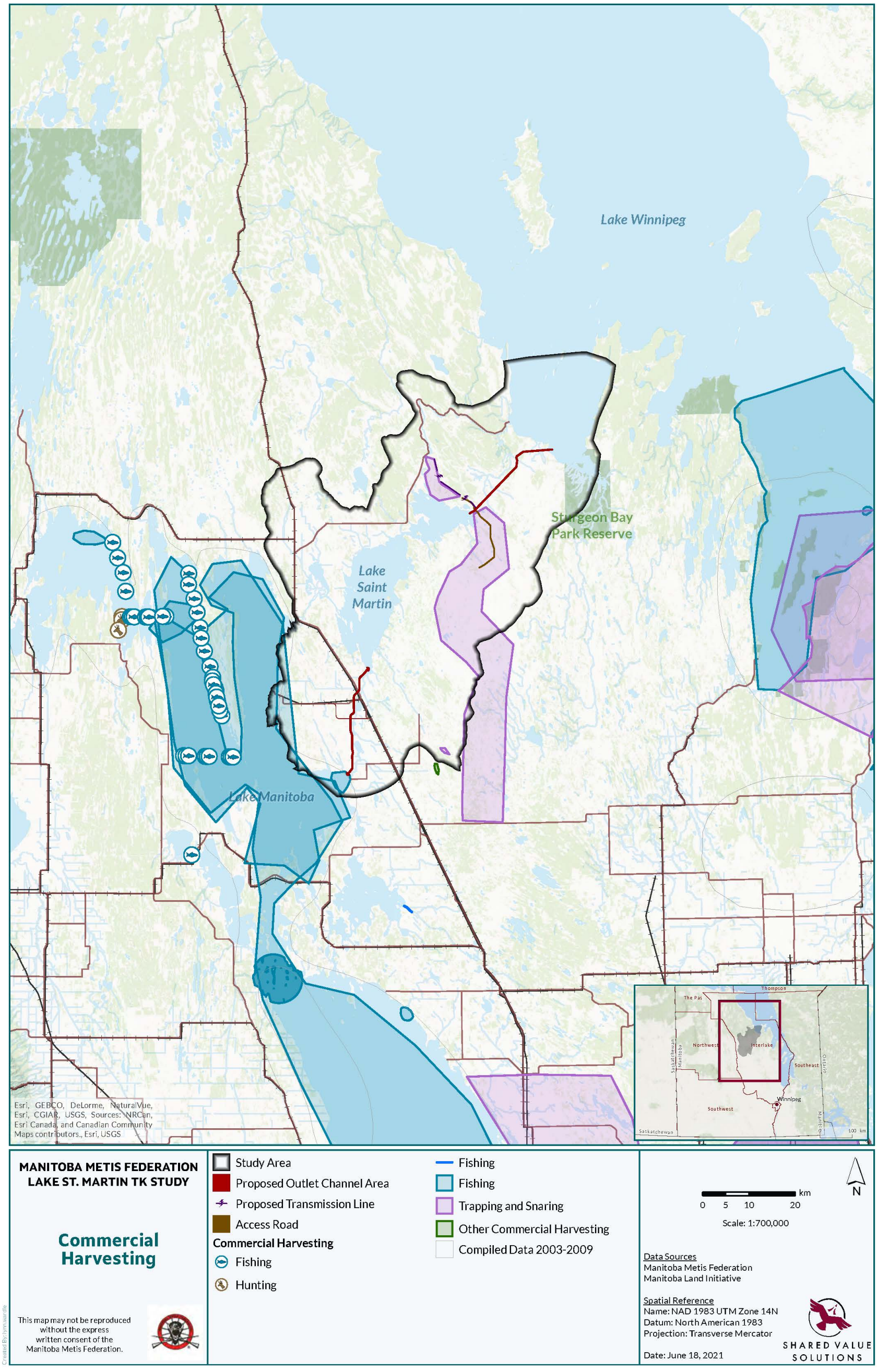


Figure 10: Commercial harvesting locations in the Lake Manitoba, Lake St. Martin, and Lake Winnipeg area

> “I commercial fish, actually where that drain starts in Lake Manitoba I have, we do, I don’t know if you know, we do mullet fishing like sucker fishing in the creeks. […] Oh yeah, I’ve been, I’ve actually been down the channel that they’ve dug, the emergency channel they dug already and yeah, I commercial fish all around that area that’s pretty much where I grew up all around here.”

As described previously in Section 2.1, the Métis Nation’s Manitoba Métis Community played a significant role in the fur trade. Trapping, snaring, and guiding are part of Métis tradition and culture, and continue today.

> *Well hunting and trapping, yeah, I grew up doing that. We have three trapper’s cabins up there, and we used to go up there every weekend and stay and fish and trap, and do all that, doing an 80-mile round trip. And then we’d skin all the fur and sell it. So I grew up doing that on the weekends, but then during the week we’d be commercial fishing as well. That would be how our winters would go down, and then during the summer we would be just commercial fishing, and then for fun we’d just be angling and whatnot.*

Interview participants who mapped commercial land use often described these practices as the source of their livelihoods. One participant described commercially fishing near the Lake St. Martin Emergency Outlet Channel, in close proximity to the proposed Project.

> *I commercial fish, actually where that drain starts in Lake Manitoba I have, we do, I don’t know if you know, we do mullet fishing like sucker fishing in the creeks. […] Oh yeah, I’ve been, I’ve actually been down the channel that they’ve dug, the emergency channel they dug already and yeah, I commercial fish all around that area that’s pretty much where I grew up all around here.*

Commercial fishing, like other harvesting practices, is often taught by family members, passing along Métis Traditional Knowledge intergenerationally. An interviewee participated in commercial fishing alongside their father, in a large family fishing outfit.

> *Well, years ago when I used to commercial fish for my dad in the early ‘60s, we had a fish camp north where I am right now. And we’d go up there on a Sunday evening or Monday morning, and we’d stay depending on how long it would take us to lift all the nets, and Friday or Saturday we’d come home. I used to fish 120 nets for my dad — he had a pretty big outfit at the time.*

For many participants, commercial fishing has sustained them for their whole lives, a year-round business that connects them to their Métis culture. Pickerel and northern pike (jackfish) are commonly harvested by commercial fishermen.

Interviewee: *I, I commercial fished up there one year too. [...] Mostly out from Oak Point and northwest of there.*

[...]

Interviewer: *Commercial fishing. And what do you catch?*

Interviewee: *Mostly pickerel. And jackfish, northern pike.*

Interviewer: *Ok. And how long ago were you doing that?*

Interviewee: *Pretty much my whole life too.*

Interviewer: *And what time of year?*

Interviewee: *Spring, summer and fall. Or winter too. Ice fishing too. Year-round.*

Manitoba Infrastructure needs to consider and account for the potential for lost wages as a result of the proposed permanent outlet channel, for those who rely on the lands and waters for their livelihood. Where necessary, the MMF and individual harvesters need to be compensated for a loss of access to the lands and waters for commercial harvesting.

Commercial harvesting is a skillset passed down intergenerationally, that reinforces Métis culture. Manitoba Infrastructure needs to consider and account for the potential for lost wages as a result of the proposed permanent outlet channel, for those who rely on the lands and waters for their livelihood. Where necessary, the MMF and individual harvesters need to be compensated for a loss of access to the lands and waters for commercial harvesting.

4.2.3 ECOLOGICAL KNOWLEDGE

Métis Ecological Knowledge refers to areas or sites where participants hold unique and specialized knowledge of the land, waters, wildlife and other aspects of the environment, as a result of their distinct Métis culture and relationships to the land throughout the seasons. This knowledge can also be gathered and shared between participants over generations through their families or the Métis Nation's Manitoba Métis Community more broadly.

The Métis Ecological Knowledge mapped in proximity to the proposed permanent outlet channels demonstrates occupancy of Métis Nation citizens in this area and is related to their ability to exercise their Section 35 rights through harvesting of wildlife. Occupancy can be demonstrated through a group's knowledge of a particular area, including specific ecological knowledge as is shared here (Tobias, 2000).

Figure 11 below shows the areas of Métis Ecological Knowledge mapped as part of this Study. Data collected from interview participants and the MMF's data catalogue showed 57 locations of Métis Ecological Knowledge within the Study Area, including fish spawning areas, bird habitat, invasive species, mammal habitat, migration routes, reptile and amphibian habitat, plant habitat, spring water, and species at risk.

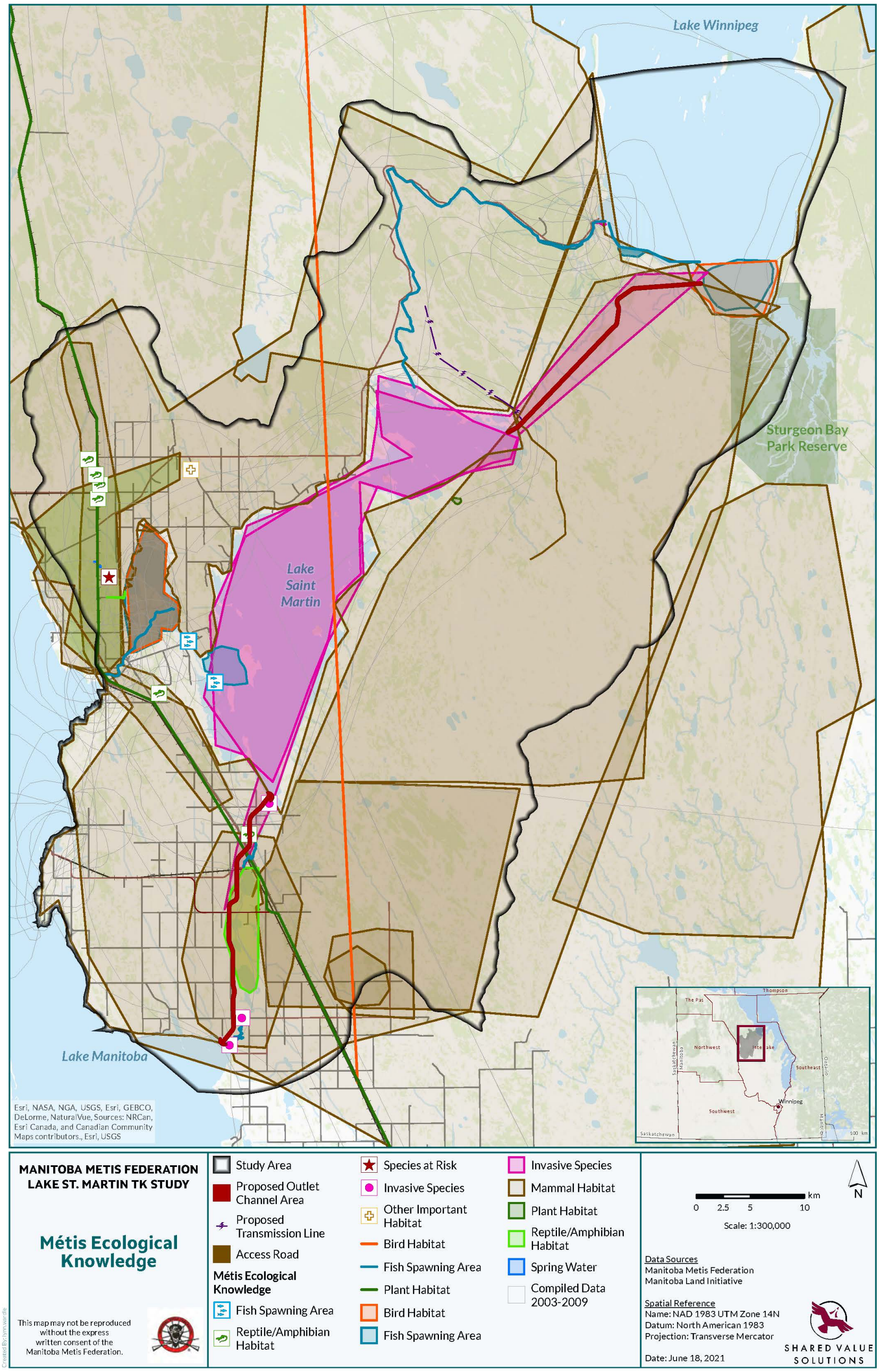


Figure 11: Areas of Métis Ecological Knowledge

Fish Spawning

Identifying fish spawning locations and the health of those environments is important to determine potential impacts to fish species. The Métis Nation's Manitoba Métis Community depends on healthy fish populations to practice their harvesting rights. It will be more difficult for land users to harvest fish if fish spawning is reduced or if fish spawning habitats are negatively impacted.

Data collected from interview participants for this study as well as the MMF data catalogue showed 18 fish spawning locations within the Study Area. The species mapped include baitfish, burbot, pickerel, sauger, jackfish/northern pike, tullibee, yellow perch, sucker, lake whitefish and carp. Many participants described the importance of certain conditions for fish spawning habitat. A participant described the prime habitat at the mouth of the Dauphin River.

> *Well, I know they're spawning right in the mouth of the river in the Dauphin River itself as well as upstream, it's a very shallow very high-quality spawning ground there. The whole Dauphin River area right where the river flows into the lake and probably most of the shoreline along there being it sand and or small stones so there will be a large number of walleye spawning there. In the wintertime when we go in there, late winter, it is absolutely incredible. I mean, there might be six feet of water in the main part of the bay where we're at, which is just basically out maybe half a mile or so from the mouth of the river itself. But you look down the hole and the fish are coming through there, it's just incredible. It's just schools of them.*

Interview participants detailed fish spawning environments, an indication of their intricate knowledge of the lands and waters.

> *Those are the shallow spawning areas on the lake that draw the, the pike, you know, all the fish species like to come into the sand. The sandy areas. To spawn. And the low-lying, of course, that's low because it's a swamp.*

Water levels are incredibly important for fish to spawn. A participant explained the balance that needs to be achieved for fish spawning to occur.

> ***Interviewer:*** *What would that do to the baitfish? If the water levels go down?*
>
> ***Interviewee:*** *Well, they, that, it just kills them. You know? They have to have water to, to spawn, you know? It has to be a certain depth. And if it's too deep they can't spawn, and if it's too shallow they can't spawn. That's a, it's a catch 22. It almost has to be perfect.*

Participants expressed concerns about the proposed outlet channels affecting these sensitive fish spawning habitats.

> ***Interviewer:*** *And since this feature is right in the* Study Area*—it's actually right at the end of one of those channels there, as we can see—I'm wondering if you can describe it in a little more detail. Like what makes it a good kind of spawning ground for fish?*

I've seen deer and bear and elk and whatever [...] all through that area, the whole area where they're plotting on building the channel."

Interviewee: *It's just a shallower area. That's all I can say, I guess. Shallow and rockier, sandy bottom.*

Interviewer: *And since it is so close to the channel here, do you have any concerns about that area?*

Interviewee: *Well, I would, yeah. Is it going to affect it, or cover up the natural sandy bottom with debris like mud, peat moss?*

Wildlife Habitat and Migration

Identifying wildlife habitat and migration routes is important to determining potential impacts to wildlife that could result from the proposed Project. If wildlife habitat or migration routes are disrupted by activities related to the project, animal populations may relocate or change. The Métis Nation's Manitoba Métis Community depends on healthy wildlife populations, as mentioned throughout section 4.2.1, to exercise their harvesting rights.

Interview participants mapped 14 wildlife habitat locations within the Study Area. Participants often mapped or described large mammal habitat, such as moose, elk, deer, and bears. A participant described the intersection of bush and farm fields that elk in particular like to inhabit within the Study Area around the Spearhill area.

Yeah, in that area [...] there's farming, and they grow [...] fields and grains, they switch to alfalfa, right? The elk move in and live comfortably. They go to the bush and come and eat in the farmer's fields for alfalfa. So it's quite a few elks around. But they're probably hunted quite extensively also.

Participants also identified deer and bear habitat throughout the Study Area.

And the deer, the deer are just kind of all over. There's no really calving grounds or anything like that. They will migrate a little bit in the winter for food. But it's pretty much everywhere.

That whole thing is just covered in bears. There's bears everywhere [in the Study Area].

Another participant expressed seeing many of these important animal species throughout the Study Area, around the proposed permanent outlet channel.

I've seen deer and bear and elk and whatever [...] all through that area, the whole area where they're plotting on building the channel.

Interview participants also discussed wildlife migration routes throughout the area, used by moose and geese.

> *Moose in particular will follow the same trail for thousands of years just on the basis of the scent of their droppings and everything else.*
>
> ***Interviewer:*** *Why do the geese stop there as part of their migration?*
>
> ***Interviewee:*** *It's, it's because there's a, it's because it's an ideal resting area for them. It's not habited, you know, uninhabited. It's, it's got food. And I think, it's just it's, it's ideal place for them. That's the big thing.*

Invasive Species

Because of their experience on the lands and waters, some interview participants were uniquely positioned to notice changes to the ecosystems in the region and species within them. One change that interview participants remarked upon is the introduction of invasive species in Lake Manitoba, Lake St. Martin, and Lake Winnipeg. In total, interview participants mapped six locations of invasive species within the Study Area.

Interview participants primarily commented on the spread of zebra mussels and carp. One participant observed the pervasiveness of zebra mussels.

> *Zebra mussels, they're all over Lake Manitoba, or Lake Winnipeg right now.*

One interview explained how the abundance of zebra mussels has impacted their fishing experience, describing how they can now pull them up on their hooks.

> *When you're fishing, you know, you hook things, and you pull them up and there's zebra mussels on them.*

Another participant shared their concerns about the spread of zebra mussels across water bodies, a threat that could increase with the proposed permanent outlet channels.

> *Definitely Zebra mussels in the […] Red River, Lake Winnipeg and again you know, some other larval forms could potentially hijack their way into Lake St. Martin, if they're not there already. Simply because of proximity and you know connected bodies of water, cause the birds can move these things. Anything that's wet they can attach themselves to. And live for a significant period of time, you know, while out of direct contact with water, so it's an issue. Then you got the problem with people, because people don't wash their boats and there's no prevision for doing it.*

Interview participants also shared that there has been an increase in carp spreading throughout the area, specifically Lake Manitoba and the Fairford River. One participant noted they have been observing this change since the 1960s.

> *It's from the, it's from the outlet of Lake Manitoba all along the Fairford River. They're all in there. They're all in the Lake St. Martin. There's carp everywhere.*

Multiple participants remarked that carp arrived in this area in the 1960s and have been abundant since.

> *Like I say, we were starting to catch carp [in the 60s]. That was the biggest change that I could remember. That's something that my dad didn't bring home when he was fishing in the '50s. But that fish came in, and we were catching carp.*

A participant explained that the reason carp have spread so quickly through the area is that they are a stronger fish.

> *"If [carp are] not already in Lake St. Martin they can certainly get there, cause they're a strong, strong fish. And they can be quite big."*

The information shared here demonstrates that Manitoba Métis Nation citizens occupy and hold knowledge of the lands and waters around the proposed permanent outlet channels. The ability of Métis Nation citizens to harvest plants and animals is dependent on the presence of adequate habitat and conditions to support these populations. Manitoba Infrastructure needs to anticipate the impacts of the proposed permanent outlet channel on wildlife habitat and invasive species, specifically as it relates to the ability of Métis Nation citizens to exercise their rights.

The information shared here demonstrates that Manitoba Métis Nation citizens occupy and hold knowledge of the lands and waters around the proposed permanent outlet channels. The ability of Métis Nation Citizens to harvest plants and animals is dependent on the presence of adequate habitat and conditions to support these populations.

4.2.4 CULTURAL SITES AND CONNECTION TO THE LAND

Participants were asked to identify cultural sites and to speak about their connection to the lands and waters in Manitoba as a Métis citizen. The connection to the land and water is spoken about by many participants as being a part of being Métis and is expressed through their land use activities. Participants' connection to the lands is enhanced by cultural sites that are specific to the Métis in Manitoba.

Figure 8 below shows locations within the Study Area where interview participants mapped culturally significant sites as well as overnight locations and access routes used while spending time out on the land. These locations exist primarily to the north of Lake St. Martin, with several camping sites identified to the south and east.

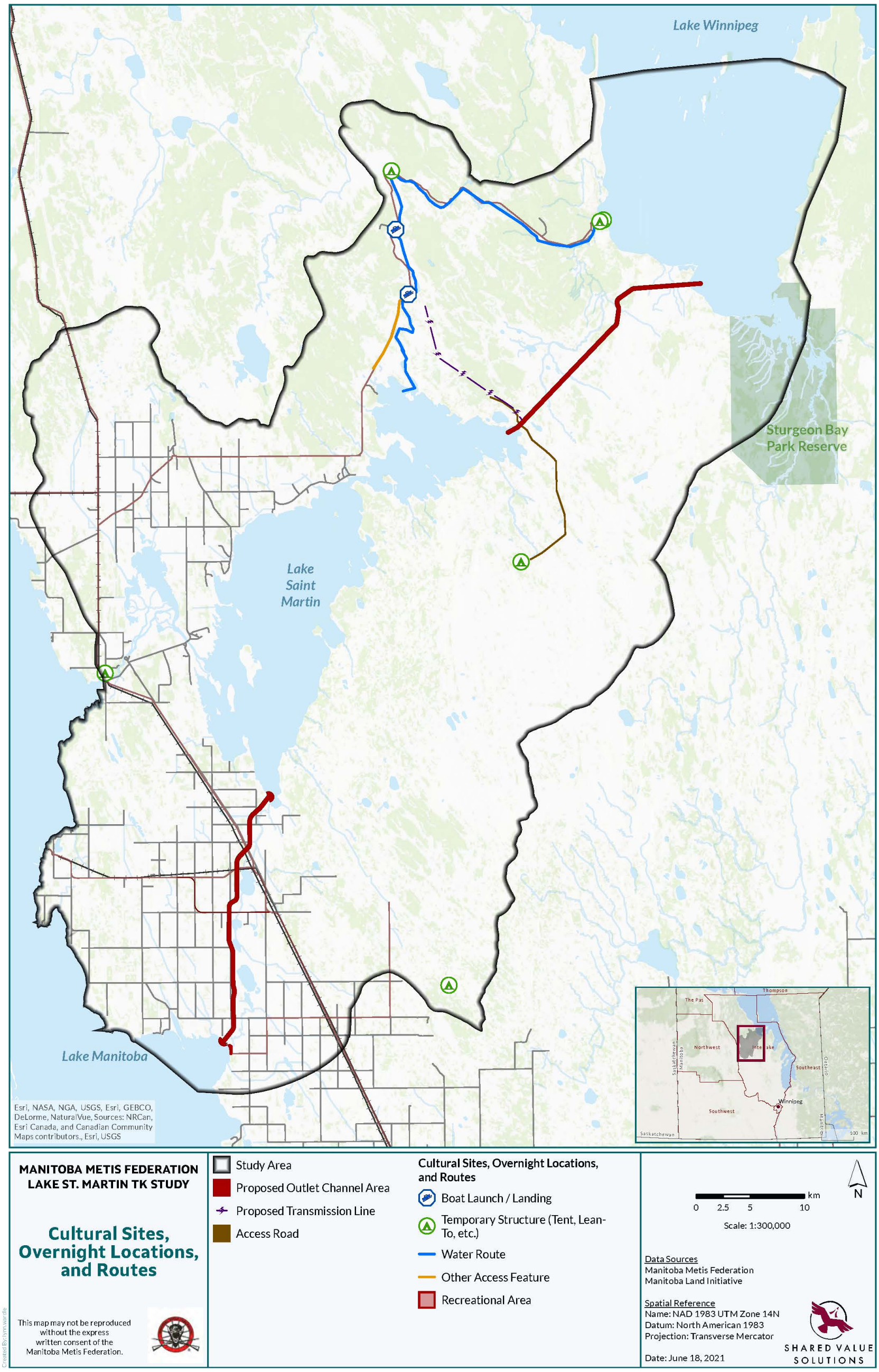


Figure 12: Cultural sites, overnight locations, and routes mapped in the study area

Specific to the area around the Project, one participant spoke about a Hudson Bay post along the Dauphin River. They said that there is a lot of history in this area and that the Dauphin River is an important waterway.

Participants connected to place and space in their homeland. One participant spoke about how they knew the land by the way it smelled and the generational connection that they felt to the area. They felt that their understanding and knowledge of the land was inherited from their ancestors and that certain ways of knowing and being came naturally to them because of that.

This participant also spoke about the generations of their family that used the Winnipeg River, English River, and Albany River for the past 250 years. They said they still know the area well and feel very at home when they go to these areas, and that when they go to an area for the first time, they feel like they have been there before.

These generational connections to the land show that some harvesters have deep connection to places that their ancestors travelled. Their knowledge of how their ancestors used the lands roots their own presence to the land.

> *Yet every town I came back here, I felt instantly at home. You know the bush was mine, I knew the smells, I knew what to do. It was just a natural thing for me, and I attribute some of that to a certain amount of historical genealogy. You know, your body are trained to do certain things over generations, and you evolve that way. So consequently, those things come naturally to you to a certain extent. So, I always felt at home out here.*
>
> *My ancestors have been along the Winnipeg River system, the English River system, the Albany River system for 250 years. These are the earliest English, French ancestry with aboriginals. We know the area well; I go out in these areas and I'm away up in the bush outta nowhere and I feel totally at home, I feel like I know this area like the back of my hand. Even though I know I don't, 'cause I haven't might of physically have been there, but I know it like the back of my hand.*

Another participant spoke about how they enjoy teaching and sharing their knowledge with others. This is an expression of their Métis knowledge and provides learning opportunities and knowledge exchange for the younger generations.

> *I teach a, actually basically I teach the kids just about all survival skills right from fire making to shelters to hunting, fishing, trapping, orienteering, canoeing, boating, safety, weather. So, and I did take an outfitting course in the, I want to say early ' 90s. So, I'll come to, and I also am certified for giving trappers education, youth. I do either a one- or two-day course, depending on the time that's set, allocated, for us to do and whoever I give the course to. It's usually around 20 people at a time, or so, 30. And I, on the*

trapping, and the food and the cooking, I forgot about all that. But anyway, I do that also.

Specific to the area around the Project, one participant spoke about a Hudson Bay post along the Dauphin River. They said that there is a lot of history in this area and that the Dauphin River is an important waterway. The Métis historically have strong connections to Hudson Bay, and this outpost may have been used by Métis fur traders in the past.

If you go up to Dauphin River there used to be a Hudson Bay outpost on the war path there. […] quite a bit of history down that river, cause it's a very important waterway there.

4.2.5 CHANGES AND CUMULATIVE EFFECTS

During the Map Biography and Oral History interviews participants highlighted that the Study Area, as well as the lands and waters surrounding the proposed permanent outlet channels, have been subject to a number of changes and cumulative effects over time. Cumulative effects are defined as "changes to the environment, health, social, and economic conditions as a result of the Project's residual environmental, health, social and economic effects combined with the existence of other past, present and reasonably foreseeable physical activities" (Impact Assessment Agency of Canada (IAAC), 2020). The IAAC further states that "the cumulative effects assessment must include consideration of cumulative effects to rights of Indigenous peoples and cultures" (Impact Assessment Agency of Canada, 2020).

Figure 13 illustrates the various locations through the Lake Manitoba, Lake St. Martin, and Lake Winnipeg area where interview participants identified changes. These include changes to the ways that Métis citizens are able to connect to the land and exercise their s.35 rights including their ability to access certain areas and changes to both personal and commercial harvesting; relatedly, changes to wildlife were also mapped including birds, mammals, fish, and plants. Interview participants also identified areas where there were changes to the environment including water, water quality, the shoreline environment as well as the environment more generally.

Due to the nature of changes and cumulative effects as defined by the IAAC, which include other physical activities in addition to the proposed Project, mapped features shown below are not limited to the identified Local Assessment Area for Traditional Land Use identified by Manitoba Infrastructure for this Project (the Study Area). These quotations and maps are intended to tell the larger story of the region in which the Project is proposed, and the impacts these activities have had on the Métis Nation citizens.

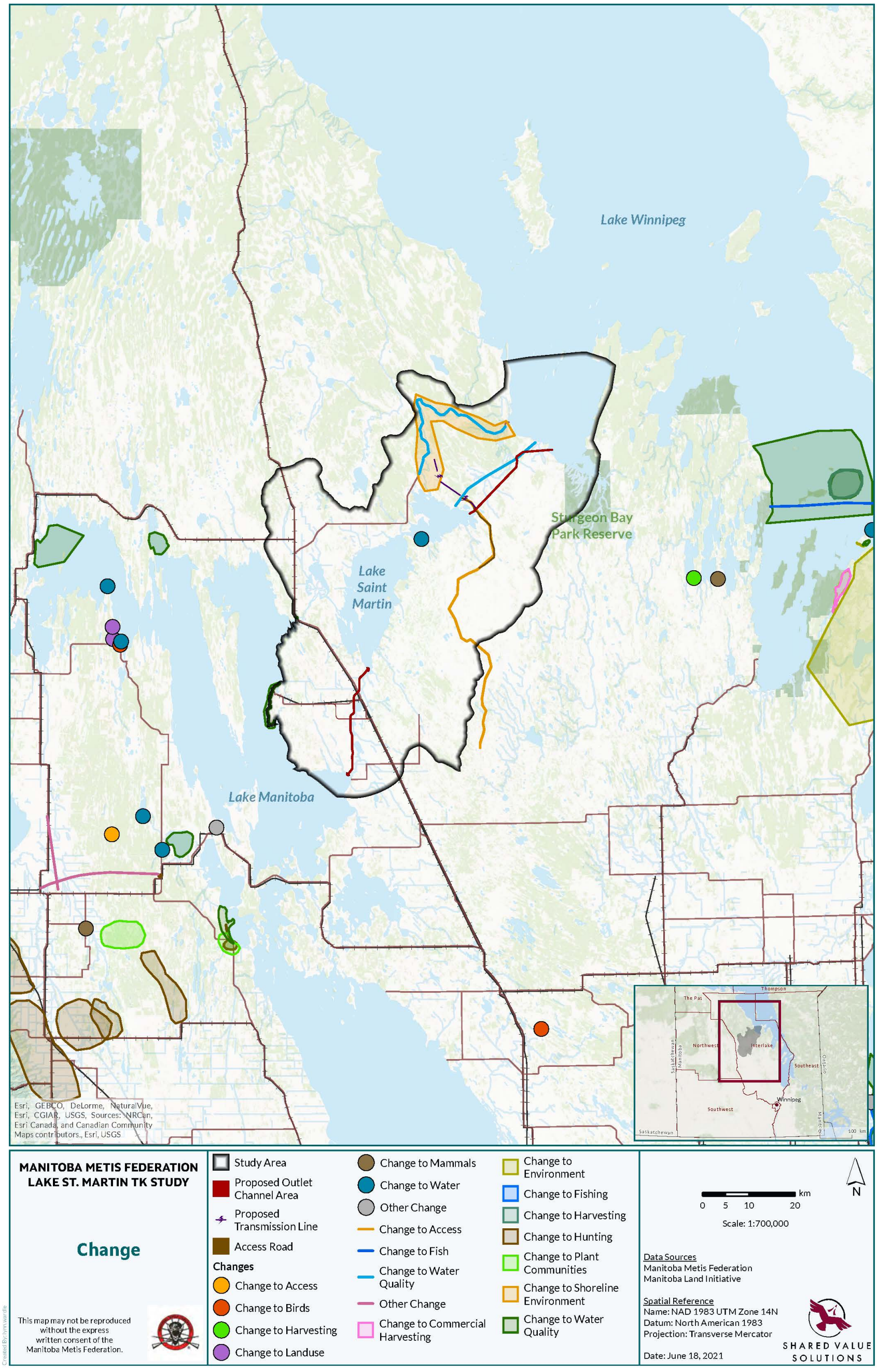


Figure 13: Changes mapped around Lake Manitoba, Lake St. Martin, and Lake Winnipeg

Changes to Fish and Fishing

Evidence gathered through the Map Biography and Oral History interview process and detailed in Section 4.2.1 of this report demonstrates that the Manitoba Métis exercise their s.35 rights by fishing in the Lake St. Martin area. This study also demonstrates that commercial fishing in Lake Manitoba and Lake Winnipeg is also an important part of the economy, providing employment and income for some Métis citizens.

Participants have both observed and experienced changes to fish and fishing in these lakes over time, including changes to fish populations, water quality, and their ability to harvest. One interview participant explained that they've observed an increase in the amount of mud and debris in their nets, and ruining their equipment, since the Lake St. Martin Emergency Outlet Channel was opened in 2011. This was also connected to a change in the distribution of fish, which seem to be staying in the area year-round instead of migrating as usual.

One interview participant explained that they've observed an increase in the amount of mud and debris in their nets, and ruining their equipment, since the Lake St. Martin Emergency Outlet Channel was opened in 2011.

> *Well, when you're adding that kind of amount of water to a lake or outlet or whatever, we're worried about changing the currents; we're worried about contaminants you're adding to the lake. What are you stirring up into it? Are you adding peat moss, mud, roots? You know, stuff like that. We don't know, but this is what we're seeing more of, is roots, and mud, and all this stuff in our nets. We're ruining equipment and nets now. And we can't point a finger, but it's a coincidence how it all happened so quick right after they opened that channel the first year. And like I mentioned with the fish, the way they kind of migrated into a different area for some odd reason, where they'd never been before. They would only come once in a while, like late fall, and then during the winter they might show up in those areas. And now we're seeing them there year-round, which is bizarre; we'd never seen that before.*

This issue of increasing dirt and debris impacting fish and fishing practices was identified by several interview participants, who have also heard similar stories from other commercial fishers. One interview participant described how this has changed their fishing practices, forcing fishers further out into the lake where conditions are more dangerous and costly to navigate.

> *We have [commercial fishers] all the way around Lake Winnipeg, and we're hearing from some of them as well. And it's these same things, where it's just dirt, and you have to move somewhere out. And you get way out in the middle of Lake Winnipeg, and now you're more at risk for big storms, like you have no shelter out there. You don't even see the land on either side, you're that far out. It's more of a cost: the fisherman has to burn*

more fuel and everything else, and they've got to run different gear, longer net lines, bigger anchors, all different kind of stuff. Because of the dirt that pushed them out, it's actually a big cost to a fisherman.

Another interview participant explained that water quality issues in more northern areas due to hydro developments have impacted fishing in those areas, bringing more harvesters down to the Winnipeg River area. Even though this is now known by people from northern areas as a good fishing spot in comparison, the interview participant explained that their family has been commercial fishing the area for generations, and the fish population has declined to an unsustainable number.

And any of the reserves up north here where they created the hydro dam, or anything like that, they've polluted the waters, generally speaking, the quality and quantity of fishing is declined, and everybody raves about how good the fishing is here in the Winnipeg River, but I can tell you that it's not that good anymore. My dad and my grandfather used to commercial fish the lake here, and they used to catch sturgeon and white fish and walleye, and they could sell it at market, and you can't, there's not enough fish in the water to have that stuff sustainable anymore.

Changes to water

Interview participants also reported observing a decline in water quality throughout the area encompassing Lake Manitoba, Lake St. Martin, and Lake Winnipeg within their lifetimes. One interview participant described growing up on Lake Manitoba and drinking the water without boiling it, which they would not do today due to the appearance of debris and an unidentified slippery film coating the rocks within the last 30 years.

Interviewee: *Well, right now, I would not drink Lake Manitoba water out of the lake. I'd have to boil it first. And I was raised on Lake Manitoba water. But now, I find the stones in the water and along the shore, they're so coated with—I don't know what it is. I will not drink from that lake anymore, unless I boil it. I never got it tested, it's just what I see. And like I say, we drank that water till probably the '70s.*

Interviewer: *And so why don't you drink it anymore? Have there been changes to the colour or clarity of the water, or its appearance at all?*

Interviewee: *Not so much the colour, but like I say, the stones are just coated with a film. I don't know what kind it is, and it sticks on the stones in the lake. I didn't see that when I was a kid, or when I was younger. That just happened over the last 30 years or so. [...] It's kind of like a moss maybe, but very fine. It's very slippery. If you grab a stone, it's very slippery, and if you walk on it you'll fall down. It's just so slippery, this coating on all these rocks at the shore's edge. That's the difference I've seen in Lake Manitoba.*

This interview participant went on to describe that pollution from a number of different sources as development of the area has increased, including sewage from urban centres like Winnipeg and runoff from farming, is likely to blame for this change in water quality.

Trapping and fishing, however, are not the only harvesting practices that have changed over time. Another interview participant described having to travel further afield to hunt due to declining moose populations in the southern part of the province, where they used to be able to harvest regularly.

> *Well, I think [the change in water quality] has to do with this pollution. The city of Winnipeg will dump two football stadiums of sewage into the river. So where does that go? And all these chemicals these farmers are using, that ends up in the lake, in the rivers, in the creeks, and comes to the lake. […] I [drank water from the lake] for years, and it didn't hurt us. But I wouldn't drink that water now. I'd have to be pretty damn certain before I had to drink that water without boiling it.*

Changes to Harvesting

As interview participants explained, many of the water quality issues and changes they've observed in the region have impacted both personal and commercial fishing for Métis harvesters. In addition, changes to the environment, such as water levels, have also greatly impacted Métis trappers as species like beaver and muskrat depend on having enough water in their habitat to survive.

> *Animals there like beaver, and muskrat and stuff, the water levels definitely impact them, for sure. They've actually, honestly, in the flood there's probably quite a few muskrats. There's more, 'cause they have so much area to…they had so much water around […]. Since then, there's been, like, a lot less muskrats now, and beaver, cause the water's so low right?*

One interview participant recalled trapping muskrats around the channel that flows from the Lake Frances marsh into Lake Manitoba during high water levels. When the channel was opened to drain out water due to flood concerns, all of the muskrats disappeared to the extent that this trapper no longer "even bothers":

> *And of course, the government always wants to control the water levels. […] There's that Lake Frances marsh. They have a little channel that flows into Lake Manitoba, and they have a little control structure there. And they used to always be all kinds of muskrats in there, but they kept the water level high. But after the flood, they opened that thing right up in the spring and summer and they let that Lake Frances drain right down, 'cause they're worried about flooding. […] And then they drained that right down, so there's never any muskrats in there anymore. Years ago, it was just loaded with muskrats in there. […] But there's no more. I just don't even bother [trapping] because there's no muskrats to catch.*

Impacts to Métis Nation citizens' ability to trap is significant. As one interview participant explained, it is "the longest running industry in North America, over 350 years", and deeply connected to the Métis way of life. Trapping and fishing, however, are not the only harvesting practices that have changed over time. Another interview participant described having to travel further afield to hunt due to declining moose populations in the southern part of the province, where they used to be able to harvest regularly.

> *Well, for myself, it's been I've been affected for hunting, like, because I can't hunt moose here anymore. We have we go north to Thompson now we got to make the travel all the way up there to moose hunt where we used to go on evenings here.*

Changes from Past Flooding

Past flooding events throughout the Lake Manitoba, Lake St. Martin, and Lake Winnipeg areas have created lasting changes to the lands and waters where Métis Nation citizens live and harvest. Interview participants described their experiences with floods, including those that happened in 1956, 1997, 2011 and 2014.

> *So I've been in this place and known about this lake and part of land for the last 70 years. I'm 76 years old, and I grew up here. So I know a lot of history about it. And the biggest impact ever made was that flood of '11. That changed everybody's life very much.*

One interview participant described the life-changing impacts of the 2011 flood, explaining that the previously good ranch land in the area can no longer support cattle and people's ability to make a living in the same way.

> *The flood was the biggest thing. That was life changing. Like I said when I started to talk to you, I used to run 200 cows here. I could pasture them and find winter feed for them comfortably. Now the same land that I leased and owned, I don't know if you could do that with 80 head of cattle. But you still have to pay all this land, and nobody can do that. You can't survive that, you just can't.*
>
> *My dad made a living along the lake here, and I made a living along the lake here, but that's gone. I don't think it can be —it's ten years passed since the flood, and it's still not very good land. It really bothers me. I realize they weren't going to let that water go to Winnipeg and flood Winnipeg; it had to come this way, it just had to. But they should also have thought of where that water was going to go, and they should really be thinking hard on it right now. We can't stand another flood like this. It just affected too many people too negatively. It was good ranch land. I raised some good cattle here and made a good living, but it's gone.*

Interview participants also described how flooding has impacted fish populations in the waterways, and harvesters' ability to use areas where the flooding occurred. One interview participant explained that they haven't been back to fish in some of the flooded locations in almost a decade.

> *Well, it flooded so much in there, I'm sure the fishing wasn't as good. And the consensus of the group I hang around with said, well, we're not going there. You know, it's like,*

don't go [until that] settles down and we get the reports are the fishing is good there again, there's just we fished a different location now a lot more on the Dauphin River or across the lake on the other side. […] So, but we haven't gone in the last seven, eight years, nine years maybe.

Additionally, an interview participant whose family has fished commercially on Lake Winnipeg for generations explained that although they have observed small changes over the years, some of the biggest changes to fish populations and distribution in the Lake have occurred after flooding. Specifically, this interview participant described an increased presence of dirt further north where there would usually be whitefish, and a drastic influx of whitefish staying further south.

Well, I've been a commercial fisher on Lake Winnipeg for at least 25 years, and I fished up there long ago with my grandfather and my dad, and we got to see how everything changes over the years. What we noticed...you know, you see little changes over the years, just small little changes here and there. We're talking fish species, the way they were feeding, the way they would move, and then the different locations—depending on the season they would go into certain places, and you would know as a fisherman to go and set your nets there at that particular time. But when they opened up the drainage for the first time, the floods...don't know if it was it a coincidence or what, but we noticed for some reason we got a fluctuation of whitefish being flooded down into the channel area, where before we never used to get whitefish. And it's like, how did this happen over one season? And then not to mention where we went to go fish for the normal whitefish up north, we got nothing but dirt. So it's almost like the fish were running away from the dirt. And it's weird, because the whitefish never left, they always just stayed around our area. We're talking Berens River, Matheson, Egg Island, Commissioner area. Like these whitefish just seemed to stay there. Before they used to go back up north. So it's almost to me like something covered up their food source, or pushed them out of their normal habitat. Something changed, and it was drastic, to push them and make a big move on a large species like that. So that's one thing that we noticed, and that was over three months. It was a huge change in fish. I mean there's lots of whitefish and lots of pickerel, but it's just the whitefish never was that thick around our area. And basically, they come overnight—that's kind of how thick they came.

During the MMF community meeting, some participants asked about why there had been so much flooding in recent years. One participant provided their observations of landscape changes that they felt has contributed to major flooding issues in Manitoba. They expressed their concern of the draining of farmland and the removal of natural drainage through the creation of man-made drainage ditches at the edges of farm fields. These drainage ditches cause mass flooding in the smaller creeks and rivers that feed into the major waterways in Manitoba, causing flash flooding.

Impacts from Development

In discussing changes and cumulative effects, interview participants identified a number of existing developments in the area surrounding Lake Manitoba, Lake St. Martin, and Lake Winnipeg that have impacted the environment and the Métis way of life.

I find it incredibly offensive that as the weeks, months and years go by. It gets more and more difficult to access lands where we don't have to get permission. Why do I have to get permission on lands that I have rights to, that are being sold out from underneath me. I do not understand that."

One interview participant emphasized that the amount of land available for Métis Nation citizens to access and exercise their rights within gets reduced further and further as time goes on, citing the privatization of land where Métis citizens hold rights as one reason. This loss of access to the land is significant for the Manitoba Métis given their connection to the lands and waters in addition to the s.35 rights they hold. The interview participant described this process as the "elimination of who we are and what we are."

> *I find it incredibly offensive that as the weeks, months and years go by. It gets more and more difficult to access lands where we don't have to get permission. Why do I have to get permission on lands that I have rights to, that are being sold out from underneath me. I do not understand that. It is abject colonization that is abetted by the federal government, through the provincial government because of business and private and personal interest. It's about social elimination of who we are and what we are. And it will continue to the end.*

Another prevalent source of cumulative effects identified by interview participants was the presence of Manitoba Hydro in rivers and waterways throughout the province causing adverse impacts, and their lack of communication with the Manitoba Métis.

> *You know, I don't like the way, I don't like the way Manitoba Hydro pushes the Métis community around, either. But, you know, they run the joint, so. If you know anything about Manitoba, and you look at, you can look at every single river, and every single waterway, and you'll see the hand of Manitoba Hydro somehow affecting it. And sometimes they screw up.*

During the MMF community meeting, some participants described how the control of water levels through dams has had lasting negative impacts on their ability to harvest and otherwise use the lands and waters. One participant spoke about the issues they had on Sipiwesk Lake and the Nelson River from Manitoba Hydro hydroelectricity projects. The noted that the controlled water levels could fluctuate by 13 ft, and when water levels were high the surrounding forests would flood. Fish would often get stuck in the forest when the water levels lowered again, impacting the harvesters' ability to fish in that area. This participant reflected on knowing what the water and land was supposed to look like, that is what it looked like before the dams were put in place. They said the younger generations have not had the chance to see how these places were naturally and all they experience is the destruction from rising and falling water levels.

Interview participants also highlighted the impacts of logging on the land and waters they use, contributing not only to the loss of habitat for wildlife but also an increasing amount of runoff into the surrounding waterways carrying pollutants and debris. One interview participant explained how the extensive logging of boreal forest has both destabilized the land and caused flooding.

> *It's unbelievable how the, the size, the mass size of the Porcupine Mountains and the Duck Mountains and [...] the trees, the value of the trees. So, they clear cut everything, then we get a big rain, washes everything away into these rivers, into these streams, mercury poisoning, everything comes right follows, all these rotting trees and bark and everything. [...] We'll get a big rain then all of the sudden the rivers are overbanked, overflooded, not just because of the debris, but the reason we're getting all this debris, and even up by Mafeking this side of the hill keeps collapsing on a highway now, cause there's no, there's no roots, there's no logs, there's no life up there. There's no more boreal forest holding everything together during the rains. [...] And because there's no trees or nothing to absorb all that water, they took them all, any rain, anything, fills up those buffer zone and all them trees now are dead and flooded, and there's nothing left for the birds there to nest on, nothing for the animals to hide in, nothing.*

Development activities directly in the Lake Manitoba, Lake St. Martin, and Lake Winnipeg areas have also impacted the lakes over time. One interview participant recalled their grandfather's experience with the construction of the causeway to Hecla Island on Lake Winnipeg, and how this disrupted the natural filtration system of the lake and contributed to the presence of algal blooms more recently.

> *But the biggest thing was for the—I didn't live through this, but my grandfather did, so he explained how this worked to me. It was the causeway that was built to Hecla Island. That is when he noticed a big change, because the water used to fluctuate through there, and algal blooms used get hung up on the weeds, and that would be the natural filter for Lake Winnipeg. And now they took that out of there, they made a road across there, and the water can't fluctuate through there. And then he noticed the algal blooms getting thicker in Lake Winnipeg after that.*

Métis Nation citizens also described a number of issues they've experienced with a water control structure on the Fairford River, and how this has greatly impacted fish and their ability to move between bodies of water. Interview participants explained how the development of this structure has disrupted thousands of fish because the fish ladders don't work for the species in the area.

> *I know they did that [control structure on the] Fairford River, like it sure messed up a lot of spawning for our lake there, when they put that bridge there. [...] They dredged the river and put a control structure in there and it sure messed everything up. Like if you go this time of year there's like thousands of fish trying to get into Lake Manitoba that are stuck there, 'cause they have fish ladders there, but they don't work.*
>
> *And the one good thing about that channel, if it's open, is the pickerel can get back into Lake Manitoba. With that Fairford dam, it's kind of shitty 'cause it's just basically a barricade. They say there's a fish ladder there but they're not salmon, they're pickerel. They can't jump up in that ladder and get onto the other side. It's, it's basically like a*

blockade for the fish. Can't even get back into Lake Manitoba. So a lot of them will go down, downstream and then can't get back up.

Interviewer: *Do you have any concerns for your commercial fishing regarding what they're proposing with the channels?*
Interviewee: *The Fairford Bridge, they figured that it wasn't gonna do anything that sure messed our lake up bad.*
Interviewer: *How did it mess up the lake?*
Interviewee: *The fish can go down, they can through the Fairford River when they spawn, but they can't get back. They go up to, they just keep going, like they got stuck at that bridge and they like literally you can go there, I don't know it it's this, I was there last year, and you could see thousands and thousands of fish stuck at that bridge trying to get through to Lake Manitoba, but they can't. They're just stuck there. They have fish ladders there, but they just don't, I guess they don't work, they're whatever something, something is not working anyway. People go there fishing, and they don't even, the fish don't have to bite the hook, they just snag them. There's so many.*

These experiences described by interview participants illustrate the effects of the many past and present physical activities in the region surrounding the proposed permanent outlet channels, and how they have impacted both the environment and Métis Nation citizens. Such activities include hydro development, logging, water control structures, and the development of other infrastructure though this is not an exhaustive list. The combination of changes and cumulative effects identified here should be considered in the assessment of impacts from the proposed outlet channels on the rights of Métis Nation citizens.

5.0 ISSUES OF CONCERN

The Métis Nation citizens interviewed for the purpose of this study expressed that although there are potential positives associated with the proposed Project, there are several outstanding issues, questions, and concerns associated with the current plans. Such issues have been identified by both interview participants and the MMF's technical review of this Project's Environmental Impact Statement (MMF, 2020). This section will summarize these outstanding issues of concern for the Métis Nation requiring further attention from both Manitoba Infrastructure and the IAAC.

5.1 PARTICIPANT-IDENTIFIED CONCERNS

While several interview participants acknowledged that there exists a need for enhanced flood management throughout the region surrounding Lake Manitoba, Lake Winnipeg, and Lake St. Martin, they also emphasized the need to address a number of issues of concern related to the environment, wildlife, Métis culture and consultation with the Métis Nation. The issues of concern that emerged from the interview process are summarized in this section.

Invasive Species

In constructing channels between Lake Manitoba and Lake St. Martin as well as between Lake St. Martin and Lake Winnipeg, one issue of concern raised by Métis Nation citizens was the presence of invasive species and potential for movement of these species between bodies of water. As described in Section 4.3.3 of this report, Métis Nation citizens who use and hold knowledge of the lands and waters surrounding the proposed Project identified invasive species in the area including carp and zebra mussels.

> *The big part, the negative, is going to be these invasive species that'll come through, right from the, you know. And that, and the destruction of the waterflow and the water levels, where that's going to affect not just the wildlife and the birds, but the fish and the everything I got that's going to be, like I say about their spawning beds where they, thousands of years right, and then they're going to drive them out, so. And it'll affect the [fishermen].*

Another interview participant expressed concerns related to the common carp specifically making its way into Lake Winnipeg from areas further south in Manitoba through the proposed channels.

> *Well, the common carp it's in every, it's in every lake in Manitoba. Or every southern lake in Manitoba, or river. I'm not concerned so much about it, but if there's any invasive species that gets in Lake Winnipeg it potentially can, would it be able to go straight across through these new diversions and go right to Lake Manitoba?*

Impacts to Fish and Waterways

As is evident in Sections 4.3.1 and 4.3.2 of this Study, the ability of Métis harvesters to fish the waters throughout the region surrounding the proposed outlet channel is critical to both exercising the s.35 rights that they hold for personal fishing as well as supporting their livelihoods through the commercial industry. Given these important connections, impacts to fish and fish habitat were a prevalent concern expressed by interview participants.

During the MMF community meeting, many participants were concerned about erosion issues and many spoke from past experiences with controlled water levels having lasting impacts on the shorelines of lakes and rivers in Manitoba. Some participants also spoke about their concern with the impacts that changing water levels may have to spawning. All of these changes may have broader impacts on commercial fishing by Métis Nation citizens in Manitoba. With changes to shorelines and spawning areas, participants were concerned about their ability to continue with commercial fishing noting that in the past they have lost whole species out of lakes because of man-made water control systems. One participant specifically referenced Fairford control structure on the Fairford River between Lake Manitoba and Lake St. Martin, noting that they were not consulted properly and have been impacted by the changes to the water levels.

One interview participant explained their concerns about potential disruptions to spawning areas from changing flow conditions, especially around Sturgeon Bay.

I would say there's a potential that it could cause an alteration or disruption to spawning in the whole bay there where the Dauphin River flows in Sturgeon Bay. You know, you see changes. […] The biota of any given area often evolve [with] respect to the conditions of that given area. Now with the change […] proposed for putting in [an] outlet there, it'll likely be either inducing or increasing current flow through that section of Sturgeon Bay. And myself, not being fully aware of how all of the various species of fish, ducks [and] all the different types of biota how they actually live in the area, how they relate to each area, if there's a change is hard to say. Because right now they've evolved in a certain [way] to live in that certain area because of the way that mother nature provides seasonal change, as well as waterflow and everything else.

Interview participants also expressed concerns related to changing water levels and the impact this may have on the nutrients that are released into the lake, explaining that without the natural temporary and periodic flooding of the area, the fish may face more issues reproducing.

One thing to keep in mind is when river lake levels come up it exposes a lot more land and even if it's on a temporary basis then what happens is that during that temporary flooding period in many cases, nutrients are released, and you get an explosion of different biota […] plankton and different things like that that fish feed on so often you get a fish explosion from periodic flooding. And what ends up happening if you eliminate that you might end up with somewhat of a more sterile lake potentially in the sense it might be sterile, and you don't have as much fish reproduction.

Additionally, interview participants expressed concerns related to fish passage and the ability of species to move between bodies of water. In addition to the concerns related to the Fairford River structure detailed in Section 4.3.5 where fish cannot move through the area, interview participants explained that they have other unanswered questions.

The negative would be that we're worried about the fish going up from Lake Winnipeg and going into Lake Manitoba. And then we're also worried about what's coming from Lake Manitoba and going into Lake Winnipeg. Are the fish going to be able to go back and forth? We're just kind of worried about that question, and nobody has answered that for us.

Impacts to Wildlife and Wildlife Habitat

Beyond fish and fish habitat, Métis Nation citizens also expressed concerns about potential impacts to other wildlife including birds, mammals and small fur-bearers that could result from changing their habitat and migration routes. Reducing flooding in some areas, for example, could decrease the amount of available nesting areas for birds such as duck and geese, and swampy areas for moose. As detailed throughout Section 4.3.1 and 4.3.3 many of these species, such as game birds and moose, are important to Métis culture and harvesting practices.

And again, not just the fish, I mean, when you take a look at things like ducks and geese, they prefer areas that are more or less continuously flooded, but in some cases they will take a periodically flooded area and raise their young to the point where they can at least fledge away from the nest and take advantage of that so there could be

some negative effects in respect to the hatching areas, the nesting areas of wetland gamebirds, you know? Primarily. And you know, just because we're controlling the flooding of the land a little bit more effectively, I'm not sure how many moose are in that area or anything like that, but they tend to like the swampy areas as well and once those areas start to dry up, they tend to move on a little bit as well until they can find better forage. Although, as land dries up, you'll probably see a lot more deer around that area.

But, you know, generally speaking, what I know is that the biology that is evolved within our particular ecosystem is generally well suited to the conditions within that ecosystem, and if you alter the ecosystem those finally balanced systems become out of balance and generally result in the elimination or extermination of species of plant and fish from those bodies.

One interview participant specifically emphasized that construction activities could have negative impacts on the elk population within the Study Area, citing how forestry activities in other areas of the province have already impacted the species.

Now that, that channel again, that's gonna be, elk are sensitive to, to construction. And it's, it's been seen in other places, you know? Like in the mountains and stuff, where they have forestry. […] I would think that, I'm a little concerned with it. You know, on a major construction project like this.

For some species, a critical element of their habitat includes migration routes or "game highways" they use to travel through different areas. As noted in Section 4.3.3 some species such as moose use the same routes for hundreds or thousands of years. One interview participant explained the importance of these routes and expressed concern that they could be fragmented by the proposed outlet channels and isolate the migratory wildlife.

The other concerns I have too in respect to creating this proposed [outlet channel] is of what may happen in respect to I guess game highways. Because what ends up happening, the more separations you put in between areas of relatively untouched wilderness. The animals don't tend to migrate the way they used to, and they become isolated. And to a certain extent, once these various animals become isolated, they're they become less viable as an entire population in an area. If you know what I mean?

The clearing of the proposed outlet channels themselves could also lead to the reduced availability of wildlife habitat, not only for animals but also plant species. One interview participant was concerned that clearing this amount of land for the channels could drive animals out of the area altogether.

I just realized that [taking] away habitat from animals how it'll drive them out of the area or, or almost make them extinct altogether. That's why how big of an area they're clearing like 20, 24 kilometres, or 26 kilometres on each end. That's even if it is only 400 yards wide or 300 yards wide. I mean, that's a lot of acres taken out of out of all habitats, not just moose or deer, whatever, I mean, keeping everything in general, plants, plants, flowers, even all that other stuff.

Impacts to Métis Culture and Land Use

Given the potential impacts to fish, wildlife, and the environment more generally, Métis Nation citizens were also concerned about how the proposed Project may impact Métis culture. As described in Section 4.3.4 the Manitoba Métis have historic and ancestral connections to the lands and waters throughout the Study Area, as well as the wider region surrounding the proposed outlet channels.

One interview participant explained how impacting the harvestability of an ecosystem would subsequently impact their Métis rights, not only at present but also for generations into the future through the elimination of accessible land.

> *Now, and just because, just because that area may not necessarily be frequented right now by Métis harvesters, it doesn't mean that it was not in the past, and it doesn't mean that it would not be in the future. But, if you eliminate the harvestability of that particular ecosystem, people will have no interest in going. […] So, basically, you know, the ideas that you try to preserve it for the future generations because you don't know what's gonna happen, and when you start eliminating the land that we have access to, you eliminate our rights. Because once we don't have the land anymore, we've lost 90 percent of our rights as Métis or Aboriginal people.*
>
> *I believe that we, need as Métis people, need to be able to maintain access over the land so that we don't get cut off further from the land and fact check the reasons for why things are being developed and how they're being developed.*

Interview participants also raised issues surrounding how the proposed outlet channels would be managed, and who would be making decisions surrounding the water levels.

Management of the Outlet Channels

Interview participants also raised issues surrounding how the proposed outlet channels would be managed, and who would be making decisions surrounding the water levels. One interview participant expressed concerns that the decision-making surrounding flood management would be political, and another about whether they would "flood out muskrats":

> *The Project would be positive, if it was managed properly. […] It'll fit whatever politician [is] in control at the time. And they'll always flood the place that's going to cost them less to flood.*
>
> *Well, the only thing I worry about is the lake levels, whether or not they can keep it controlled. Like if the water level is coming in too fast, are they able to control that? It just takes you back to whether they're going to flood out muskrats.*

Similarly, another interview participant emphasized that the water levels of the lakes should be agreed on from the outset of the Project and controlled automatically, instead of by a human.

> *I hope they get [the proposed permanent outlet channels] done. It has to be done, and I hope they get it done, because there'll be another flood coming. It's just a matter of when. So you've got to get ready for it. […] And the biggest thing I can ever tell anybody is have no human to do with the height of the lake. Build it at a certain level that everybody can agree on to keep Lake Manitoba at 812 feet, 813 feet, whatever it is. Once it hits that high, it'll automatically go. And I think that would solve a lot of our problems.*

During the MMF community meeting, some participants expressed that they were concerned about the future use of the Project site by Manitoba Hydro to control water levels for the purposes of supporting their hydro-electricity projects. They said would not want to see Lake Manitoba to be used a reservoir to control the water levels in Lake Winnipeg and that they were concerned about the possibility of allowing Manitoba Hydro to lower the water levels in Lake Manitoba even more. Participants also spoke about their concerns about the safety of the ice in the wintertime if there were changes to the ice from the water management. One participant noted that it needs to be safe for both animals and humans to cross without the risk of breaking through the ice.

Consultation with the Manitoba Métis

Underpinning the conversations with interview participants surrounding the proposed permanent outlet channels were issues related to a lack of meaningful consultation with the Manitoba Metis Federation, the duly elected representative of Métis citizens in Manitoba. Several interview participants emphasized the importance of this process.

> *Well, [the Métis in Manitoba] should be consulted every step of the way. They should be engaged with discussions and conversations on what's planned and proposed. That goes for the Indigenous population as well. Anybody that lives on the land or off the land around this area or that area should definitely be consulted and have an input.*

> *Just don't forget the people you're doing it for. Just try to include them in some of the decision-making or give it the appearance of it anyway. It goes a long way toward making people feel comfortable with what's happening, if they know what's happening.*

One interview participant explained how the current government of Manitoba specifically has not consulted adequately with the Métis, detailing their "one-sided" experience with poor communication, biased consultation and messaging, as well as frustration with the lack of recourse available through avenues like protesting when all else fails.

> ***Interviewer:*** *That's ok. Before we finish up, is there anything else you want to discuss or share with us?*
>
> ***Interviewee:*** *Just the fact that the current government doesn't consult with us. Maybe that.*

Interviewer: *I guess that's a good question. What do you think meaningful consultation would look like? What are your expectations for that?*

Interviewee: *Well, I think there should be consultation with both the province, the provincial side of it, and the federal side of it, because it's too one-sided right now. The way it's always been in the last few years here with the conservatives was they already had their mind made up before they came to the table, so it's just like there's no point having consultations, because they already have their agenda made up. So at least this way, if the federal was in it, it's going to be a non-biased meeting. So all parties would actually have a say, and you wouldn't get communities so much in an uproar at the end of the day, if this was non-biased. But if people would just listen to facts, then maybe we can work around certain obstacles together. Some people can maybe give a little and take a little on this side, and if you can communicate properly with these communities, it would probably go through without a hiccup. But it's probably to the point now where people are just saying no, because of the lack of consultation. They're just not communicating. I don't know how else to say it, because it's true. And then they go around to the media and tell everybody, "We talked to somebody, and everybody said it's ok." It's frustrating for these communities, and it's funny because how come the government put no barricades, or no protests? They don't want us to protest. Well, that was the only way we had to before. Like nobody wants to go to that extreme of protesting, but I mean, when we try every avenue, every politician, and every local MP, and nothing gets done, that's our only choice. But now they took that away in the last bill that Pallister's pushing through, so now everyone is really upset about this. That's all.*

While acknowledging the positive aspects of the proposed Project, interview participants expressed concern surrounding whether their identified issues and questions would be given due consideration in the assessment of this proposed Project, and whether they would follow through on recommendations and suggested measures such as compensation.

The problem is, is getting the appropriate bodies to do the right thing. There's nothing wrong in, as a concept, in having this drainage path. I get it, I think it makes sense. But if you sit back and you actually debate, ask the questions, talk about things and put the groundwork in place to try to minimize the disruptions and damage that are out there to try to maintain a healthy biosystem so that everybody will be able to reap the benefit of that down the road. That's where we have to go. But I have no desire to live anywhere else.

I know a lot of the things that go on are wrong and it's not to say that this Project is wrong. You have to do things at certain times, but I think that there's many times when due consideration is not necessarily being given. Things just go far enough where the concerned party's needs are met and that's good enough. Without actually taking it a little bit further to see what would really happen.

So, in the end I hope we're not just ticking off ticking boxes here, and that something of true value, meaningful value will come out of this for all of the parties involved you know. I hope that the government learns to correctly assess things, I mean they, we've

got the groundwork in place, but whether or not they're obligated to follow the recommendations is another thing. Whether or not they are willing to discuss recommendations that don't get followed and the potential ramifications of it, so that then okay, if this does happen, we need to look at doing this as compensation, as an example.

The data collected from interview participants detailed here shows there are a number of outstanding issues identified by Métis Nation citizens to be addressed related to the proposed Project. Notably, the lack of meaningful consultation with the Manitoba Métis as described has likely contributed to the existence of these issues outstanding at this stage in the Project.

5.2 OUTSTANDING TECHNICAL ISSUES

Outstanding technical issues are documented in the MMF report titled "Review of Lake Manitoba and Lake St. Martin Outlet Channels Project: Technical Review of the Updated Environmental Impact Statement (May 15, 2020)". For reference this report has been included in Appendix A.

6.0 CONCLUSIONS AND RECOMMENDATIONS

This Métis Knowledge, Land Use and Occupancy Study has provided Manitoba Infrastructure and IAAC with data surrounding Métis Nation citizens' use and knowledge of the Study Area identified for the proposed permanent outlet channels Project. As detailed in Section 3.0 of this report, this information should not be considered an exhaustive record of the Métis Nations' traditional land and resource use in the area.

The results of this Métis Knowledge, Land Use and Occupancy Study, and the quotations from Métis Nation citizens presented throughout, demonstrate that Métis Nation citizens both use and occupy the lands and waters within and surrounding the Study Area. The Project is of concern to the MMF as it intersects with the MMF Interlake and Northwest Regions and may affect the Southeast Region that borders Lake Winnipeg including areas of Métis land use. This evidence also suggests that any adverse environmental impacts resulting from the proposed outlet channels, such as impacts to fish, wildlife, water, and more, have the potential to impact the rights, claims, and interests of the Manitoba Métis.

This study also identifies a number of outstanding issues of concern related to the proposed Project which have not been adequately addressed by Manitoba Infrastructure, or through the Environmental Assessment process to date. Issues identified through the MMF's review of the EIS found in Appendix A are supported by the findings of this Study, including issues related to invasive species, fish and fish habitat, wildlife and wildlife habitat, water quality and flow, the management of the outlet channels as well as the lack of consultation with the MMF.

Both the MMF's technical review of the EIS and this Métis Knowledge, Land Use and Occupancy Study have identified a failure to appropriately consult with the Métis Nation's Manitoba Métis

Manitoba should establish a forum and process with the MMF where issues regarding the Project can be brought forward, discussed, and addressed throughout the life of the Project. This forum/process can facilitate the involvement of the MMF in ongoing permitting and approvals related to the Project and should include the provision of capacity funding to MMF to support this process.

Community by meaningfully engaging with the MMF and discussing both potential impacts to Métis rights from the Project, and reasonable mitigation or accommodation measures for such impacts. Each of the issues raised by the MMF must be accurately and adequately considered in the environmental assessment process and, where applicable, resolved through additional mitigation, accommodation, and compensation measures agreed upon with the MMF.

The following are the recommendations from the MMF for moving forward with this Project:

- Manitoba Infrastructure must formally and functionally acknowledge MMF jurisdiction, sovereignty, rights, claims, and interests and the related requirements for consultation and engagement moving forward with the proposed Project. This must be done within Manitoba Infrastructure's Environmental Assessment documentation.
- Manitoba should commit to meaningful consultation with the MMF and involvement of the MMF in future planning, decision making, licensing, and monitoring of developments that are enabled by the Project.
- Manitoba should establish a forum and process with the MMF where issues regarding the Project can be brought forward, discussed, and addressed throughout the life of the Project. This forum/process can facilitate the involvement of the MMF in ongoing permitting and approvals related to the Project and should include the provision of capacity funding to MMF to support this process.
- To increase understanding of how the Manitoba Métis have been or will be impacted by the proposed Project, further study, including field interviews and ground-truthing areas with Métis land users, is required. This will ensure the most appropriate site-specific mitigation and accommodation measures can be developed for these areas. As mentioned, the MMF plan to undertake these activities in the coming months. Manitoba Infrastructure must engage with the MMF to evaluate how this information will be incorporated into the Project to inform mitigation, management, and compensation measures.
- Manitoba Infrastructure should continue to engage the MMF about the issues of concern expressed by the Manitoba Métis outlined in Section 5.0 of this document, as there remain

unanswered questions and unaddressed concerns. Meaningful ongoing engagement and consultation with the MMF may also help to reduce concerns.

- Manitoba Infrastructure should work with Métis citizen scientists and harvesters, including commercial fishers, to collect baseline data surrounding the existing conditions of Lake Manitoba, Lake St. Martin, and Lake Winnipeg. Through the life of the proposed Project, Manitoba Infrastructure should work with these groups to monitor conditions and impacts on an ongoing basis and report the findings to the MMF at regular intervals.
- Manitoba Infrastructure and the MMF should negotiate agreements to address impacts of the Project on the rights, claims and interests of the Manitoba Métis, and to support the MMF's participation in environmental and cultural monitoring throughout the life of the Project. Components of this agreement should include (but not be limited to):
    - Funding for MEK and ground-truthing studies
    - Hiring and training of MMF environmental and cultural monitors for all phases of the Project
    - Annual reporting to the MMF on results of monitoring and any adaptive management measures being implemented
- Manitoba Infrastructure should provide Métis citizens, through consultation with the MMF, with economic opportunities related to the proposed Project including:
    - A procurement target for goods and services to be provided by Métis businesses
    - Employment targets for Métis citizens

7.0 REFERENCES

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APPENDIX A: REVIEW OF LAKE MANITOBA AND LAKE ST. MARTIN OUTLET CHANNELS PROJECT – TECHNICAL REVIEW OF THE UPDATED ENVIRONMENTAL IMPACT STATEMENT

Review of Lake Manitoba and Lake St. Martin Outlet Channels Project

Technical Review of the Updated Environmental Impact Statement

May 22, 2020

Manitoba Metis Federation

Summary and Recommendations

The Manitoba Metis Federation (MMF) has completed a review of the updated Environmental Impact Statement (EIS) for the Lake Manitoba and Lake St. Martin Outlet Channels project (the Project). This review includes an evaluation of how the potential effects of the Project may impact the rights, claims, and interests of the Manitoba Métis Community (MMC). In our review, we have provided **30 specific comments with related recommendations on the EIS** in the areas of the water resources and fish and fish habitat. These comments have focused on all phases of the Project. We have also evaluated how issues raised by the MMF during the review of the Lake St. Martin Emergency Outlet Channel have been incorporated and addressed by Manitoba Infrastructure (MI or the Proponent) as part of planning for the Project (or not).

In general, we have identified inadequacies with respect to certain baseline characterization (e.g. fish productivity), the effects assessment, monitoring plans, and mitigation measures. Moreover, we have identified a failure to appropriately consult with the MMC by meaningfully engaging with the MMF and discussing both potential impacts to Métis rights from the Project, and reasonable mitigation or accommodation measures for such impacts. In addition to the specific comments included in this review, we are putting forward the following high-level recommendations to guide future discussions for addressing the concerns raised in our review:

1. MI to provide written responses to each comment raised as part of this review and impact assessment. Responses should include specific information and actions to be taken by MI to ensure resolution of the issue. Where MI disagrees with specific recommendations, a substantial rationale and alternative recommendation should be given. To facilitate this process, we have included a tracking table with all comments and recommendations described in this report (Appendix A).

2. MI to establish a forum and process with Manitoba and the MMF where issues regarding the Project can be brought forward, discussed, and addressed throughout the life of the Project (including the provision of capacity funding to MMF to support this process). This forum/process can facilitate the involvement of the MMF in ongoing permitting and approvals related to the Project.

3. To further understand how the Métis Nation's MMC has been or will be impacted by changes to the Project Area, further studies, including Métis ecological knowledge (MEK) studies and groundtruthing areas with Métis land users, is needed. The Proponent must the engage with the MMF to evaluate how this information can be incorporated into the Project to inform mitigation, management and compensation.

4. MMF and MI to negotiate agreements to address impacts of the Project on MMC rights, claims and interest and to support MMF's participation in environmental and cultural monitoring throughout the life of the Project. Components of this agreement should include (but not be limited to):
   - Funding for MEK and groundtruthing studies;

- Hiring and training of MMF environmental and cultural monitors for all phases of the Project; and
- Annual reporting to the MMF on results of monitoring and any adaptive management measures being implemented.

5. Manitoba should commit to meaningful consultation with the MMC and involvement of the MMF in future planning, decision making, licensing, and monitoring of developments that are enabled by the Project.

Table of Contents

1.0 Introduction

The Manitoba Metis Federation (MMF), with support from Shared Value Solutions (SVS), has completed a review and impact assessment of the updated Environmental Impact Statement (EIS) for the Lake Manitoba and Lake St. Martin Permanent Outlet Channels Project (the Project). This review builds on a previous comments completed on the of the Lake St. Martin Emergency Outlet Channel Environment Act Proposal (EAP) Report by the MMF (MMF, 2018) and by a technical review of the updated EIS for the Permanent Outlet Channels completed by Dr. Nicholas Mandrak (Mandrak, 2020). The objectives of our review are outlined below:

- Evaluate the adequacy of changes/updates to the EIS with regards to issues and recommendations that have been previously identified to the Proponent (Manitoba Infrastructure [MI]);
- Identify other changes to the updated EIS which would represent acceptable solutions to outstanding issues;
- Where issues have been addressed by MI, they have been labelled "addressed." Outstanding issues are labelled either "partially addressed" or "not addressed." Additional context is provided on all issues where applicable;
- Identify any additional environmental and technical issues with the updated EIS, and provide recommendations on where and how Manitoba Métis Community's (MMC) rights, claims and interests may need to be better accommodated through revisions and additions to the Final EIS and Project plan; and
- Identify issues and challenges with the Project that will require ongoing engagement and consultation with MMF on behalf of the MMC.

The Project is of concern to the MMF as it intersects with the MMF Interlake and Northwest Regions and may affect the Southeast Region that borders Lake Winnipeg including areas of Metis Land-Use, Occupancy, and Traditional Ecological Knowledge including hunting, fishing, trapping, gathering, and cultural and occupancy sites. For these reasons, the MMF is concerned that environmental effects of the Project may impact the rights, claims and interests of the MMC.

1.1 Project Description

Flooding in the Lake St. Martin region has been an ongoing challenge for residents, land-users, businesses, and municipalities; all of which include citizens of the MMC. Flooding in 2011 resulted in the long-term evacuation or several communities and the construction of the Emergency Outlet Channel, which is slated to be replaced by the current Project. The total economic costs of the 2011 flood have been estimated at $1.2 billion (Manitoba Infrastructure, 2020). To develop a permanent flood control system, MI has proposed to develop two permanent outlet channels which would be used to divert water during periods of flood. The purpose of these channels is to facilitate the transfer of water from Lake Manitoba through Lake St. Martin and into Lake Winnipeg (Figure 1). A detailed planning and design process was used to evaluated several alternative route alignments and designs, culminating in the current preferred option.

The Lake Manitoba Outlet Channel (LMOC) is a 24.1 km, 100 m wide channel that would connect Lake Manitoba to Lake St. Martin. The Lake St. Martin Outlet Channel (LSMOC) is a 23.8 km, 120 m wide channel that would connect Lake St. Martin to Sturgeon Bay on Lake Winnipeg. Each outlet channel would be operated using a water control system that is operated at the upstream end, which would allow water to enter the floodways under flood conditions, as established by guidelines prepared by the Lake Manitoba and Lake St. Martin Regulation Review Committee. The total estimated cost of the Project is $540 million, which will be shared between the Province of Manitoba and the Government of Canada. Associated with the Project are combined bridge and water control structures for each channel, the realignment of Provincial Road 239, three bridges over the LMOC, drop structures at the downstream end of the LSMOC and other associated works including quarries, work camps, and electrical wires.

The Project is undergoing a federal Environmental Assessment under the Canadian Environmental Assessment Act (CEAA, 2012). Guidelines for the preparation of the EIS were shared by the Impact Assessment Agency of Canada (formerly the Canadian Environmental Assessment Agency) on May 15, 2018. In addition to the federal Environmental Assessment, the Project is simultaneously undergoing an application for a 'Class 3' application under *The Environment Act* of Manitoba. Several provincial and federal permits, including work permits, quarry permits, burn permits, etc. will also be required for construction and operation phases of the Project.

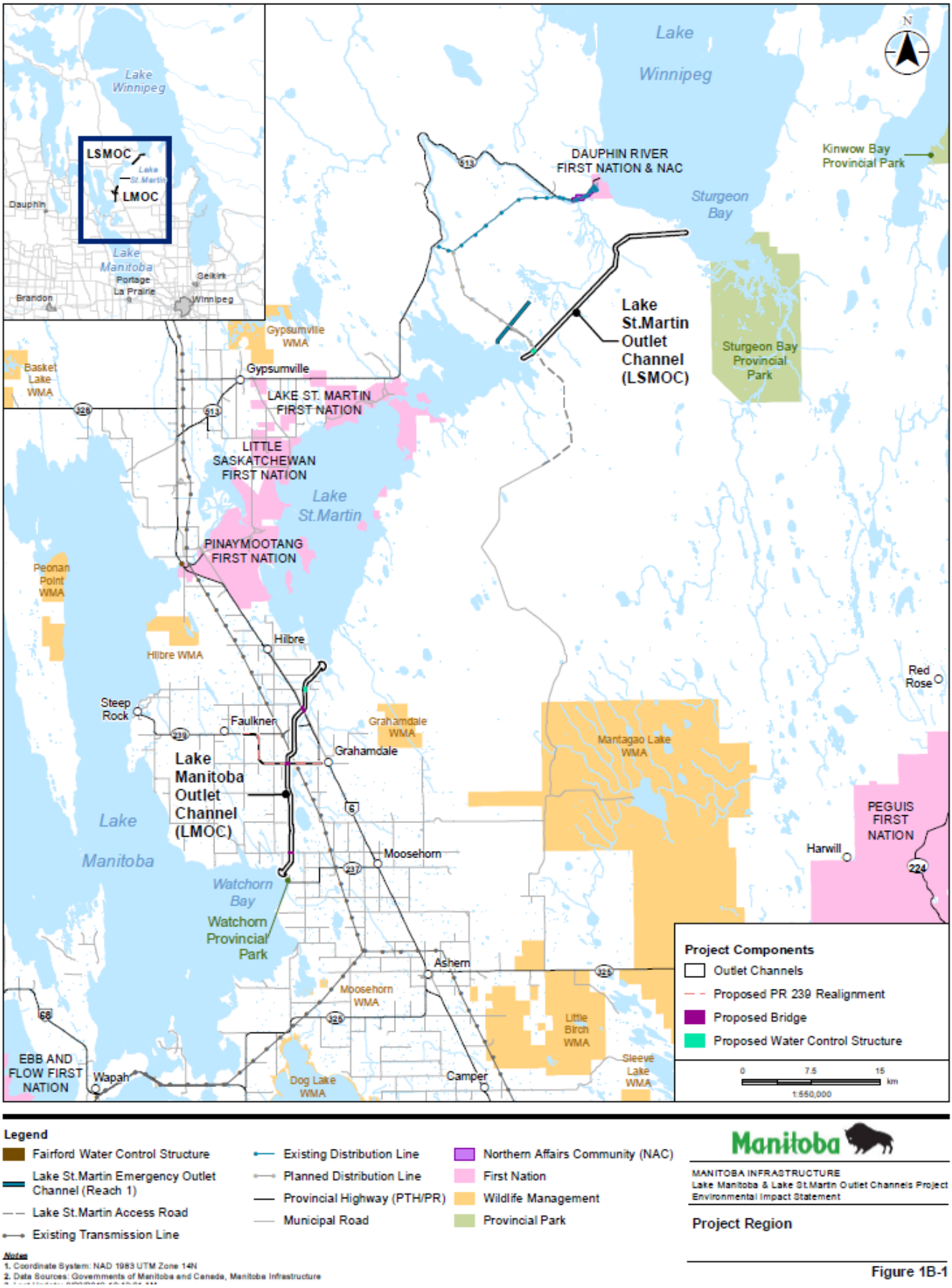


Figure 1. Project location and layout (Manitoba Infrastructure, 2020)

1.2 Methodology and Scope

The reviews completed by the MMF and SVS consider the entire area of the Project and any potential effects, including cumulative effects, with a focus on evaluating the changes made by MI to the new EIS documents. The majority of issues related to the impacts of the Project on aquatic ecosystems are adapted from a report completed by Dr. Mandrak for the MMF (Mandrak, 2020) (see Appendix B). The MMF and SVS analyzed the connections between proposed activities and potential risks and impacts to the MMC. In our review, we have:

- assessed adequacy of baseline information and data, effects assessment, mitigation, management, and monitoring plans;
- assessed adequacy of information provided in the EIS;
- evaluated the use of local knowledge, Métis Knowledge and land use incorporated in the EIS; and
- evaluated the changes made by MI to the updated EIS since submission of previous comments made on the EAP and original EIS document.

Using the results of the review, we have assessed previous comments brought forth in the EAP application for the Lake St. Martin Emergency Outlet Channel (where applicable) and the original EIS and provided specific recommendations to address the remaining and any new issues and concerns, which we believe are representative of the MMC's values, rights, and interests (Section 2.0). Our recommendations include best practice mitigations, management and monitoring plans for respective subject areas. These issues and recommendations reflect potential impacts from the Project on the MMC's rights, claims and interests, and are meant to inform the priority issues for resolution/accommodation. The review was completed by focusing on the following categories of concern:

Section 4.1 Water Resources

Section 4.2 Fish, Fish Habitat, and the Aquatic Environment

2.0 Manitoba Métis Community

History and Identity

The Métis Nation—as a distinct Indigenous people—evolved out of relations between European men and First Nations women who were brought together as a result of the early fur trade in the Northwest. In the eighteenth century, both the Hudson Bay Company and the Northwest Company created a series of trading posts that stretched across the upper Great Lakes, through the western plains, and into the northern boreal forest. These posts and fur trade activities brought European and Indigenous peoples into contact. Inevitably, unions between European men—explorers, fur traders, and pioneers—and Indigenous women were consummated. The children of these families developed their own collective identity and political community so that "[w]thin a few generations, the descendants of these unions developed a culture distinct from their European and Indian forebears" and the Métis Nation was born—a new people, indigenous to the western territories *(Alberta (Aboriginal Affairs and Northern Development) v. Cunningham*, [2011] 2 SCR 670 at para. 5; 2008 MBPC *R. v. Goodon*, 59 at para. 25;

Manitoba Metis Federation Inc. v. Canada (Attorney General), [2013] 1 SCR 623 at para. 2).

The Métis led a mixed way of life. "In early times, the Métis were mostly nomadic. Later, they established permanent settlements centered on hunting, trading and agriculture" (*Alberta v. Cunningham*, at para. 5). The Métis were employed by both of the fur trades' major players, the Hudson's Bay and Northwest companies. By the early 19th century, they had become a major component of both firms' workforces. At the same time, however, the Métis became extensively involved in the buffalo hunt. As a people, their economy was diverse; combining as it did, living off the land in the Aboriginal fashion with wage labour (*MMF Inc. v. Canada*, at para. 29).

It was on the Red River, in reaction to a new wave of European immigration, that the Métis Nation first came into its own. Since the early 1800s, the MMC—as a part of the larger Métis Nation—has asserted itself as a distinct Indigenous collective with rights and interests in its Homeland. The MMC shares a language (Michif), national symbols (infinity flags), culture (i.e., music, dance, dress, crafts), as well as a special relationship with its territory that is centered in Manitoba and extends beyond the present-day provincial boundaries.

The MMC has been recognized by the courts as being a distinctive Indigenous community, with rights that are protected in section 35 of the *Constitution Act, 1982*. In *Goodon*, the Manitoba court held that:

The Métis community of Western Canada has its own distinctive identity […] the Métis created a large inter-related community that included numerous settlements located in present-day southwestern Manitoba, into Saskatchewan and including the northern Midwest United States. This area was one community […] The Métis community today in Manitoba is a well-organized and vibrant community (paras. 46-47; 52).

This proud independent Métis population constituted a historic rights-bearing community in present day Manitoba and beyond, which encompassed "all of the area within the present boundaries of southern Manitoba from the present-day City of Winnipeg and extending south to the United States" (*R. v. Goodon*, at para. 48).

The heart of the historic rights-bearing Métis community in southern Manitoba was the Red River Settlement; however, the MMC also developed other settlements and relied on various locations along strategic fur trade routes. During the early part of the 19th century, these included various posts of varying size and scale spanning the Northwest Company and the Hudson Bay Company collection and distribution networks.

More specifically, in relation to the emergence of the Métis—as a distinct Aboriginal group in Manitoba—the Supreme Court of Canada wrote the following in the *MMF Inc. v. Canada* case:

[21] The story begins with the Aboriginal peoples who inhabited what is now the province of Manitoba—the Cree and other less populous nations. In the late 17th century, European adventurers and explorers passed through. The lands were claimed nominally by England which granted the Hudson's Bay Company, a company of fur traders' operation of out London, control over a vast territory called Rupert's Land, which included modern Manitoba. Aboriginal peoples continued to occupy the territory. In addition to the original First Nations, a new Aboriginal group, the Métis, arose—people descended from early unions between European adventurers and traders, and Aboriginal women. In the early days, the descendants of English-speaking parents were referred to as half-breeds, while those with French roots were called Métis.

[22] A large—by the standards of the time—settlement developed at the forks of the Red and Assiniboine Rivers on land granted to Lord Selkirk by the Hudson's Bay Company in 1811. By 1869, the settlement consisted of 12,000 people, under the governance of Hudson's Bay Company.

[23] In 1869, the Red River Settlement was a vibrant community, with a free enterprise system and established judicial and civic institutions, centred on the retail stores, hotels, trading undertakings and saloons of what is now downtown Winnipeg. The Métis were the dominant demographic group in the Settlement, comprising around 85 percent of the population [approximately 10,000 Métis], and held leadership positions in business, church and government.

The fur trade was vital to the ethnogenesis of the Métis and was active in Manitoba from at least the late 1770s, and numerous posts and outposts were established along cart trails and waterways throughout the province. These trails and waterways were crucial transportation networks for the fur trade (Jones 2014; Figure 2) and were the foundation of the MMC's extensive use of the lands and waters throughout the province. In the early 20th century, the MMC continued to significantly participate in the commercial fisheries and in trapping activities, which is well documented in Provincial government records.

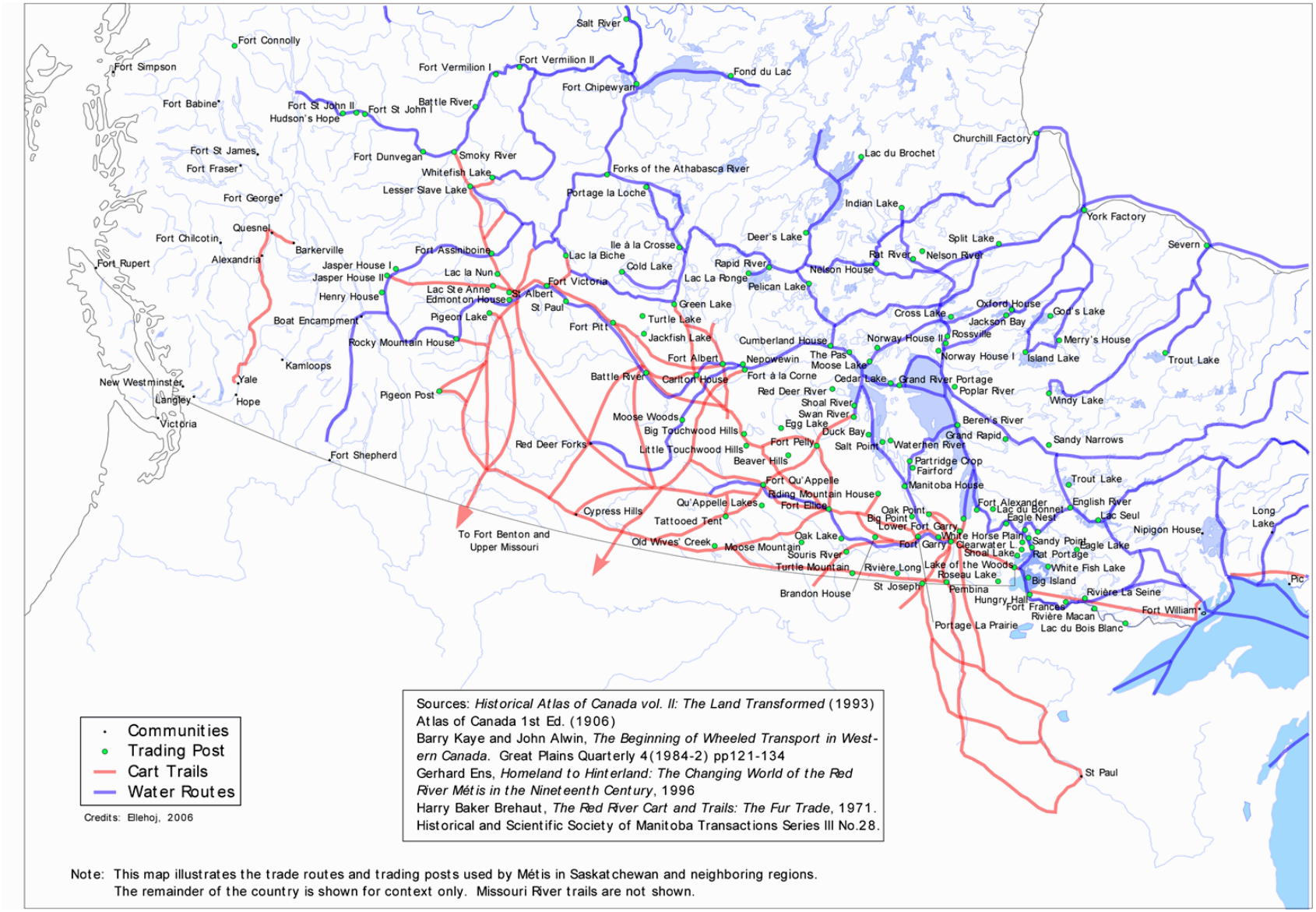


Figure 2. The Fur Trade Network: Routes and Posts Prior to 1870

Manitoba Metis Federation

The MMF is the democratically elected government of the Métis Nation's MMC. The MMF is duly authorized by the Citizens of the MMC for the purposes of dealing with their collective Métis rights, claims, and interests, including conducting consultations and negotiating accommodations (as per MMF Resolution No. 8). While the MMF was initially formed in 1967, its origins lie in the 18th century with the birth of the MMC and in the legal and political structures that developed with it. Since the birth of the Métis people in the Red River Valley, the MMC—as a part of the larger Métis Nation—has asserted and exercised its inherent right of self-government. The expression of this self-government right has changed over time to continue to meet the needs of the MMC. For the last 50 years, the MMF has represented the MMC at the provincial and national levels.

During this same period, the MMF has built a sophisticated, democratic, and effective Métis governance structure that represents the MMC at the local, regional, and provincial levels throughout Manitoba. The MMF was created to be the self-government representative of the MMC—as reflected in the Preamble of the MMF's Constitution (also known as the MMF Bylaws):

WHEREAS, the Manitoba Metis Federation Inc. has been created to be the democratic and self-governing representative body of the Manitoba Métis Community.

In addition, the purpose "to provide responsible and accountable governance on behalf of the MMC using the constitutional authorities delegated by its citizens" is embedded within the MMF's objectives, as set out in the MMF Constitution as follows:

I. To promote and instill pride in the history and culture of the Métis people.

II. To educate members with respect to their legal, political, social and other rights.

III. To promote the participation and representation of the Métis people in key political and economic bodies and organizations.

IV. To promote the political, legal, social and economic interests and rights of its citizens.

V. To provide responsible and accountable governance on behalf of the Manitoba Métis community using the constitutional authorities delegated by its members.

The MMF is organized and operated based on centralized democratic principles, some key aspects of which are described below.

President: The President is the Chief Executive Officer, leader, and spokesperson of the MMF. The President is elected in a province-wide ballot-box election every four years and is responsible for overseeing the day-to-day operations of the MMF.

Board of Directors: The MMF Board of Directors, or MMF Cabinet leads, manages, and guides the policies, objectives, and strategic direction of the MMF and its subsidiaries. All 23 individuals are democratically elected by the citizens.

Regions: The MMF is organized into seven regional associations or "Regions" throughout the province (Figure 3): The Southeast Region, the Winnipeg Region, the Southwest Region, the Interlake Region, the Northwest Region, the Pas Region, and the Thompson Region. Each Region is administered by a Vice-

President and two executive officers, all of whom sit on the MMF's Cabinet. Each Region has an office which delivers programs and services to their specific geographic area.

Locals: Within each Region are various area-specific "Locals" which are administered by a chairperson, a vice-chairperson and a secretary-treasurer. Locals must have at least nine citizens and meet at least four times a year to remain active. There are approximately 140 MMF Locals across Manitoba.

While the MMF has created an effective governance structure to represent the MMC at the local, regional, and provincial levels, it is important to bear in mind that there is only one large, geographically dispersed, MMC. Citizens of the MMC live, work and exercise their s. 35 rights throughout and beyond the province of Manitoba.

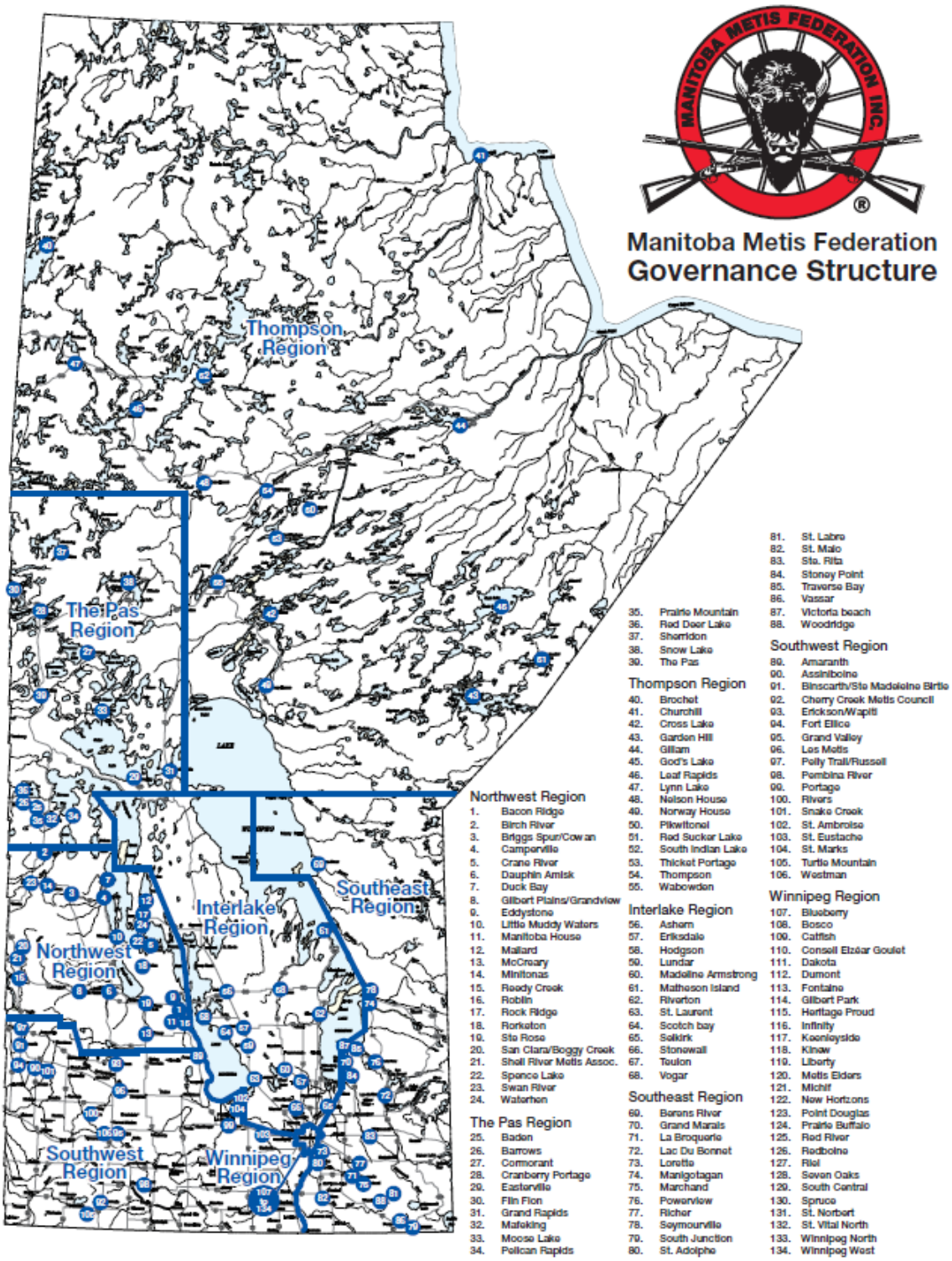


Figure 3. Manitoba Metis Federation (MMF) Regions

MMF Resolution No. 8

Among its many responsibilities, the MMF is authorized to protect the Aboriginal rights, claims, and interests of the Métis Nation's MMC, including as related to harvesting, traditional culture, and economic development, among others.

In 2007, the MMF Annual General Assembly unanimously adopted Resolution No. 8 that sets out the framework for engagement, consultation, and accommodation to be followed by Federal and Provincial governments, industry, and others when making decisions and developing plans and projects that may impact the MMC. Under MMF Resolution No. 8, direction has been provided by the MMC for the MMF Home Office to take the lead and be the main contact on all consultation undertaken with the MMC. Resolution No. 8 reads, in part that:

…this assembly continue[s] to give the direction to the Provincial Home Office to take the lead and be the main contact on all consultations affecting the Métis community and to work closely with the Regions and Locals to ensure governments and industry abide by environmental and constitutional obligations to the Métis…

The MMF Home Office works closely with the Regions and Locals to ensure the rights, interests, and perspective of the MMC are effectively represented in matters related to consultation and accommodation.

Resolution No. 8 has five phases:

Phase 1: Notice and Response

Phase 2: Funding and Capacity

Phase 3: Engagement or Consultation

Phase 4: Partnership and Accommodation

Phase 5: Implementation

Each phase is an integral part of the Resolution No. 8 framework and proceeds logically through the stages of consultation.

Manitoba Métis Community Rights, Claims, and Interests

The MMC possesses Aboriginal rights, including pre-existing Aboriginal collective rights and interests in lands recognized and affirmed by section 35 of the *Constitution Act, 1982*, throughout Manitoba. The Manitoba court recognized these pre-existing, collectively held Métis rights in *R. v. Goodon* (at paras. 58; 72):

I conclude that there remains a contemporary community in southwest Manitoba that continues many of the traditional practices and customs of the Métis people.

I have determined that the rights-bearing community is an area of southwestern Manitoba that includes the City of Winnipeg south to the U.S. border and west to the Saskatchewan border.

As affirmed by the Supreme Court of Canada, such rights are "recognize[d] as part of the special aboriginal relationship to the land" (*R. v. Powley,* 2003 SCC 43, at para. 50) and are grounded on a "communal Aboriginal interest in the land that is integral to the nature of the Métis distinctive community and their relationship to the land" (*MMF Inc. v. Canada*, at para. 5). Importantly, courts have also recognized that Métis harvesting rights may not be limited to Unoccupied Crown Lands (*R. v. Kelley*, 2007 ABQB 41, para. 65).

The Crown, as represented by the Manitoba government, has recognized some aspects of the MMC's harvesting rights through a negotiated agreement: The *MMF-Manitoba Points of Agreement on Métis Harvesting* (2012) (the *MMF-Manitoba Harvesting Agreement*). This Agreement was signed at the MMF's 44th Annual General Assembly and "recognizes that collectively-held Métis Harvesting Rights, within the meaning of s. 35 of the *Constitution Act, 1982*, exist within the [Recognized Métis Harvesting Zone], and that these rights may be exercised by Métis Rights Holders consistent with Métis customs, practices and traditions…" (*MMF-Manitoba Harvesting Agreement*, section 1). In particular, the *MMF-Manitoba Harvesting Agreement* recognizes that Métis rights include "hunting, trapping, fishing and gathering for food and domestic use, including for social and ceremonial purposes and for greater certainty, Métis harvesting includes the harvest of timber for domestic purposes" throughout an area spanning approximately 169,584 km² (the "Métis Recognized Harvesting Area") (*MMF-Manitoba Harvesting Agreement*, section 2; Figure 4 below). The MMF further asserts rights and interests beyond this area, which require consultation and accommodation as well.

Beyond those rights already established through litigation and recognized by agreements, the MMC claims commercial and trade-related rights. Courts have noted that Métis claims to commercial rights remain outstanding (*R. v. Kelley* at para. 65). These claims are strong and well-founded in the historical record and the customs, practices, and traditions of the MMC, and it is incumbent on the Crown and Proponents to take them seriously.

As noted above, the MMC has its roots in the western fur trade (*R. v. Blais*, 2003 SCC 44 at para. 9 [*Blais*]; *R. v. Goodon* at para. 25). The Métis in Manitoba are descendants of early unions between Aboriginal women and European traders (*MMF Inc. v. Canada* at para. 21). As a distinct Métis culture developed, the Métis took up trade as a key aspect of their way of life (*R. v. Powley* at para. 10). Many Métis became independent traders, acting as middlemen between First Nations and Europeans (*R. v. Goodon* at para. 30). Others ensured their subsistence and prosperity by trading resources they themselves hunted and gathered (*R. v. Goodon* at para. 31, 33, & 71). By the mid-19th century, the Métis in Manitoba had developed the collective feeling that "the soil, the trade and the Government of the country [were] their birth rights." (*R. v. Goodon* at para. 69(f)). Commerce and trade are, and always have been, integral to the distinctive culture of the MMC. Today, the Manitoba Métis have an Aboriginal, constitutionally protected right to continue this trading tradition in modern ways to ensure that their distinct community will not only survive, but also flourish.

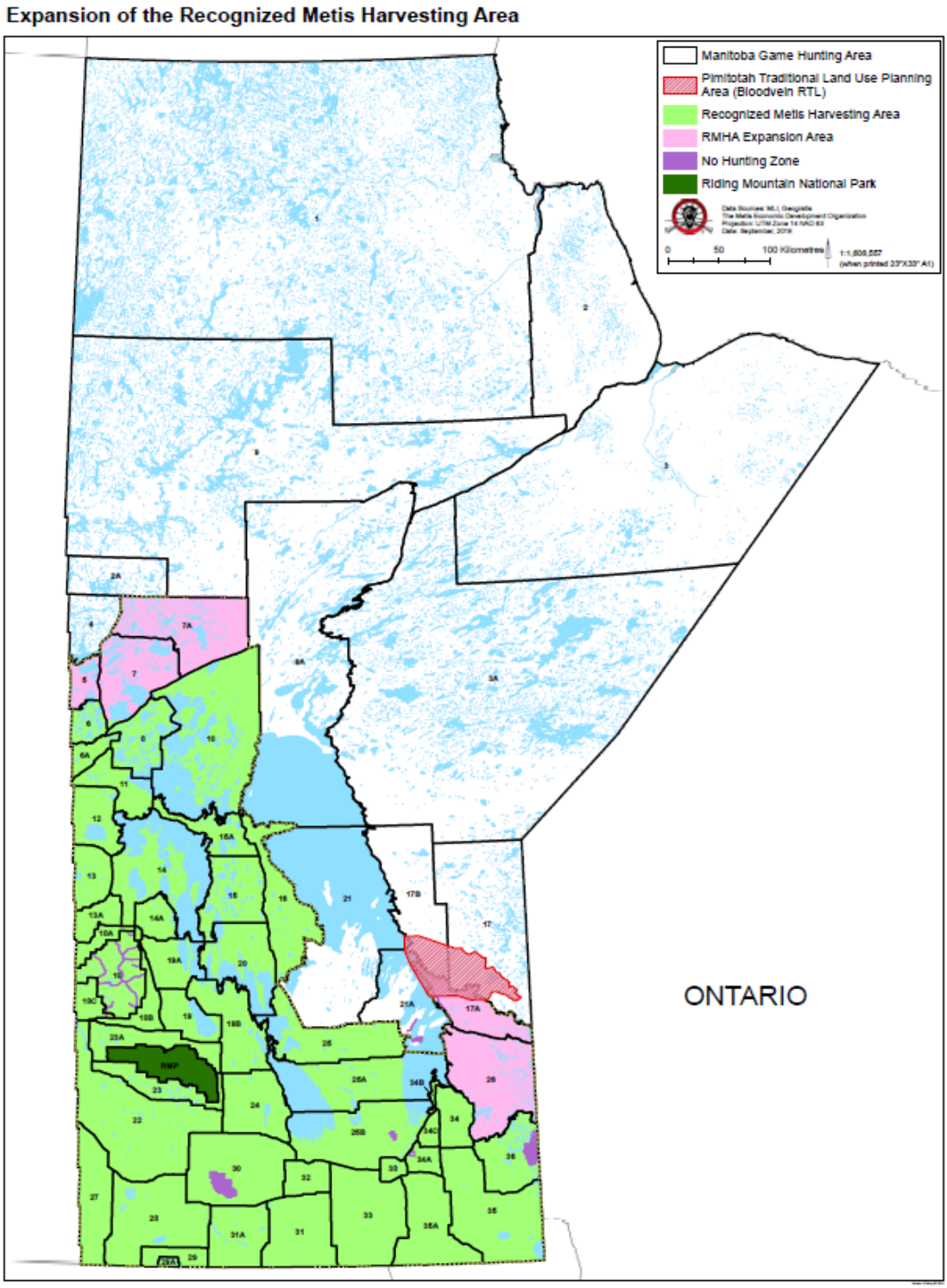


Figure 4. MMF-Manitoba Harvesting Agreement Recognized Manitoba Métis Harvesting Zones (Green and Pink)

Unlike First Nations in Manitoba, whose commercial rights were converted and modified by treaties and the *Natural Resources Transfer Agreement* (*NRTA)* (*R. v. Horseman*, [1990] 1 SCR 901), the Métis' pre-existing customs, practices, and traditions—including as they relate to commerce and trade—were not affected by the *NRTA* (*R. v. Blais*) and continue to exist and be protected as Aboriginal rights. First Nations' treaty rights in Manitoba are, for example, inherently limited by the Crown's power to take up lands (*Mikisew Cree First Nation v Canada* (*Minister of Canadian Heritage*), [2005] 3 SCR 388 at para 56). Métis rights, in contrast, are not tempered by the "taking up" clauses found in historic treaties with First Nations. Métis rights must be respected as they are, distinct from First Nations' rights and unmodified by legislation or agreements.

In addition to the abovementioned rights to land use that preserve the Métis culture and way of life, the MMF has other outstanding land related claims and interests with respect to lands. Specifically, these claims relate to the federal Crown's constitutional promise to all Aboriginal peoples, including Manitoba Métis, as set out in the Order of Her Majesty in Council Admitting Rupert's Land and the North-Western Territory into the Union (the "1870 Order") which provides

that, upon the transference of the territories in question to the Canadian Government, the claims of the Indian tribes to compensation for lands required for purposes of settlement will be considered and settled in conformity with the equitable principles which have uniformly governed the British Crown in its dealings with the aborigines.

The manner in which the federal Crown implemented this constitutional promise owing to the Manitoba Métis—through the *Dominion Lands Act* and the resulting Métis scrip system—effectively defeated the purpose of the commitment. Accordingly, the MMF claims these federal Crown actions constituted a breach of the honour of the Crown, which demand negotiations and just settlement outside of the 'old postage stamp province' within Manitoba as well.

The MMF also claims that the *Dominion Lands Act* and the resulting Métis scrip system were incapable of extinguishing collectively held Métis title in specific locations where the MMC is able to meet the legal test for Aboriginal title as set out by the Supreme Court of Canada. These areas in the province, which the Manitoba Métis exclusively occupied—as an Indigenous people—prior to the assertion of sovereignty, establish a pre-existing Métis ownership interest in these lands.

The MMF also has an outstanding legal claim within what was the 'old postage stamp province' of Manitoba relating to the 1.4 million acres of land promised to the children of the Métis living in the Red River Valley, as enshrined in s. 31 of the *Manitoba Act, 1870* (*MMF Inc. v. Canada* at para 154).

This land promised was a nation-building, constitutional compact that was meant to secure a "lasting place in the new province [of Manitoba]" for future generations of the Métis people (*MMF Inc. v. Canada* at para 5). This "lasting place" was to have been achieved by providing the MMC a "head start" in securing lands in the heart of the new province (*MMF Inc. v. Canada* at paras 5-6).

Instead, the federal Crown was not diligent in its implementation of s. 31, which effectively defeated the purpose of the constitutional compact.

In March 2013, the Supreme Court of Canada found that the federal Crown failed to diligently and purposefully implement the Métis land grand provision set out in s. 31 of the *Manitoba Act, 1870* (*MMF Inc. v. Canada* at para 154). This constituted a breach of the honour of the Crown. In arriving at this legal conclusion, the Court wrote:

What is at issue is a constitutional grievance going back almost a century and a half. So long as the issue remains outstanding, the goal of reconciliation and constitutional harmony, recognized in s. 35 of the Constitution Act, 1982 and underlying s. 31 of the Manitoba Act, remains unachieved. The ongoing rift in the national fabric that s. 31 was adopted to cure remains unremedied. The unfinished business of reconciliation of the Métis people with Canadian sovereignty is a matter of national and constitutional import. (*MMF Inc. v. Canada* at para 140)

This constitutional breach is an outstanding Métis claim flowing from a judicially recognized common law obligation which burdens the federal Crown (*MMF Inc. v. Canada* at paras 156; 212). It can only be resolved through good faith negotiations and a just settlement with the MMF (see for example: *R v Sparrow*, [1990] 1 SCR 1075 at paras 51–53; *R v Van der Peet*, [1996] 2 SCR 507 at paras 229, 253; *Haida* at para 20; *Carrier Sekani* at para 32). Lands both within the 'old postage stamp province' as well as in other parts of Manitoba—since little Crown lands remain within the 'old postage stamp province'—may need to be considered as part of any future negotiations and settlement in fulfillment of the promise of 1.4 million acres, together with appropriate compensation.

On November 15, 2016, the MMF and Canada concluded a *Framework Agreement for Advancing Reconciliation* (the "Framework Agreement"). The Framework Agreement established a negotiation process aimed, among other things, at finding a shared solution regarding the Supreme Court of Canada's decision in *MMF Inc. v. Canada* and advancing the process of reconciliation between the Crown and the MMC. It provides for negotiations on various topics including, but not limited to, the "quantum, selection and management of potential settlement lands." Negotiations under the Framework Agreement are active and ongoing.

3.0 Manitoba Métis Community Land Use and Values in Project Area

The MMC use Lake St. Martin, Lake Manitoba, and their tributaries for traditional harvesting and land use activities. The MMF has conducted many studies with Métis land users and Elders who have provided evidence of land use and occupancy within the Regional Assessment Area (RAA). These areas specifically have been important to the Métis way of life for generations as Métis communities were built around fur trade areas and important fishing locations (Barkwell, 2018). Today, Métis have Constitutionally protected rights to harvest, and any impact on these rights needs to be adequately and appropriately assessed and, if necessary, accommodated and mitigated for.

Results of previously conducted Manitoba Métis Land Use and Occupancy Studies show extensive use and occupancy by the MMC across the entire Project Area. The data is housed in the *MMF Data Catalogue*. To further understand how the MMC has been or will be impacted by changes to the Project Area, further studies, including groundtruthing areas with Métis land users, is needed. The following summary provides more detailed information on specific sites within the MMF Data Catalogue.

Personal and Commercial Harvesting within the Project Area

The MMC participates in many harvesting activities, including fishing, hunting, trapping, and gathering and commercial harvesting activities such as guiding, commercial fishing and commercia trapping.

Métis harvesters fish throughout the entire Project Area. Lake Manitoba to Lake St. Martin, through the Dauphin River and into Lake Winnipeg has been identified as being used by Métis harvesters personal fishing (Figure 5). Lake Winnipeg is also an important fishing area, and many harvesters have discussed changes that they have seen in fish populations and water flow, quality and levels.

Métis harvesters engage in commercial fishing and trapping activities within the Regional Assessment Area and beyond (Figure 5 and Figure 6). Specifically, these locations include the areas throughout Lake Manitoba, Lake Winnipeg, and up through Waterhen Lake, Playgreen Lake and Little Playgreen Lake. Trapping areas around Lake St. Martin and Lake Manitoba were identified. Harvesters discussed impacts to commercial fishing from rising and falling water levels in Lake Winnipeg (discussed further below).

In past Studies, Métis citizens identified gathering areas in past studies that fall within the Project Area (Figure 5). The shorelines of Lake Manitoba and Lake Winnipeg were mapped as areas where Métis citizens harvest plants and other natural materials. Hunting areas were identified throughout the entire Project Area (Figure 6). These sites include hunting for large and small game. Areas that will interact with this Project include hunting along the shores of Lake St. Martin and Lake Manitoba, specifically on the eastern side of Lake Manitoba and Dog Lake along HWY 6 near to Camper, Ashern, and Moosehorn. Participants also mapped many hunting sites along the Nelson River south of Norway House.

Places of Occupancy and Travel Routes within the Project Area

Past studies have also collected information on places where participants have stayed out on the land, their travel routes, and their MEK (Figure 7). MEK refers to specific knowledge that is learned from generations of land use and includes observations and experience that Métis citizens have from spending time on the land. These areas are especially important to consider in any development projects given that this knowledge is gained from spending many years on the lands, often through multiple consecutive seasons. The time spent on the land is also how Métis citizens identify changes that they have observed or experienced (discussed further below).

MEK identified in past studies includes reptile habitats along the south and western shores of Lake St. Martin, fish spawning areas in Lake St. Martin and Pineimutal Lake, and bird and mammal habitats along the southern shores of Lake Manitoba.

There are many places where participants stay on the land overnight, either in a tent or cabin, throughout the entire Project Area. Many of these areas are along the shores and islands of Lake Winnipeg. Many travel routes were also identified throughout the Project Area, specifically through Lake Manitoba and along the northern and eastern shores of Lake Winnipeg. Travel routes that participants identified are similar to the water routes that were used during the fur trade prior to

1870 (see Figure 2 The Fur Trade Network: Routes and Posts Prior to 1870). Many cultural routes were also mapped by participants within the Project Area, these often correspond to Métis settlement areas, travel routes, trading posts, and follow travel routes.

Observed Changes within the Project Area

As part of a previous study, Métis citizens were asked to identify changes that they had observed over their lifetime in the Lake Winnipeg and the Lake Winnipeg Basin. The following discussion only touches on some of the changes that have been observed by participants. A more fulsome study will be needed that focuses on the impacts of the emergency outlet channel and other cumulative effects experienced by harvesters.

The Project Area overlaps with the areas identified by participants (Figure 7). Many of these changes included changes to water quality and flow, which participants noted impacted fish populations and health. In some instances, participants also discussed how the changing water levels made it difficult to harvest fish. For example, a participant spoke about noticing changes to the water quality in Lake Winnipeg after an emergency drainage channel that had been dug between Lake St. Martin and Lake Winnipeg. Specifically, they said, they noticed an increase in debris of mud and roots in their fishing nets. Similarly, one participant also noted that because of increased water levels in Lake St. Martin, they could no longer access the boat launch.

Participants also identified areas within the Project Area, further north along the eastern shoreline of Lake Winnipeg and into the Nelson River, Playgreen Lake and Little Playgreen Lake where they noticed changes to shorelines, fish populations, and water quality. One participant said they have noticed an increase in erosion on the shorelines of Lake Winnipeg between the Belanger River and the mouth of the Nelson River which they said has caused impacts to fish populations in the area. Another participant also noted that they have observed algal blooms in this same area. Into the most northern part of the Project Area, participants noticed changes that they felt were caused by hydroelectric activities. For example, one participant said their fishing nets fill with debris along the Nelson River between Lake Winnipeg and Norway House. They said the debris is from the fluctuating water levels caused by hydroelectric activities in the area. Other participants have noticed changes to fish populations and water levels.

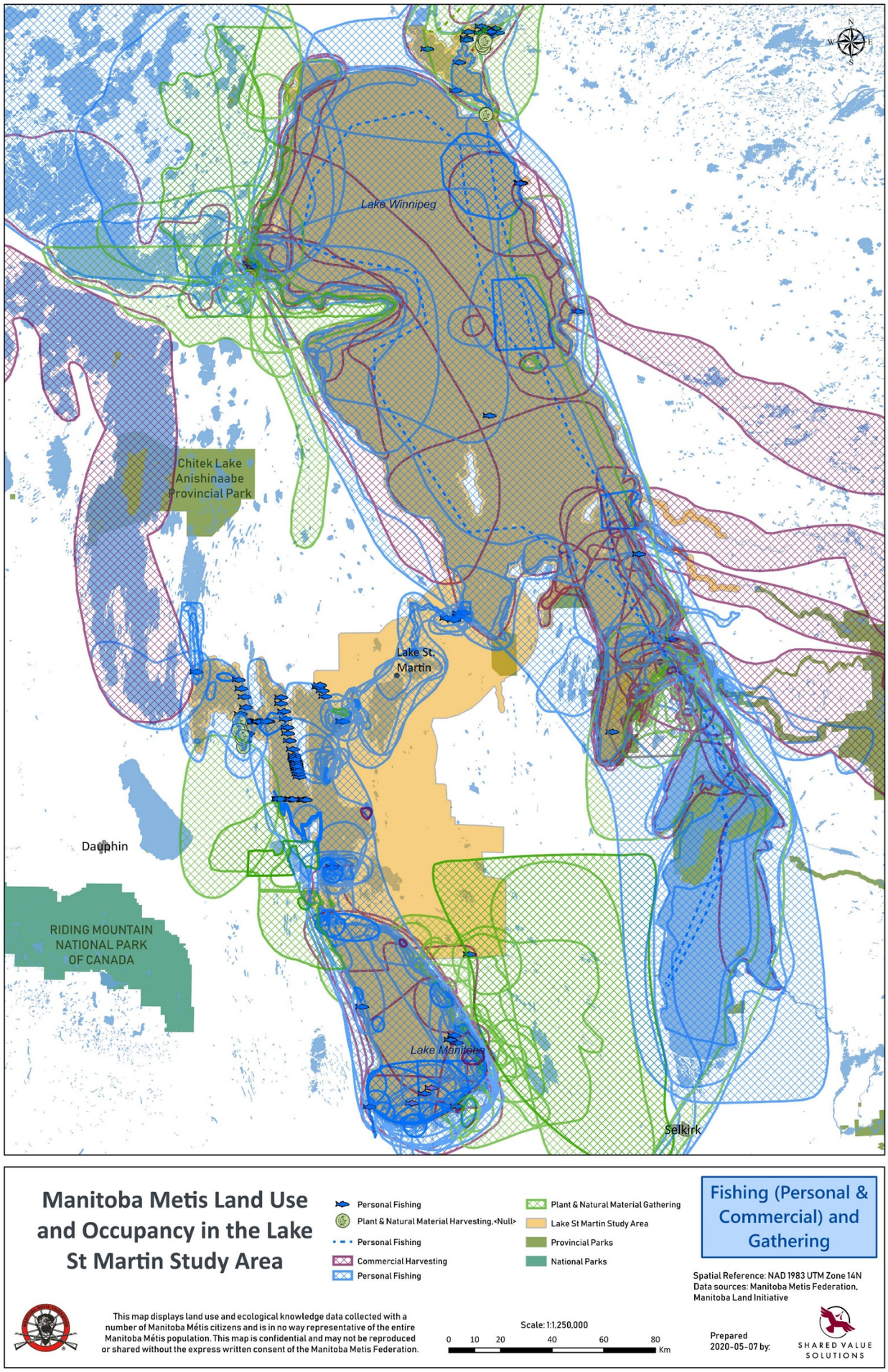
Métis citizens have identified other areas of change beyond the Project Site but within the waters and tributaries in which it is located. Many participants have identified algal blooms within Lake Winnipeg that have significantly impacted harvesting activities, particularly when nets are filled with algae. Changes also included observations of increased harvesting in the lake by non-Indigenous harvesters which puts an added pressure on the amount of time and money Métis harvesters spend on harvesting activities.

The MMC has experienced many changes to the landscape from human activities. These changes, compounded, have had extensive cumulative impacts on how and where Métis citizens can harvest and access the lands and waters. Generally, the entire Métis Resource Harvesting Zone has been impacted by developments such as urbanization, agriculture, and industrial activities such as hydroelectricity.

Additional impacts from this Project may further cumulatively impact the MMC and will need to be assessed through a process that considered the cumulative impacts that are already being experienced and the potential additive effects of this Project.

Comment 1: It is clear from the data presented here and available to the MMF, that there is a strong presence by the MMC in the regional and local assessment areas for the Project. This includes harvesting, occupancy, cultural values and other land uses. Presently, the Proponent has not adequately engaged with the MMF so that these land uses and values can be incorporated into the Environmental Assessment of this Project. Without incorporating this information into the effects assessment, the impacts of the Project cannot be meaningfully mitigated.

Recommendation 1: To further understand how the MMC has been or will be impacted by changes to the Project Area, further studies, including MEK studies and groundtruthing with Métis land users, is needed. The Proponent must engage with the MMF to evaluate how this information can be incorporated into the Project to inform mitigation, management, and compensation.



Manitoba Metis Land Use and Occupancy in the Lake St Martin Study Area

Personal Fishing
Plant & Natural Material Harvesting.<Null>
Personal Fishing
Commercial Harvesting
Personal Fishing
Plant & Natural Material Gathering
Lake St Martin Study Area
Provincial Parks
National Parks

Fishing (Personal & Commercial) and Gathering

Spatial Reference: NAD 1983 UTM Zone 14N
Data sources: Manitoba Metis Federation, Manitoba Land Initiative

This map displays land use and ecological knowledge data collected with a number of Manitoba Métis citizens and is in no way representative of the entire Manitoba Métis population. This map is confidential and may not be reproduced or shared without the express written consent of the Manitoba Metis Federation.

Scale: 1:1,250,000
0 10 20 40 60 80 Km

Prepared 2020-05-07 by:
SHARED VALUE SOLUTIONS

Figure 5 Manitoba Métis Fishing and Gathering in the Project Region

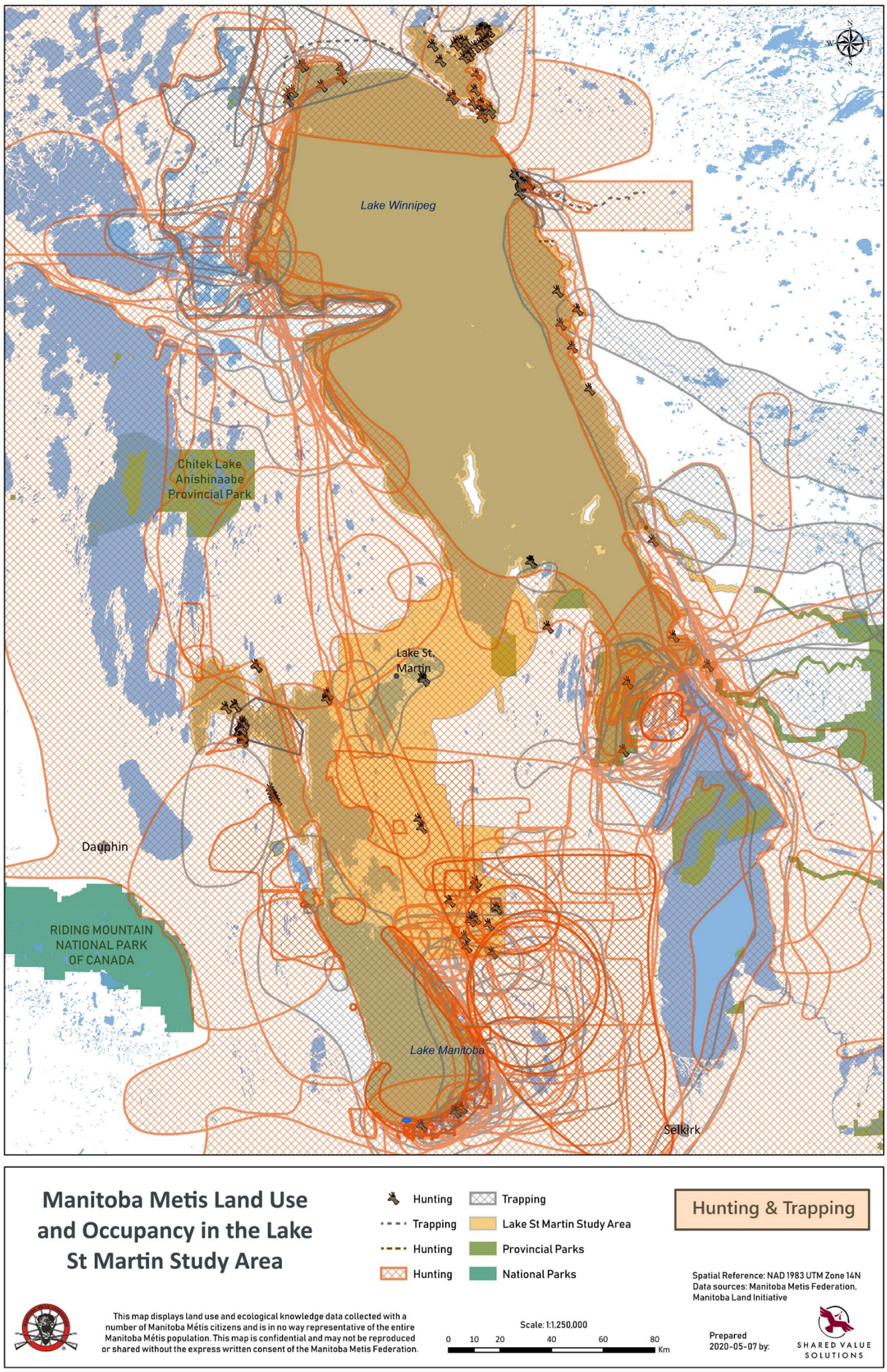


Figure 6. Manitoba Métis Hunting and Trapping in the Project Region

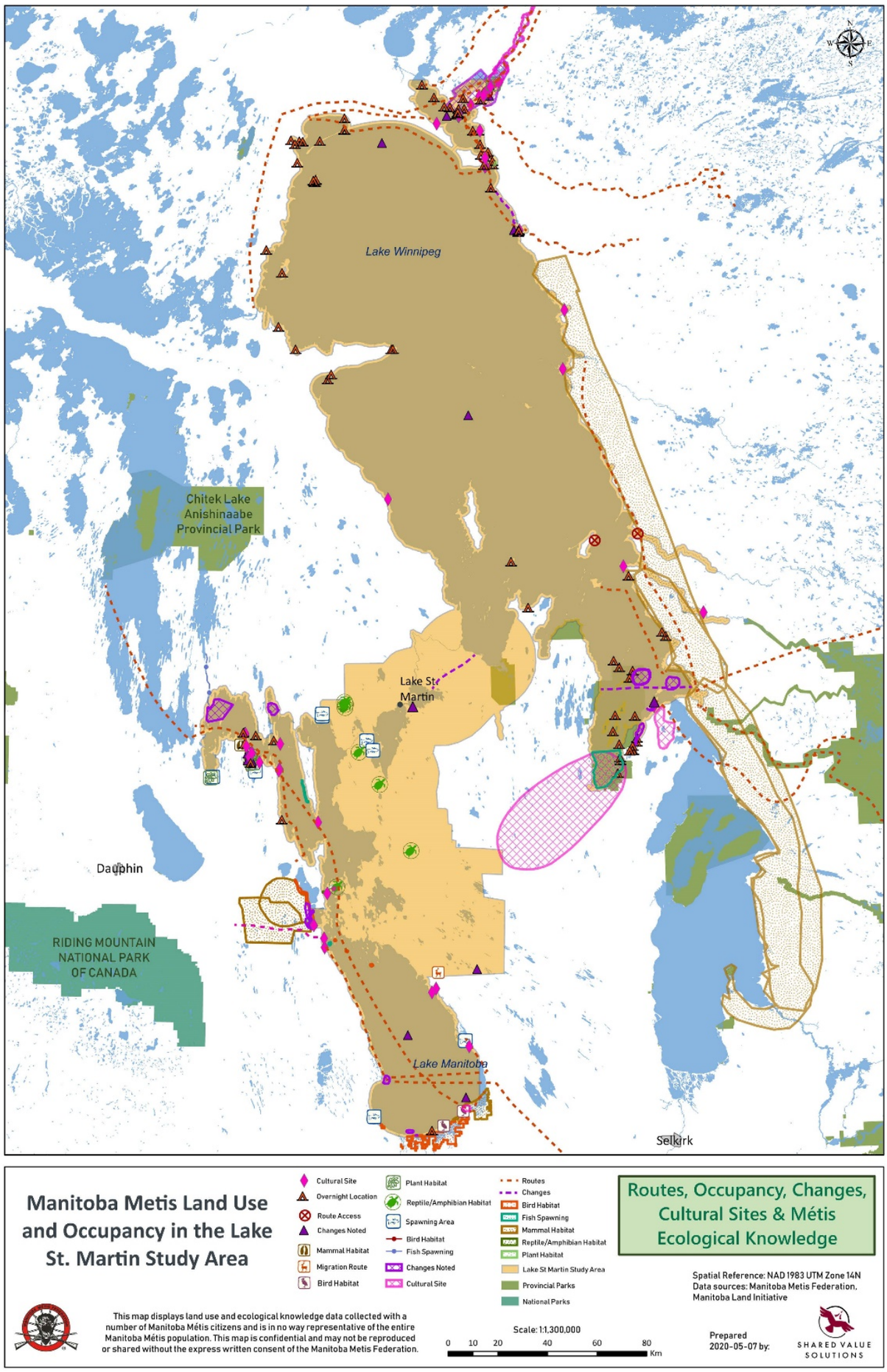


Figure 7. Manitoba Métis Occupancy and Cultural Sites in the Project Region

4.0 Review Findings

4.1 Water Resources

4.1.1 Summary of Updated EIS Content

The purpose of the LMOC and LSMOC is to effectively manage floodwaters in Manitoba. Southern Manitoba is susceptible to severe flooding, and the construction of these outlet channels allows MI to reduce the risk of flooding as the channels are designed to move water to Lake Winnipeg much more efficiently than the natural rivers in the area. Calculations from the Proponent suggest that Lake Winnipeg is likely to be able to assimilate the additional water volume without causing flooding along its shoreline.

Construction of the LMOC and LSMOC will result in substantial changes to the hydrology and hydrogeology of the Project area. Wetlands and farmland next to the LMOC and LSMOC are most likely to be directly affected. The construction of the channels will lower nearby groundwater tables and change surface water flows around the channels. Lowering of the aquifer groundwater table and the surficial groundwater table will have negative effects on the wetland habitats where groundwater levels will be lowered. The largest associated risk is an increase in mercury methylation in affected wetlands as a result of a change or increase in the wetting and drying cycle.

Construction of the channel will expose a large area to the potential of erosion. This could significantly affect water quality through increased total suspended solids, nutrients (phosphorous, nitrogen and ammonia) and turbidity in Lake St Martin and Lake Winnipeg. This would have a negative effect on the fisheries in downstream lakes. High total suspended solids and turbidity negatively affect fish in a variety of ways, such as degrading spawning habitat or irritating gills, which negatively affects oxygen intake and growth rates. Increased nutrient loading can lead to algae blooms, which when they decay can reduce oxygen available for fish. Other potential concerns related to the Project are the management of soil stockpiles adjacent to the Project site and the colonization of the channels by invasive species.

4.1.2 Assessment of Issue Status from EAP Review

Table 1. Assessment of issues from the review of EAP, completed by the MMF in 2018 (MMF, 2018).

Comment #	Issue	Question/Recommendation (*January 2018*)	Addressed/Partially Addressed/Not Addressed
WATER RESOURCES			
1.1	The LSMEOC System provides additional protection for residents on the shores and adjacent to Lake St. Martin during times of flooding by diverting flows further north towards Lake Winnipeg, however there are concerns for the residents adjacent to Dauphin River that flooding risk may be increased. The impacts to Metis residents who live and harvest around the Dauphin River floodplain include loss of property, reduced land use activities and harvesting opportunities. These impacts affect Metis citizens, who have strong ties to the land and most of them were born and have remained in the same area of the Province throughout their lives.	While diverting and reducing flooding in the southern portion of the Province is being managed, MI should not unduly increase the flood risk elsewhere in the Province as a result. Downstream residents and ecosystems must be considered during operation of the emergency spillway. A more gradual release of water from the upstream system to limit the impact on downstream environments, with lower velocities and flow volumes is recommended. The option of storage and delayed release should be incorporated into the spillway design to minimize downstream impacts.	**Not applicable**
1.2	The operation of the emergency channel indicates that a large volume of water (a 'slug' of water) enters the spillway, which likely causes considerable damage at the downstream end as it releases with higher velocities and much higher flow volumes than typically seen in these downstream environments. The force of this impact is very likely to cause fish avoidance in the area and may result in fish mortality at the outlet of the Reach. Additionally, the 'first flush' of the system with the initial release of water into the emergency channel creates considerable impact to the downstream receiving environment due to increased loadings from the plug, substrate and the re-suspension of debris which has collected within the channel during non-flowing months, depositing it into the downstream environment.	**Recommendation 2a:** A more gradual release of water from the upstream system to limit the impact on downstream environments, with lower velocities and flow volumes is recommended. The option of storage and/or delayed release could be incorporated into the spillway design to lessen the impact of the flood surge. **Recommendation 2b:** The emergency channels should incorporate some natural channel design and some meanders to increase flow length, which could reduce flow velocities by the time it reaches the end and thus reducing the impact of the receiving waters downstream. Other options could include structures at the outlet to dissipate hydraulic energy or divert water away from erodible areas (i.e. groynes, etc.), or the creation of lower velocity off-channel areas as refugia during higher flows. **Recommendation 2c:** The emergency channel material including the base and the plug are a source of sediment, debris and increased loadings for the downstream environment. MI should consider mitigation measures and develop a contingency plan to reduce the amount of sedimentation that enters the receiving waters from these anthropogenic sources.	a. **Not Applicable** b. **Not Addressed** Natural channel design has not been included in the design of the LMOC or LSMOC c. **Not Addressed** MI has stated that adaptive management and contingency and response measures will be drafted but have not yet been included in the EIS. The MMF request the opportunity to review the adaptive management, contingency and response measures plan once it is prepared.

Comment #	Issue	Question/Recommendation (*January 2018*)	Addressed/Partially Addressed/Not Addressed
1.3	The timing of the water releases may considerably alter the natural flow variability of the downstream systems, which causes stress to aquatic species, including ones that are important for Metis citizens. Many fish species rely on flows for certain life cycle cues, such as spawning and over-wintering, including spring spawning fish such as walleye, yellow perch and pike. Additionally, high flows in the receiving waters may prevent fish from utilizing long stretches of the creek that are impacted for long periods of time, as it exceeds the flow velocities that fish are able to tolerate. The operation of the emergency channel has shown to decrease biodiversity in the downstream environment for up to a year, which requires Metis citizens that rely on these water bodies to travel further to find suitable fish harvesting grounds. Also, the temporary nature of the operation of the emergency channel prevents the system from becoming suitable fish habitat or habitat for other aquatic species, which may also be the cause of the short-term declines in biodiversity in the area.	**Recommendation 3a:** There should be some consideration for the natural variability in the flow regime to limit the impact to the aquatic life in the downstream environment and the Metis peoples that rely on these water bodies as fishing grounds for personal and commercial fishing. The full operation of the channel needs to consider the economic impacts of decreasing biodiversity on the Metis. **Recommendation 3b:** MI should also consider ways to allow for a slower release of water through a slower 'ramp up period' to lessen the impact on the downstream habitat and to have a fish salvage mitigation measure to protect important fish species.	a. **Not Addressed** MI has not considered direct or indirect effects of decreasing biodiversity as a result in temporal changes in flow, nor how this will affect the MMC. **b. Not applicable**
1.4	The emergency channel design is a straight linear feature, whereas a more natural channel would include meanders, connection to the riparian and terrestrial environments, varied substrates and vegetated banks. The channel is therefore poor-quality habitat, despite it being in operation for a year at a time and fish and other aquatic species get mobilized into the channel.	The emergency channels should incorporate some natural channel design and some meanders to increase flow length, which could reduce flow velocities by the time it reaches the end and thus reducing the impact of the receiving waters downstream. The Province must consider the downstream effects of diverting floodwaters into the downstream environments, which are sensitive and important to the MMF.	**Not Addressed** Natural channel design has not been included in the design of the LMOC or LSMOC.
1.5	The water quality from Lake St. Martin differs from the water quality of the downstream river system and may have altered the water chemistry in the creeks to more lake-like properties, negatively impacting the aquatic species that inhabit the creeks. Declines in water quality were seen in Buffalo Creek, Dauphin River and Sturgeon Bay due to the operation of the emergency channel, including increased water hardness, decreased dissolved oxygen, increased total dissolved solids, increased total suspended sediments (TSS), increase in nutrients (phosphorus, nitrogen and ammonia), increases in metals and increases in chloride. Many of these parameters had results which exceeded water quality guidelines and occurred for long durations (weeks to months) during the operation of the LSMEOC. Buffalo Creek had the greatest decline in water quality during the operation, with substantial increases in conductivity,	**Recommendation 5a:** The influx of a significant volume of water for months at a time into these receiving water bodies (Buffalo Creek, Dauphin River and Sturgeon Bay) is causing declines in many of the routine water quality parameters that are important to protection of aquatic life. TSS is the most problematic of these parameters, which can deplete oxygen in the river and further choke aquatic life by clogging gills and increases turbidity in the water. However, TSS can often be easily mitigated and MI should incorporate measures to reduce TSS into the receiving waters through modifications of the emergency channel and operation. **Recommendation 5b:** It is recommended that measures are put in place to reduce the amount of erosion and scour of the channel to reduce sedimentation impacts on the downstream environment,	a. **Addressed** b. **Addressed** c. **Addressed**

Comment #	Issue	Question/Recommendation (*January 2018*)	Addressed/Partially Addressed/Not Addressed
	total dissolved solids (exceeded 500mg/L drinking water objective) and hardness, and total suspended solids ranged from 10 to 180mg/L, well above the baseline concentrations of 2-6mg/L.	including improving the substrate material, providing a better solution to the limestone and clay plug, and other operational procedures of the emergency channel that reduce erosion and sedimentation. **Recommendation 5c:** It is recommended that MI vegetate the banks, which could provide additional protection from erosion and sedimentation along the banks, as well as creating better habitat for aquatic, terrestrial and avian species.	
1.6	Diverting considerable amounts of water also mobilizes aquatic species and may introduce invasive species faster and further than typical migration patterns. Zebra mussels are of particular concern in the Lake Winnipeg system that should be prevented from entering nearby water bodies wherever possible, especially into new waterbodies in Manitoba where there may be impacts to Metis traditional uses.	It is recommended that it is the policy of the LSMEOC System to prevent the extent and migration of invasive species into the downstream environments. MI must monitor for and take measures to control the spread of invasive species wherever possible.	**Not Addressed** MI has not verified that monitoring of invasive species will be a part of the Aquatic Environment Monitoring Plan, Vegetation Monitoring Plan or Wildlife Monitoring Plan. MI must give the MMF an opportunity to review any invasive species monitoring plans prior to the commencement of construction.
1.7	The channel banks are devoid of vegetation (see Figure 15) and has created a wide linear gap in terrestrial habitat where natural re-growth of vegetation has not occurred, nor is expected due to the marginal soil quality, compaction, erosion and constant disturbance of the banks as a result of heightened flood conditions.	MI should prioritize active restoration and rehabilitation of the emergency channel banks to the extent in which heightened flood conditions and damage is no longer expected. Embankment and riparian areas provide unique habitats for vegetation and stand structural diversity preferred by many wildlife species that are important to the MMC. The MMF requests the use of native seed mixes and tree species that mimic pre-disturbance habitat types for the restoration of these areas.	**Addressed**
1.8	The increased flows and subsequent flooding of the Buffalo Creek system has caused vegetation die back along the banks (see Figure 18 in the EAP), which may be habitat for many terrestrial and avian species (especially waterfowl and furbearers) that the MMC rely on for traditional and commercial uses.	On-going monitoring of natural revegetation success in the Buffalo Creek system must be completed by MI. In consultation with MMF, adaptive management thresholds should be identified, for which active restoration will be implemented to improve recovery of the area if needed. MI should make a clear commitment that a reclamation goal for the area is to return the site to a productive state that supports traditional land-use as quickly as possible, including important vegetation and habitats that support wildlife species of importance to the MMC.	**Not applicable**

4.1.3 Evaluation and Recommendations on EIS

Comment 2: In Surface Water Quality (Section 6.4.7.7) the Proponent states that "surface water quality in LM varies spatially and is not well understood or studied" and "water levels do not appear to be a driver of LM water quality." The Proponent did acknowledge that the "timing of effect has high sensitivity because the effect occurs during a critical life stage (e.g. fish spawning)" but have dismissed the concern when stating that "direction is neutral because change in flows and lake levels will occur within previous range". The volume of water and timing has a significant effect on fish populations and this is not adequately addressed in the EIS (Mandrak, 2020).

Recommendation 2: MI has dismissed the risks posed to wildlife and habitat as a result of the anticipated changes in the duration and timing of water flows through the LSM system, and the potential effects on fish and wildlife important to Métis citizens. MI must address the risks to wildlife that the volume and temporal changes in flow pose to fish and wildlife in the Project area, especially during critical life stages.

Comment 3: In Project Interactions with Surface Water Environment (Sections 6.4.6/6.4.8.2/6.4.11.2) the details the Proponent has provided for the Lake Winnipeg water balance model are vague. Furthermore, the Proponent also does not appear to have incorporated climate change into their modelling. The Proponent has implied that having 100 years of climate data is sufficient to demonstrate that Lake Winnipeg does not require detailed modelling. This is not sufficient for the MMC who utilize Lake Winnipeg for personal and commercial fishing purposes and whose ability to continue to practice personal and commercial fishing is directly impacted by the changing climate. (Mandrak, 2020).

Recommendation 3: MI must provide further information on their modelling of the water balance in Lake Winnipeg and demonstrate that climate change scenarios have been included in the model.

Comment 4: In Surface Water Overview (Section 6.4.5.2) the Proponent acknowledges the complexity of the Buffalo Creek system and the uncertainty around surface water flow and surface water – ground water interactions, suggesting that the hydrological impacts on the Buffalo Creek watershed are highly uncertain. Potential risks include increased mercury methylation and reduced flows and water volumes in the wetland system. This will likely affect hunters and trappers using the area and potentially poses a risk in increased exposure to methyl mercury.

Recommendation 4: MI must do a detailed hydrological study on the Buffalo Creek Watershed including Big Buffalo and Little Buffalo lakes, to better understand the impacts the Project will have on this watershed and the consequent effects on MMF rights, claims and interests.

Comment 5: In Changes in Regional and/or Local Surface Water Quality (Section 6.4.7.7) the Proponent acknowledges that mercury and methylmercury were found in higher concentrations in EOC waters and that this could be directly attributed to changes induced by the EOC. This points to the risk of increased mercury methylation as a result of this Project. Increased fluctuation in groundwater levels around the LSMOC, especially in the surficial hydrogeology of the wetlands, creates an environment favourable to increased mercury methylation (Zillioux, Porcella, & Benoit, 1993; Ulrich, Tanton, & Abdrashitova, 2001). Porewater and surface waters within the wetlands adjacent to the LSMOC could have much higher concentrations of mercury and methylmercury than the LSMOC channel and other major surface water bodies and as such present a potential pathway for mercury bioaccumulation into organisms consumed by the MMC.

Recommendation 5: MI must acknowledge the risks and potential impacts to Métis citizens as a result of the potentially increased concentrations of methylmercury, and include MMC harvesters in follow-up mercury monitoring in waters, fish and game from the Project Regional Assessment Area.

Comment 6: The LSM channel presents a significant physical barrier to accessing hunting lands on the south side of the channel, and also potentially presents a barrier to wildlife movement to either side of the channel. This has significant potential impacts on MMC citizens usage of the area

Recommendation 6: The MMF should be given the opportunity to groundtruth the area to provide thorough background knowledge on the game species they utilize in the area and how access for MMC hunters will be reduced and how wildlife behaviours and movements would be affected by the channel. This is an important input to the EA process and documentation.

Comment 7: In Groundwater Monitoring (Section 12.4.1.1), the Proponent acknowledges the probable changes to wetland hydrology and groundwater-surface water interactions as a consequence of the Project. The consequent effects of favourable conditions for Mercury methylation are a significant concern for the MMC, who use the land and consume fish and wildlife that bioaccumulate methylmercury.

Recommendation 7: The MMF should be given the opportunity to comment on and contribute to the detailed groundwater monitoring plan. MMC citizens should be given the opportunity to participate in groundwater monitoring during Project construction and operation.

Comment 8: In Changes in Regional and/or Local Ice Processes (Section 6.4.12.6), the Proponent argues that increases in suspended sediment will be temporary, however this is dependent on proper construction, sediment and erosion control measures and rapid establishment of vegetation in the channel. Ineffective sediment and erosion control measures risk deteriorating the quality of the fisheries in Lake Winnipeg and negatively affecting the MMC.

Recommendation 8: The MMC should be provided employment opportunities to participate in construction and operational monitoring of the effectiveness of sediment and erosion control measures taken on site. MMC citizens should also be provided employment opportunities to monitor for the establishment of invasive species in the channel.

Comment 9: In the Geology and Soils Follow-up and Monitoring Program (Section 12.3) not enough information is provided on the management and monitoring of soil stockpiles, which if improperly managed are a potential source of increased sediment loading into the LMOC and LSMOC and the downstream environments.

Recommendation 9: The Proponent must provide detailed information on how and where soil stockpiles will be placed, separated by soil types (topsoil, high quality subsoil and low-quality subsoil) and the stabilization, erosion control, revegetation and monitoring practices that will take place. MMC citizens should be given the opportunity to participate in soil management through employment opportunities.

Comment 10: In Figure 6.3B-15 (Soil and Terrain Sensitive Sites), MI has identified several locations along the LMOC where soils are potentially impacted by manure. Soils exposed through the construction of the LMOC channel will likely result in elevated levels of nitrogen and phosphorous in the downstream environment, especially shortly after construction. There does not appear to have been adequate modelling to predict the downstream nutrient loading from the LMOC into Lake St. Martin. This poses significant risks to MMC citizens who use the waterways downstream of the LMOC for traditional and commercial harvesting.

Recommendation 10: MI must provide detailed modelling results and a clear assessment of the downstream nutrient loading risks as a result of the channel construction through agricultural soils impacted by the application of manure. MI must demonstrate that the residual effects are as “negligible” as they state in Section 6.4.7.7.

4.2 Fish, Fish Habitat, and Aquatic Ecology

4.2.1 Summary of EIS Content

The aquatic assessment areas for the LSMOC and LMOC include Lake Manitoba, Lake St. Martin, the Fairfield River, Dauphin River and tributaries to Lake St. Martin (Figure 8). These waterways are all part of the Nelson River watershed, which flows northeast relative to the Project, with the ultimate discharge to Hudson Bay. MI selected study sites for baseline characterization within this area, with a focus on areas most likely to be affected including: the outlet of Fairford River, Watchorn Bay (Lake Manitoba), the outlet of Harrison Creek, and Birch Creek (Lake St. Martin). Field work occurred from 2011 – 2016 with a focus on the Lake St. Martin Emergency Outlet Channel. This fieldwork included assessments of aquatic habitats, fish distribution and diversity, and benthic invertebrates. These initial baselines were supplemented with additional surveys carried out between 2015 and 2018, with a focus on the currently proposed Project.

Lake Manitoba, Lake St. Martin and Lake Winnipeg contain a wide diversity of fish species and habitat types. Known spawning grounds for lake whitefish (*Coregonus clupeaformis*) populations which, regionally are an important commercial species, are abundant throughout the study area. Lake whitefish are able to

move between Lake St. Martin and Lake Winnipeg using the Dauphin River (Manitoba Water Commission, 1978). Other large bodied native fish species that are common to these lake systems include:

- walleye (*Sander vitreus*)
- yellow perch (*Perca flavascens*)
- northern pike (*Esox lucius*)
- burbot (*Lota lota*)
- freshwater Drum (*Aplodinotus grunniens*)
- cisco (*Coregonus spp.*)
- goldeye (*Hiodon tergisus*)
- rainbow smelt (*Osmerus mordax*)
- common carp (*Cyprinus carpio*)
- white bass (*Morone chrysops*)

Lake Manitoba is subdivided into two basins: north and south. It is a relatively shallow lake within a largely agricultural watershed. As a result, it has become eutrophic, with turbid waters that provide good habitat for shallow open water species (e.g. sauger, walleye, cisco, and suckers). The lake is surrounded by a vast network of marshlands that provide important spawning and nursery habitats for many species. Lake Manitoba supports a community of at least 37 species of fish.

Lake St. Martin possesses two main basins, separated by a narrow stretch. The lake is relatively shallow with a maximum depth of 6.4m in the southwest basin. Like other large shallow lakes in the area, the lake does not develop thermal stratification in the summer. However, due to nutrient inputs in the lake (it is considered mesotrophic), there are known occurrences of reduced dissolved oxygen levels, especially in the northeast portion. Larval Lake Whitefish were captured throughout the north basin each spring, indicating that spawning occurred in Lake St. Martin during the previous fall seasons. Lake Whitefish move from Sturgeon Bay to spawning areas in Lake St. Martin during late summer/early fall as confirmed by catches in fall 2014. The occurrence of Lake Whitefish larvae in Lake St. Martin suggests that adults are able to ascend the Dauphin River and will then return to Lake Winnipeg during post-spawn. Lake St. Martin is known to support at least 37 species of fish.

Lake Winnipeg is a large lake, having a surface area of 23,750 km^2. It also has a north and south basin, with the south being characteristically shallow and turbid, while the north has deeper areas (up to 60m in depth) and provides better habitat for species adapted to cold water environments. Due to the large size, and relatively shallow depths, the lake does not typically develop stratification in the summer. However, recent measurements indicate that a thermocline does occur in the deeper north basin, and these have been associated with hypolimnetic oxygen depletion at depth. The lake supports a productive aquatic ecosystem with an abundant population of forage fish (e.g. minnows and cisco) which in turn support large populations of predatory gamefish such as walleye and northern pike. Lake Winnipeg is the most diverse waterbody in the region, with at least 65 known species of fish in the lake.

Waterbodies in the Project area support commercial, recreational, aboriginal and Métis fisheries. The relative importance of species in each lake is variable. The Proponent has summarized this information for evaluation through a compilation of records provided by Manitoba Sustainable Development. A high-level summary of these fisheries is provided below. The most abundant species caught in Lake Manitoba are sucker species, followed by carp. Walleye are also relatively abundant, and likely more valuable. Lake St. Martin historically supported an important whitefish harvest. Though in recent years catches have declined substantially. Other fish harvested include carp, sucker, northern pike and walleye. The most important fishery in the region occurs in Lake Winnipeg. This lake includes large commercial fisheries primarily for walleye and sauger, with lake whitefish being the secondarily important species. Recreational, aboriginal and Métis fisheries also exist on this lake, though catch numbers are not as readily available.

The Proponent effects assessment for the Project, based on the application of mitigation measures to minimize or eliminate impacts. Evaluation of the potential effects of the Project were completed using four groups of fish as representatives of all fishes in the study area. These include:

- Lake whitefish (*Coregonous clupeaformis*)
- Walleye (*Sander vitreus*)

- Northern pike (*Esox lucius)*
- Forage fish (small bodied fish that form an important link in the ecosystem)

The effects pathways for evaluating the potential impacts on the above fish, were separated into three broad categories, impacts on fish habitat, fish passage and fish health. Each of these were assessed for several effect pathways determined by the Proponent (Table 2). Mitigation measures designed to offset potential effects of fish habitat have been described by the Proponent (Section 7.2.4). Based on the assessment, the EIS concludes that with the implementation of the recommended mitigation measures, no significant adverse effects on fish habitat are expected to occur as a result of the LSMOC and LMOC.

Table 2. Potential effects and effect pathways evaluated by the Proponent (Manitoba Infrastructure, 2020).

Potential Effect	Effect Pathway
Permanent alteration of destruction of fish habitat	Change in habitat in Watchorn Bay, Birch Bay, the north basin of Lake St. Martin, and Sturgeon Bay due to excavation of bottom substrates
	Change in groundwater inflows to lakes and streams along or adjacent to the channels
	Introduction of aquatic invasive species
	Change in habitat due to realignment, isolation, or dewatering of drains and headwater streams
	Change in habitat due to movement and deposition of sediment
	Change in riparian area inundation along lake and river shorelines
	Change in flow patterns in rivers and streams
Change in fish passage	Change in fish passage due to replacement or installation of new road crossing structures
	Change in passive or active movement of fish out of Lake Manitoba and Lake St. Martin
	Changes in attraction flows in Fairford and Dauphin Rivers
Change in fish health or mortality	Accidental release of deleterious substances
	Introduction of sediment
	Stranding of fish and fish eggs
	Increased fish mortality due to increased angling pressure and access
	Bioaccumulation of methylmercury due to change in terrestrial habitat inundation

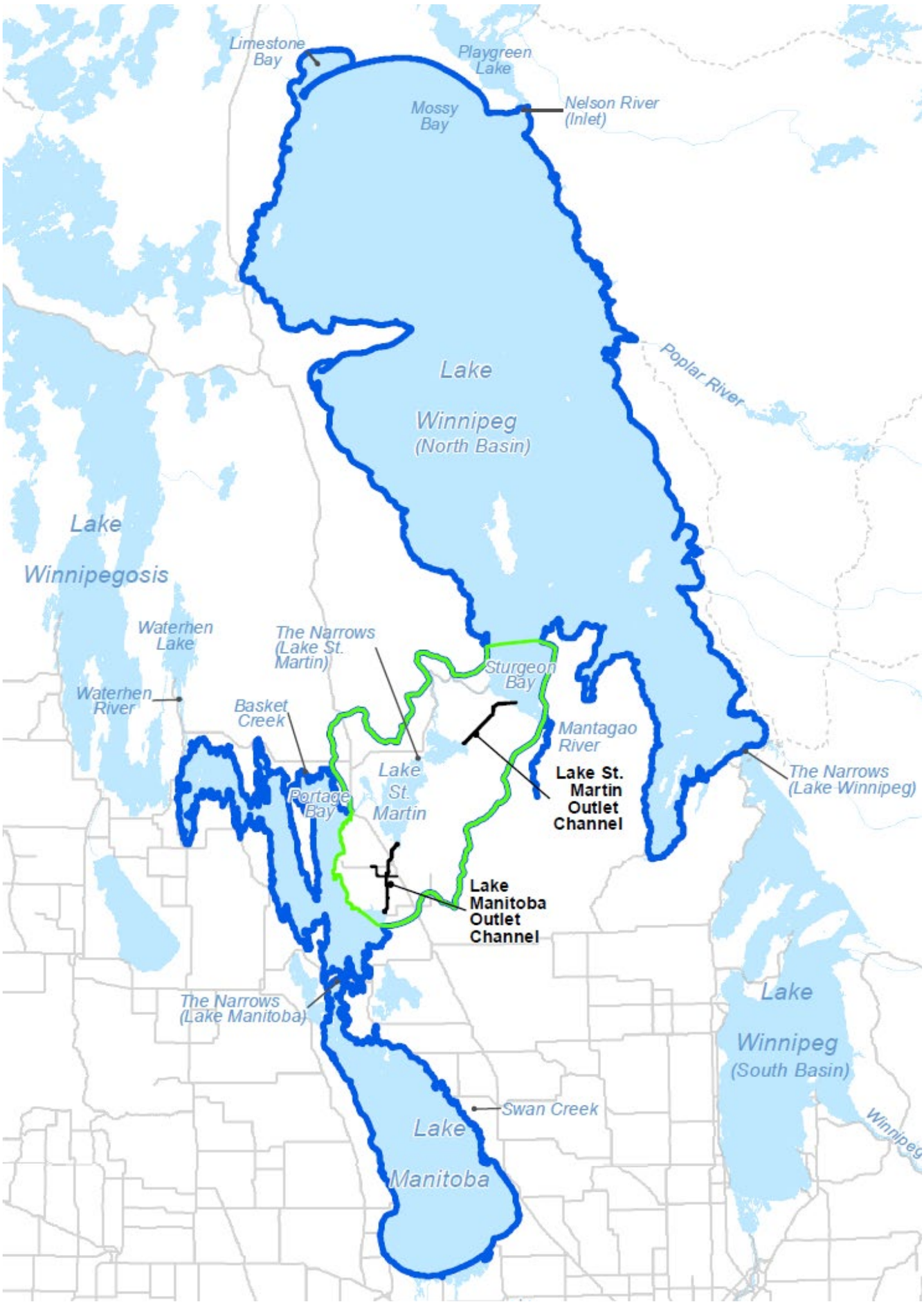


Figure 8. Local Assessment Area (green) and Regional Assessment Area (blue) for the Lake Manitoba and Lake St. Martin Outlet Channels Project (Manitoba Infrastructure, 2020).

4.2.2 Assessment of Issue Status from EAP Review

Table 3. Assessment of issues from the review of EAP, completed by the MMF in 2018 (MMF, 2018).

Comment #	Issue	Question/Recommendation (*January 2018*)	Addressed/Partially Addressed/Not Addressed
FISH, FISH HABITAT, AND THE AQUATIC ENVIRONMENT			
2.2.2-1	Fish stranding in Reach 1 and potentially in the Bog complex are operational issues that were identified during the 2011 operation. The EAP states fish stranding issues are related to the timing of closure. In order to avoid future fish stranding concerns, operational conditions provided by Fisheries and Oceans Canada (DFO) describing timing restrictions will be used. When in use, Reach 1 will remain open between September and June 15th during fish migration, spawning, hatching and rearing periods. The assumption is that keeping Reach 1 open during this time period will ensure that any fish drawn into the system have sufficient time to complete their life history activities and move into either Lake St. Martin or Dauphin River. There is little evidence provided to support this claim, and there is no indication that fish will not continue to stay in the channel, specifically with respect to small-bodied bait fish and benthic species.	The fish stranding issue needs more detail. Where is the data or substantiated professional judgement that supports the claim that fish will remove themselves from the reach provided the channel remains open outside of spawning periods? This may be true for large bodied fish, however, there is a distinct possibility that small-bodied baitfish and benthic invertebrate species will remain. Please provide more information on the stranding issue and how the Proponent will deal with large numbers of small-bodied fish in the channel.	**Not Addressed** The LSMOC and LMOC will be operated based on the Operating Guidelines prepared by the Lake Manitoba and Lake St. Martin Outlet Channels Operating Guidelines Technical Committee. These guidelines establish the target water levels of both lakes and target flows in the Dauphin and Fairford Rivers. Based on the operating guidelines, it is expected that these channels may begin operation in spring of the year (after April 30th unless there is severe flooding) and will continue, so long as there is a need for reducing water levels in the lakes. During operation, it is possible that fish may enter into the outlet channels and become trapped. This is especially problematic for fall spawning fish, such as lake whitefish, who may enter the channels for spawning. If the water control structures are subsequently closed, the fish and their eggs could become trapped. In fact, this has already occurred, with lake whitefish becoming trapped in Reach 1 of the emergency outlet channel during the fall/winter of 2011/2012. The Proponent must provide additional information and justification regarding the potential for stranding in the LSMOC. Current mitigation measures are inadequate and do not justify the evaluation of no significant residual effects.

Comment #	Issue	Question/Recommendation (*January 2018*)	Addressed/Partially Addressed/Not Addressed
2.2.2-2	Field investigation conducted by North/South from 2011 until 2015 confirmed the presence of spawning Lake Whitefish in the Narrows at Lake St. Martin. Existing data indicate that Lake St. Martin has been an important spawning area for Lake Whitefish, sucker species and Yellow Perch during the operation and the closure phases of the Project (North/South 2016a). Monitoring revealed some temporary changes in spawning behaviour throughout the Buffalo Creek watershed between operation and post operation phases of the Project. A decline in spawning behaviour and larval transport was noted throughout the Buffalo Creek watershed during the post closure period. Changes in spawning behaviour is directly associated to the timing and operation of the LSMEOC.	On-going spawning studies should be carried out and continued throughout the affected waterbodies. More information is needed on how these changes that are already being observed, will affect the long-term health and viability of important fish populations in the area.	**Not Addressed** The Proponent has not identified any measurable parameters which would be able to evaluate potential changes to spawning behaviour and success (Table 7.2-2). Moreover, detailed monitoring programs have not been identified, as these will be part of the Aquatic Effects Monitoring Plan (AEMP) which was not included in the EIS. The Proponent must consult with the MMF on development and implementation of the AEMP. Specific monitoring of spawning behaviour and spawning success must be included for relevant areas within the Local Assessment Area, including in Lake St. Martin and Buffalo Creek.
2.2.2-3	Compact fines comprise the substrate within Reach 1, so the channel walls of the inlet, which were designed to extend 3.0 m above the regulated water levels within Reach 1, were armoured with till boulders and a geotextile underlay. The Proponent states that increased sedimentation and erosion will likely occur at the outlet of Reach 1 as a result of channel substrates and increased velocity. It is unclear and not documented what this may due to the aquatic habitat in the long-term and the downstream end of the channel.	MI must provide more information on the long-term hydrology outcomes of the operation of channel. It's possible that continuous increased flows at the outlets of these channels will begin to alter the aquatic habitat. This is particularly true with respect to the bog complex. It is recommended that there be modelling done in order to predict the long-term effects of increased sedimentation and discharge.	**Partially addressed** The issues associated with erosion and deposition in bog habitat is avoided through the construction of the continuous LSMOC that bypasses Buffalo Creek. However, the Proponent has not addressed the potential long-term effects of sediment mobilization. It is stated that due to wind and wave action, sediment from the LSMOC will be transported from Sturgeon Bay to the main basin of Lake Winnipeg. The Proponent must provide additional rationale, including sediment transport modelling, to support the claim that long term erosion and sedimentation will not impact fish habitat within Lake Winnipeg and Sturgeon Bay.
2.2.2-4	Reach 3 originates at Buffalo Creek and is approximately 6 km in length and terminates in a lowland area 3.5 km inland of Sturgeon Bay (Figure 1). Substrate within the channel is mostly clayey till but an area of bedrock occurs just upstream of the channel outlet. The channel base is 21 m wide in areas where the substrate is comprised of fines, but it expands to a	Similar to **Recommendation 3.** The same information regarding inundation and impacts on the receiving waters of Reach 3 is required. It is not clear if the aquatic habitat will be impacted positively or negatively due to the fluctuating nature of the operating channel.	**Partially Addressed** As described above the Proponent must provide additional rationale, including sediment transport modelling, to support the claim that long term erosion

Comment #	Issue	Question/Recommendation (*January 2018*)	Addressed/Partially Addressed/Not Addressed
	width of 28 m within the bedrock section. As with Reach 1, it is unclear what impact the increased sedimentation and continuous discharge will have on the receiving aquatic habitat.		and sedimentation will not impact fish habitat within Lake Winnipeg and Sturgeon Bay.
2.2.2-5	Sediment traps installed in Sturgeon Bay demonstrated that no evident relationship can be established between sedimentation rate and trap distances from the mouth of the Dauphin River. There is little discussion on the subsequent changes in nutrient input from the changing hydrology. In addition, no discussion on the changes to the benthic invertebrate community is given.	The Proponent should offer more detail on the nutrient affects downstream due to the change in hydrology. They have not discussed the impacts of changing nutrient levels and sedimentation with respect to the receiving waters in Sturgeon Bay. In particular, impacts to the benthic invertebrate community is not discussed. Its recommended that a detailed benthic invertebrate study be completed and be on-going in order to monitor long-term changes in nutrients and benthic environments, as an important indicator of prey availability for resident fish.	**Not Addressed** The Proponent has not assessed how changes in nutrient input and sedimentation may alter downstream ecosystems. Sturgeon Bay is moderately nutrient-rich and is phosphorus limited. Inflows from the LSMOC will increase nutrients from sediment and agricultural runoff in the flows. The Proponent should incorporate an assessment of how nutrients into Sturgeon Bay as a pathway of effect on fish health and mortality.
2.2.2-6	Fish stranding and mortality was identified as a potential effect associated with the interim operation of the LSMEOC. During the initial closure of the LSMEOC, approximately 2,000 fish became stranded and died due to low dissolved oxygen levels. The stranding and mortality of fish throughout the LSMEOC is an operational issue related to the timing of the closure of the Reach 1 Channel. In order to ensure that fish stranding and mortality does not occur, MI states that it will ensure that, if operated, the LSMEOC will remain open between September and June 15th of the following year during fish migration, spawning, hatching and rearing periods. The Proponent says that a fish salvage program will be required for each operation of Reach 1. It is unclear if this means that they will simply keep the channel open, or they will physically conduct salvage efforts to remove fish from the channel.	MI must provide rationale on follow up monitoring with regards to stranding fish. Provide details on what they mean with respect to salvage efforts. Will this simply be keeping the channel open, or will it entail physical salvage efforts?	**Partially Addressed** Stranding episodes have been observed in the past. Despite the ongoing risk, the Proponent has stated that future stranding will be mitigated by preventing upstream movement into the LSMOC with a drop structure. However, fish that are attracted into the LSMOC during operation may become stranded once flows are restricted in the fall/winter. This may include post-spawning whitefish that are moving downstream from Lake St. Martin and into the LSMOC. The Proponent has acknowledged this possibility but states that the productivity of these species will not be measurable impacted. This is not sufficient, as fish are culturally and commercially important to the MMC. Moreover, fish mortality is prohibited under the *Fisheries Act.* For these reasons, the MMF requests that the Proponent describe additional mitigation and monitoring to ensure that stranding impacts are avoided.

Comment #	Issue	Question/Recommendation (*January 2018*)	Addressed/Partially Addressed/Not Addressed
2.2.2-7	The EAP states that MI is currently involved in a supplementary process with DFO in order to review the effects of the LSMEOC on fish and fish habitat. Any additional mitigation measures or requirements emerging from the supplementary aquatics review process will also be implemented. It is not clear what the status of this review is, and whether it has been used to inform the mitigation measures described in the EAP.	Please provide further detail on the status of this supplemental DFO review. MMF requests the opportunity to review this document and provide comment in order to address potential gaps in the EAP mitigation measures.	**Not Addressed** The Proponent has not provided any details of the *Fisheries Act* review or any comments from DFO regarding the potential need for a Fisheries Act Authorization for construction/operation of the LMOC or the LSMOC. The MMF requests further detail on the status of this supplemental DFO review or any other DFO reviews related to authorization under the *Fisheries Act*. The MMF requests the opportunity to review this document(s) and provide comment in order to address potential gaps in the application and/or mitigation measures.
2.2.2-8	The EAP states that the impacts to commercial fishing include the mobilization of some vegetation and woody debris expected to occur as a result of flushing from the interim operation of the LSMEOC. The EAP claims that although vegetation and woody debris may be mobilized as a result of the interim operation of the LSMEOC, it is expected to decline over time as the system experiences flushing associated with its periodic use. Therefore, no mitigation measures have been established in order to offset any effects associated with the interim operation of the LSMEOC on commercial fishing activities.	The Proponent needs to expand on the claim that impacts to commercial fishing will be negligible, and thus no mitigation measures are warranted. If MMF fisheries are in fact impacted, will there be accommodation or compensation as a result of no mitigation efforts?	**Not Addressed** The Proponent has stated that there is expected to be no measurable impact on commercial, recreational or aboriginal fisheries. However, as discussed in section 5.0, the Proponent has not adequately assessed the productivity of fisheries and is thus unable to confidently make that claim. The MMF recommends that a robust monitoring program be established for evaluating the potential impacts to productivity. If impacts are observed, compensation must be provided.

4.2.3 Evaluation and Recommendations on EIS

Comment 11: The Proponent has not assessed productivity of fish habitats within the study area. (Mandrak, 2020). This assessment is fundamental to understanding the potential impacts of the Project and is a cornerstone of fish habitat compensation under the *Fisheries Act*. While diversity, biology, and habitat types have been characterized during baseline studies, there is no information on productivity and potential changes to productivity. This is of importance to the MMC as changes in productivity will have direct consequences on their ability to fish for commercial, recreational or cultural purposes.

Recommendation 11: The Proponent must complete an assessment of the productivity of aquatic habitats within the study area. This can be completed in a variety of ways including population estimates, habitat suitability indexes for multiple life-stages (e.g. spawning, rearing, foraging, overwintering), and/or estimates based on effort (e.g. catch per unit effort) with robust baseline data. As noted by Dr Mandrak:

"*the lack of fish production estimates in the EIS would be addressed by multi-year standardized sampling to determine fish production in areas impacted by the Project, stratified by habitat type, and conducted across a full range of water levels. This would allow fish production estimates by area per year to be calculated and, hence, allow the amount of fish production lost, due to the Project, to be calculated by using water levels to estimate habitat area lost. However, as such data were not referred to in the EIS, it is assumed that such data do not exist. These data could be collected prior to the commencement of the Project, but the time series would likely be shorter than preferred. An indirect method for estimating the impact of changes in water levels on fish production would be to examine year-class strength using aging structures and developing age-length keys across a variety of species. Year-class strength allows the determination of specific years as good or bad in terms of recruitment, and the results can be correlated to water levels to determine the extent of influence of water level and, hence, flooded riparian area, on the recruitment of the fishes studied."* (Mandrak, 2020).

Comment 12: The areas surrounding the Project are characteristically flat and swampy. The Proponent has written that this was noted by early explorers and is demonstrated by regular flooding events (Manitoba Infrastructure, 2020). Wetlands, riparian areas, and seasonally flooded areas provide important habitat for a variety of freshwater fishes. Many species spawn on flooded vegetation in spring (e.g. northern pike and yellow perch) and rely on wetlands and flooded areas for rearing. As a result, these areas are of critical importance for overall fish productivity. By reducing floodwaters in the Project area, the Project will directly impact fisheries productivity. The impacts of decreased flooding are potentially large as noted by (Mandrak, 2020) "*A decrease of 0.46 m in LM will decrease flooded riparian area by 754 km^2 as noted elsewhere in the document (Section 7.2.4). This is a huge area if being used as spawning and nursery habitat and would result in a substantial decrease in fish production*." This is part of an ongoing trend that has been occurring since colonization by Europeans (i.e. through clearing, agriculture, and development) and represents a cumulative impact which must be addressed.

Recommendation 12a: The Proponent should adequately mitigate and offset for the negative impacts that reduced flooding will have on productivity of fish, with a focus on those species which rely on wetlands and flooded areas to carry out important life processes. This can be completed through the development of a fish habitat compensation plan or offsetting plan. This plan, which would be approved under the *Fisheries Act,* must be completed through consultation and collaboration with the MMF.

Recommendation 12b: The Proponent should evaluate how reduced flooding will act cumulatively with historic, current and future changes to the landscape which have affected important fish habitat, such as wetlands and areas prone to flooding.

Comment 13: The impacts of regulating water levels on fish habitat and spawning areas are not well understood. The Proponent has typically described the impact of reduced water levels, in terms of average water level, for example:

> *"Lake Manitoba 0.024 m (non-flood) to 0.387 (m) average decrease in water level. Lake St. Martin 0.06 m (non-flood) to 0.74 (m) average decrease in water level." (Section 6.4.7.2)*

However, as noted by Mandrak (2020), even moderate decreases in water levels may cause massive reductions in riparian habitat. For example, it is stated in the EIS that a decrease of 0.46 m in Lake

Manitoba will decrease flooded riparian area by 754 km^2 (Section 7.2.4). This is a potentially vast area which may have value for spawning and nursery habitat, the loss of which may result in significant impacts on fish productivity (Mandrak, 2020).

Recommendation 13a: To adequately account for the lost productivity, the Proponent must engage in a comprehensive baseline assessment (as described above). This baseline data could then be linked with a meaningful monitoring program, which the MMF must be involved in developing. Where impacts are observed, compensation must be provided.

Recommendation 13b: The potentially large areas which were previously inundated will result in a loss of productivity that will result in a residual environmental effect that has not been mitigated. The Proponent must amend the evaluation of residual effects on fish habitat to 'significant' unless adequate offsetting or compensation measures are applied.

Recommendation 13c: The loss of fish habitat, due to decreased flooding must be compensated through a fish habitat compensation plan. The Proponent must engage with the MMF and DFO to determine the steps necessary for obtaining an Authorization for impacts to fish habitat.

Comment 14: Under the currently designed conditions, the channels cannot be considered fish habitat, or be able to provide any positive benefits, as has been suggested by the Proponent (Section 7.2.3). The constructed channels for both LSMOC and LMOC are designed to provide hydraulic channels and not to provide fish habitat (Mandrak, 2020). Channel margins will be lined with rip rap and hardened to prevent erosion, and low-flow channels are designed to conduct water, all characteristics that are not ideal for sustaining aquatic habitats. This represents an outdated way of designing water conveyances. It is possible that the channel may even act as an "ecological trap" whereby aquatic organisms are drawn into the area during periods when conditions are suitable but then become trapped and unable to complete the phases of their natural history. This essentially removes these individuals from the local population (e.g. isolation, stranding and mortality), contributing to reduced productivity.

It is expected that any species which colonize and persist in the channels will be those that are adapted to disturbance and poor-quality habitat. It is also possible that the channels may act as corridors that facilitate the spread of aquatic invasive species, such as common carp which are adapted to the poor habitat conditions that may be present.

Recommendation 14a: The Proponent should incorporate modern restoration techniques and practices (such as including principles of natural channel design) into the design of the LSMOC and LMOC to improve habitat quality and reduce impacts on local fish populations (Wohl, Lane, & Wilcox, 2015). This should include designing channels to sustain velocities, depths, and habitat types which could support a diverse aquatic community. The channel should be designed to pass maximum and minimum flows while maintaining refuge areas where species can persist.

Where possible, channel morphology should contain design considerations that mimic natural channels and allow fluvial geomorphological processes to operate and create a diverse habitat. A properly designed channel should include features such as flood plains, riparian and aquatic vegetation, channel meanders, pools, riffles, runs, offline wetlands and diverse substrate. Importantly, the design will accommodate the expected conditions so that the ecosystem processes area allowed to operate and will become a naturally regenerative system (within the limits of the imposed water control guidelines). Ultimately, these channels represent an opportunity to create a positive effect on local aquatic populations. Engagement with the MMC on how to implement natural channel design should occur with the MMF.

Recommendation 14b: The Proponent should consider incorporating additional habitat features below the drop structure in Sturgeon Bay. Some resident species (e.g. walleye and some sucker species) may be attracted to the outfall flows and spawn if appropriate spawning substrate is available (e.g. gravels and boulders). This is commonly observed in the tailrace of dams.

Comment 15: The Project will result in changes to shoreline geomorphology and local drainage areas/patterns that will result in the loss of fish habitat (Mandrak, 2020). This habitat loss will include nursery and spawning habitat, which are important for the overall productivity within the LAA. For example:

- Alteration to shoreline in Watchorn Bay (LM) and Sturgeon Bay (LSM) due to excavation of lake bottom during construction and dredge during operation (Section 6.4.7).
- Scouring in Birch Bay (LSM) and Sturgeon Bay (LW) from discharge (Section 6.4.7).
- Reduced flows in Birch Creek (27.4%) and Watchhorn Creek (4%) from reduced drainage areas (Section 6.4.7).
- Direct loss of habitat from rock-filled jetties and other engineered structures proposed by the Proponent as "mitigation".

Recommendation 15: The Proponent must compensate for the impacts of the Project on fish and fish habitat due to **c**hanges to shoreline geomorphology and local drainage areas/patterns. This can be completed through the development of a fish habitat compensation plan or offsetting plan, which must be developed with engagement of DFO and the MMF (as described above in recommendations 11 and 12).

Comment 16: The Proponent has chosen four fish species to evaluate potential impacts of the Project. Unfortunately, these species do not capture the full extent of life-history requirements and habitats used by fish in the LAA or RAA and thus underestimate the potential impacts (Mandrak, 2020). Moreover, the MMF considers all species to be important for a variety of reasons, including commercial, recreational, cultural or ecological values. This perspective on the importance of all fish species is in agreement with the current *Fisheries Act* which provides protection for all species, not just representatives.

Recommendation 16: The Proponent must provide a more fulsome evaluation of impacts to all fish species potentially impacted by the Project.

Comment 17: The Biosecurity Management Plan (Section 3.7.2) and Emergency Response Plan (Section 3.7.2) focus on terrestrial invasive species that may be spread during construction but do not address aquatic invasive species (Mandrak, 2020). There is a risk that aquatic invasive species may also be spread during construction.

Recommendation 17: The Proponent must include aquatic and terrestrial invasive species in the Biosecurity Management Plan and Emergency Response Plan.

Comment 18: The Proponent has not provided information on the effort that will be applied to fish salvage (e.g. until no fish are left in the areas) or whether all fish, including invasive species will be salvaged (Section 2.4.3) (Mandrak, 2020).

Recommendation 18a: The Proponent must provide information on fish salvage effort and measures to prevent spread of non-fish aquatic invasive species during salvage operations.

Recommendation 18b: A SAR permit may be required to salvage fish SAR.

Comment 19: It has not been explicitly described how habitat quality for temporary diversions will be maintained (Section 2.4.3) (Mandrak, 2020).

Recommendation 19: The Proponent must describe how habitat quality of temporary diversions will be maintained (e.g. O_2, low turbidity, aquatic vegetation, physical structures).

Comment 20: The Proponent has not provided a discussion of potential noise pollution and mitigation in aquatic environment (Change in Acoustic Environment (Sections 6.2.4.4/6.2.6.2/6.2.8.3) (Mandrak, 2020). The potential impacts of noise and vibration on aquatic environments are well established.

Recommendation 20: The Proponent should elaborate on the potential impacts of noise and vibrations on fish and fish habitat. This must include proposed mitigation measures and a commitment to implement DFO guidelines on the use of explosives near fish bearing waters (DFO, 1998).

Comment 21: The Project may use nighttime safety lighting near water control structures (Sections 6.2.4.5/6.2.6.3/6.2.8.4:

"During the project operation and maintenance, some nighttime safety lighting may be required for water control structures. The final lighting design has not yet been completed (p. 6.67)".

These lights may attract fishes, causing negative impacts such as reduced feeding success or higher predation. Despite these potential impacts, the Proponent has not provided a discussion of potential light pollution and mitigation in aquatic environment (Mandrak, 2020).

Recommendation 21: The Proponent should elaborate on the potential impacts of night-time lighting on fish and fish habitat. This must include proposed mitigation measures.

Comment 22: The definition provided by the Proponent for fish and fish habitat does not include adequate detail on physical (e.g. substrate), chemical (e.g. water quality) and biological (e.g. aquatic vegetation) components (Mandrak, 2020). These are important considerations that must be carried through the effects assessment.

Recommendation 22: The Proponent must expand the definition of fish habitat to ensure it includes physical (e.g. substrate), chemical (e.g. water quality), and biological (e.g. aquatic vegetation) components.

Comment 23: The scope of the Local Assessment Area does not include all of Lake Manitoba (Table 7.2-2, Section 7.2.1.5) even though many impacts (e.g. water-level changes, fish movement, nutrient loading) may occur throughout the lake. Based on the evidence provided by the Proponent, there is no reason to believe that impacts to fish and fish habitat would not be measurable, with an adequate monitoring program (Mandrak, 2020).

Recommendation 23: The MMF recommends that the scope of the LAA be expanded to include all of Lake Manitoba.

Comment 24: The Proponent has identified that for a residual effect to fish habitat or fish passage to be considered significant, they must be permanent (Section 7.2.1.7). It is not clear why these effects need to be permanent to be significant. Indeed, this language is not in the amended *Fisheries Act*. If the Project results in temporary changes to either fish habitat or fish passage, there could be impacts on fish productivity, especially if appropriate mitigation is not implemented (Mandrak, 2020).

Recommendation 24: The Proponent should modify the definition for significant effects on fish habitat and fish passage to include temporary effects with a high magnitude.

Comment 25: The Proponent has not included any evaluation of the risk posed by aquatic invasive species which may invade the region in the future. For examples, the Prussian carp which is currently found in Saskatchewan and which may spread to the Project area in the future (Mandrak, 2020).

Recommendation 25a: The Proponent should update the existing conditions (Section 7.2.2) to evaluate risk of potential aquatic invasive species, such as the Prussian carp.

Recommendation 25b: A post-Zebra Mussel invasion stage should be added to the description of the Lake Winnipeg benthos.

Recommendation 25c: The Proponent must provide additional information on the proposed Biosecurity Management Plan and the Access Management Plan and how these will comply with provincial aquatic invasive species regulations.

Comment 26: Based on the existing condition (Section 7.2.2.2), it appears that Pineimuta Lake supports ideal spawning and nursery habitat for a variety of species. Further information is required on this habitat (Mandrak, 2020).

Recommendation 26: The Proponent should provide additional information on habitat in Pineimuta Lake, including its use by migratory species, oxygen levels during winter/summer, and observations of winterkill (if any).

Comment 27: It is not clear if the Denil fishway will continue to operate between LSM and LM (Section 7.2.2.2). This fishway plays an important role in fish passage and the potential impacts of the Project may be exacerbated if it is no longer operated (Mandrak, 2020).

Recommendation 27: The Proponent must clarify whether the Denil fishway will continue to be operated. If not, this must be factored into the effects assessment on fish passage.

Comment 28: The information on fish sampling effort is poor (Section 7.2.2.2). Data for recent sampling in RAA for fish occurrence, abundance, movement and habitat does not include levels effort (i.e. catch per unit effort) (Mandrak, 2020). This must include information on these parameters during low- and high-water years. This information would provide critical information for understanding the relationship between commercial harvest and water levels. Secondly, there is a lack of good recreational fishing data.

Recommendation 28a: The Proponent must include information on fishing effort that was used for baseline characterization. This is relevant for understanding existing conditions and for comparing with results of monitoring to assess potential effects.

Recommendation 28b: The Proponent should provide a more detailed discussion of commercial and recreational data. This must include an evaluation of the relationship between water levels and productivity.

Comment 29: Fish productivity was not considered in the development of six options considered in the EIS or the preferred option.

Recommendation 29: The Proponent must include fish productivity as a factor considered in the evaluation of alternative route options. Information on how this assessment will affect current Project designs should be shared with the MMF.

Comment 30: The Proponent has defined a significant effect on fish health or mortality as: “a change in fish health or mortality that is likely to result in a measurable change in the abundance of any CRA fish population in the RAA” (Section 7.2.1.7). Despite this description, the effect of sedimentation during construction and operations is rated as not significant. The effects of sediment are well known and cause considerable impacts within the LAA and RAA. Sand, silt and clay that erodes from the LSMOC, LMOC or upstream waterbodies could be mobilized downstream, contributing to impacts on fish and fish habitat. Moreover, nutrients (e.g. phosphorus bound to clay particles) can also be mobilized, contributing to increased nutrient levels and algal blooms. Due to its size and economic importance, the effects of nutrient loading and sedimentation on Lake Winnipeg has been a particular focus of recent research (Matisoff, Watson, Guo, Duewiger, & Steely, 2017; Schindler, Hecky, & McCullough, 2012). Given the sensitivity of the aquatic habitats in the region, it is unclear how the proponent has determined that the residual effects of sedimentation are not significant (Section 7.2.5). Moreover, a properly designed monitoring program will most certainly detect effects from these changes on fish populations, thus resulting in a significant effect, as defined in the EIS.

Recommendation 30a: The MMF strongly disputes this characterization that the impact of sedimentation is negligible or low (Table 7.2-9). The Proponent must change characterization of residual effects and increase the characterization for the magnitude of effect to “moderate”.

Recommendation 30b: The Proponent must complete sediment transport modelling, to support the claim that long term erosion and sedimentation will not impact fish habitat within Lake Winnipeg and Sturgeon Bay.

Recommendation 30c: The Proponent must describe adequate monitoring of erosion and sedimentation. This monitoring program should be tied to the results of sediment transport modeling so that results can be meaningfully interpreted based on observations and predictions made in the EIS.

Comment 31: The information provided on monitoring is insufficient for ensuring that effects of the Project will be detected and managed appropriately. The Proponent has not provided information on any specific monitoring that will occur to ensure the accuracy of predictions or evaluate changes to fish and fish habitat. Instead, they have stated that an Aquatic Effects Monitoring Plan (AEMP) will be developed which would describe monitoring of water quality, fish habitat, and fish populations (Section 7.2.8).

Recommendation 31a: MI must provide additional details on the specific monitoring activities that will be completed as part of construction and operation phases for the Project. This should include details on methodology, timing and scope of monitoring activities. It should be clear how monitoring of effects is

linked to the measurable parameters described in the EIS (Table 7.2-2), with established triggers for initiating adaptive management.

Recommendation 31b: MI must consult with the MMF on development and implementation of the AEMP. A draft version of this plan should be prepared and circulated to the MMF for comment. Adequate funding (identified through engagement with the MMF) for supporting the review, should be provided.

Recommendation 31c: MI must consult with the MMF on involvement of the MMC as monitors for all phases of the Project. This could be guided through an agreement regarding opportunities for training and capacity building. The MMF can provide guidance on specific components of the Project with which the MMC can be involved (e.g. construction monitoring, sediment and erosion control, and water quality).

5.0 Summary and Recommendations

The MMF has completed a review of the updated EIS for the Project. This review includes an evaluation of how the potential effects of the Project may impact the rights, claims, and interests of the MMC. In our review, we have provided **30 specific comments with related recommendations on the EIS** in the areas of the water resources and fish and fish habitat. These comments have focused on all phases of the Project. We have also evaluated how issues raised by the MMF during the review of the Lake St. Martin Emergency Outlet Channel have been incorporated and addressed by MI as part of planning for the Project (or not).

In general, we have identified inadequacies with respect to certain baseline characterization (e.g. fish productivity), the effects assessment, monitoring plans, and mitigation measures. Moreover, we have identified a failure to appropriately consult with the MMC by meaningfully engaging with the MMF and discussing both potential impacts to Métis rights from the Project, and reasonable mitigation or accommodation measures for such impacts. In addition to the specific comments included in this review, we are putting forward the following high-level recommendations to guide future discussions for addressing the concerns raised in our review:

1. MI to provide written responses to each comment raised as part of this review and impact assessment. Responses should include specific information and actions to be taken by MI to ensure resolution of the issue. Where MI disagrees with specific recommendations, a substantial rationale and alternative recommendation should be given. To facilitate this process, we have included a tracking table with all comments and recommendations described in this report (Appendix A).

2. MI to establish a forum and process with Manitoba and the MMF where issues regarding the Project can be brought forward, discussed, and addressed throughout the life of the Project (including the provision of capacity funding to MMF to support this process). This forum/process can facilitate the involvement of the MMF in ongoing permitting and approvals related to the Project.

3. To further understand how the MMC has been or will be impacted by changes to the Project Area, further studies, including MEK studies and groundtruthing areas with Métis land users, is needed. The Proponent must the engage with the MMF to evaluate how this information can be incorporated into the Project to inform mitigation, management and compensation.

4. MMF and MI to negotiate agreements to address impacts of the Project on MMC rights, claims and interest and to support MMF's participation in environmental and cultural monitoring throughout the life of the project. Components of this agreement should include (but not be limited to):
   - Funding for MEK and groundtruthing studies;
   - Hiring and training of MMF environmental and cultural monitors for all phases of the Project; and
   - Annual reporting to the MMF on results of monitoring and any adaptive management measures being implemented.

5. Manitoba should commit to meaningful consultation with the MMF and involvement of the MMC in future planning, decision making, licensing, and monitoring of developments that are enabled by the Project.

6.0 References

Barkwell, L. (2018). *Historic Métis Settlements in Manitoba and Geographical Place Names.* Winnipeg: Louis RIel Institute.

DFO. (1998). *Guidelines for the Use of Explosives.* Ottawa, Ontario: Habitat Management & Environmental Science Directorate, Department of Fisheries and Oceans.

Mandrak, N. E. (2020). *Update of Review Based on March 2020 Version of Lake Manitoba and Lake St. Martin Outlet Channels Project Environmental Impact Statement.* University of Toronto.

Manitoba Infrastructure. (2020). *Lake Manitoba and Lake St. Martin Outlet Channels Project: Environmentla Impact Statement.* Manitoba.

Matisoff, G., Watson, S. B., Guo, J., Duewiger, A., & Steely, R. (2017). Sediment and nutrient distribution and resuspension in Lake Winnipeg. *Science of The Total Environment*, 173-186.

MMF. (2018). *Lake St. Martin Emergency Outlet Channel: Technical Review of the Environmental Act Proposal Report.*

Schindler, D. W., Hecky, R. E., & McCullough, G. K. (2012). The rapid eutrophication of Lake Winnipeg: Greening under global change. *Journal of Great Lakes Research*, 38: 3, 6-13.

Ulrich, S. M., Tanton, T. W., & Abdrashitova, S. A. (2001). Mercury in the aquatic environment: a review of factors affecting methylation. *Critical reviews in environmental science and technology*, 31(3), 241-293.

Wohl, E., Lane, S. N., & Wilcox, A. C. (2015). The science and practice of river restoration. *Water Resources Research*, 51 (8), 5974-5997.

Zillioux, E., Porcella, D., & Benoit, A. J. (1993). Mercury cycling and effects in freshwater wetland ecosystems. *Environmental Toxicology and Chemistry*, 2245-2264.

Appendix A – Comment Tracking Table for Updated EIS

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
Manitoba Métis Community Land Use and Values in Project Area			
1	It is clear from the data presented here and available to the MMF, that there is a strong presence by the MMC in the regional and local assessment areas for the Project. This includes harvesting, occupancy, cultural values and other land uses. Presently, the Proponent has not adequately engaged with the MMF so that these land uses and values can be incorporated into the Environmental Assessment of this Project. Without incorporating this information into the effects assessment, the impacts of the Project cannot be meaningfully mitigated.	To further understand how the MMC has been or will be impacted by changes to the Project Area, further studies, including MEK studies and groundtruthing with Métis land users, is needed. The Proponent must engage with the MMF to evaluate how this information can be incorporated into the Project to inform mitigation, management, and compensation.	
Water Resources			
2	In Surface Water Quality (Section 6.4.7.7) the Proponent states that "surface water quality in LM varies spatially and is not well understood or studied" and "water levels do not appear to be a driver of LM water quality." The Proponent did acknowledge that the "timing of effect has high sensitivity because the effect occurs during a critical life stage (e.g. fish spawning)" but have dismissed the concern when stating that "direction is neutral because change in flows and lake levels will occur within previous range". The volume of water and timing has a significant effect on fish populations and this is not adequately addressed in the EIS (Mandrak, 2020).	MI has dismissed the risks posed to wildlife and habitat as a result of the anticipated changes in the duration and timing of water flows through the LSM system, and the potential effects on fish and wildlife important to Métis citizens. MI must address the risks to wildlife that the volume and temporal changes in flow pose to fish and wildlife in the Project area, especially during critical life stages.	
3	In Project Interactions with Surface Water Environment (Sections 6.4.6/6.4.8.2/6.4.11.2) the details the Proponent	MI must provide further information on their modelling of the water balance in Lake Winnipeg and demonstrate	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
	has provided for the Lake Winnipeg water balance model are vague. Furthermore, the Proponent also does not appear to have incorporated climate change into their modelling. The Proponent has implied that having 100 years of climate data is sufficient to demonstrate that Lake Winnipeg does not require detailed modelling. This is not sufficient for the MMC who utilize Lake Winnipeg for personal and commercial fishing purposes and whose ability to continue to practice personal and commercial fishing is directly impacted by the changing climate. (Mandrak, 2020).	that climate change scenarios have been included in the model.	
4	In Surface Water Overview (Section 6.4.5.2) the Proponent acknowledges the complexity of the Buffalo Creek system and the uncertainty around surface water flow and surface water – ground water interactions, suggesting that the hydrological impacts on the Buffalo Creek watershed are highly uncertain. Potential risks include increased mercury methylation and reduced flows and water volumes in the wetland system. This will likely affect hunters and trappers using the area and potentially poses a risk in increased exposure to methyl mercury.	MI must do a detailed hydrological study on the Buffalo Creek Watershed including Big Buffalo and Little Buffalo lakes, to better understand the impacts the Project will have on this watershed and the consequent effects on MMF rights, claims and interests.	
5	In Changes in Regional and/or Local Surface Water Quality (Section 6.4.7.7) the Proponent acknowledges that mercury and methylmercury were found in higher concentrations in EOC waters and that this could be directly attributed to changes induced by the EOC. This points to the risk of increased mercury methylation as a result of this Project. Increased fluctuation in groundwater	MI must acknowledge the risks and potential impacts to Métis citizens as a result of the potentially increased concentrations of methylmercury, and include MMC harvesters in follow-up mercury monitoring in waters, fish and game from the Project Regional Assessment Area.	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
	levels around the LSMOC, especially in the surficial hydrogeology of the wetlands, creates an environment favourable to increased mercury methylation (Zillioux, Porcella, & Benoit, 1993; Ulrich, Tanton, & Abdrashitova, 2001). Porewater and surface waters within the wetlands adjacent to the LSMOC could have much higher concentrations of mercury and methylmercury than the LSMOC channel and other major surface water bodies and as such present a potential pathway for mercury bioaccumulation into organisms consumed by the MMC.		
6	The LSM channel presents a significant physical barrier to accessing hunting lands on the south side of the channel, and also potentially presents a barrier to wildlife movement to either side of the channel. This has significant potential impacts on MMC citizens usage of the area	The MMF should be given the opportunity to groundtruth the area to provide thorough background knowledge on the game species they utilize in the area and how access for MMC hunters will be reduced and how wildlife behaviours and movements would be affected by the channel. This is an important input to the EA process and documentation.	
7	In Groundwater Monitoring (Section 12.4.1.1), the Proponent acknowledges the probable changes to wetland hydrology and groundwater-surface water interactions as a consequence of the Project. The consequent effects of favourable conditions for Mercury methylation are a significant concern for the MMC, who use the land and consume fish and wildlife that bioaccumulate methylmercury.	The MMF should be given the opportunity to comment on and contribute to the detailed groundwater monitoring plan. MMC citizens should be given the opportunity to participate in groundwater monitoring during Project construction and operation.	
8	In Changes in Regional and/or Local Ice Processes (Section 6.4.12.6), the Proponent argues that increases in suspended sediment will be temporary, however this is	The MMC should be provided employment opportunities to participate in construction and operational monitoring of the effectiveness of sediment and erosion control measures taken on site. MMC citizens should also be	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
	dependent on proper construction, sediment and erosion control measures and rapid establishment of vegetation in the channel. Ineffective sediment and erosion control measures risk deteriorating the quality of the fisheries in Lake Winnipeg and negatively affecting the MMC.	provided employment opportunities to monitor for the establishment of invasive species in the channel.	
9	In the Geology and Soils Follow-up and Monitoring Program (Section 12.3) not enough information is provided on the management and monitoring of soil stockpiles, which if improperly managed are a potential source of increased sediment loading into the LMOC and LSMOC and the downstream environments.	The Proponent must provide detailed information on how and where soil stockpiles will be placed, separated by soil types (topsoil, high quality subsoil and low-quality subsoil) and the stabilization, erosion control, revegetation and monitoring practices that will take place. MMC citizens should be given the opportunity to participate in soil management through employment opportunities.	
10	In Figure 6.3B-15 (Soil and Terrain Sensitive Sites), MI has identified several locations along the LMOC where soils are potentially impacted by manure. Soils exposed through the construction of the LMOC channel will likely result in elevated levels of nitrogen and phosphorous in the downstream environment, especially shortly after construction. There does not appear to have been adequate modelling to predict the downstream nutrient loading from the LMOC into Lake St. Martin. This poses significant risks to MMC citizens who use the waterways downstream of the LMOC for traditional and commercial harvesting.	MI must provide detailed modelling results and a clear assessment of the downstream nutrient loading risks as a result of the channel construction through agricultural soils impacted by the application of manure. MI must demonstrate that the residual effects are as “negligible” as they state in Section 6.4.7.7.	
Fish, Fish Habitat, and Aquatic Ecology			

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
11	The Proponent has not assessed productivity of fish habitats within the study area. (Mandrak, 2020). This assessment is fundamental to understanding the potential impacts of the Project and is a cornerstone of fish habitat compensation under the *Fisheries Act*. While diversity, biology, and habitat types have been characterized during baseline studies, there is no information on productivity and potential changes to productivity. This is of importance to the MMC as changes in productivity will have direct consequences on their ability to fish for commercial, recreational or cultural purposes.	The Proponent must complete an assessment of the productivity of aquatic habitats within the study area. This can be completed in a variety of ways including population estimates, habitat suitability indexes for multiple life-stages (e.g. spawning, rearing, foraging, overwintering), and/or estimates based on effort (e.g. catch per unit effort) with robust baseline data. As noted by Dr Mandrak: "*the lack of fish production estimates in the EIS would be addressed by multi-year standardized sampling to determine fish production in areas impacted by the Project, stratified by habitat type, and conducted across a full range of water levels. This would allow fish production estimates by area per year to be calculated and, hence, allow the amount of fish production lost, due to the Project, to be calculated by using water levels to estimate habitat area lost. However, as such data were not referred to in the EIS, it is assumed that such data do not exist. These data could be collected prior to the commencement of the Project, but the time series would likely be shorter than preferred. An indirect method for estimating the impact of changes in water levels on fish production would be to examine year-class strength using aging structures and developing age-length keys across a variety of species. Year-class strength allows the determination of specific years as good or bad in terms of recruitment, and the results can be correlated to water levels to determine the extent of influence of water level and, hence, flooded riparian area, on the recruitment of the fishes studied.*" (Mandrak, 2020).	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
12	The areas surrounding the Project are characteristically flat and swampy. The Proponent has written that this was noted by early explorers and is demonstrated by regular flooding events (Manitoba Infrastructure, 2020). Wetlands, riparian areas, and seasonally flooded areas provide important habitat for a variety of freshwater fishes. Many species spawn on flooded vegetation in spring (e.g. northern pike and yellow perch) and rely on wetlands and flooded areas for rearing. As a result, these areas are of critical importance for overall fish productivity. By reducing floodwaters in the Project area, the Project will directly impact fisheries productivity. The impacts of decreased flooding are potentially large as noted by (Mandrak, 2020) *"A decrease of 0.46 m in LM will decrease flooded riparian area by 754 km^2 as noted elsewhere in the document (Section 7.2.4). This is a huge area if being used as spawning and nursery habitat and would result in a substantial decrease in fish production*." This is part of an ongoing trend that has been occurring since colonization by Europeans (i.e. through clearing, agriculture, and development) and represents a cumulative impact which must be addressed.	A: The Proponent should adequately mitigate and offset for the negative impacts that reduced flooding will have on productivity of fish, with a focus on those species which rely on wetlands and flooded areas to carry out important life processes. This can be completed through the development of a fish habitat compensation plan or offsetting plan. This plan, which would be approved under the *Fisheries Act,* must be completed through consultation and collaboration with the MMF. B: The Proponent should evaluate how reduced flooding will act cumulatively with historic, current and future changes to the landscape which have affected important fish habitat, such as wetlands and areas prone to flooding.	
13	The impacts of regulating water levels on fish habitat and spawning areas are not well understood. The Proponent has typically described the impact of reduced	A: To adequately account for the lost productivity, the Proponent must engage in a comprehensive baseline assessment (as described above). This baseline data could then be linked with a meaningful monitoring program,	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
	water levels, in terms of average water level, for example: *"Lake Manitoba 0.024 m (non-flood) to 0.387 (m) average decrease in water level. Lake St. Martin 0.06 m (non-flood) to 0.74 (m) average decrease in water level." (Section 6.4.7.2)* However, as noted by Mandrak (2020), even moderate decreases in water levels may cause massive reductions in riparian habitat. For example, it is stated in the EIS that a decrease of 0.46 m in Lake Manitoba will decrease flooded riparian area by 754 km^2 (Section 7.2.4). This is a potentially vast area which may have value for spawning and nursery habitat, the loss of which may result in significant impacts on fish productivity (Mandrak, 2020).	which the MMF must be involved in developing. Where impacts are observed, compensation must be provided. B: The potentially large areas which were previously inundated will result in a loss of productivity that will result in a residual environmental effect that has not been mitigated. The Proponent must amend the evaluation of residual effects on fish habitat to 'significant' unless adequate offsetting or compensation measures are applied. C: The loss of fish habitat, due to decreased flooding must be compensated through a fish habitat compensation plan. The Proponent must engage with the MMF and DFO to determine the steps necessary for obtaining an Authorization for impacts to fish habitat.	
14	Under the currently designed conditions, the channels cannot be considered fish habitat, or be able to provide any positive benefits, as has been suggested by the Proponent (Section 7.2.3). The constructed channels for both LSMOC and LMOC are designed to provide hydraulic channels and not to provide fish habitat (Mandrak, 2020). Channel margins will be lined with rip rap and hardened to prevent erosion, and low-flow channels are designed to conduct water, all characteristics that are not ideal for sustaining aquatic habitats. This represents an outdated way of designing water conveyances. It is possible that the channel may even act as an "ecological trap" whereby aquatic organisms are drawn into the area	A: The Proponent should incorporate modern restoration techniques and practices (such as including principles of natural channel design) into the design of the LSMOC and LMOC to improve habitat quality and reduce impacts on local fish populations (Wohl, Lane, & Wilcox, 2015). This should include designing channels to sustain velocities, depths, and habitat types which could support a diverse aquatic community. The channel should be designed to pass maximum and minimum flows while maintaining refuge areas where species can persist. Where possible, channel morphology should contain design considerations that mimic natural channels and	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
	during periods when conditions are suitable but then become trapped and unable to complete the phases of their natural history. This essentially removes these individuals from the local population (e.g. isolation, stranding and mortality), contributing to reduced productivity. It is expected that any species which colonize and persist in the channels will be those that are adapted to disturbance and poor-quality habitat. It is also possible that the channels may act as corridors that facilitate the spread of aquatic invasive species, such as common carp which are adapted to the poor habitat conditions that may be present.	allow fluvial geomorphological processes to operate and create a diverse habitat. A properly designed channel should include features such as flood plains, riparian and aquatic vegetation, channel meanders, pools, riffles, runs, offline wetlands and diverse substrate. Importantly, the design will accommodate the expected conditions so that the ecosystem processes area allowed to operate and will become a naturally regenerative system (within the limits of the imposed water control guidelines). Ultimately, these channels represent an opportunity to create a positive effect on local aquatic populations. Engagement with the MMC on how to implement natural channel design should occur with the MMF. B: The Proponent should consider incorporating additional habitat features below the drop structure in Sturgeon Bay. Some resident species (e.g. walleye and some sucker species) may be attracted to the outfall flows and spawn if appropriate spawning substrate is available (e.g. gravels and boulders). This is commonly observed in the tailrace of dams.	
15	The Project will result in changes to shoreline geomorphology and local drainage areas/patterns that will result in the loss of fish habitat (Mandrak, 2020). This habitat loss will include nursery and spawning habitat, which are important for the overall productivity within the LAA. For example:	The Proponent must compensate for the impacts of the Project on fish and fish habitat due to changes to shoreline geomorphology and local drainage areas/patterns. This can be completed through the development of a fish habitat compensation plan or offsetting plan, which must be developed with engagement of DFO and the MMF (as described above in recommendations 11 and 12).	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
	• Alteration to shoreline in Watchorn Bay (LM) and Sturgeon Bay (LSM) due to excavation of lake bottom during construction and dredge during operation (Section 6.4.7). • Scouring in Birch Bay (LSM) and Sturgeon Bay (LW) from discharge (Section 6.4.7). • Reduced flows in Birch Creek (27.4%) and Watchhorn Creek (4%) from reduced drainage areas (Section 6.4.7). • Direct loss of habitat from rock-filled jetties and other engineered structures proposed by the Proponent as "mitigation".		
16	The Proponent has chosen four fish species to evaluate potential impacts of the Project. Unfortunately, these species do not capture the full extent of life-history requirements and habitats used by fish in the LAA or RAA and thus underestimate the potential impacts (Mandrak, 2020). Moreover, the MMF considers all species to be important for a variety of reasons, including commercial, recreational, cultural or ecological values. This perspective on the importance of all fish species is in agreement with the current *Fisheries Act* which provides protection for all species, not just representatives.	The Proponent must provide a more fulsome evaluation of impacts to all fish species potentially impacted by the Project.	
17	The Biosecurity Management Plan (Section 3.7.2) and Emergency Response Plan (Section 3.7.2) focus on terrestrial invasive species that may be spread during	The Proponent must include aquatic and terrestrial invasive species in the Biosecurity Management Plan and Emergency Response Plan.	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
	construction but do not address aquatic invasive species (Mandrak, 2020). There is a risk that aquatic invasive species may also be spread during construction.		
18	The Proponent has not provided information on the effort that will be applied to fish salvage (e.g. until no fish are left in the areas) or whether all fish, including invasive species will be salvaged (Section 2.4.3) (Mandrak, 2020).	A: The Proponent must provide information on fish salvage effort and measures to prevent spread of non-fish aquatic invasive species during salvage operations. B: A SAR permit may be required to salvage fish SAR.	
19	It has not been explicitly described how habitat quality for temporary diversions will be maintained (Section 2.4.3) (Mandrak, 2020).	The Proponent must describe how habitat quality of temporary diversions will be maintained (e.g. O_2, low turbidity, aquatic vegetation, physical structures).	
20	The Proponent has not provided a discussion of potential noise pollution and mitigation in aquatic environment (Change in Acoustic Environment (Sections 6.2.4.4/6.2.6.2/6.2.8.3) (Mandrak, 2020). The potential impacts of noise and vibration on aquatic environments are well established.	The Proponent should elaborate on the potential impacts of noise and vibrations on fish and fish habitat. This must include proposed mitigation measures and a commitment to implement DFO guidelines on the use of explosives near fish bearing waters (DFO, 1998).	
21	The Project may use nighttime safety lighting near water control structures (Sections 6.2.4.5/6.2.6.3/6.2.8.4: *"During the project operation and maintenance, some nighttime safety lighting may be required for water control structures. The final lighting design has not yet been completed (p. 6.67)"*. These lights may attract fishes, causing negative impacts such as reduced feeding success or higher predation.	The Proponent should elaborate on the potential impacts of night-time lighting on fish and fish habitat. This must include proposed mitigation measures.	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
	Despite these potential impacts, the Proponent has not provided a discussion of potential light pollution and mitigation in aquatic environment (Mandrak, 2020).		
22	The definition provided by the Proponent for fish and fish habitat does not include adequate detail on physical (e.g. substrate), chemical (e.g. water quality) and biological (e.g. aquatic vegetation) components (Mandrak, 2020). These are important considerations that must be carried through the effects assessment.	The Proponent must expand the definition of fish habitat to ensure it includes physical (e.g. substrate), chemical (e.g. water quality), and biological (e.g. aquatic vegetation) components.	
23	The scope of the Local Assessment Area does not include all of Lake Manitoba (Table 7.2-2, Section 7.2.1.5) even though many impacts (e.g. water-level changes, fish movement, nutrient loading) may occur throughout the lake. Based on the evidence provided by the Proponent, there is no reason to believe that impacts to fish and fish habitat would not be measurable, with an adequate monitoring program (Mandrak, 2020).	The MMF recommends that the scope of the LAA be expanded to include all of Lake Manitoba.	
24	The Proponent has identified that for a residual effect to fish habitat or fish passage to be considered significant, they must be permanent (Section 7.2.1.7). It is not clear why these effects need to be permanent to be significant. Indeed, this language is not in the amended *Fisheries Act*. If the Project results in temporary changes to either fish habitat or fish passage, there could be impacts on fish productivity, especially if appropriate mitigation is not implemented (Mandrak, 2020).	The Proponent should modify the definition for significant effects on fish habitat and fish passage to include temporary effects with a high magnitude.	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
25	The Proponent has not included any evaluation of the risk posed by aquatic invasive species which may invade the region in the future. For examples, the Prussian carp which is currently found in Saskatchewan and which may spread to the Project area in the future (Mandrak, 2020).	A: The Proponent should update the existing conditions (Section 7.2.2) to evaluate risk of potential aquatic invasive species, such as the Prussian carp. B: A post-Zebra Mussel invasion stage should be added to the description of the Lake Winnipeg benthos. C: The Proponent must provide additional information on the proposed Biosecurity Management Plan and the Access Management Plan and how these will comply with provincial aquatic invasive species regulations.	
26	Based on the existing condition (Section 7.2.2.2), it appears that Pineimuta Lake supports ideal spawning and nursery habitat for a variety of species. Further information is required on this habitat (Mandrak, 2020).	The Proponent should provide additional information on habitat in Pineimuta Lake, including its use by migratory species, oxygen levels during winter/summer, and observations of winterkill (if any).	
27	It is not clear if the Denil fishway will continue to operate between LSM and LM (Section 7.2.2.2). This fishway plays an important role in fish passage and the potential impacts of the Project may be exacerbated if it is no longer operated (Mandrak, 2020).	The Proponent must clarify whether the Denil fishway will continue to be operated. If not, this must be factored into the effects assessment on fish passage.	
28	The information on fish sampling effort is poor (Section 7.2.2.2). Data for recent sampling in RAA for fish occurrence, abundance, movement and habitat does not include levels effort (i.e. catch per unit effort) (Mandrak, 2020). This must include information on these parameters during low- and high- water years. This information would provide critical information for understanding the relationship between commercial	A: The Proponent must include information on fishing effort that was used for baseline characterization. This is relevant for understanding existing conditions and for comparing with results of monitoring to assess potential effects. B: The Proponent should provide a more detailed discussion of commercial and recreational data. This must	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
	harvest and water levels. Secondly, there is a lack of good recreational fishing data.	include an evaluation of the relationship between water levels and productivity.	
29	Fish productivity was not considered in the development of six options considered in the EIS or the preferred option.	The Proponent must include fish productivity as a factor considered in the evaluation of alternative route options. Information on how this assessment will affect current Project designs should be shared with the MMF.	
30	The Proponent has defined a significant effect on fish health or mortality as: "a change in fish health or mortality that is likely to result in a measurable change in the abundance of any CRA fish population in the RAA" (Section 7.2.1.7). Despite this description, the effect of sedimentation during construction and operations is rated as not significant. The effects of sediment are well known and cause considerable impacts within the LAA and RAA. Sand, silt and clay that erodes from the LSMOC, LMOC or upstream waterbodies could be mobilized downstream, contributing to impacts on fish and fish habitat. Moreover, nutrients (e.g. phosphorus bound to clay particles) can also be mobilized, contributing to increased nutrient levels and algal blooms. Due to its size and economic importance, the effects of nutrient loading and sedimentation on Lake Winnipeg has been a particular focus of recent research (Matisoff, Watson, Guo, Duewiger, & Steely, 2017; Schindler, Hecky, & McCullough, 2012). Given the sensitivity of the aquatic habitats in the region, it is unclear how the proponent has determined that the residual effects of sedimentation are not significant	A: The MMF strongly disputes this characterization that the impact of sedimentation is negligible or low (Table 7.2-9). The Proponent must change characterization of residual effects and increase the characterization for the magnitude of effect to "moderate". B: The Proponent must complete sediment transport modelling, to support the claim that long term erosion and sedimentation will not impact fish habitat within Lake Winnipeg and Sturgeon Bay. C: The Proponent must describe adequate monitoring of erosion and sedimentation. This monitoring program should be tied to the results of sediment transport modeling so that results can be meaningfully interpreted based on observations and predictions made in the EIS.	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
	(Section 7.2.5). Moreover, a properly designed monitoring program will most certainly detect effects from these changes on fish populations, thus resulting in a significant effect, as defined in the EIS.		
31	The information provided on monitoring is insufficient for ensuring that effects of the Project will be detected and managed appropriately. The Proponent has not provided information on any specific monitoring that will occur to ensure the accuracy of predictions or evaluate changes to fish and fish habitat. Instead, they have stated that an Aquatic Effects Monitoring Plan (AEMP) will be developed which would describe monitoring of water quality, fish habitat, and fish populations (Section 7.2.8).	A: MI must provide additional details on the specific monitoring activities that will be completed as part of construction and operation phases for the Project. This should include details on methodology, timing and scope of monitoring activities. It should be clear how monitoring of effects is linked to the measurable parameters described in the EIS (Table 7.2-2), with established triggers for initiating adaptive management. B: MI must consult with the MMF on development and implementation of the AEMP. A draft version of this plan should be prepared and circulated to the MMF for comment. Adequate funding (identified through engagement with the MMF) for supporting the review, should be provided. C: MI must consult with the MMF on involvement of the MMC as monitors for all phases of the Project. This could be guided through an agreement regarding opportunities for training and capacity building. The MMF can provide guidance on specific components of the Project with which the MMC can be involved (e.g. construction monitoring, sediment and erosion control, and water quality).	

Comment #	Issue	Question/Recommendation	Response from Manitoba Infrastructure
Summary and Conclusions			
Sum 1	1. MI to provide written responses to each comment raised as part of this review and impact assessment. Responses should include specific information and actions to be taken by MI to ensure resolution of the issue. Where MI disagrees with specific recommendations, a substantial rationale and alternative recommendation should be given. To facilitate this process, we have included a tracking table with all comments and recommendations described in this report (Appendix A).		
Sum 2	2. MI to establish a forum and process with Manitoba and the MMF where issues regarding the Project can be brought forward, discussed, and addressed throughout the life of the Project (including the provision of capacity funding to MMF to support this process). This forum/process can facilitate the involvement of the MMF in ongoing permitting and approvals related to the Project.		
Sum 3	3. To further understand how the MMC has been or will be impacted by changes to the Project Area, further studies, including MEK studies and groundtruthing areas with Métis land users, is needed. The Proponent must the engage with the MMF to evaluate how this information can be incorporated into the Project to inform mitigation, management and compensation.		
Sum 4	4. MMF and MI to negotiate agreements to address impacts of the Project on MMC rights, claims and interest and to support MMF's participation in environmental and cultural monitoring throughout the life of the project. Components of this agreement should include (but not be limited to): • Funding for MEK and groundtruthing studies; • Hiring and training of MMF environmental and cultural monitors for all phases of the Project; and • Annual reporting to the MMF on results of monitoring and any adaptive management measures being implemented.		
Sum 5	5. Manitoba should commit to meaningful consultation with the MMF and involvement of the MMC in future planning, decision making, licensing, and monitoring of developments that are enabled by the Project.		

Appendix B – Technical Report by Dr. Mandrak

Update of Review based on March 2020 version of Lake Manitoba and Lake St. Martin Outlet Channels Project Environmental Impact Statement

Nicholas E. Mandrak, PhD

Professor

University of Toronto Scarborough

April 2020

Objective

The objective of this second review is determine if the fisheries components of Lake Manitoba and Lake St. Martin Outlet Channels Project (subsequently referred to as the "Project") Environmental Impact Statement (EIS) changed substantially between original and March 2020 versions and, if so, amend my review of the original EIS dated February 19, 2020.

Comments

In Table 1A-1, the revised EIS did indicate that the *Fisheries Act* was amended in 2019. Although the amended *Fisheries Act* is referred to in Table 1A-1, the associated Regulations/Policy Implications in the table do not reflect the amendments to the Act, particularly as it relates to fish habitat. Section 7 (Aquatic Environment) does not appear to have been revised to reflect significant changes in the Act as language found in the previous version of the EIS and no longer in the Act (e.g. CRA species) is still present in the revised EIS. In fact, except for the *Fisheries Act* note in Table 1A-1, the fisheries components of the EIS appear to have not been revised in any discernible way; therefore, my comments on the fisheries components of the original EIS are still valid. Note that I have made minor revisions to the references in my original comments to reflect minor changes in page and section numbering in the revised EIS.

Review of Fisheries Components of Lake Manitoba and Lake St. Martin Outlet Channels Project Environmental Impact Statement

Nicholas E. Mandrak, PhD

Professor

University of Toronto Scarborough

February 19, 2020

Objective

The objective of this review is to critically evaluate the fisheries components of Lake Manitoba and Lake St. Martin Outlet Channels Project (subsequently referred to as the "Project") Environmental Impact Statement (EIS). This review will specifically identify the strengths and weaknesses of the EIS as it relates to the potential impacts of the Project on fishes, fish habitat, and fish production. Although important, it does not consider the Indigenous or socio-economic implications of the proposed project as it is beyond the scope of my expertise. I have partitioned my comments into major and minor comments.

Major Comments

1. Lack of estimates of impact on fish production.

From a fisheries perspective, the critical shortcoming of the EIS is the lack of any estimates of past, present, or future fish production under historical, current, and projected Project conditions, respectively. As fish production is the cornerstone of the federal government (i.e. Fisheries and Oceans Canada (DFO)) legislation (*Fisheries Act*) and policy (DFO Fish and Fish Habitat Protection Program (FFHPP)) for protecting fishes, fish habitat, and fisheries, it is surprising that this is not directly and comprehensively addressed. Although information is provided on the composition and biology of the fishes within the Project area, this is only the first step required to fully identify potential impacts.

Wetlands and seasonally flooded areas are critical spawning and nursery habitats for a majority of Canadian freshwater fishes. <u>If these areas are reduced or lost, overall fish production is reduced or lost.</u> The EIS points out in several places how extensive such areas were in the past and present. For example:

"Early explorers in the area also noted that the area around Lake St. Martin and on Dauphin River was "flat and swampy country" (Hind 1860)." (Section 2.2)

"The greater fluctuations in water levels combined with the low and swampy shorelines around Lake St. Martin has resulted in more frequent overland flooding during periods of high-water levels from Lake St. Martin since regulation of Lake Manitoba began." (Section 2.2)

"Given the flat topography in much of Manitoba, the province is susceptible to flooding; especially in the spring, when surface water flows are typically at their peak. Land development in the prairie provinces has increased over the past century, including clearing and draining lands to make way for urban areas and agricultural development. These practices have generally resulted in quicker drainage and increased flows to receiving water bodies, creating conditions where flooding events have resulted in increasing impacts to people, the economy, and infrastructure." (Section 2.2)

"marshlands surrounding the lake are considered important spawning and nursery areas for fish" (Section 7.2.2.2)

The flat and swampy country experienced by early explorers provided critical fish spawning and nursery habitat and was responsible for what was likely higher fish production prior to European settlement. Undoubtedly, this productivity started to decline as a result of European land "development". In areas prone to development, such as the Project area, this has led to the conflict between aquatic productivity and terrestrial development including farms and human populated areas. By substantially reducing floodwaters, the Project is in direct conflict with maintaining existing fish production.

"The purpose of the Project is to develop a permanent flood control management system for Lake Manitoba and Lake St. Martin for alleviating flooding in the Lake St. Martin region" (Section 1.1)

"These new channels will facilitate better management and control of the floodwater on these lakes by providing additional capacity to move floodwater from Lake Manitoba through Lake St. Martin into Lake Winnipeg. The Project will reduce or completely avoid overland inundation during high water events such as the 2011 flood." (Section 1.1)

The impacts of regulating water levels on aquatic habitat in the Project area had previously been identifies as a concern, as recently as 2003. The EIS indicates that guidance on lake levels provided in 2003 will be used to guide the operation of the proposed Project. It is not clear how

the 2003 guidance was derived; however, it was very unlikely to be based on fish production as such studies pre-dating 2003 were not cited in the EIS and DFO policies have changed since then.

"While several previous studies of Lake Manitoba undertaken by the Manitoba Water Commission between 1968 and 1973 had recommended status quo as the best option (MFRTF 2013), further study by the Lake Manitoba Regulation Review Advisory Committee in 2003 recommended that the lake be allowed to fluctuate more naturally to benefit aquatic habitat along the lakeshore. As a result, desired lake levels were identified for Lake Manitoba and Lake St. Martin and are used to guide the operation of flood mitigation and water control infrastructure. Specific to the proposed Project, these desired lake levels are used to guide operation of the FRWCS via operating guidelines." (Section 2.3)

A preliminary analysis of over 70 mitigation was pared down to six options based on a relative assessment of environmental concerns and cost effectiveness. The relative assessment of environmental concerns did not appear to include fish production, nor appeared to be the primary driver of the decision making.

"Overall, more than 70 mitigation options were evaluated for more than 100 vulnerabilities in subsequent analyses for the overall study area" (Section 2.3)
"The Study concluded that an "Increase in the discharge capacity from Lake Manitoba and Lake St. Martin is a viable and direct means to limit rises in flood conditions on both lakes" (KGS Group 2016). (Section 2.3)"
"Of the options evaluated, the construction of an additional Lake St. Martin channel (to become the EOC) and full use of the FRWCS was considered to be the most timely, effective, and economical option for lowering Lake Manitoba and Lake St. Martin at that time."(Section 2.3)
"Six Lake Manitoba outlet options were identified in Stage 1" (Section 2.3)
"The general environmental concerns were described for each option in terms of relative effects on surface water quality, groundwater, terrestrial environment, fish habitat, fish resources, and

social environment. A relative ranking of each option was generated based on the environmental effects for all six of the Lake Manitoba channel options (KGS Group 2016a) … Furthermore, the Lake Manitoba Outlet Channel Options C and D were preferred due to their cost effectiveness and the positive relative environmental rankings." (Section 2.3)

Depending on duration and time of year, loss of fish production is likely directly proportional to the amount of flooded riparian area lost due to regulation of water levels by the project. The extent of lost production has not been estimated in the EIS, and it is even difficult to determine the amount of flooded riparian as the impact of the project is typically reported in water levels, not area lost. For example:
"Lake Manitoba 0.024 m (non-flood) to 0.387 (m) average decrease in water level. Lake St. Martin 0.06 m (non-flood) to 0.74 (m) average decrease in water level." (Section 6.4.7.2)

A decrease of 0.46 m in LM will decrease flooded riparian area by 754 km^2 as noted elsewhere in the document (Section 7.2.4). This is a huge area if being used as spawning and nursery habitat and would result in a substantial decrease in fish production.

Ideally, the lack of fish production estimates in the EIS would be addressed by multi-year standardized sampling to determine fish production in areas impacted by the Project, stratified by habitat type, and conducted across a full range of water levels. This would allow fish production estimates by area per year to be calculated and, hence, allow the amount of fish production lost, due to the Project, to be calculated by using water levels to estimate habitat area lost. However, as such data were not referred to in the EIS, it is assumed that such data do not exist. These data could be collected prior to the commencement of the Project, but the time series would likely be shorter than preferred. An indirect method for estimating the impact of changes in water levels on fish production would be to examine year-class strength using aging structures and developing age-length keys across a variety of species. Year-class strength allows the determination of specific years as good or bad in terms of recruitment, and

the results can be correlated to water levels to determine the extent of influence of water level and, hence, flooded riparian area, on the recruitment of the fishes studied.

2. The channels do not provide high-quality habitat for native fishes and have the potential to act as ecological traps.

The EIS acknowledges that PDAs will be maintained as hydraulic channels, not as natural rivers. Channel design will provide for downstream fish passage, but hardened to prevent erosion, and not designed to mimic a natural riverine system with ecological functions.

"During non-flood operations, when the WCS gates are closed (70% to 87% of the time, depending on the month), there will be an approximately 1 m to 2.5 m depth of water in the channel, as a minimum, with average velocities typically less than 0.1 m/s depending on base flow." (Section 3.4.3.1)

"…a limited discharge from Lake St. Martin may be conveyed through the WCS to maintain adequate water quality in the channel when it is not in operation for flood management and to sustain fish habitat." (Section 3.4.3.1)

At a minimum, this habitat is not suitable for many native fish species. However, it is suitable for many AIS, e.g. Common Carp, Goldfish, Prussian Carp, dreissenid mussels, and may facilitate the spread and establishment of AIS. At worst, the habitat may act as an "ecological trap". An ecological trap is a phenomenon, typically human induced, that draws organisms into an area from which it cannot readily leave, but does not provide sufficient life-history requirements (e.g. food, water quality, spawning habitat) for long-term survival, leading to the loss of the "trapped" individuals from the population and, hence, resulting in reduced production. Production will be lost if fishes simply avoid the channels, but may be even further lost if fishes are drawn into the channels and trapped. Fishes may be drawn into the channels from upstream by dispersal from above the gates or from downstream by dispersal toward the attractant flow through the gates. In any given year, as flood operations cease and the flows lessen, fishes may get trapped (stranded) in the channels as it will be difficult to design the channels for the fish to "escape" or "minimize the potential for stranding" as flows drop.

Contrary to what the EIS claims, the channels will NOT "create new fish habitat during operations, a potential benefit (Section 7.2.3)".

"The high velocities and elevation difference through the drop structures will prevent the movement of fish in the upstream direction from Sturgeon Bay in Lake Winnipeg to Lake St. Martin. However, since fish may be able to move downstream into the LSMOC from Lake St. Martin when the WCS gates are open during flood conditions, the drop structure design criteria considers that fish must be able to escape from the LSMOC as much as practical post-flooding when the control structure gates are closed." (Section 3.4.3.4)
"The design must accommodate the movement of fish downstream past any of the drop structures. This will minimize the potential for fish stranding after flood operations end in any particular year when the LSMOC is used." (Section 3.4.3.4)

3. The Project will impact fish habitat beyond the channels.

Changes in shoreline geomorphology and local drainage areas and patterns will result in the loss of fish habitat, including spawning habitat, and, consequently, fish production. For example:

- Changes in local shoreline geomorphology in Watchorn Bay (LM) and Sturgeon Bay (LSM) due to excavation of lake bottom during construction and dredge during operation (Section 6.4.7).
- Discharge to Birch Bay (LSM) and Sturgeon Bay (LW) may cause scouring (Section 6.4.7).
- Reduced drainage areas of Birch Creek (27.4%) and Watchhorn Creek (4%) resulting in reduced flows (Section 6.4.7).

The footprint of rock-filled jetties or other engineered structures proposed to mitigate changes in shoreline geomorphology and shoreline erosion will, themselves, cause habitat destruction.

4. "Residual effects" will require offsetting.

Based on the revised *Fisheries Act* and associated policies of FFHPP, the "residual effects" on fishes and fish habitat will require offsetting. Offsetting is a policy approach to compensating for projects with negative impacts that cannot be mitigated. The offset is an action that will have a positive impact typically greater than the negative impact (e.g. result in a net gain of fish production). Ideally, the offset should be directly related (geography, nature of impact) to the Project, but may be different in nature or location if a more suitable offset is not practical. The EIS claims that the "channels will create new fish habitat during operations, a potential benefit" and "inherently mitigates effects on fish habitat by creating new fish habitat in LMOC and LSMOC" (Section 7.2.3). Based on the information provided in the EIS, it is pretty clear that the channels will NOT provide an adequate offset. As will be required by the DFO Authorization, the Project will be required to identify suitable offsets. However, this will be difficult as the best way to determine the nature and extent of offset required and to measure its success is by estimating fish production for the areas where it will be lost and for the offset. The EIS provides no such estimates.

5. Four Chosen Fish Species May Not Represent Entire Fish Community

Section 7.2.1.4 - information related to *Fisheries Act* has to be updated with the passing of Bill C-69 (Royal Ascent Jun 21, 2019). The effects of the Project on all species and fish habitat must be assessed, not just the four chosen species. The species chosen likely to be less impacted during full operation as they may largely spawn outside of the timing window (walleye, pike, whitefish) and their spawning and rearing habitat in deeper waters (walleye, whitefish).

Minor Comments

1. Mitigations identified to protect fishes and fish habitat during construction are adequate (Sections 3.3, 3.4), except if coffer dams remain in place for more than a year, which may block annual migrations. The EIS adequately identifies the potential impacts and knowledge gaps under such a circumstance (Section 3.5.2).

2. Biosecurity Management Plan (Section 3.7.2) and Emergency Response Plan (Section 3.7.2) appear to primarily address terrestrial invasive species that may be spread during the construction phase. Aquatic invasive species may also be spread during this phase. Both aquatic and terrestrial invasive species should be explicitly addressed.
3. There is no indication of amount of effort required for fish salvage (e.g. until no fish are left in the areas) nor whether all fish, including invasive species, should be salvaged (Section 2.4.3). How will fish salvage prevent spread of non-fish aquatic invasive species?
4. SAR permit is also required to salvage fish SAR (Section 2.4.3).
5. In addition to allowing for fish passage, temporary diversions also require sufficient habitat (e.g. O_2, low turbidity, aquatic vegetation, physical structures) and this should be explicitly added (Section 2.4.3).
6. The results of public and Indigenous engagement identified many of the potential impacts to fishes (Section 5.2), but did not explicitly identify fish production, a more theoretical concept related to the issues identified (e.g. abundance, habitat).
7. Change in Acoustic Environment (Sections 6.2.4.4/6.2.6.2/6.2.8.3). No discussion of potential noise pollution and mitigation in aquatic environment. Table 6.2-28 identifies disturbed ecological context without additional information and indicates a high prediction confidence high – does this really apply to any disturbed ecological context?
8. Change in Ambient Light (Sections 6.2.4.5/6.2.6.3/6.2.8.4). No discussion of potential light pollution and mitigation in aquatic environment. *"During the project operation and maintenance, some nighttime safety lighting may be required for water control structures. The final lighting design has not yet been completed (p. 6.67)"*. These are likely to unnaturally draw fishes to them and may result in negative impacts (e.g. higher predation). Table 6.2-28 identifies disturbed ecological context without additional information and indicates a high prediction confidence high – does this really apply to disturbed ecological context?
9. Project Interactions with Surface Water Environment (Sections 6.4.6/6.4.8.2/6.4.11.2). Lake Winnipeg Water balance model details vague. Does not appear to incorporate

climate change. Recommend that you have a hydrologist check these numbers. *"Ecological context is disturbed because previously disturbed by human development"* – not sure if the entire aquatic ecological context should be considered disturbed. It is good that they recognized, *"Timing of effect has high sensitivity because the effect occurs during a critical life stage (e.g. fish spawning) (p. 6.190)"*. Because there is 100 years of data does not mean that there is necessarily high degree of confidence (6.4.10.2) – this may allow accurate modeling of the past, but may not lead to accurate modeling of the future under different climate scenarios.

10. Changes in Fluvial Geomorphology and Shoreline Geomorphology (Section 6.4.7.3). See Major Comment Section#1 for additional issues directly related to productivity. *"Ecological context is disturbed because previously disturbed by human development*" – not sure if the entire aquatic ecological context should be considered disturbed. It is good that they recognized, *"Timing of effect has high sensitivity because the effect occurs during a critical life stage (e.g. fish spawning)"*. Not clear why *"direction is neutral because change in flows and lake levels will occur within previous range"* as duration and timing is also important not indicated if this would also be the same. *"Difficult to quantify effects on Buffalo Creek system before construction complete (p. 6.199)"* – therefore, should assume there will be impacts on fishes and avoid or mitigate.
11. Sediment and Debris Transport (Section 6.4.7.5). *"Ecological context is disturbed because previously disturbed by human development"* – not sure if the entire aquatic ecological context should be considered disturbed. It is good that they recognized, *"Timing of effect has high sensitivity because the effect occurs during a critical life stage (e.g. fish spawning)"*.
12. Surface Water Quality (Section 6.4.7.7). *"Expected to be within limits for aquatic life", "surface water quality in LM varies spatially and is not well understood or studied"* and *"water levels do not appear to be a driver of LM water quality"* – this is very subjective and not very reassuring. It is good that they recognized, *"Timing of effect has high sensitivity because the effect occurs during a critical life stage (e.g. fish spawning)"*. Not clear why *"direction is neutral because change in flows and lake levels will occur within*

previous range" as duration and timing is also important not indicated if this would also be the same.

13. Table 7.2-2 - Need to define fish habitat to ensure it includes physical (e.g. substrate), chemical (e.g. water quality), and biological (e.g. aquatic vegetation) components. The table does not address water quality, nor explicitly address aquatic vegetation.
14. Table 7.2-2, Section 7.2.1.5. - Local Assessment Area does not include all of Lake Manitoba although water-level changes and potential fish movements, and hence impacts, could be lake wide. No reason to believe that effects on fishes and fish habitat would be "unmeasurable" – production can be measured at lake level.
15. Significance Definition (Section 7.2.1.7) – *"Permanent alteration or destruction of fish habitat likely to lead to irreversible, measurable reduction in annual production of CRA fishes in RAA".* Not clear why it needs to be permanent and irreversible to be significant – this language is not in the amended *Fisheries Act*. If either one or both, there may be significant impacts on production, particularly if mitigation is not undertaken to reverse. "*Permanent alteration of fish passage likely to result in irreversible, measurable reduction of critical movements or irreversible measurable increase in distribution of AIS likely to reduce annual production of CRA fish species".* Not clear why it needs to be permanent as, even if temporary, there may be significant impacts. *"Change in fish health or mortality likely to result in a measurable change in the abundance of any CRA population in RAA"*. This seems reasonable. RAA of LSM, LM, and LW (north basin) and associated changes seems reasonable. Note CRA will need to be changed given recent changes to *Fisheries Act*.
16. Existing Conditions for Fish and Fish Habitat (Section 7.2.2) – Should include risk assessments of potential AIS, e.g. Prussian Carp currently spreading eastward from Saskatchewan.
17. Section 7.2.2.2 - A post-Zebra Mussel invasion stage could be added to the description of the Lake Winnipeg benthos.
18. Table 7.2-4 – I don't think Lake Sturgeon was introduced to Lake Manitoba. Many of the NT species are likely to be found in the nearshore of lakes.

19. Section 7.2.2.2 – Pineimuta Lake appears to have ideal spawning and nursery habitat. Is it used by migratory species? Is it prone to winterkill?
20. Section 7.2.2.2 – It is not clear if the Denil fishway will continue to operate between LSM and LM. Impact will be increased if no longer operated.
21. Section 7.2.2.2 – Recent sampling in RAA for fish occurrence, abundance, movement and habitat is not comprehensive. What is CPUE and production in low- and high- water years? Is commercial harvest related to water levels, including a lag? There is a lack of good recreational fishing data.
22. Table 7.2-5 – Not clear how there will be a change in fish health or mortality not related to habitat alteration.
23. Assessment of Residual Environmental Effects (Section 7.2.4) – Change in habitat due to excavation is a fair assessment. Change in groundwater inflows appears to be a good assessment, but I recommend you get a hydrologist to review it. Change in habitat due to realignment, isolation or dewatering of drains and headwater streams is a good assessment. Change in habitat due to movement and deposition of sediment is a fair assessment. Change in flow patterns is a fair assessment.
24. Assessment of Residual Environmental Effects (Section 7.2.4) – Introduction of AIS is missing Prussian Carp. Mitigation of AIS does not discuss new connectivity potentially facilitating the spread of AIS. “Implement access management plan” is far too vague. Does the plan comply with provincial AIS regulations? Likely effectiveness assessed as “moderate” but more likely low.
25. Assessment of Residual Environmental Effects (Section 7.2.4) – Change in riparian area inundation is poorly assessed. “Riparian areas flooded during extreme high-water events generally not considered important due to infrequent occurrence, but contribute nutrients and supplementary food items.” What about high-water events that provide spawning habitat? Also depends on when flooding occurs now and in future (e.g. earlier runoff associated with climate change). Note that a decrease of 0.46 m in LM will decreased flooded riparian area by 754 km^2 – this is a huge area if being used as

spawning and nursery habitat and would result in a substantial decrease in fish production.

2.1 The purpose of this Act is to provide a framework for

- **(a)** the proper management and control of fisheries; and
- **(b)** the conservation and protection of fish and fish habitat, including by preventing pollution.

Rights of Indigenous peoples of Canada

2.3 This Act is to be construed as upholding the rights of Indigenous peoples recognized and affirmed by section 35 of the *Constitution Act, 1982*, and not as abrogating or derogating from them.

- 2019, c. 14, s. 3

Duty of Minister

2.4 When making a decision under this Act, the Minister shall consider any adverse effects that the decision may have on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*.

- 2019, c. 14, s. 3

Considerations for decision making

2.5 Except as otherwise provided in this Act, when making a decision under this Act, the Minister may consider, among other things,

- **(a)** the application of a precautionary approach and an ecosystem approach;
- **(b)** the sustainability of fisheries;
- **(c)** scientific information;
- **(d)** Indigenous knowledge of the Indigenous peoples of Canada that has been provided to the Minister;
- **(e)** community knowledge;
- **(f)** cooperation with any government of a province, any Indigenous governing body and any body — including a co-management body — established under a land claims agreement;
- **(g)** social, economic and cultural factors in the management of fisheries;
- **(h)** the preservation or promotion of the independence of licence holders in commercial inshore fisheries; and
- **(i)** the intersection of sex and gender with other identity factors.

- 2019, c. 14, s. 3