Appendix T
Mi'kmaq of Nova Scotia Ecological Knowledge Study

Boat Harbour Remediation MEKS

Membertou
GEOMATICS SOLUTIONS

June 2018
Version 1d

M.E.K.S. Project Team

Jason Googoo, Project Manager

Dave Moore, Author and Research

Craig Hodder, Author and GIS Technician

Aaron Googoo, GIS Technician

Josh LaPorte, GIS Technician

Kim Strickland, MEKS Interviewer

Tanya Francis, MEKS Interviewer

Kerry Prosper, MEKS Traditionalist

Ralph Francis, MEKS Traditionalist

MGS would like to acknowledge the assistance received from Michelle Francis-Denny, Boat Harbour Remediation Community Liaison, PLFN, throughout the entire project.

Prepared by:

Craig Hodder, Author

Reviewed by:

Jason Googoo, Manager

Executive Summary

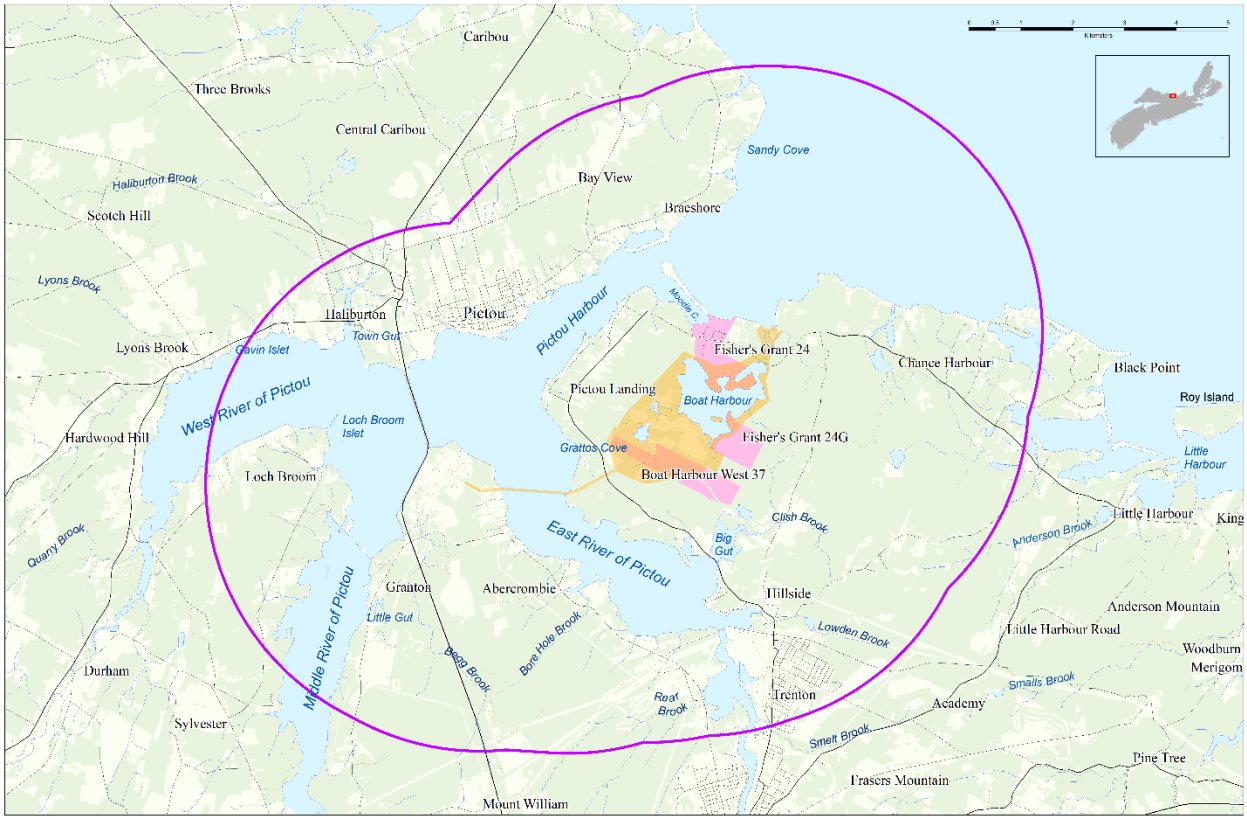
This Mi'kmaq Ecological Knowledge Study, also commonly referred to as a MEKS or a Traditional Ecological Knowledge Study (TEKS), was developed by Membertou Geomatics Solutions (MGS) for GHD Limited with regards to the proposed Boat Harbour Remediation located adjacent to Pictou Landing First Nation (PLFN), Nova Scotia.

This MEKS mandate is to consider land and water areas in which the proposed properties contained within the proposed project are located and to identify what Mi'kmaq traditional use activities have occurred, or are currently occurring within, and what Mi'kmaq ecological knowledge presently exists in regards to the area. In order to ensure accountability and ethic responsibility of this MEKS, the MEKS development has adhered to the "Mi'kmaq Ecological Knowledge Protocol, 2nd Edition". This protocol is a document that has been established by the Assembly of Nova Scotia Mi'kmaq Chiefs, which speaks to the process, procedures and results that are expected of a MEKS.

The Mi'kmaq Ecological Knowledge Study consisted of two major components:

- **Mi'kmaq Traditional Land and Resource Use Activities**, both past and present,
- A **Mi'kmaq Significance Species Analysis**, considering the resources that are important to Mi'kmaq use.

The Mi'kmaq Traditional Land and Resource Use Activities component utilized interviews as the key source of information regarding Mi'kmaq use within the Project Site and Study Area. The Project Site includes Boat Harbour and the lands surrounding Boat Harbour subject to remediation.



Project Site (orange areas) and Study Area (purple outline) are identified by the Project Team.

The Study Area will consist of areas within a 5 km radius of the Project Site boundaries.

Interviews were undertaken by the MEKS Team with Mi'kmaq knowledge holders from the community of Pictou Landing. Knowledge holders from Paq'tnkek also provided information on use in the area. The interviews took place between December 2017 and March 2018.

Informants were shown topographical maps of the Project Site and Study Area and asked to identify where they undertake their activities as well as to identify where and what activities were undertaken by other Mi'kmaq, if known. Forty-four (44) individuals were asked to provide information in regards to past and present traditional use activities. Permission was requested of the interviewee(s) to have their information incorporated into the GIS data. These interviews allowed the team to develop a collection of data that reflected the most recent Mi'kmaq traditional use in this area, as well as historic accounts.

All interviewee's names are kept confidential and will not be released by MGS as part of a consent agreement between MGS and the interviewee to ensure confidentiality.

The data gathered was also considered in regards to its significance to the Mi'kmaq people. Each species identified was analyzed by considering their use as food/sustenance resources, medicinal/ceremonial plant resources and art/tools resources. These resources were also considered for their availability or abundance in the areas listed above, and their availability in areas adjacent or in other areas outside of these areas, their use, and their importance, with regards to the Mi'kmaq.

Historic Review Summary

The Project Site and Study Area is underlain with 300-306 mega-annum (Ma) aged Pictou Group mudstone, sandstone, conglomerate and lacustrine limestone. The southwestern portion of the Study Area is underlain with 309 Ma aged New Glasgow Conglomerate of the Cumberland Group. New Glasgow Conglomerate is comprised of alluvial conglomerate, sandstone and siltstone. No hard stone suitable for tools and weapons are naturally found within the Study Area with than exception of millstone quality grit of the New Glasgow Conglomerate for grinding and abrasive tools.

The Study Area spans a syncline (downward fold) in bedrock orientated northeast to southwest from approximately Chance Harbour Lake to the community of Central West River. The adjacent anticlines (upward folds) had the tops of the folds worn down by successive glacial periods exposing rock layers close to the surface.

The landscape left behind by the ice sheets was a cover of tills derived from the ice grinding sedimentary rock. The mostly fine grain tills developed into rich agricultural soils. The landscape changed dramatically from tundra conditions, warmer hardwood forests to cooler spruce forest conditions of present-day.

Sea level rise since the last glacial period also changed dramatically. Between 10,000 and 8,000 years before present (B.P.), P.E.I. was part of mainland New Brunswick and Nova Scotia. The Northumberland Strait was a drainage valley draining southeast from a point midway between Shemogue Head, N.B. and Cape Egmont P.E.I. From the same drainage divide, surface drainage was to the northwest until rounding West Point of P.E.I. where the drainage was north-northeast to empty into a bay between Point Escuminac N.B. and Cape Gage, P.E.I. Boat Harbour transitioned from an elevated lake/pond to a tidal estuary approximately 2,500 to 1,000 years ago when rising sea levels reached the former outlet.

Evidence of presence of early peoples are scattered throughout the Project Study Area. Shell middens, burial grounds and archaeological finds of stone tools and weapons were found during cultivation of lands by early Pictou English settlers of 1773 and afterwards. A known burial ground is located at Indian Cross Point within or in close proximity to the Project Site. The exact location of burial sites has not been determined by this study.

The Mi'kmaq of the area petitioned for and received 50 acres of reserve lands of Fisher Grant in 1864. Additions to the original Reserve were made for sources of wood for fuel and additional hunting areas. Today PLFN have Fisher Grant I.R. 24 (142.7 Hectares), Fisher Grant I.R. 24G (60 Hectares) and Boat Harbour West I.R. 37 (98.2 Hectares). PLFN also share Franklin Manor I.R 22 and Merigomish Island I.R 31 with other First Nations.

Pictou Landing First Nation's history concerning Boat Harbour has been not been a positive experience for the Community. Over a 53-year period beginning in 1965, the Province has made agreements with PLFN in exchange for promises to cleanly operate and later decommission the existing Boat Harbour Effluent Treatment Facility. In accordance with the Boat Harbour Act, the existing BHETF must be closed by 2020.

A review of the Indigenous and Northern Affairs Canada Status on Specific Claims show no active claims within the Project Site or Study Area.

Traditional Use - Project Site Summary

Based on the data documented and analyzed, it was concluded that there is Mi'kmaq use reported on the Project Site, or in the immediate vicinity.

Deer and rabbit hunting, as well as berry gathering were found to be the most common activity in the area.

Traditional Use - Study Area Summary

Deer hunting and salmon fishing were the most commonly reported activity by informants within the Study Area, followed by trout, smelt, bass, and mackerel bass fishing, as well as rabbit hunting and blueberry gathering. Overall, the activities took place in what this report categorizes as the Historic Past and the Recent Past. There are enough current use activities occurring in the area to suggest concurrent use.

Other Information

The waters surrounding Pictou Land First Nation were often used for water recreation activities (swimming, canoeing, etc.). They were often described as occurring in Pictou Harbour, Chance Harbour, Boat Harbour, and other waters in the area.

Many of the informants had described past activities around and in Boat Harbour. Many stories were also shared of dead fish floating on the water's surface not too long after Boat Harbour was being used by the pulp mill. There is a high level of distrust of anything harvested in the area of Boat Harbour (fish, plants, game). Some stories were told of fish and animals with bumps or cancer in them. There is a strong desire to have Boat Harbour back to the way it used to be.

Table of Contents

1.0 INTRODUCTION

1.1 Membertou Geomatics Solutions

Membertou Geomatics Solutions (MGS) is a Membertou First Nation company that was developed as a result of the 2002 Supreme Court Marshall Decision. MGS was established as a commercially viable company that could provide expertise in the field of GIS Services, Database Development, Land Use Planning Services and Mi'kmaq Ecological Knowledge Studies (MEKS). MGS is one of many companies established by the Membertou First Nation – Membertou Corporate Division and these companies provide employment opportunities for aboriginal persons and contribute to Membertou's efforts of growth and development. As well, Membertou's excellent management and accountability of their operations is further enhanced by their ISO 9001:2015 certification.

For the development of this MEKS, MGS brings to the table a team whose expertise and skills with land documentation have developed a sound MEKS. The team skills include knowledge of historical Mi'kmaq research, GIS data analysis, Mi'kmaq ecological and cultural knowledge, and Mi'kmaq community connections.

1.2 Boat Harbour Remediation Project

Boat Harbour, formerly known as A'se'k, was originally a tidal estuary connected to Pictou Harbour and Northumberland Strait in Nova Scotia. The Boat Harbour Effluent Treatment Facility (BHETF) was constructed by the Province of Nova Scotia in 1967 to treat effluent from the bleached kraft pulp mill at Abercrombie Point. There has been a long history with the nearby Pictou Landing First Nation (PLFN), who want the treatment facility closed and Boat Harbour returned to tidal.

Recently a steering committee was setup between the Province of Nova Scotia and PLFN, and they have negotiated an agreement to discontinue the use of Boat Harbour for

receipt and treatment of pulp mill effluent by January 31, 2020. The outcome of these negotiations was then entrenched in the Boat Harbour Act. This enables future remediation of Boat Harbour, which has been extensively studied and is known to contain several containments in the sediment. The overall goal will be to remove the containments and return Boat Harbour to tidal influence.

2.0 MI'KMAQ ECOLOGOCAL KNOWLEDGE STUDY SCOPE & OBJECTIVES

2.1 Mi'kmaq Ecological Knowledge

The Mi'kmaq people have a long-existing, unique and special relationship with the land and its resources, which involves the harvesting of resources, the conservation of resources and spiritual ideologies. This relationship is intimate in its overall character, as it has involved collective and individual harvesting of the resources for various purposes, be it sustenance, medicinal, ceremonial and/or conservation. This relationship has allowed the Mi'kmaq to accumulate generations of ecological information and this knowledge is maintained by the Mi'kmaq people and has been passed on from generation to generation, youth to elder, ***kisaku kinutemuatel mijuijij***.

The assortment of Mi'kmaq Ecological Information, which is held by various Mi'kmaq individuals, is the focus of MEKS, also commonly referred to as Traditional Ecological Knowledge Studies (TEKS). When conducting a MEKS, ecological information regarding Mi'kmaq/Aboriginal use of specific lands, waters, and their resources are identified and documented by the project team.

Characteristically, MEKS have some similar components to that of an Environmental Assessment; yet differ in many ways as well. Among its purpose, Environmental Assessments measure the impact of developmental activity on the environment and its resources. This is often done by prioritizing significant effects of project activities in

accordance with resource legislation, such as the Federal *Species at Risk Act* and the Nova Scotia *Endangered Species Act.*

Mi'kmaq Ecological Knowledge Studies are also concerned with the impacts of developmental activities on the land and its resources, but MEKS do so in context of the land and resource practices and knowledge of the Mi'kmaq people. This is extremely important to be identified when developing an environmental presentation of the Study Area as Mi'kmaq use of the land, waters and their resources differs from that of non-Mi'kmaq. Thus, the MEKS provides ecological data which is significant to Mi'kmaq society and adds to the ecological understandings of the Project Site and Study Area.

2.2 Mi'kmaq Ecological Knowledge Study Mandate

Membertou Geomatics Solutions was contacted by GHD to undertake a MEKS for the Project Site. This project will require the documentation of key environmental information in regards to the project activities and its possible impacts on the water, land and the resources located here. The MEKS must be prepared as per the **Mi'kmaq Ecological Knowledge Study Protocol** ratified by the Assembly of Nova Scotia Mi'kmaq Chiefs on November 22, 2007, and the 2nd Edition released in 2014.

MGS proposed to assist with the gathering of necessary data by developing a MEKS which will identify Mi'kmaq traditional land use activity within the Project Site and in the surrounding areas within a 5-kilometer radius (Study Area). This MEKS had gathered, identified, and documented the collective body of ecological knowledge which is held by individual Mi'kmaq people. The information gathered by the MEKS team is documented within this report and presents a thorough and accurate understanding of the Mi'kmaq's use of the land and resources within the Project Site/Study Area.

MGS understands that this study could be included in an Environmental Assessment, being conducted by GHD, under the Nova Scotia Environmental Assessment Act that

will be submitted to the Nova Scotia Department of Environment and will be used as an indicator identifying Mi'kmaq traditional land and resource use within the Study Area.

It must be stated, however, that this MEKS preparation and/or acceptance of this report is not considered Consultation within itself, nor is it deemed to fulfill the Duty to Consult owed by the Crown to the Mi'kmaq. This report does not replace any Consultation process that may be required or established in regards to Aboriginal people. As well, this report cannot be used for the justification of the Infringement of S.35 Aboriginal Rights that may arise from the project.

2.3 Mi'kmaq Ecological Knowledge Study Scope & Objective

This MEKS will identify Mi'kmaq ecological information regarding Mi'kmaq traditional land, water and resource use within the Project Site/Study Area. The data that the study will gather and document will include traditional use from both the past and present time frames. The final MEKS report will also provide information that will identify where the proposed project activities may impact the traditional land and resource of the Mi'kmaq. If such possible impact occurrences are identified by the MEKS then the study will also provide recommendations that should be undertaken by the proponent. As well, if the MEKS identifies any possible infringements with respect to Mi'kmaq constitutional rights, the MEKS will provide recommendations on necessary steps to initiate formal consultation with the Mi'kmaq.

2.4 MEKS Project Site and Study Area

This MEKS will focus on the proposed Project Site. This site is defined as Boat Harbour and lands surrounding Boat Harbour subject to remediation.

The Study Area will consist of areas within a 5 km radius of the Project Site's boundaries.

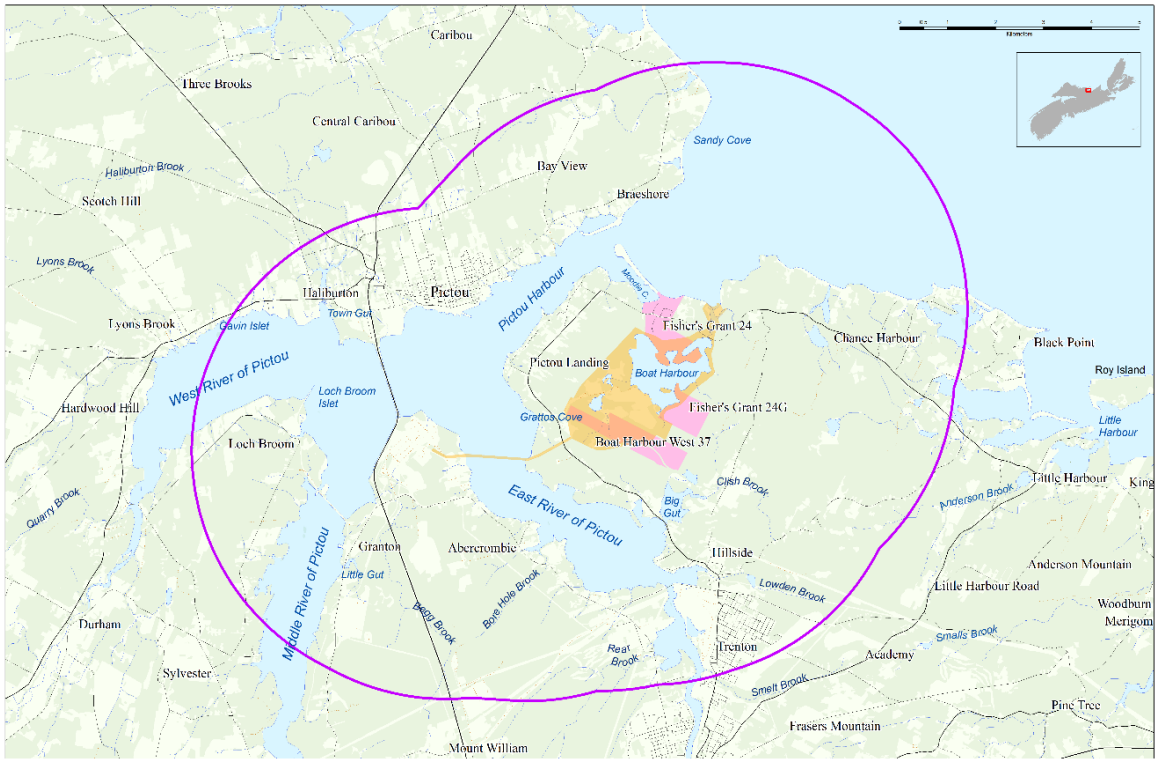


Figure 1. Project Site (orange areas) and Study Area (purple outline) are identified by the Project Team.

3.0 METHODOLOGY

3.1 Interviews

As a first step to gathering traditional use data, the MEKS team had initiated dialogue and correspondence with PLFN given their close proximity and history with the Project Site.

Discussions occurred with PLFN staff to identify individuals who undertake traditional land use activities or those who are knowledgeable of the land and resources. Individuals from the PLFN community were also identified to assist in the interview process. These individuals were then contacted by the MEKS team members and interviews were conducted between December, 2017 and March, 2018.

For this MEKS, forty-four (44) individuals were asked to provide information in regards to past and present traditional use activities. The majority of interviewees were from the community of Pictou Landing, with some information being provided by Paq'tnkek as well. All of the interviews that were completed following the procedures identified within the Mi'kmaq Ecological Knowledge Protocol (MEKP) document. Prior to each interview, interviewees were provided information about the MEKS, including the purpose and use of the MEKS, an agreement of non-disclosure of their personal information in any reports, and the future use of the traditional use information they provided.

Interviewees were asked to sign a consent form, providing permission for MGS to utilize their interview information within this MEKS. During each interview, individuals were provided a map of the Project Site/Study Area and asked various questions regarding Mi'kmaq use activities, including where they undertook their activities or where they knew of activities by others, when such activities were undertaken, and how that type of resource was utilized. Other information gathered could be species habitats, changes in species populations, and/or general information about the land related to its' use. When required or preferred, interviews were conducted in the Mi'kmaq language.

3.2 Literature and Archival Research

With regards to this MEKS, various archival documents, maps, oral histories and published works were reviewed in order to obtain accurate information regarding the past or present Mi'kmaq use or occupation relevant to the Project Site and Study Area.

As part of the historical review process, it should be noted there may be other sources of Historical and Archaeological data available but may have restricted access or not uncovered within this project's Historical Review. A complete listing of the documents that were referenced is outlined within the *Sources* section.

3.3 Field Sampling

Methodology

Field sampling, or site visits, are conducted as another method to gather and document plants, trees, animal signs/tracks, fish and wildlife habitats, or any other land feature which would hold significance to the Mi'kmaq (food or sustenance, social, cultural, or ceremonial purposes).

Site visits consist of site reconnaissance (to evaluate the entrances to the site, terrain characteristics, and evaluation of any other information that would affect safety or logistics of the site visit), logistics planning, as well as capturing "observation points" with the assistance of a Mi'kmaq knowledge holder. Observation points are stops along the site visit where species or landmarks significant to the Mi'kmaq were observed to be occurring. These are taken at approximate set intervals, or whenever a species or feature was deemed worthy to be noted by the knowledge holder.

Over a five (5) day period in June 2018, MGS staff, accompanied by Mi'kmaq knowledge holders from Pictou Landing and Paq'tnkek conducted a site visit of the Project Site. Throughout the site visit various species (and subspecies) of plants, trees, and animal signs/tracks were observed.

Figure 2, Site visit underway. The team is making their way to the shores of Boat Harbour

Site Visit Observations

Maple, spruce, birch, fir, pine, and poplar trees were observed the most throughout the entire site.

Observation	# of observations
maple	32
spruce	29
birch	26
fir	22
pine	20
poplar	15
alder	9

Observation	# of observations
beach	1
bird tracks	1
birds	1
bobcat tracks	1
bricks	1
building foundation	1
bulrush	1

beech	8
ash	7
blueberry	7
hemlock	7
oak	7
teaberry	7
deer	5
apple	4
sarsaparilla	4
firepit	3
golden rod	3
hazelnut	3
lady slipper	3
lionpaw	3
strawberry	3
well head	3
fern	3
chokecherry	2
beaver sign	2
monitor well	2
bayberry	1

campsite	1
cat tail	1
clam	1
coldsfoot	1
feather	1
foundation	1
foxberry	1
ironwood	1
mussel	1
oyster	1
partridge	1
pincherry	1
rabbit	1
razor clam	1
red clover	1
rock wall	1
rose	1
service berry	1
sweetgrass	1
willow	1

Table 1. Summary of observation points

4.0 MI'KMAQ LAND, WATER AND RESOURCE USE

4.1 Overview

The Mi'kmaq Land, Water and Resource Use Activities component of the MEKS provides relevant data and analysis in regards to Mi'kmaq traditional use activities that are occurring or have occurred within the Study Area. It identifies what type of traditional use activities are occurring, it provides the general areas where activities are taking place and it presents an analysis regarding the significance of the resource and the activity as well.

The Mi'kmaq traditional use activities information that is provided by interviewees is considered both in terms of "Time Periods" and in regards to the "Type of Use" that the resource is being utilized. The Time Periods that the MEKS team differentiates traditional use activities by are as follows:

"Current Use" – a time period within the last 10 years
"Recent Past" – a time period from the last 11 – 25 years ago
"Historic Past" – a time period previous to 25 years past

The "Type of Use" categories include spiritual use, and sustenance use, such as fishing, hunting or medicinal gathering activities.

Finally, the study analyzes the traditional use data in consideration of the type of land and resource use activities and the resource that is being accessed. This is the Mi'kmaq Significant Species Analysis, an analysis which ascertains whether a species may be extremely significant to Mi'kmaq use alone and if a loss of the resource was to occur through project activities, would the loss be unrecoverable and prevent Mi'kmaq use in the future. This component is significant to the study as it provides details as to Mi'kmaq use activities that must be considered within the environmental understanding of the Project Site and Study Area.

By analyzing the traditional use data with these variables, the MEKS thoroughly documents Mi'kmaq traditional use of the land and resources in a manner that allows a detailed understanding of potential effects of project activities on Mi'kmaq traditional use activities and resources.

4.2 Limitations

By undertaking a desktop background review and interviews with Mi'kmaq participants in traditional activities, this study has identified Mi'kmaq Traditional Use activities that have occurred or continue to occur in the Study Area and Project Site. This has allowed the study to identify traditional use activities in a manner that the MEKS team believes is complete and thorough, as required by the MEKP. Historical documents within public institutions were accessed and reviewed and individuals from nearby Mi'kmaq communities were interviewed. The interviews were undertaken with key Mi'kmaq community people, identified by the PLFN and MEKS team, who are involved and are knowledgeable regarding traditional use activities. Through the historical documentation review and the interview process, the MEKS team is confident that this MEKS has identified an accurate and sufficient amount of data to properly reflect the traditional use activities that are occurring in the Study Area.

The MEKS process is highly dependent on the information that is provided to the team. Because only some of the Mi'kmaq traditional activity users and not all Mi'kmaq traditional activity users are interviewed, there is always the possibility that some traditional use activities may not have been identified by this MEKS.

4.3 Historical Review Findings

Historic Review

The history of a Project Site and Study Area begins with the natural history. How the present-day land came to be what it is today, what resources it offers and what attracted early peoples to the area. Usually, geology is very important to early prehistoric peoples as a source of tools, weapons and ornamentation. Harder rock for weapons and tools are absent within the Study Area of this project with the exception of mill stone of the New Glasgow Conglomerate for grinding and abrasive use.

Geology

The bedrock underlying most of the entire Study Area is of the Pictou Group (LCP), aged approximately between 300 to 306 mega-annum (Ma) and comprised of floodplain mudstone, fluvial sandstone, conglomerate and lacustrine limestone. The Pictou Group underlies an area that has a southern and western limit that includes Big Island of Merigomish Harbour, Anderson Mountain, Trenton, Granton, Abercrombie Point, and the Town of Pictou. The onshore northern and eastern limit of the underlying Pictou Group extends along the entire coastline from Ernie's Point to Big Island including Caribou Harbour, Pictou Harbour, East River of Pictou, Pictou Island, Little Harbour, Melmerby Beach. *(1)*

A band of slightly older bedrock of the Cumberland Group, Malagash Formation (LCCm) of approximately 306 to 311 Ma in age, underlies an approximate 1.6 km wide strip of area west of the Town of Pictou that spans from Town Gut to midway between Hamilton and Lyons Brook Station. The Malagash Formation is comprised of sandstone, mudstone, lacustrine limestone and rare coal. This band of Malagash Formation continues northwest beyond the Study area and Town of Pictou to Ernies Point. *(1)*

To the west of the Cumberland Group, Malagash Formation is an older still Cumberland Group, Boss Point Formation (LCCbp) of approximately 315 Ma in age and comprised of fluvial sandstone, calcrete limestone, conglomerate and mudstone. *(1)*

The bedrock underlying the southwestern portion of the Study Area including the Middle River of Pictou from Granton to Loch Broom is Cumberland Group, New Glasgow Conglomerate (LCCng). New Glasgow Conglomerate is approximately 309 Ma in age and comprised of alluvial conglomerate, minor sandstone and siltstone. Beyond the Study Area, the New Glasgow Conglomerate underlies an area from Loch Broom and southwest to the community of Greenhill and east to Alma. New Glasgow Conglomerate continues as a narrow band east through Mount William, Frasers Mountain, community of Micmac and including Indian Island. *(1)*

The western extents of the Study Area includes a portion of the West River of Pictou from Loch Broom to mid-distance to the highway bridge crossing the West River of Pictou. Underlying this area and extending further southwest as a band to Limerock is the Cumberland Group, Middle River Formation of approximately 310 Ma in age. The Middle River Formation is comprised of sandstone, mudstone, lacustrine limestone and rare coal. *(1)*

None of the Groups and Formations underlying the Project Site and Study Area are the coal, shale oil and mineral rich formations that made early Pictou County a leader in mining, steel and industry. The Cumberland Group, Stellarton Formation (LCCs) is responsible for spawning industry in early Pictou County and is located approximately 1.4km south of the Study Area Limits at its closest point. The Stellarton Formation is among the youngest of the Cumberland Group at approximately 307 Ma in age and is comprised of Lacustrine-alluvial shale, sandstone, minor conglomerate, oil shale and coal. The Stellarton Formation underlies an area that extends roughly 6 km north to south from New Glasgow to Riverton and roughly 19 km west to east from Alma to Thorburn. *(1)*

While most coal deposits in the province resulted from in-situ rich growth of vegetation building up and compressed by overlying deposits, the Stellarton Formation coal deposits are a result of an accumulation of drifting vegetation into a shallow bay or inlet. *(2)* In coastal areas the peat was covered by the sea and sea sediments with the weight of accumulating layers compressed the peat layers squeezing out moisture and producing heat. Under these conditions, the initial stage of coal formation begins with coal being formed as pressure and heat intensifies. It takes 3 to 7 feet of compacted plant material to form 1 foot of bituminous coal. *(3)*

The layers of bedrock are compressed in a northwest to southeast orientation and folded over time in an accordion shape with a series of anticlines (upward folds) and synclines (downward folds) aligned in a northeast to southwest direction. The Study Area is over a syncline that runs from approximately Chance Harbour Lake, the community of Abercrombie and the community of Central West River. The corresponding anticlines are located north from Logans Point to Plainfield and south from approximately Priestville to Plymouth. The folded tops of the anticlines have since been worn down by successive glaciers exposing the edges of layered bedrock near the surface. *(1)*

The discussion of the glacial periods is useful in providing some context to the long durations and movement of large continental and later smaller regional ice sheets over the area. The last of the ice sheets may have been present just before or upon arrival of the earliest known peoples in the region.

There have been at least 16 glacial periods that lasted approximately 100 thousand years each. The last glacial period was the Wisconsin Glaciation which began 75 thousand years ago and ended between 12 and 10 thousand years ago. After extensive sampling in Nova Scotia, evidence indicates that successive glaciation had four distinct phases with different and shifting ice centers. *(2)(4)*

The Phase 1 ice flows moved eastward across the region including Prince Edward Island and Cape Breton Island before shifting flow direction southeastward across the present-

day Bay of Fundy, Mainland Nova Scotia and Cape Breton Island. The ice flowed across the Study Area in this phase in an eastward direction and then at some time shifted to a southeast flow direction. *(4)*

The Phase 2 ice center was located north of present day Prince Edward Island with flow direction south over mainland Nova Scotia and southeast over lower southeast portions of Cape Breton Island. The Phase 2 ice flow direction was south over the Study Area. *(2)(4)*

The Phase 3 ice center was parallel to the present-day Nova Scotia Atlantic Coast and extended on land from Cape Sable, through Cape Canso to offshore and approximately south of present day Louisbourg, Cape Breton Island. From this ice divide, ice flows moved northeast across eastern portions of Cape Breton Island, northwest across western portions of Cape Breton Island, northeast across northern portions of the mainland from Cape George to Minas Basin including the Study Area and west to northwest across the present-day Annapolis Valley. On the Atlantic side of the ice divide, all flow directions were in a southeast direction over the Scotia Shelf. *(2)(4)*

Phase 4 was a period when several remnant ice sheets were located throughout the province and advanced and receded in a radial direction from the ice centers. Cape Breton had two glaciers that were centered on the Highlands and another centered on the Bas d'Or Lakes. The Chedabucto Glacier filled the present day Chedabucto Bay and St. Georges Bay with an early northwest ice flow to a late westward direction across the central portion the province including the Study Area into the Northumberland Strait, Minas Basin and the Atlantic. The Chignecto Glacier was centered near Baie Verte and Cape Tormentine and the South Mountain Ice Cap was centered between the Bay of Fundy and Atlantic Coast near present day Kejimkujik National Park. The direction of ice advance of the southern portion of the Chedabucto Bay Glacier was a west to southwest flow direction across the eastern shore of the mainland. *(2)(4)*

The last of the glaciers gradually receded with the Bay of Fundy being ice free between 16 and 14 thousand years ago. Northern portions of the province experienced periodic

advancement and stalls in movement of a remnant ice cap centered near the Antigonish Highlands approximately 15 thousand years ago. The Study Area was ice free approximately 12,000 years ago and possibly remained ice free during periods of further ice advancement. By 13 thousand years ago the ice sheets had receded to the approximate coastline of today and then only residual ice caps remained in highland areas at approximately 12 thousand years ago. *(2)(4)*

Between 11 and 10 thousand years ago, the Younger Dryas Period was an abrupt climate change with a cold period lasting approximately 200 years. During the Younger Dryas Period, previously colonized plants that followed the once receding glaciers were covered in permanent snowfields and advancing ice sheets at a time when some large mammals became extinct. *(5)* The cold period of the Younger Dryas may have pushed the Paleo-Indian people south with its permanent snowfields, or they may have abandoned the region. *(8)*

As the last remnant glaciers receded, and the climate warmed again, the landscape the ice left behind was what the earliest peoples inherited, which had changed dramatically during the time since.

The landscape was gradually colonized by tundra vegetation of willow shrubs and herbaceous plants between 10 and 7.5 thousand years ago and were replaced by boreal vegetation such as fir, spruce and birch until 6 thousand years ago when pine and oak were prominent. *(6)* Temperatures were 2 degrees Celsius warmer than today for a period until about 4 thousand years ago when forests of hemlock mixed with beech, and maple was the dominant vegetation. Gradual cooling to present day temperatures and increased moisture favoured spruce forests. *(7)*

Between 10,000 and 8,000 years B.P., there was no Northumberland Strait as it exists today but rather a land connection with Prince Edward Island during the peak of mantle rebound at approximately 9000-year BP. With the combination of lower global sea levels compared to today, and the rebound of the mantle beneath the Gulf of St. Lawrence once

free of the weight of ice sheets, Prince Edward Island was connected to Mainland Nova Scotia and New Brunswick (9)(10). The Magdalen Islands was a large roundish island of over 100km wide east to west and separated from the mainland mass including the ancient shore of P.E.I. by an approximately 32 km wide channel. The ancient shore of the Magdalen Island was approximately 50 km north of present-day East Point of P. E. I. (9)(10)(11)

Based on present-day nautical charts and multi-beam surveys of the Northumberland Strait bottom in the area of the Confederation Bridge, the ancient land connection high point and east-west drainage divide was approximately 36 km northwest of the present-day Confederation Bridge, midway between Shemogue Head, N. B. and Cape Egmont, P. E. I. From this point, surface water drained southeast feeding tributaries of a larger river that eventually flowed eastward, close to the present-day P.E.I. shore between Guernsey Cove P. E. I. and Pictou Island N. S. before emptying into a bay between East Point, P. E. I. and Sight Point, Cape Breton Island. (9)(10)(11)(12)

On the other side of the 9000-year B.P. drainage divide between Cape Egmont P. E. I. and Shemogue Head, N. B., surface drainage was northwest until rounding West Point P. E. I. where the direction was north-northeast until emptying into a bay between Point Escuminac, N. B. and Cape Gage. P. E. I. (9)(10)(11)

Sea level rise occurred very rapidly between approximately 8,000 and 5,000 years B.P with the Northumberland Strait inundated and creating the island of P. E. I. at approximately 6,000 years B. P. The New Brunswick and Nova Scotia shoreline approximated the shoreline of present-day at that time with the sea level rise slowing from a rate of 1m/century prior to 2,500 years B.P.to to a steady rate 20cm/century afterwards with a 30cm rise in the past century. (4)(13)

At the rate of 20 cm/century, the relative sea level of the Study Area 2,500 years B.P. would be approximately 5.0 m below the relative sea level of today and approximately 2.0m below today's relative sea level 1,000 years B.P. Approximately 2,500 to 1,000

years ago B.P., rising sea levels filled a once elevated ancient pond/lake, thus transforming into a tidal estuary of Boat Harbour which evolved into the abundant sea life and shore habitat that once existed prior to the effluent pond of today.

Within the Study Area, the melted ice sheets left behind a ground cover of mostly silty till plain. There are some elevated areas of exposed bedrock such as Frasers Mountain and the high ground between Granton and Abercrombie. There is a large area surrounding the Boat Harbour effluent treatment facility, Moodie Point, Fisher Grant I.R. 24, Chance Harbour and inland to the community of Little Harbour road that is covered with hummocky ground moraine material. This till material consists of a mix of gravel, sand and mud directly released by melting glaciers. Similar patches of hummocky ground moraine are found east of Granton and north of the Town of Pictou that extend to Logans Point and Braeshore. *(2)*

The tills left behind by the ice within the Study Area developed into some of the best agricultural soils in Pictou. Agricultural Class 2 soils (Capable of Most Common Field Crops) are found on Abercrombie Point from the shore of the East River of Pictou at Abercrombie to Begg Brook on Middle River of Pictou. Class 2 soils are also found at Rear Brook opposite Trenton on the East River of Pictou. A large area of Class 2 soils is located south of Boat Harbour to the shoreline of Big Gut and East River of Pictou. *(14)*

Agricultural Class 3 soils (also Capable of Most Common Field Crops) are found mostly adjacent Class 2 soils such as south of Abercrombie Point between Begg Brook and East River of Pictou to approximately the Northwest town limits of New Glasgow. Class 3 soils are found along the eastern shore of East River of Pictou from Greens Point to Big Gut and inland to Marshalls Crossing. Class 2 soils also include Indian Cross Point to Moodie Point and Moodie Cove with the exception of a shoreline strip of Class 4 soils (Marginal) along the shore of Pictou Harbour between Mussel Point and Moodie Point. Class 4 soils follow the western shore and northern shore of the Boat Harbour effluent treatment facility as well as small patches at Chance Harbour, in between the predominant Class 3 soils along the Northumberland Strait coast from Powells Head to

Black Point. A large area of the southeastern portion of the Study Area from Highway 348, near Chance Harbour Lake to Trenton are Class 4 soils with patches of Class 5 (Capable of Pasture and Hay) at Marshalls Crossing and Hillside. *(14)*

There is a large area of Agricultural Class 5 soils along the shore of Middle River of Pictou from Begg Brook to Begg Point with Class 3 soils adjacent south at Granton. Within the southwestern portion of the Study Area, all of the area of Loch Broom Point between Middle River of Pictou and West River of Pictou are covered with Agricultural Class 3 soils. The northwestern and northern portion of the Study Area is covered in Agricultural Class 3 soils from Lyons Brook to Logans Point with a narrow strip of Class 4 soils along the shore of Pictou Harbour from Norway point to adjacent Lowdens Beach, west of Braeshore. There are patches of Class 5 soils among the Class 3 soils and are located north of Braeshore and inland from Sandy Cove. There are also some patches of Class 4 soils north of Bayview and south of Central Caribou that straddle the north limit of the Study Area. *(14)*

The only areas with Agricultural Class 7 (Incapable of Cultivation) soils found within the Study Area are Lowdens Beach at Braeshore, Lighthouse Beach at Moodie Cove and Sinclairs Beach and Sinclairs Island. *(14)*

People on the Land

The Natural History of Nova Scotia lists 5 Archaeological time periods for the Province of Nova Scotia that are prior to and including European contact with the Mi'kmaq (15):

<u>11,000-10,000 Years BP, Paleo-Indians</u>

The earliest evidence of early peoples east of the State of Maine is found at the foot of the Cobequid Mountains at Debert, Nova Scotia. There is evidence of an encampment on the site dated to be in use roughly 11,000 to 10,500 years B.P. *(16).* At this time, local ice sheets remained centered at locations of Bras d'Or Lakes/Highlands of Cape Breton,

Canso, Baie Verte and South Mountain adjacent the Annapolis Valley. There was a large ice sheet centered on the Eastern Mainland of province with ice flows into St. Georges Bay, Minas Basin and along the Eastern Shore. *(4)* The time of the Debert Site occupation is within the same period of the glacial re-advances of the Younger Dryas Period of 11,000 and 10,000 years B.P.. Increasingly harsh conditions are thought to have caused the early peoples to abandon the region. *(15)*

10,000-5,000 Years BP, the Great Hiatus

The rising sea levels and submerging coastlines are thought to be responsible for the lack of physical evidence of early peoples for this time period. Any evidence of coastal settlements of that period would be lost to coastal erosion and submergence. *(15)*

Sea level rise on the Atlantic Coast was a combination of land rebound after ice sheets receded, rising ocean temperatures and water released by melting glaciers. *(15)* As the thick and heavy ice sheet centers depressed the earth's mantle, the areas of mantel along the ice sheet margins were less weighted by ice and rose slightly through displacement. There was an ice sheet center located in the Gulf of St Lawrence. As the weight of the ice sheets diminished with melting, the depressed center areas rebounded and rose in elevation while the mantel of the former ice margin areas lowered in elevation. *(17)*

5,000-3,500 Years BP, the Archaic Period

A period characterized by physical evidence of stone tools some of which are found offshore and possibly lost during deep water fishing. There was a cultural influence or cultural presence of peoples in the southern part of the province dated at a time between 3,500 and 2,500 B.P. known as the Susquehanna Tradition. The Susquehanna Tradition originated in area of the mid-Atlantic states of today and is identified by some unique artifacts. *(15)*

2,500-500 Years BP, the Ceramic Period

Evidence of pottery is introduced to the archaeological record during this period as are burial mounds. Ceramic period sites are scattered throughout the province and a 10 m diameter burial mound was discovered at Whites Lake, HRM, dated at 2,300 B.P. *(15)*

500-100 Years BP, the Contact Period

The first European contact with the Mi'kmaq was most likely with Portuguese fishermen roughly 500 years ago. *(15)*

However, there are other period delineations being used in the Province and Maritime publications which differ in the number of periods, names, and time span of periods. The Archaeological Periods Table below places the periods in context with each other. It is useful to provide these various periods for reference and context when reviewing archaeological reports and placing in time the artifacts and features found.

Artifacts are archaeological objects that can be recorded and removed from the site as flakes (chips from tool or point manufacture), arrow/spear tips (points), tools, bones, preforms (unfinished tool or point blanks) and pottery sherds. Features are archaeological finds that cannot be removed from the site and can only be recorded, such charred or discoloured ground, a storage pit or Historic Period building foundations, as some examples.

		Archaeological Periods	* (Dates are Approximate)	
Time	**Natural History of N. S.**	*** Periods**	*** Northeastern Periods**	*** Maritime Region Tradition**
11,000 B.P.	< Paleo-Indians		< Paleo-Indian	< Paleo-Indian
	11,000 - 10,000 yrs. B.P.	< Early Period	11,000 - 10,000 yrs. B.P.	11,000 - 10,000 yrs. B.P.
	↓	10,600 - 6,000 yrs. B.P.	↓	↓
10,000 B. P.	< Great Hiatus	|	< Early Archaic	—
	10,000 - 5,000 yrs. B.P.	|	10,000 - 8,000 yrs. B.P.	?
	?	|	↓	?
8,000 B.P.	?	|	< Middle Archaic	?
	?	|	8,000 - 6,000 yrs. B.P.	?
	?	↓	↓	?
6,000 B.P.	?	< Middle Period	< Late Archaic	< Laurentian
	?	6,000 - 3,000 yrs. B.P.	6,000 - 2,500 yrs. B.P.	+/- 5,000 yrs. B.P.
	< Archaic Period	|	|	< Maritime Archaic
	5,000 - 3,500 yrs. B.P.	|	|	5,000 - 3,700 yrs. B.P.
4,000 B.P.	↓	|	|	< Susquehanna Tradition
	< Susquehanna Tradition	|	|	4,000 - 3,500 yrs. B.P.
	3,500 - 2,500 yrs. B.P.	|	|	—
	|	↓	↓	?
3,000 B.P.	|	< Late Period	< Ceramic (Woodland)	< Maritme Woodland
	|	3,000 - 500 yrs. B.P.	3,000 - 500 yrs. B.P.	+/- 3,000 yrs. B.P.
	↓	|	|	- Present
2,500 B.P.	< Ceramic Period	|	|	|
	2, 500 - 500 yrs. B.P.	|	|	< Middlesex
	|	|	|	+/- 2400 yrs. B.P.
2,000 B.P.	|	|	|	|
	↓	↓	↓	↓
500 B.P	< Contact Period	< Historic Period	< Historic	< Mi'kmaq, Maliseet and
	500 -100 yrs B.P.	500 yrs B.P. - Present	500 yrs B.P. - Present	European Traditions
	—	↓	↓	↓
Present (1950)	—	—	—	—

Table 2. Archaeological Periods (15)(18)

Many maps of the 1700's show Pictou Island but usually nothing of Pictou Harbour or Merigomish Harbour. Some maps of that period do show "Village Sauvage" at general locations east and west of Pictou Island. The west locations are near and east of Tatamagouche and the east locations vary in distance between Merigomish and Antigonish which may be the Barneys River location.

Monsieur Denys described the Pictou area in a 1672 publication as a large opening with cliffs adjacent low headland and meadows with numerous ponds surrounded by an abundance of game. The land supported large oak, maples, pines and firs. The size of oysters and clams in the harbour were described as the size of a shoe and in large

quantity. The size and quantity of the oysters and clams had diminished at the time of the source since the first European recorded descriptions of the area. *(19)*

The place name "Pictou" is thought to be the corruption of "Poictou", which is an old Province of France and given to the area by the French. But the source states that this origin is in error, and the place name has origins in Mi'kmaq "Pictook" with the French dropping the "k" and pronouncing "ou". Mi'kmaq "Pict" refers to gas and may have origins in gas release from the underlying coal fields of the East River of Pictou. *(19)*

Mi'kmaq Place Names

Other known Mi'kmaq place-names of the area include:

Abercrombie	*Pgoagoigang*	No meaning given *(26)*
Barneys River	*Sigiangatagang*	No meaning given *(26)*
Brown's Point	*Ne'iknejk*	"at the opening, where it begins" *(25)*
Begg Brook	*Sogomogoagang*	"chewing gum" *(26)*
Big Gut	*Poooigetjg*	No meaning given *(26)*
Big Island	*Sonatitjg*	No meaning given *(26)*
Boat Harbour	*Wisaoq*	"at the yellow/gold coloured rocks" *(25)*
	Esasok	"western encampment" *(26)*
Chance Harbour	Menpekwijk	"at the erosion place" *(25)*
East River Encampment	*Oqwa'skuk*	"where the canoes arrive" *(25)*
East River	*Amasipukwejk or*	
	Apji'jkmujue'katik	"Long River or Place of Ducks" *(25)*
Fisher's Grant	*Pqutamo'taqniktuk*	"at the ferry crossing place" *(25)*
Indian Cross Point	*Sukle'katik*	"at the rotting place" *(25)*
Indian Island	*Maliko'mijk*	"diversified by coves" *(25)*
Island in Little Harbour	*Ja'jikn wi'k*	'at George's" *(25)*
Little Harbour	*Menpekwik*	*"erosion" (25)*
Loch Broom Point	*Oisigoeoeg*	No meaning given *(26)*
Logan's Point	*Tanielek*	"at Daniels place" *(25)*
Middle River	*Mekwaie'katik*	"at the middle place" *(25)*
Pictou	*Piktuk or Piwktuk*	"at the explosions" *(25)*
Pictou Harbour	*Puknipkejk*	"at the narrow harbour" *(25)*
Pictou Landing	*Puksaqte'kne'katik*	"place of the wood chups" *(25)*
Trenton	*Apji'jkmujue'katik*	"place of ducks" *(25)*

Table 3. Mi'kmaq place names.

One source refers to shell heaps found near “old Indian encampments” found within Merigomish Harbour on Big Island and the smaller islands and suggests these encampments were no longer in use at that time. The eastern side of the mouth of Barneys River was the principle location of the Mi’kmaq upon the English Settlers arrival. There, the Mi’kmaq had clearings where they grew corn and beans. The Mi’kmaq burial ground for the Merigomish area is located on the western end of Big Island near Savage Point *(Named after a Captain Savage who drowned at this location).* This location was in use until about the 1830’s until burials were conducted on Indian Island which was donated to the Mi’kmaq of the area by Governor Wentworth. Merigomish Harbour was thought to be the headquarters of the Mi’kmaq Political District of Pectougawak. *(19)*

Using the general boundaries provided by the sources, MGS interpreted the source maps and recreated detailed district boundaries of the 7 districts of Mi’kma’ki using significant watersheds as the defining features on the ground. The district boundaries may be adjusted after review by the Mi’kmaq and Maliseet Communities. Until then, the Project Study Area is with the District Epekwitk aqq Piktuk and District Sipekni’katik (Wild Potato Area) of Mi’kma’ki. (28)(29)(30):

Epekwitk (Lying in the Water) aqq Piktuk (The Explosive Place)

This District combines the entire Island of Prince Edward Island with all the lands and waters draining into the Northumberland Strait and St. Georges Bay from the Mainland. The District includes the East River of Pictou watershed to and including the Tracadie River and Little Tracadie River watersheds.

Sipekni’katik (Wild Potato Area)

This District includes all lands and waters draining into the Northumberland Strait from Macfarlane Point, Wallace Harbour to and including the Middle River of Pictou watershed. Sipekni’katik also includes all the lands and waters draining into Cobequid Bay, Minas Basin and Bay of Fundy from Five Islands Carrs Brook and Economy River watersheds to and including North River and Salmon River, Avon River, Cornwallis

River watersheds to MacNeily Brook near Margaretsville. In addition, Sipekni'katik includes all lands draining into St. Margarets Bay and Mahone Bay including the Ingram River watershed to and including eastern shore of the LaHave River.

Another burial location is found on Big Island approximately a half mile east of the known Point Savage location. The source interprets the then much disturbed site as a post conflict mass burial. The original find by a farmer was a 10-foot diameter site of about 20 inches deep black soil covered in different vegetation from its surroundings. The original site contained stone weapons, copper knives, granite smoking pipe as well as skulls and decaying bone fragments. One skull was struck with a stone tipped arrow which was still found inside the skull. The remains were interpreted as those of smaller stature than Mi'kmaq which led to speculation of being a possible invading or occupying northern peoples that were killed in a prehistoric conflict. The presence of charcoal, ash and some burnt bone are interpreted by the source as the possible burning of captives. *(19)*

The source reports other conflicts with invaders that happened at Caribou Harbour and at Little Harbour- Barneys River. The Caribou Harbour conflict is more of a deception than hand to hand combat and involved the Mohawk. The Mi'kmaq waited in a hidden location and at the appropriate time to reveal themselves and tempt the Mohawk to wade across the water only to be swept out with the strong tide and drown. The Little Harbour-Barneys River conflict was between two fortified encampments with the Little Harbour encampment occupied by the Canibas (Abenaki) and Barneys River location occupied by Mi'kmaq. The two encampments had no conflicts until the Canibas attacked a Mi'kmaq fishing party on a beach midway between the two camps. The Mi'kmaq were killed and their bodies burned. The Mi'kmaq returned with violations upon the Canibas. The surviving parties of both camps formed a peace to cease further hostilities to compete in physical contact sports with wagers. *(19)*

Within the Study Area, there was an encampment located on the eastern shore of the East River of Pictou, opposite the present-day Loading Ground-Dunbar Point. This location was interpreted by the source from a 1744 map by cartographer Bellin and published by

Charlevoix in 1748. The map does depict Pictou Harbour in some detail with “Village Sauvage” calligraphy positioned to the east of the East River of Pictou but could also be intended for the Merigomish-Antigonish location. *(20)* However, the source backs up their interpretation with accounts by English settlers of the rounded flat point of land being cleared upon their arrival and subsequent ploughing turned up European as well as some early Mi’kmaq artifacts and oyster shells. Similar artifacts and oyster shells were also found in the 1800’s during ploughing of William Dunbar’s fields at present day Dunbar Point on the western shore of the East River of Pictou. Ploughing of fields at Frasers Point and Middle River Point also turned up an abundance of oyster shells along with stone tools indicating frequent use by early peoples. *(19)*

There is a known Mi’kmaq burial ground on Indian Cross Point located on a point of land on the eastern shore of the East River of Pictou. The 1877 source reports that a 10-foot-high iron cross had stood at that location. Indian Cross Point was known to the Mi’kmaq as *soogunagade* translated as *The Rotting Place.* Indian Cross Point was in use as burial ground by Mi’kmaq until a few years before the 1877 source which reported the burials were marked by rows of flat stones which were already partially grown over by grass at that time. Erosion of the river bank which deposited human bones along the shore was also reported by the source. *(19)*

The French

Prior to English settlement of Pictou there were the French. The English settlers found the remains of French homesteads in the form of abandoned open cellars, clearings, wells and at least one sawmill. Tatamagouche was the main French settlement of the region with an overland route to Cobequid (Truro) and sea routes to connections to Ile St. Jean (P.E.I.), Cape Breton and Minas Basin. Not much was recorded of French settlement within the Pictou area, nor of their departure. However, they left behind evidence of their presence and hasty departure. Their clearings were reverting to forest. The largest settlement was on Big Island at Merigomish Harbour at the head of the French Channel within the harbour with several building remains of open cellars, along with some

orchards and gardens overgrown. West of this settlement on Big Island were the remains another similar French settlement, some tools, knives, spoons, crockery and some coins were later found at these locations by the English settlers. *(19)*

The English Settlers

In 1767, the brig *Betsy* left Philadelphia destined for an area west of the West River and bounded on the east at present-day Haliburton. Granted in 1765 to a company in Philadelphia, the charter dropped off at least six men and one family to settle the Philadelphia Grant. *(24)*

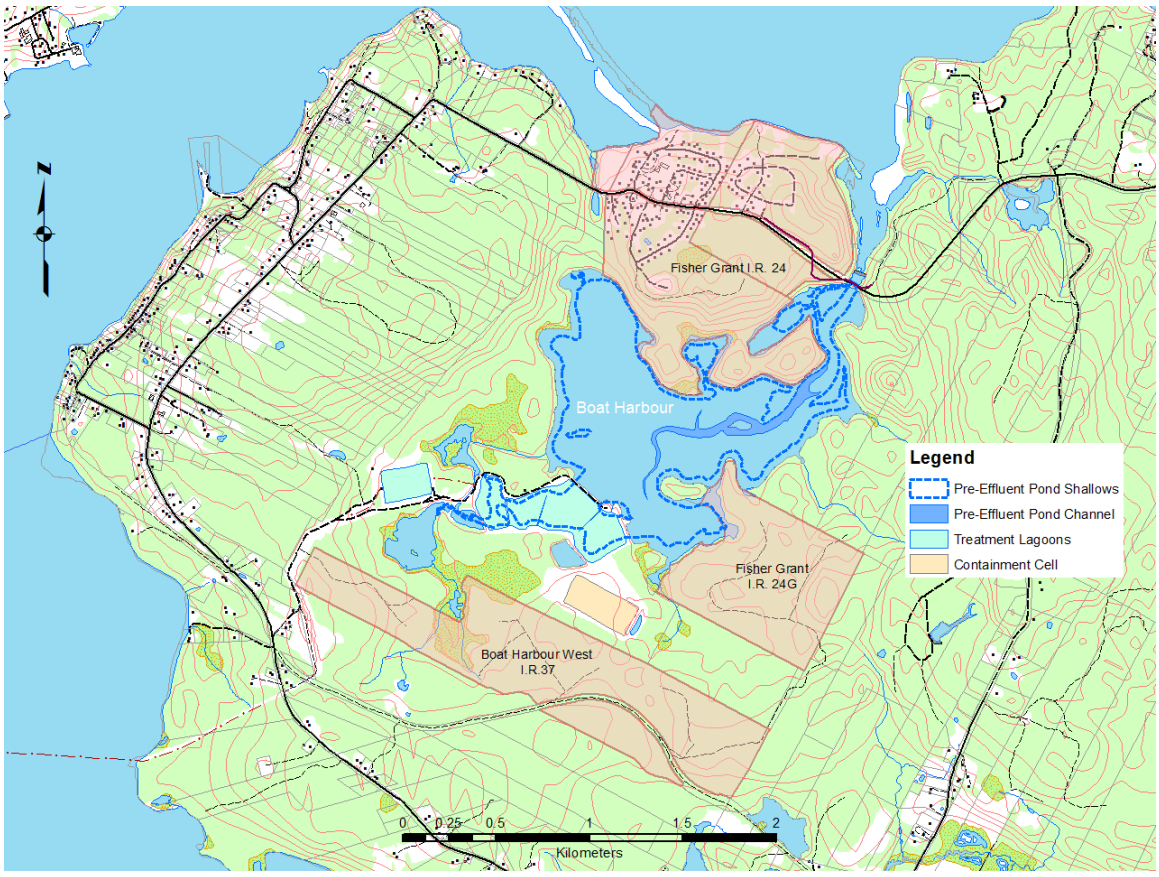
The *Hector* arrived from Loch Broom, Scotland in 1773 with 179 passengers and an additional 10 passengers from Greenock. The *Hector* passengers settle the McNutt Grant and founded the town. The McNutt Grant was escheated in 1770 and re-granted in 1778 to 44 individuals mostly *Hector* passengers. Five thousand acres of the McNutt Grant was granted to Lieutenant Richard Williams of the 80th Regiment in 1775. Williams traded the grant with Walter Patterson and then acquired by John Patterson who divided the grant into lots as well as a town laid out in 1788 with the first house built in 1790. *(24)* Although peace had been made between the Mi'kmaq and British with the burying of the hatchet and gun in Halifax in 1761, the Pictou Settlers were uneasy with the local Mi'kmaq presence. Although the local Mi'kmaq had no intention of breaking the peace, they were amused with the uneasiness the settlers felt around them and did little to discourage it. *(19)*

As late as 1804-1808, it was noted by the then Superintendent of Indian Affairs for the Province that the Mi'kmaq were travelling to Quebec to gather with other tribes/nations to discuss the possibility of an invasion by the French to drive the British from former French Territories. The local Mi'kmaq were taking a "wait and see" attitude during all this speculation and eventually invited the Pictou Settlers to a successful and well attended feast hosted by the Mi'kmaq to improve relationships between the two communities and cultures. *(19)*

Pictou Landing owes the place name to the ferry crossing Pictou Harbour to the Town of Pictou. Originally a 1765 grant to John Fisher, the Fisher Grant was laid out in 1785 as the town of Walmsley by the disbanded 82nd Regiment but the town did not materialize. *(24)*

Beginning in 1820, Mi'kmaq were petitioning the government for lands for their exclusive use. Fifty acres at Fisher's Grant were acquired in 1864 for the Mi'kmaq of the Pictou area. In the same year two small islands at Merigomish were also acquired to be shared between the Pictou area and the Antigonish area Mi'kmaq. The Fisher Grant Reserve was eventually expanded over the years for food and fuel supply by acquiring near and adjacent parcels. *(27)*

Boat Harbour



Boat Harbour was the chosen location by the Province to discharge wastewater from the, then proposed, Scott Maritimes pulp mill at Abercrombie Point. The Province acquired

title from landowners adjacent Boat Harbour by purchase but Pictou Landing First Nation Reserve Parcels required specific processes to acquire title. *(21)*

The Province could only acquire title of Reserve lands by way of surrender under the Indian Act through which requires a majority vote of Electors of the Band at a duly called meeting or by referendum. The other option to acquire title to Reserve lands was by transfer in lieu of expropriation under the Indian Act which required the Province enactment authorizing the expropriation. *(21)*

The Province decided to acquire the riparian rights associated with the Reserve parcels rather than attempting to acquire full title. A September 2, 1966 Federal Order-in-Council purported to transfer riparian rights, associated to the Reserve, to the Province. However, the source maintains that riparian rights are an interest in land and can only be transferred under the Indian Act by way of surrender and in lieu of expropriation by processes previously mentioned. *(21)*

Pictou Landing First Nation Chief and Council passed a Band Council Resolution in October, 1965 consenting to transfer to the Province. This did not meet the requirements of surrender under the Indian Act and no other corrective actions or remedies have taken place since. *(21)*

Prior to construction of the effluent treatment facility, a public meeting was held on PLFN Reserve on August 25, 1965, between PLFN community members and Mr. Wigglesworth of the Nova Scotia Water Authority with the meeting chaired by a representative of Indian Affairs. All PLFN community members present at the meeting were against the proposed project. The community members were upset over the loss of:

- Clams, quahogs, eels, smelt, lobster and trout
- Feeding grounds for ducks and geese
- Safe anchorage for their boats
- Use for swimming and recreation
- Future building lots along the Boat Harbour shoreline

The community members were also upset over possible odours affecting their community a short distance from the proposed facility and the lack of consideration given to their feelings about the *ruination of land they considered their own*. *(21)*

Mr. Wigglesworth informed those present at the meeting that Boat Harbour would be dammed to maintain the high-water shoreline as a lake. Saltwater species would not survive but the newly created lake may be suitable for freshwater species. Mr. Wigglesworth also expressed his opinion that there would be no odour from the treatment facility except in the spring when the ice broke up. *(21)*

The Province considered a cash payment to PLFN to overcome the community concerns and objections to the proposed project. In October, 1965, Mr. Wigglesworth took the then PLFN Chief and another Band Council Member to observe a domestic sewage disposal system in Renforth, New Brunswick. They were told that the system was similar to that proposed for Boat Harbour and the Chief and Council member were impressed enough with the facility to sign a hand-written agreement in principle on the same day of their visit, giving consent to the proposed Boat Harbour Project. *(21)*

The resulting 1966 Order in Council for the purported transfer of riparian rights included conditions that:

- The Province take remedial action should the water in Boat Harbour become septic
- The Province build a slipway to allow boats to go in and out of Boat Harbour
- The Province pay compensation

The province did pay the compensation but the slipway was never built. The water of Boat Harbour was devoid of life very soon after the effluent began to flow in 1967. The increased oxygen demand caused by organic material in the effluent exceeded the natural system, and Boat Harbour was reduced to a retention pond. A 1970 Federal Department of Fisheries and Forestry Canada showed an accumulation of pollutants in the water. *(21)*

The Province did attempt to improve the water conditions in the early 1970's but the odour from sulfur compounds in the effluent water continued to adversely impact the PLFN resident's enjoyment of their lands. The Province did nothing further to remedy the odour problem. *(21)*

In 1991, the Province admitted to allowing water levels in Boat Harbour to exceed the previous ordinary high-water mark, thereby flooding PLFN Reserve parcel's low areas without authority. A 25-year agreement between Scott Maritimes and the Province was made in September,1970 that the Province would operate the wastewater facility at Boat Harbour and continue to receive wastewater from the pulp mill until approximately 1995. *(21)*

As a result of a 1986 PLFN lawsuit against Canada for breach of fiduciary duty regarding the Boat Harbour effluent treatment facility, the Province confirmed in writing to the Federal Minister of Indian Affairs in 1991 that the Province committed to removing the treatment facility within 5 years and returning Boat Harbour to a tidal estuary. This commitment by the Province was partly instrumental in PLFN settling their lawsuit with Canada in July, 1993. The settlement stipulated any surrender of Reserve lands or interests in exchange for the cash settlement paid by Canada. The Province and Scott Maritimes were not part of the 1993 settlement. *(21)*

In September, 1995, the Province reached an agreement with PLFN to postpone the decommissioning of the effluent treatment facility as planned for 1995, for 10 years ending in December, 2005. In exchange for PLFN foregoing any legal action or interference with the effluent treatment facility within the 10-year period, the Province agreed to completely remove the effluent treatment facility after the 10 year period expired and transfer lands adjacent Boat Harbour to PLFN with additional land transfers upon decommissioning of the effluent treatment facility. Included within the 1995 agreement was that the Province remediate Boat Harbour at the end of the 10-year period. *(21)*

With the 1995 agreement with PLFN, the Province entered into a 10-year Memorandum of Understanding with Scott Maritimes that included a lease of the wastewater facility to Scott Maritimes, license to discharge wastewater into Boat Harbour, indemnify Scott Maritimes from any costs arising from claims associated with using Boat Harbour as a wastewater facility and also from any costs arising from a forced relocation of the wastewater facility. An August, 1996 Provincial Order-in-Council approved the arrangement with Scott Maritimes and the land transfers to PLFN. *(21)*

A 2000 engineering report estimated the cost of an alternate wastewater facility within the Abercrombie Point pulp mill site, including a discharge pipeline extending to Lighthouse Beach, to be $60,000,000. The source reports that the results of the 2000 engineering report was not shared with PLFN. *(21)*

The successor to Scott Maritimes was Kimberly-Clark who together with the Province proposed an alternative plan where a new effluent discharge pipeline would be built to by-pass the larger body of water within Boat Harbour and discharge directly into the channel leading to the Northumberland Strait. The existing settling basin, emergency spill basin and the aeration stabilization basin would remain in operation until December, 2030. The new pipeline would be in place to honour the December, 2005 date to return Boat Harbour to a tidal estuary. After December, 2030, the remaining wastewater treatment components would be decommissioned and the land transfer to PLFN completed. *(21)*

A Memorandum of Understanding between PLFN and Kimberly-Clark concerning this new proposal was presented to and approved by PLFN by community referendum in September, 2000. In exchange for agreeing to the alternative plan proposed, PLFN would receive annual payments until 2030 as well as some forest land transfers from Kimberly-Clark upon completion of the by-pass pipeline. *(21)*
With the Memorandum of Understanding between PLFN and Kimberly-Clark in place, the Province extended the lease of the effluent treatment facility to December, 2030. The Province hired an engineering firm to test the sediments of Boat Harbour in preparation

of remediation. Testing confirmed the presence of heavy metals, dioxins and furans in the sediment. *(21)*

Kimberly-Clarke and its successor, Neenah Paper Company of Canada (Neenah), did not build the by-pass pipeline by December, 2005. Further engineering reports determined that the effluent discharged into the channel leading to the Northumberland Strait would return upon rising tides so the Province and current mill owner continued to search for an alternative and the effluent treatment facility continued to operate. *(21)*

A January, 2006 Memorandum of Understanding between PLFN and Neenah agreed to extend the deadline for building the by-pass pipeline of the Kimberly-Clark originally proposed alternative from December, 2005 to December, 2008. This would allow the Province more time to find a more suitable solution to the by-pass pipeline. However, engineers hired by the Province were unable to find an alternative solution. *(21)*

In November, 2008, PLFN wrote to Federal Ministers that PLFN would not agree to further extensions and insisted that the Province close the effluent treatment facility within a reasonable period and remediate Boat Harbour as per the 1991, 1995 and 1997 commitments. This resulted in face to face meetings on December 02, 2008 in Halifax with Hon. Murray Scott, Minister of Transportation and Public Works, Hon. David Morse, Minister of Natural Resources as well as Hon. Michael Baker, Minister of Justice and Aboriginal Affairs. A December 04, 2008 follow up letter from Hon. Murray Scott confirming the Province's commitment to find another location of effluent discharge and to clean up Boat Harbour. However, a new NDP Government was elected on June 9, 2009 and the replacement/remediation project was put on hold. *(21)*

The pipeline crossing the bottom of the East River of Pictou leaked into the river had to be repaired and replaced in some sections. This event, and the passing of the December 04, 2008 Letter of Commitment, led to a lawsuit against the Province and Northern Pulp, the current owners of the Pulp Mill. *(23)*

The Province hired an engineering company to update the 2000 engineering report with an April 2010 report on a proposed mill site treatment facility and including an effluent discharge pipe to Lighthouse Beach that would cost $94,000,000. PLFN hired their own engineering firm to propose an alternative tertiary system added to the treatment facility that would remove more contaminants and allow discharge into Pictou Harbour with considerable overall cost savings. *(21)* The existing effluent treatment facility continues to operate without modifications to this day.

In June 2014, the effluent pipe running across the bottom of the East River of Pictou, from the pulp mill at Abercrombie Point, burst near shore on Indian Cross Point where the pipe comes ashore on route to Boat Harbour. The June 2014 leak released approximately 47 million litres of wastewater. *(22)*

This triggered a protest by PLFN over concern for the traditional burial ground at the spill location and lack of notice and communication with PLFN concerning the latest spill. The two-week long blockade of the spill site by PLFN had the attention of the Provincial Government which led to another agreement in principle with the Province to end the use of the effluent treatment facility by January 2020 and remediate Boat Harbour. The Province later passed the *Boat Harbour Act* in March 2015 to mandate the closure of the existing BHETF. *(23)*

The remediation will begin to accelerate in 2020 when the pulp mill must have a new wastewater treatment facility in operation. The Province had awarded the contract for a detailed remediation plan to GHD in May of 2017. *(22)*

A review of the Indigenous and Northern Affairs Canada Status on Specific Claims show no active claims within the Project Site or Study Area. *(31)*

4.4 Mi'kmaq Traditional Use Findings

The traditional use data gathered for this MEKS was drawn from one primary source: interviews with Mi'kmaq individuals who reside in the surrounding Mi'kmaq communities and those who are familiar with or undertake these types of activities. This data was acquired through interviews with informants that allowed the study team to identify the various traditional use activities, resources and areas that are currently or have been used by the Mi'kmaq, and any information that was gathered in previous MEKS in the area. Interviewees were asked to identify areas within the Study Area and Project Site where they knew of traditional use that had taken place, or currently in use. These interviews took place between December, 2017 and March, 2018. Information collected during previous studies was also incorporated into the information gathered.

To easily identify the traditional use data findings of this study, the analysis has been broken down into two groups. The first is the Project Site analysis, and the second is the Study Area, which includes areas that fall within a 5 km radius of the Project Site.

Unless otherwise stated, areas identified by informants are considered to be utilized by the Mi'kmaq currently, in the recent past, and/or the historic past.

Project Site

The Project Site, as well as locations in the *immediate* vicinity (within 50 meters) of the Project Site, will be considered when analyzing traditional use activities.

Fishing

(see Appendix B, map "Boat Harbour Remediation MEKS – Mi'kmaq Traditional and Current Fishing Areas")

Salmon fishing was the predominant fishing activity by the informants within the Project Site. Eleven (11) areas were identified in the areas of:

- East River of Pictou
- Pictou Harbour
- Boat Harbour

Smelt fishing was identified in ten (10) areas of:

- East River of Pictou
- Boat Harbour to the Northumberland Strait

Other species identified in the Project Site are eel (7 areas), clam (6 areas), mackerel, (6 areas), bass (5 areas), trout (5 areas), lobster (4 areas), gaspereau (2 areas), crab (1 area), "flat fish" (1 area), minnow (1 area), perch (1 area), quahog (1 area), and tommy cod (1 area).

Hunting

(see Appendix C, map "Boat Harbour Remediation MEKS – Mi'kmaq Traditional and Current Hunting Areas")

Twenty-nine (29) deer hunting areas were found to be located:

- Areas surrounding Pictou Landing
- Boat Harbour West 37
- Fisher's Grant 24G
- Fisher's Grant 24
- Chance Harbour to Pictou Landing First Nation

Twenty-two (22) rabbit hunting areas consisted of:

- Areas surrounding Pictou Landing
- Boat Harbour West 37
- Fisher's Grant 24G

- Fisher's Grant 24
- Chance Harbour to Pictou Landing First Nation

Other species hunted in the Project Area include partridge (11 areas), beaver (7 areas), fox (6 areas), muskrat (5 areas), bobcat (3 areas), coyote (3 areas), fisher (3 areas), porcupine (3 areas), moose (2 areas), raccoon (2 areas), squirrel (2 areas), duck (1 area), geese (1 area), lynx (1 area), minx (1 area), otter (1 area), and pheasant (1 area).

Gathering

(see Appendix D, map "Boat Harbour Remediation MEKS – Mi'kmaq Traditional and Current Gathering Areas")

Blueberry was found to be the most gathered species within the Project Site with twenty (20) areas identified:

- Pictou Landing First Nation
- Pictou Landing
- Boat Harbour West 37
- Fisher's Grant 24G

Fifteen (15) strawberry gathering areas were shown to be located:

- Pictou Landing First Nation
- Pictou Landing
- Boat Harbour West 37
- Fisher's Grant 24G

Apple (13 areas), blackberry (13 areas), cranberries (8 areas), raspberries (6 areas), "berries" (3 areas), grapes (3 areas), mayflower (3 area), sweetgrass (3 areas), teaberry (3 areas), fox tail (2 areas), goldenthread (2 areas), mushrooms (2 areas), pear (2 area), white ash (2 areas), birch (bark) (1 area), black ash (1 area), chaga (1 area), spruce boughs (1 area), crab apple (1 area), eagle feathers (1 area), evergreen trees (1 area),

heather (1 area), maple sap (1 area), cow lily (*pakosi*) (1 area), pine (1 area), "roots" (1 area), rhubarb (1 area), and sage (1 area) were found to be located in the Project Site.

Study Area

As mentioned previously, the MEKS data is also drawn from the Study Area which encompasses areas within a five (5) kilometer radius from the Project Site boundaries. The purpose of this portion of the study is to portray other land characteristics and land use activities that may have been missed in a narrow Project Site data analysis.

Fishing

(see Appendix B, map "Boat Harbour Remediation MEKS – Mi'kmaq Traditional and Current Fishing Areas")

From the data gathered, this study found that salmon, trout, and bass were/are the most reported fishing activity by the informants in the Study Area.

Fifty-one (51) salmon fishing areas were found to be located:

- East River of Pictou from the pulp mill to Hillside
- East River of Pictou from Trenton to New Glasgow
- Big Gut
- Pictou Harbour
- Middle River of Pictou
- West River of Pictou
- Boat Harbour

Trout was reportedly caught in fifty-one (51) areas including:

- East River of Pictou
- Big Gut

- near Trenton
- Middle River to Pictou
- West River of Pictou
- Pictou Harbour
- Ferguson Pond and Chance Harbour Lake
- near Chance Harbour

Forty-six (46) bass fishing areas were reported in:

- Pictou Harbour
- Big Gut
- Waters around Trenton and Hillside
- East River of Pictou
- Haliburton
- The mouth of Middle River of Pictou
- Ferguson Pond and Chance Harbour Lake
- Chance Harbour

Other species fished in the Study Area are smelt (38 areas), mackerel (30 areas), eel (27 areas), lobster (21 areas), clam (19 areas), crab (11 areas), gaspereau (11 areas), herring (6 areas), quahog (6 areas), minnow (4 areas), cod (3 areas), mussel (3 areas), “flat fish” (2 areas), perch (2 areas), tommycod (2 areas), cat fish (1 area), and oyster (1 area).

When analyzing timelines for fishing activities, current use activities were reported the most out of all the fishing use with approximately forty-six percent (~44%) of data collected as being utilized within the last 10 years. Recent Past use accounted for approximately twenty-eight percent (~28%) of the information. Historic Use accounted for about twenty-six percent (~26%) of the information.

Hunting

(see Appendix C, map "Boat Harbour Remediation MEKS – Mi'kmaq Traditional and Current Hunting Areas")

Deer and rabbit hunting areas was reported in the Study Area the most by the informants.

Fifty-three (53) deer hunting areas were found to be located in areas:

- Around Boat Harbour
- Boat Harbour West 37, Fisher's Grant 24G, Picout Landing First Nation
- Pictou Landing
- Hillside
- Chance Harbour
- Pictou
- Loch Broom

Rabbit hunting areas were reported thirty-five (35) times in the areas of:

- Around Boat Harbour
- Boat Harbour West 37, Fisher's Grant 24G, Picout Landing First Nation
- Pictou Landing
- Chance Harbour
- Pictou
- Loch Broom
- Haliburton

Other species identified as being hunted in the Study Area include partridge (16 areas), fox (11 areas), beaver (10 areas), porcupine (7 areas), muskrat (6 areas), bobcat (5 areas), coyote (5 areas), fisher (3 areas), raccoon (3 areas), duck (2 areas), moose (2 areas), squirrel (2 areas), geese (1 area), lynx (1 area), minx (1 area), otter (1 area), and pheasant (1 area).

When analyzing timelines for hunting activities, a slight majority of activities took place in the Historic Past and Recent Past. Recent Past activities were mentioned in approximately forty-two percent (~42%) of areas. Historic Use activities represented approximately thirty-nine percent (~39%) of the fishing areas. Approximately nineteen percent (~19%) activities accounted for Current Use activities.

Gathering

(see Appendix D, map "Boat Harbour Remediation MEKS – Mi'kmaq Traditional and Current Gathering Areas")

Blueberries were found to be gathered in the highest frequency in the Study Area. Thirty-two (32) uses were reported in the areas of:

- Surrounding Pictou Landing First Nation
- Around Boat Harbour
- Boat Harbour West 37
- Hillside to Chance Harbour
- Mount William
- South of Loch Broom

Twenty-three (23) areas identified as apple picking areas were identified:

- Surrounding Pictou Landing First Nation
- Around Boat Harbour
- Between Chance Harbour and Hillside
- Mount William

Twenty-two (22) strawberry gathering areas were reported near:

- Surrounding Pictou Landing First Nation
- Around Boat Harbour
- Boat Harbour West 37
- Hillside to Chance Harbour

- Mount William
- South of Loch Broom

Other species/activities gathered in the Study Area include blackberries (17 areas), cranberries (10 areas), raspberries (10 areas), grapes (8 areas), mayflower (6 areas), pear (5 areas), sweetgrass (5 areas), evergreen (4 areas), goldenthread (4 areas), teaberry (4 areas), "basket making materials" (3 areas), "berries (3 areas), eagle feathers (3 areas), "lobster trap making materials (3 areas), lady slippers (3 areas), mushrooms (3 areas), fox tail (2 areas), cow lily (*pakosi*) (2 areas), plum (2 areas), princess pine (2 areas), rhubarb (2 areas), sage (2 areas), white ash (2 areas), spruce boughs (2 areas), birch bark (1 area), black eye susie's (1 area), black ash (1 area), cedar (1 area), chaga (1 area), cherry (1 area), chokecherry (1 area), crab apple (1 area), hazelnut (1 area), heather (1 area), maple sap (1 area), "medicines" (1 area), peach (1 area), potatoe (1 area), "roots" (1 area), "sugarberry" (1 area), and walnut (1 area).

Gathering activities were reported more in the Historic Past with approximately forty percent (~40%) of the data gathered represented as such. Recent Past use was described in approximately thirty-four percent (~34%) of the information, and Current Use was categorized in approximately twenty-six percent (~26%) of the traditional use activities.

Other Information

During the interviews, informants were given the opportunity to describe any other information they felt would be considered a culturally significant area, or information about an area. Generally, this is where informants would describe, for example, areas of past settlements, migration routes, culturally significant areas, or places with ties to legends.

The waters surrounding Pictou Land First Nation were often used for water recreation activities (swimming, canoeing, etc.). They were often described as occurring in Pictou Harbour, Chance Harbour, Boat Harbour, and other waters in the area.

Many of the informants had described past activities around and in Boat Harbour. Many stories were also shared of dead fish floating on the waters surface not too long after Boat Harbour was being used by the pulp mill. There is a high level of distrust of anything harvested in the area of Boat Harbour –fish, plants, game. Some stories were told of fish and animals with bumps or cancer in them. There is a strong desire to have Boat Harbour return to the way it used to be.

4.5 Mi'kmaq Significant Species Process

In order to identify possible project activities which may be of significance to the Mi'kmaq with regards to traditional use of the Study Area, the project team undertakes a number of steps in order to properly consider the MEKS data. This involves three main components: Type of Use, Availability, and Importance.

Type of Use

The first component of analysis is the "Type of Use" of the resource which involves the categorization of the resource. All resources are placed into various general categories regarding the Type of Use**.** The category headings are Medicinal/Ceremonial, Food/Sustenance, and Tool/Art. These general headings are used so as to ensure further confidentiality with respect to the resources and the area where they are harvested. As well, the total number of instances where a resource harvest has been documented by the study is quantified here as well.

Availability

After the data is considered by the Type of Use, it is considered in accordance with its availability. This involves considering whether the resource is abundant in the Study Area or whether it is rare or scarce. Based on the information that is provided to the team from the ecological knowledge holders and/or written literature sources, the availability of the resource is then measured in regards to other water or land areas that are outside of the Study Area. This measuring is primarily done in the context of the areas adjacent to

the Study Area, and if required, other areas throughout the province. By proceeding in this manner, the study can provide an opinion on whether that resource may be **Rare, Scarce** or **Abundant**.

The data is classified in accordance with following:
Rare – only known to be found in a minimum of areas, may also be on the species at risk or endangered plants list;
Common – known to be available in a number of areas; and
Abundant – easily found throughout the Study Area or in other areas in the vicinity.
This allows the study team to identify the potential impact of a resource being destroyed, by the proposed project activities, will affect the traditional use activity being undertaken.

Importance

The final factor the MEKS team considers when attempting to identify the significance of a resource to Mi'kmaq use is whether the resource is of major importance to Mi'kmaq traditional use activities. This can be a somewhat subjective process, as any traditional resource use will be of importance to the individual who is acquiring it, regardless of whether its use is for food or art, and regardless if the resource is scarce or abundant. However, to further identify the importance, the MEKS team also considers the frequency of its use by the Mi'kmaq; whether the resource is commonly used by more than one individual, the perceived importance to the Mi'kmaq in the area, and finally the actual use itself. These factors support the broad analysis of many issues in formulating an opinion on significance and supports identifying whether the loss of a resource will be a significant issue to future Mi'kmaq traditional use, if it is impacted by the project activities.

4.6 Mi'kmaq Significance Species Findings

This MEKS identified resource and land/water use areas within the Project Site and Study Area that continue to be utilized by the Mi'kmaq people, to varying degrees.

Type of Use

The study identified the following in the Study Area:

Table 3: Resource Use within all Study Area

TYPE OF USE	NUMBER OF AREAS	NUMBER OF SPECIES
Food/Sustenance	577	74
Medicinal/Ceremonial	94	19
Tools/Art	40	15

Availability

During the information gathering for the Study Area, informants had mentioned the fishing for salmon. The Atlantic Salmon is considered an endangered species in Canada. *(32)*

The Nova Scotian mainland moose population is listed as an endangered species in Nova Scotia with approximately 1000 moose located in isolated sub-populations across the mainland portion of Nova Scotia. (*33*)

The American Eel, while not listed on the Nova Scotia species at risk registry, is considered a threatened species by the federal species registry. (*32*)

Striped bass, again like the American Eel, has no status with the Nova Scotia species registry, the federal species at risk registry consider the Gulf of St. Lawrence population of Striped Bass to be of special concern (*31*)

No other rare or endangered species were identified by informants.

Importance

While stated above, it is worth noting again that assigning an importance designation for any activity done by Mi'kmaq can be a subjective process, and that all activities are considered ways of preserving the Mi'kmaq way of life, in some shape or form. Scarcity and abundance of a species in an area can both increase the importance of species.

As noted previously, Atlantic Salmon, American Eel, and Striped Bass are considered an endangered, threatened, or species of special concern in Canada and the Mi'kmaq still rely on these species for sustenance and cultural ceremonies. Any disturbances to their habitats could have an impact on Mi'kmaq use.

Sweetgrass gathering is considered an important activity to the Mi'kmaq. It is used during ceremonies to smudge or cleanse oneself of negativity. Some crafters will also use sweetgrass to decorate their creations (e.g., some basket makers will weave sweetgrass into the basket).

Based upon the high frequency of activities reported by the informants, deer, trout, salmon, bass, rabbit, mackerel, and smelts are considered to be the favored activity for Mi'kmaq in this particular area.

5.0 CONCLUSIONS

This Mi'kmaq Ecological Knowledge Study has gathered, documented and analyzed the traditional use activities that have been occurring in the Project Site and the Study Area by undertaking interviews with individuals who practice traditional use, or know of traditional use activities within these areas and reside in the nearby Mi'kmaq communities.

The information gathered was then considered in regards to species, location, use, availability and frequency of use to further understand the traditional use relationship that the Mi'kmaq maintain within the Project Site and Study Area.

Historically, sources record evidence found of occupation in the area of prehistoric early peoples, including traditional and Mi'kmaq burial grounds being used until the mid-1800's. PLFN petitioned and received Reserve lands of Fisher Grant I.R. 24 that eventually included the shores of Boat Harbour. PLFN has had a recent 53-year history of dealing with the Province and Federal Government concerning the clean operation, decommissioning and remediation of the BHETF.

Historic Review Summary

The Project Site and Study Area is underlain with 300-306 Ma aged Pictou Group mudstone, sandstone, conglomerate and lacustrine 1imestone. The southwestern portion of the Study Area is underlain with 309 Ma aged New Glasgow Conglomerate of the Cumberland Group. New Glasgow Conglomerate is comprised of alluvial conglomerate, sandstone and siltstone. No hard stone suitable for tools and weapons are naturally found within the Study Area with than exception of millstone quality grit of the New Glasgow Conglomerate for grinding and abrasive tools.

The Study Area spans a syncline (downward fold) in bedrock orientated northeast to southwest from approximately Chance Harbour Lake to the community of Central West

River. The adjacent anticlines (upward folds) had the tops of the folds worn down by successive glacial periods exposing rock layers close to the surface.

The landscape left behind by the ice sheets was a cover of tills derived from the ice grinding sedimentary rock. The mostly fine grain tills developed into rich agricultural soils. The landscape changed dramatically from tundra conditions, warmer hardwood forests to cooler spruce forest conditions of present-day.

Sea level rise since the last glacial period also changed dramatically. Between 10,000 and 8,000 years B.P., P.E.I. was part of mainland New Brunswick and Nova Scotia. The Northumberland Strait was a drainage valley draining southeast from a point midway between Shemogue Head, N.B. and Cape Egmont P.E.I. From the same drainage divide, surface drainage was to the northwest until rounding West Point of P.E.I. where the drainage was north-northeast to empty into a bay between Point Escuminac N.B. and Cape Gage, P.E.I. Boat Harbour transitioned from an elevated lake/pond to a tidal estuary approximately 2,500 to 1,000 years ago when rising sea levels reached the former outlet.

Evidence of presence of early peoples are scattered throughout the Project Study Area. Shell middens, burial grounds and archaeological finds of stone tools and weapons were found during cultivation of lands by early Pictou English settlers of 1773 and afterwards. A known burial ground is located at Indian Cross Point within or in close proximity to the Project Site. The exact location of burial sites has not been determined by this study.

The Mi'kmaq of the area petitioned for and received 50 acres of reserve lands of Fisher Grant in 1864. Additions to the original Reserve were made for sources of wood for fuel and additional hunting areas. Today Pictou Landing First Nation have Fisher Grant I.R. 24 (142.7 Hectares), Fisher Grant I.R. 24G (60 Hectares) and Boat Harbour West I.R. 37 (98.2 Hectares). PLFN also share with other First Nations Franklin Manor I.R 22 and Merigomish Island I.R 31.

Pictou Landing First Nation's history concerning Boat Harbour has been not been a positive experience for the Community. Over a 53-year period beginning in 1965, the Province has made agreements with PLFN in exchange for promises to cleanly operate and later decommission the existing waste water treatment facility at Boat Harbour. Agreed target dates have come and gone during this period with no improvements with the most recent target date for decommissioning and beginning remediation set at year 2020.

A review of the Indigenous and Northern Affairs Canada Status on Specific Claims show no active claims within the Project Site or Study Area.

Traditional Use - Project Site Summary

Based on the data documented and analyzed, it was concluded that there is Mi'kmaq use reported on the Project Site, or in the immediate vicinity.

Deer and rabbit hunting, as well as berry gathering were found to be the most common activity in the area.

Traditional Use - Study Area Summary

Deer hunting and salmon fishing were the most commonly reported activity by informants within the Study Area, followed by trout, smelt, bass, and mackerel fishing, as well as rabbit hunting and blueberry gathering. Overall, the activities took place in what this report categorizes as the Historic Past and the Recent Past. There are enough current use activities occurring in the area to suggest concurrent use.

Other Information

The waters surrounding Pictou Land First Nation were often used for water recreation activities (swimming, canoeing, etc.). They were often described as occurring in Pictou Harbour, Chance Harbour, Boat Harbour, and other waters in the area.

Many of the informants had described past activities around and in Boat Harbour. Many stories were also shared of dead fish floating on the water's surface not too long after Boat Harbour was being used by the pulp mill. There is a high level of distrust of anything harvested in the area of Boat Harbour (fish, plants, game). Some stories were told of fish and animals with bumps or cancer in them. There is a strong desire to have Boat Harbour back to the way it used to be, before being utilized by the pulp mill, and before the pollution.

Sources

1 Keppie, J. D., *Geological Map of the Province of Nova Scotia*, Nova Scotia Department of Natural Resources, Minerals and Energy Branch, 2000

2 Fisher, B., DP ME 36, Version 2, 2006 Digital Version of Map ME 1992-3, Surficial Geology Map of the Province of Nova Scotia, Stea, R., Conley, H., Brown, Y., Nova Scotia Department of Natural Resources, 2011

3 Gregory, D. J., Richardson, J. M., Bisson, L. M., *A History of Coal Mining in Nova Scotia, Information Series 2,* Nova Scotia Department of Mines, 1978

4 Online: Nova Scotia Museum of Natural History, *T3.3 Glaciation, Deglaciation and Sea-Level Changes*, Natural History of Nova Scotia, Volume 1, Topics and Habitats, 2011

5 Online: Nova Scotia Museum of Natural History, *T4.1 Post-Glacial Climatic Change*, Natural History of Nova Scotia, Volume 1, Topics and Habitats, 2011

6 Online: Nova Scotia Museum of Natural History, *T4.2 Post-Glacial Colonization by Plants*, Natural History of Nova Scotia, Volume 1, Topics and Habitats, 2011

7 Online: Nova Scotia Museum of Natural History, *T4.1 Post-Glacial Climatic Change*, Natural History of Nova Scotia, Volume 1, Topics and Habitats, 2011

8 Online: Nova Scotia Museum of Natural History, *T12.1 Colonization by People*, Natural History of Nova Scotia, Volume 1, Topics and Habitats, 2011

9 Shaw, J., Gareau, P., Courtney, R. C., *Palaeogeography of Atlantic Canada 13-0 kyr*, Quarternary Science Reviews, 21, 2002

10 Shaw, J., *Geomorphic Evidence of Postglacial Terrestrial Environments on Atlantic Canadian Continental Shelves*, Ge'ografie physique et Quaternaire, vol. 59. 2005.

11 Canadian Hydrographic Service, *CHS Chart 4023*, Edition 2, Fisheries and Oceans Canada, 2002.

12 Webster, T., Collins, K., Vallis, A. *Topo-Bathymetric Lidar Research to Support Remediation of Boat Harbour,* Technical Report, Applied Geomatics Research Group, NSCC Middleton, N. S., 2017.

13 *The 2009 State of Nova Scotia's Coast,* Report, Nova Scotia Government, 2009.

14 Webb, K.T., *Soils of Pictou County, Nova Scotia, Soil Report 18, Nova Scotia Soil Survey,* Agriculture Canada, 1990

15 Davis, D. Brown, S., *The Natural History of Nova Scotia, Volumes 1, 2*, Nova Scotia Museum, Department of Education and Culture, Province of Nova Scotia, Nimbus, 1996

16 Online: Canadian Museum of History, The Debert Palaeo-Indian National Historic Site, 2014, http://www.historymuseum.ca/cmc/exhibitions/tresors/ethno/etb0370e.shtml

17 DeMont, John, *In the eye of the storm*, Canadian Geographic, October 2010, Volume 130, No. 5, Canadian Geographic Enterprises, 2010

18 Leavitt, Robert, *Maliseet & Micmac First Nations of the Maritimes*, Second Pilot Edition, Micmac-Maliseet Institute, University of New Brunswick, Fredericton, 1991.

19 Patterson, Rev. George, *A History of The County Of Pictou, Nova Scotia*, Dawson Brothers, Montreal, 1877

20 Gilles Robert de Vaugondy, *Atlas Paratif, universel et militaire* (Paris, 1748/1749)

21 Herbert, Brian J., *Submissions of Pictou Landing First Nation, Volume 1*, McKiggan Hebert, Halifax, 2013.

22 Withers, Paul, CBC News, Jun. 20, 2017, 6:30 Am AT

23 Chief Andrea Paul, *Letter to Judge Atwood, Nova Scotia Provincial Court*, Feb. 17, 2016, Pictou Landing First Nation

24 *Place Names and Places*, Nova Scotia Archives

25 Pjila'si Mi'kma'ki: Mi'kmaw Place Names Digital Atlas, Saint Mary's University, 2018

26 The Toponomy Project, KMKNO

27 Bennett, Ella, 'We Had Something Good Here': ReStoring A'se'k with Pictou Landing First Nation, Thesis, Dalhousie University, 2013

28 Trigger, Bruce G., *Northeast*, Vol.15, Smithsonian Institute, Washington, 1978

29 Paul, Daniel M., *We Were Not Savages, A Collision Between European North American Civilizations*, 3rd ed. Fernwood, Halifax, 2006

30 UINR, CMM, NCNS., *The Mi'kmaw Resource Guide*, 3rd ed., Eastern Woodland Publishing

31 Status Report on Specific Claims, Indigenous and Northern Affairs Canada, 2018

32 Online: *Species at Risk in Nova Scotia: Identification & Information Guide, Mersey* Tobiatic Research Institute, 2008, http://www.speciesatrisk.ca/SARGuide/download/SAR%20Guide.pdf

33 Online: Species at Risk Overview: NS Endangered Species Act: Legally Listed Species NS Dept of Natural Resources, 2018, https://novascotia.ca/natr/wildlife/biodiversity/species-list.asp

APPENDICES

Map A

Mi’kmaq Traditional and Current Use Areas

Boat Harbour MEKS

Mi'kmaq Traditional and Current Use Areas

Legend

- Traditional Use Areas
- ProjectSite
- StudyArea
- County Border
- Highway
- Trunk Road
- Collector Road
- Local Road
- Loose Surface/Cart Track
- Rivers
- Reserve Land

Disclaimer

This map is a graphical representation of Mi'kmaq ecological knowledge gathered throughout the study, and should not be used for navigation purposes. Features presented may not accurately representaactual topographical or proposed features.

The Mi'kmaq ecological knowledge data presented is a sampling of knowledge held by those interviewed and should not be interpreted as an absolute measure of Mi'kmaq ecological knowledge and land use.

N

Datum: UTM
NAD83 Zone 20
Scale: 1:55,000
Version: 1
18 July 2018

Membertou
GEOMATICS SOLUTIONS

0 0.5 1 2 3 4 5
Kilometers

Caribou
Three Brooks
Central Caribou
Haliburton Brook
Bay View
Braeshore
Northumberland Strait
(Gulf of St. Lawrence)
Sandy Cove
Haliburton
Pictou
Town Gut
Gavin Islet
Lyons Brook
Pictou Harbour
Moodie C.
Fisher's Grant 24
Chance Harbour
Pictou Landing
Boat Harbour
West River of Pictou
Loch Broom Islet
Loch Broom
Grattos Cove
Fisher's Grant 24G
Boat Harbour West 37
Clish Brook
Big Gut
East River of Pictou
Anderson Brook
Granton
Abercrombie
Hillside
Little Gut
Middle River of Pictou
Bore Hole Brook
Begg Brook
Lowden Brook
Little Harbour Road
Rear Brook
Trenton
Smalls Brook
Academy
Sylvester
Smelt Brook
Frasers Mountain

Map B

Mi’kmaq Traditional and Current Fishing Areas

Boat Harbour MEKS

Mi'kmaq Traditional and Current Fishing Areas

Legend

- Fishing Areas
- ProjectSite
- StudyArea
- County Border
- Highway
- Trunk Road
- Collector Road
- Local Road
- Loose Surface/Cart Track
- Rivers
- Reserve Land

Disclaimer

This map is a graphical representation of Mi'kmaq ecological knowledge gathered throughout the study, and should not be used for navigation purposes. Features presented may not accurately representaactual topographical or proposed features.

The Mi'kmaq ecological knowledge data presented is a sampling of knowledge held by those interviewed and should not be interpreted as an absolute measure of Mi'kmaq ecological knowledge and land use.

Datum: UTM
NAD83 Zone 20
Scale: 1:55,000
Version: 1
18 July 2018

Membertou GEOMATICS SOLUTIONS

Map C

Mi’kmaq Traditional and Current Hunting Areas

Boat Harbour MEKS

Mi'kmaq Traditional and Current Hunting Areas

Legend

- Hunting Areas
- ProjectSite
- StudyArea
- County Border
- Highway
- Trunk Road
- Collector Road
- Local Road
- Loose Surface/Cart Track
- Rivers
- Reserve Land

Disclaimer

This map is a graphical representation of Mi'kmaq ecological knowledge gathered throughout the study, and should not be used for navigation purposes. Features presented may not accurately representaactual topographical or proposed features.

The Mi'kmaq ecological knowledge data presented is a sampling of knowledge held by those interviewed and should not be interpreted as an absolute measure of Mi'kmaq ecological knowledge and land use.

Datum: UTM
NAD83 Zone 20
Scale: 1:55,000
Version: 1
18 July 2018

Membertou
GEOMATICS SOLUTIONS

Map D
Mi’kmaq Traditional and Current Gathering Areas

Boat Harbour MEKS

Mi'kmaq Traditional and Current Gathering Areas

Legend

- Gathering Areas
- ProjectSite
- StudyArea
- County Border
- Highway
- Trunk Road
- Collector Road
- Local Road
- Loose Surface/Cart Track
- Rivers
- Reserve Land

Disclaimer

This map is a graphical representation of Mi'kmaq ecological knowledge gathered throughout the study, and should not be used for navigation purposes. Features presented may not accurately representaactual topographical or proposed features.

The Mi'kmaq ecological knowledge data presented is a sampling of knowledge held by those interviewed and should not be interpreted as an absolute measure of Mi'kmaq ecological knowledge and land use.

N

Datum: UTM
NAD83 Zone 20
Scale: 1:55,000
Version: 1
18 July 2018

Membertou
GEOMATICS SOLUTIONS

0 0.5 1 2 3 4 5
Kilometers

Caribou
Three Brooks
Central Caribou
Haliburton Brook
tch Hill
Bay View
Braeshore
Sandy Cove
Northumberland Strait
(Gulf of St. Lawrence)
Haliburton
Pictou
Town Gut
Lyons Brook
Gavin Islet
Pictou Harbour
Moodie C.
Fisher's Grant 24
Chance Harbour
Black Poi
Pictou Landing
Boat Harbour
West River of Pictou
Loch Broom Islet
od Hill
Loch Broom
Grattos Cove
Fisher's Grant 24G
Boat Harbour West 37
Clish Brook
Big Gut
East River of Pictou
Anderson Brook
Little Har
Granton
Abercrombie
Hillside
Middle River of Pictou
Little Gut
Begg Brook
Bore Hole Brook
Lowden Brook
Anderson
Little Harbour Road
ham
Rear Brook
Trenton
Academy
Smalls Brook
Sylvester
Smelt Brook
Pine T
Frasers Mountain