EVALUATING CO-MANAGEMENT OF LAKE NIPISSING'S FISHERIES

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SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ENVIRONMENTAL STUDIES

NIPISSING UNIVERSITY
SCHOOL OF GRADUATE STUDIES
NORTH BAY, ONTARIO

NIPISSING UNIVERSITY

SCHOOL OF GRADUATE STUDIES

CERTIFICATE OF EXAMINATION

Certificate of Examination

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The major research paper by

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entitled

EVALUATING COMANAGEMENT OF LAKE NIPISSING'S FISHERIES

is accepted in partial fulfillment of the requirements for the degree of

Master of Environmental Studies

August 28, 2019
Date

Robin Gendron
Chair of the Examination Committee

[redacted]

Abstract

Canada is widely recognized for its fisheries as the country is comprised of over two million lakes and rivers that flow into five major ocean drainage basins. Fishing has historically been identified as one of the country's prominent recreational, commercial and subsistence activities for Indigenous and non-Indigenous users (Fisheries and Oceans Canada, 2012). However, tensions have been emerging due to conflicts over current management practices, how they are applied, and treaty obligations (Allain, 1996). Changes in fish stocks, users, and treaty obligations have led to the need to reassess management arrangements between Indigenous and non-Indigenous fishers. As an effort to alleviate these rising concerns, governments throughout Canada have considered working alongside Indigenous community members through co-management practices. Similar to other fisheries, Lake Nipissing has been experiencing increasing conflict amongst fishers, due to decreasing walleye populations, mutual mistrust between Indigenous and non-Indigenous users, and varying treaty interpretations that lead to uneven application of management measures. The goal for this research project is to evaluate the current management practices in place for the Lake Nipissing fishery, in particular, the co-management of the Lake's fisheries by government and First Nations. This evaluation will be based on geographical setting, trends in the fishery, institutional setting, and how its success is measured. Based on the assessment, it is apparent that the government needs to continue working on building communal relations amongst fishers and ensure adequate funding for further management, monitoring, and research initiatives that are focused on recovering the fishery.

Acknowledgements

This paper would not have been possible without the support from my family, friends and academic supervisor. I am so grateful for Dr. James Abbott agreeing to take me under his wing for this paper as an academic supervisor. I truly appreciate the guidance that was provided by my academic supervisor throughout the entire process of writing this paper. Having no background or prior knowledge on this topic, I heavily relied on Dr. James Abbott for his wisdom and experience in this related discipline. This paper would also not have been possible without Dr. Dan Walters agreeing to be one of my committee members. I would also like to thank both my parents, Lisa and Ted Ruszin, for ensuring that I always had adequate resources and emotional support during my term at Nipissing University. I also would not have had the confidence to pursue a higher education if it was not for my dear friends Elizabeth Elliott, Guliana Ruffolo, Jessica Almeida, Jill Neskovski, and Tyler Murphy. Needless to say, the individuals acknowledged here have played a significant role in the completion of this major research paper and I am eternally thankful to each and every one of them.

Table of Contents

List of Figures

1. Introduction:

Canada is widely recognized for its fisheries as the country is comprised of over two million lakes and rivers that flow into five major ocean drainage basins. Fishing has historically been identified as one of the country's prominent recreational, commercial and subsistence activities for Indigenous and non-Indigenous users (Fisheries and Oceans Canada, 2012). However, the overall sustainability of fish stocks are continuously being threatened by factors including habitat loss and fragmentation, contaminants, poaching, and the introduction of non-native species (Government of Canada, 2018). Tensions have also emerged due to conflicts over current management practices, how they are applied, and treaty obligations (Allain, 1996). Changes in fish stocks, users, and treaty obligations have led to the need to reassess management arrangements between Indigenous and non-Indigenous fishers.

In an effort to alleviate these rising concerns, governments throughout Canada have considered working alongside Indigenous community members. This collaborative framework for managing fisheries is commonly referred to as co-management or cooperative management. Co-management may be defined as a partnership agreement amongst the community of local resource users, government officials, other stakeholders, and external agents to share the responsibility and authority for the management of a fishery (Pomeroy, Rivera-Guieb, & C.A.B. International, 2006). The success of co-management practices is reliant on the willingness of the governments to share the management power. While there are varying frameworks for co-management practices (Ostrom *et al.,* 2002), all co-management institutions are comprised of two characteristics: decentralized decision-making with local resource personnel (Jentoft, McCay, & Wilson, 1998) along with power-sharing and partnership between all essential actors (Jentoft, 2004). In doing so, co-management arrangements seek to alleviate issues arising in

fisheries that are managed by the top-down approach (Hoggarth *et al*., 1999). This is accomplished through emphasizing two-way communication and the use of flexible approaches that are adaptable to the environmental and social characteristics of a specific fishery.

Collective action arrangements like co-management are not fixed; rather, they occur on a continuum. Hoggarth *et al.* (1999) developed a model that highlights this through the range of partnership arrangements between the central government and local communities. As illustrated in Figure 1, the levels of information and responsibility sharing between partners in co-management may range anywhere from fully centralized government management, and completely independent bottom-up self-management by communities. Where a specific co-management arrangement falls along this line depends on the nature and scale of the management problems at hand and the abilities and capacity of each of the different collaborators (Hoggarth *et al*., 1999). However, collective action initiatives like co-management would ideally be adopted in the middle of fully centralized government management, and completely independent bottom-up self-management by communities. Equal collaboration between these two actors is ideal for co-management frameworks as the community members might more knowledge on the area's natural resources and the government could have more theoretical knowledge on the overall state of the fishery (Hoggarth, et al., 1999). Nonetheless, being able to tailor the management frameworks during the implementation, and adaptation, of collective action initiatives is the key factor for its success and evolution. Implementing policies, like co-management, that encourage the development and strengthening of networks of institutions and organizations that have the capability of being flexible to deal with contingency and complexity is increasingly needed. Notably, co-management systems have been recently recognized by scholars as a promising management organization to apply to Indigenous peoples and community

conserved territories and areas (Acheson, 2013). Thus, co-management could be a viable option as an effective management technique and governance structure.

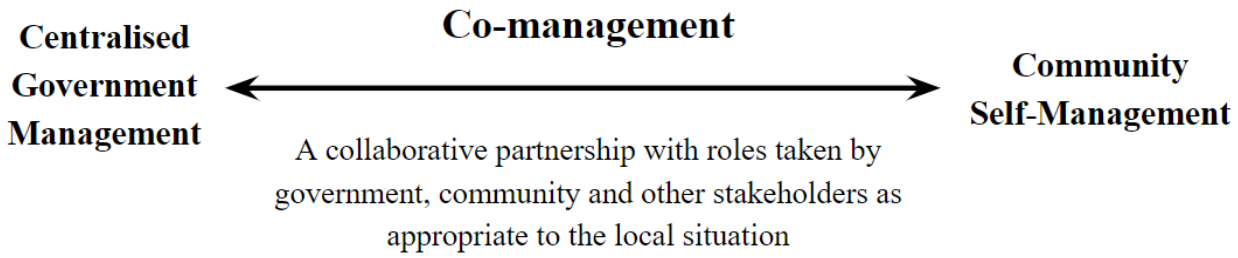

Figure 1. The continuum of co-management (adapted from Hoggarth *et al.*, 1999)

The goal for this research project is to evaluate the current management practices in place for the Lake Nipissing fishery, in particular the co-management of the Lake's fisheries by government and First Nations. This evaluation will be based on geographical setting, trends in the fishery, institutional setting, and how its success is measured. Based on the assessment of the Lake Nipissing Fishery Management Plan from its implementation in 2014recommendations will be proposed, when applicable, to improve any flaws within the fishery's management framework. These suggested changes will be drawn from other existing or emerging examples of fisheries co-management in Canada. A re-assessment of the Lake Nipissing fishery management practices is needed as the area is still encountering similar issues as other fisheries, such as disagreements over appropriate fishing levels and methods.

A review of several news articles has revealed that the area is experiencing increasing conflict amongst fishers, due to decreasing walleye populations, mutual mistrust between Indigenous and non-Indigenous users, and varying treaty interpretations that lead to uneven application of management measures. One of the predominant contributing factors to these discrepancies amongst Indigenous and non-Indigenous users is a decline in walleye stocks. The

overall trends in the fish stocks within Lake Nipissing have been steadily declining as the fisheries gain popularity amongst fishers. In fact, there has been a decline in the number of adult walleye, ranging from 30 percent to 55 percent, over the past five decades (Ministry of Natural Resources, 2018). The walleye population in Lake Nipissing has declined as the current population is half of what it was in the 1980s. Given the emerging tensions between stakeholders and the decline in fish abundance, the Lake Nipissing fishery may benefit from a redesigned management framework. Additionally, broadening our understanding of the management practices for Canadian fisheries will help inform the design, support, and implementation of co-management for other fisheries at risk.

2. Review of Literature:

It has been recognized that conventional, state-driven and top-down fisheries management frameworks are not particularly effective in sustainably managing natural resources (Acheson, 2013). This realization amongst scholars has encouraged new research ideas pertaining to innovative management techniques and governance structures. Co-management is considered one of the most promising management techniques as it includes local populations that depend on natural resources, like fish stocks(Acheson, 2013). The overall acceptance of co-management by stakeholders may also be due to the shared authority and collaboration of policymaking between resource users and government agencies (Ostrom 1990; Pinkerton 1994). Co-management is also quite favourable as evidence suggests that the process and linkage components of this framework establishes an adaptive capacity at multiple levels through fostering shared understanding, increasing dialogue and interaction, distributing control and shared responsibility for actions, and improving conditions for individual and group learning (Berkes, 2009; Plummer, 2009). As scholars continue to gain interest in researching co-

management, new approaches are being used to analyze institutions within natural resource management, governance, and livelihoods (Nunan, Hara, & Onyango, 2015).

There are several examples of the implementation of co-management in the northern regions of Canada for various species. Rather than solely focusing on fisheries, publications exploring adaptive co-management consider other animals affected by climate change such as grizzly bears (Clark & Slocombe, 2011), migratory tundra caribou (Gunn, Russell, & Greig, 2014), and polar bears (Walmark *et al*., 2013). These studies have revealed that collective action frameworks, such as co-management, are capable of sustainably managing these different species. The papers consulted suggested that co-management could help mitigate the harmful effects of climate change that are now being exposed to species in the northern regions of Canada. It has been argued that co-management institutional arrangements have a significant role in establishing ideal conditions for social learning and adaptation for the rapidly changing northern environment (Armitage *et al*., 2011). More specifically, studies focusing on how to mitigate unstable stressors, like climate change, that affect the sustainability of various species look at the application of a variation of co-management that is adaptive. Adaptive co-management is a conceptual model that was developed to effectively maintain natural resource management systems that are exposed to conditions of uncertainty and social-ecological complexity (Armitage *et al*., 2007; Folke *et al*., 2005; Plummer, 2009).

For instance, Clark and Slocombe (2011) argued that adaptive co-management practices will sustain northern bear-human systems as it encourages considerable social-ecological resilience and adaptive capacity. An adaptive co-management framework was applied to the bear-human systems in the north as they are enduring rising pressures of climate change, increasing human populations, and industrial development. Study areas within Nunavut and the

Inuvialuit Settlement Region in Clark and Solcombe's (2011) research exhibited a commonly held vision for effective adaptive co-management of bear-human systems. This included the objective that utilizes different, but complementary, knowledge systems in a governance framework in which community concerns are rapidly and adequately considered amongst all governing levels and acted on. Correspondingly, Clark and Solcombe (2011) concluded that this approach will prompt effective transformation and change in bear-human systems if a crisis were to occur in these northern regions.

Gunn, Russell, and Greig (2014) recognized that evaluations on the impact of industrial developments, along with adopted management and monitoring strategies significantly influence the instability of Canadian migratory tundra populations. This study sought to identify how adaptive management is correlated to the product of implemented assessment, monitoring, and mitigation strategies for the migratory tundra caribou. These researchers were also interested in understanding how the results of herd-level monitoring, assessment, and decision making could determine a corresponding adaptive management framework. In order to achieve these objectives, a framework of cumulative effects pertaining to monitoring and management for the migratory tundra caribou was created. The information designing this framework was drawn from the overall condition and patterns of the Bathurst caribou herd. This caribou herd was selected as a primary example because it was experiencing substantial declining population rates, even with the implementation of extremely strict harvesting restrictions (Gunn, Poole, & Wierzchowski, 2011). Based on the data drawn and analyzed from this example, the researchers developed a framework that is comprised of project-specific mitigation, landscape-scale mitigation, and population-level mitigation (Gunn, Russell, & Greig, 2014). Adaptive management has also been proposed to be incorporated with the herd's annual range as it will

create favourable results of its correlated planning and collaboration process. This study also found that considering the recognized cumulative effects and herd management will identify any restrictions and drawbacks of the relationship amongst development and various management strategies, such as habitat management (Gunn, Russell, & Greig, 2014). Integrating all of these factors was found to establish effective management approaches for all actors, including land and wildlife agencies and co-management boards that govern such frameworks.

Additionally, Walmark *et al.* (2013) found that creating an adaptive co-management strategy though the Indigenous Stewardship Model will increase self-sufficiency and self-governance for Indigenous communities while also promoting transboundary cooperation with other users. The Indigenous Stewardship Model provides a framework to create and implement co-management strategies from Indigenous perspectives that also fosters and encourages the participation of Indigenous partners (Walmark *et al.,* 2013). By doing so, this management approach addresses cultural and spiritual perspectives and the mixed economy, while also promoting sovereignty, self-governance, and self-sufficiency for Indigenous individuals (Ross *et al*., 2011). This management framework was implemented for the Fort Severn Cree as the declaration of polar bears being officially threatened under the *Endangered Species Act* of Ontario created two issues for their community. First, the listing of polar bears completely restricted the Cree traditional harvest of polar bears, infringing their previously agreed upon constitutional treaty rights. Secondly, the subsequent need to establish additional protected habitats for the species in northern Ontario (Walmark *et al*., 2013). An adaptive co-management approach like the Indigenous Stewardship Model has been deemed a viable option to address these issues posed on the Fort Severn community. It provides a means to reduce conflict, allocate natural resources sustainably, and establish a political forum; allowing Indigenous users to

develop the knowledge and skills necessary for sustainable management (Carlsson & Berkes, 2005). Even though there are limited case studies with the application of the Indigenous Stewardship Model, the leaders of Fort Severn continue to advocate for this model as it was created for and by Indigenous people.

These studies demonstrate that northern institutional arrangements in Canada are moving beyond specific projects, single resources, and individuals. Northern regions of Canada are initiating collective action arrangements that create networks, or horizontal and vertical linkages that build new social practices and stakeholder interactions (Armitage *et al*., 2011). Frameworks like co-management provide communities and governing bodies a greater ability to cope with variability, while also building longer-term adaptive strategies that will minimize risk and uncertainty. At the same time, while design is important, implementation and commitment by all participants is equally important. These inferences regarding co-management were drawn from studies focusing on species other than those that encompass fisheries. In Section 3, I describe examples of co-managed fisheries in different parts of Canada that could be used to explore how to implement and maintain this framework.

3. Examples of Co-managed Fisheries in Canada:

3.1. Alberta – Whitefish First Nation:

In Alberta, the adoption of co-management was initiated by issues arising from 40 years of resource extraction that negatively affected the Whitefish First Nation community (Ivanitz, 1996). In an effort to meet industrial and Crown interests, the land surrounding the Whitefish First Nation was drastically changed. The alteration of Whitefish Lake had essentially limited all forest uses, including the traditional land use patterns of Whitefish Lake band members. In 1985,

in response to the land transformation, the Whitefish First Nation band members asserted that the Crown had been failing to sustainably manage the land base that they were entitled to since 1908 (Natcher, 2001). A Treaty Land Entitlement Claim was then submitted to the Crown and was later ratified in November of 1988 through a Memorandum of Intent. Along with securing an additional land base and a financial settlement, the Whitefish First Nation was also able to develop a clause in the Memorandum that requires the cooperative management of lands surrounding their reserves (Indian and Northern Affairs Canada, 1988). The land that falls under this co-management arrangement encompasses approximately 2,700 km² (Natcher, 2001). As recognized under the Treaty Land Entitlement Claim, the Whitefish First Nation established the first cooperative management agreement in the province of Alberta. This agreement manages fishing within Whitefish Lake, which is located along the north and west shores of Utikuma Lake, in north-central Alberta Canada (Natcher, 2000).

This co-management agreement formed a trilateral understanding between the Whitefish First Nation, Alberta Environmental Protection, and the federal department of Aboriginal Affairs. The purpose of this particular arrangement was to provide the Whitefish First Nation community with a legislative role in the off-reserve management of fish, timber and wildlife resources (Natcher, 2001). These shared obligations consist of identifying key resource management issues, implementing processes to address those issues, and recommending processes leading to resolution including policy recommendations and changes to meet such agreed upon objectives (Natcher, 2000). This agreement is structured as a three-tiered system that takes into consideration perspectives from a provincial, regional, and local level. The provincial level of this agreement is currently represented by the Whitefish Lake Chief and Council and the Assistant Deputy Ministers of Environmental Protection and Aboriginal Affairs

(Natcher, 2001). The regional scale is comprised of two Whitefish Lake Council representatives along with senior government officials (Natcher, 2001). Finally, and probably most importantly, the local level consists of the Whitefish Lake Council, Elders, and a representative from the Whitefish Lake Trappers Association working alongside local community representatives from Alberta Lands and Forests and the Department of Fish and Wildlife (Natcher, 2001). Nonetheless, when addressing any concerns raised regarding natural resource management the cooperation of all these actors is essential for the success of this co-management initiative.

With this in mind, ensuring the success of this management framework is a vital component for restoring the overall health of the northern pike in Alberta. The Fisheries and Oceans Canada's *Survey of Recreational Fishing in Canada* (2015) identified the northern pike as the second highest species caught by recreational fishers in Alberta. Even though northern pike has been historically supported in most of Alberta's fish-bearing lakes, its fish stocks have been steadily declining over the years. In fact, the surveys conducted in 2004, 2009, 2012, and 2016 also noted that the northern pike population has been substantially decreasing and is now considered as a very high risk on the index (Government of Alberta, 2018). Historically, 73 per cent of Alberta's northern pike populations have been categorized as low to moderate risk, but the current status of the adult density for this species is at 32 per cent (Government of Alberta, 2015). In other words, about three-quarters of the northern pike populations were initially considered abundant, but only one-third of the stocks are currently in good standing on the Fish Sustainability Index. The primary threats to the sustainability of the northern pike in Alberta are overharvesting, nutrient runoff from growth in surrounding watersheds, and the industrial developments occurring along the waterbodies (Government of Alberta, 2015). Even though the northern pike populations have been slowly recovering over the years, these populations are still

at very low abundance levels. Thus, it is evident that strong conservation efforts by Alberta fisheries managers are imperative for the restoration of Alberta's northern pike fisheries.

Given the current state of the northern pike in Alberta, the government continues to work alongside community members to maintain the area's management frameworks. For instance, the Alberta Environmental and Parks Policy and Operations Division for fisheries management has been focusing on updating the Fisheries Management Program over the last few years (Government of Alberta, 2018). The update for this management plan was initiated as governing officials recognized the need for the northern pike management framework to be cohesive with Alberta's Fish Conservation and Management Strategy. In order to ensure community involvement, this update relied on public consultation through three phases that commenced in 2017 (Alberta Environment and Parks, n.d.). Phase one sought public feedback on key management questions (Government of Alberta, 2018). Phase two also consulted community members for their input on drafted management frameworks that were composed from information collected in phase one (Government of Alberta, 2018). Phase three consisted of further consultation within areas that are experiencing declines in northern pike stocks as they may need more tailored management objectives (Government of Alberta, 2018). By considering the community's feedback that was provided throughout these phases, the government has been able to effectively update their management framework for northern pike.

3.2. Nunavut – Nunavut Wildlife Management Board (NWMB):

Nunavut was officially established as a Territory in Canada on April 1, 1999 and the Nunavut Land Claims Agreement (NCLA) was created and signed in May 1993 (Wheatley, 2003). Under the NLCA, all wildlife in this region is to be jointly managed by the Inuit of

Nunavut along with the federal and territorial government. Wildlife management decisions are based on data provided from both conventional science and Inuit traditional knowledge (*Quajimajatuqangit*) (Wheatley, 2003). Consulting Inuit traditional knowledge is crucial for resource management practices as their information, values, and beliefs have been passed down for countless generations. This understanding is highly correlated to their long association with the land, which adds a critical perspective on Nunavut's resources. The NWMB's role in the decision-making process also moves beyond the pre-NLCA paradigm, which is essentially superseding any limitations that were originally posed on the Inuit (Nunavut Wildlife Management Board, n.d.). The NWMB notes in their Governance Manual (2012, 2) that their involvement broadens the decision-making process as it may be described as "a system of partnerships, in which the partners work cooperatively to assist the NWMB to make particular decisions, to conduct and commission research, and to provide approvals, advice, recommendations, and information." Some of the other duties of the NWMB are establishing and managing the level of total allowable harvest in the settlement area, allocating resources to other residents and to existing operations, approving and modifying boundaries for conservation areas, and identifying wildlife management zones (Indian and Northern Affairs Canada, 1997).

The NWMB plays a significant role in wildlife management as it is a primary regulator of access to the wildlife in the Nunavut Settlement Area. The Nunavut Settlement Area is composed of two parts that cover most of the territory. Part A is composed of the Arctic Islands, the mainland of Eastern Arctic along with adjacent marine areas described in the NLCA and Part B covers the Belcher Islands, the associated islands and adjacent marine areas in Hudson Bay as described in the NLCA (Indian and Northern Affairs Canada, 1997). The NWMB also has an advisory role on issues pertaining to marine management that occurs in Zone I and Zone II. Zone

I refers to waters north of 61 degrees latitude subject to Canada's jurisdiction seaward of the territorial sea boundary, that are not part of the Nunavut Settlement Area or any other land claim settlement areas. Zone II refers to the waters of James Bay, Hudson Bay, and Hudson Strait that are also not a part of the Nunavut Settlement Area or any other land claim settlement area (Indian and Northern Affairs Canada, 1997). The government may seek the advice of the NWMB on wildlife management decisions in these zones when they affect Inuit harvesting rights within marine areas of the Nunavut Settlement Area.

The co-management practices for fisheries within Nunavut have been predominantly focused on developing conservation initiatives for the Arctic Char. Throughout the West Kitikmeot region of Nunavut, anadromous Arctic Char live about three to eight years in these freshwater lakes and migrate annually (Swanson, 2007). Since this species are sea-run they typically migrate annually and feed in the sea for two to four weeks (Klemetsen *et al*., 2003). After spending some time in the sea, the Arctic Char frequently migrate back to freshwater lakes during winter and spawning periods. This species of fish has significant cultural and economic ties to Northerners as the species represents over 40% of traditional uses, such as subsistence, in Nunavut between 1996 and 2001 (Nunavut Wildlife Management Board, 2004). The Fisheries and Oceans Canada's 2015 *Survey of Recreational Fishing in Canada* also identified the Arctic Char as the most fish caught recreationally in Nunavut. Unfortunately, the Arctic Char are susceptible to various stressors that may considerably impact their migration patterns and overall population levels. More specifically, climate change has been recognized as one of the most predominant stressors that affect the Arctic Char populations. For instance, this species is unable to successfully migrate during warm, dry seasons as the water levels of the streams are significantly lower than the average mild years (Svenning & Gullestad, 2002).

It should also be noted that Arctic Char are the most sought after in the commercial fishery industry for the northern Canadian areas, such as Nunavut (Fisheries and Oceans Canada, 2014). With this in mind, there have been advancements made over the years to increase the commercial exploitation of Arctic Char in this region. For example, commercial fishers in Gjoa Haven is hoping to increase their fishing quotas and, in turn, also establishing a fish plant in the community (Neary, 2019). Given that the commercial fishery quotas for Gjoa Haven were established about 20 years ago, the community is ecstatic about the update as it will reflect the current fish stock rates of the lakes. This community-driven project will be implemented through the NLCA as it is considering both the Inuit Qaujimajatuqangit and best available science (Neary, 2019). With this in mind, the Department of Fisheries and Oceans would be acting at an advisory capacity as the federal government is not an official partner for this initiative. Along with this initiative, the federal government also funded exploratory licences to verify the feasibility of commercial fisheries in Iqaluit, Taloyoak, Cape Dorset and Qikiqtarjuaq (Nunavut Impact Review Board, 2019).

3.3. Newfoundland and Labrador – Nunatsiavut/Torngat Wildlife, Plants and Fisheries Co-management Board:

Newfoundland's co-management practices for wildlife are founded on a self-governing region, named Nunatsiavut, which was established during land claim negotiations in 1977 (Boudreau, Postcards from the Postdoc: Fisheries Co-Management in the Canadian North, n.d.). This governing body was initiated in collaboration with the Labrador Inuit Association and the Newfoundland and Labrador and Canadian governments. The Labrador Inuit Settlement Area and the Nunatsiavut Government were later legally recognized in 2005 (Boudreau, Postcards from the Postdoc: Fisheries Co-Management in the Canadian North, n.d.). This area of

responsibility encompasses, unless otherwise stated, Labrador Inuit Lands, the Inuit Communities, the assigned zone, and the Torngat Mountains National Park. The Labrador Inuit Settlement Area are areas that are covered by water, tidal waters, and islands outlined in the Labrador Inuit Land Claims Agreement (Torngat Wildlife Plants and Fisheries Secretariat, 2015). Two public governing bodies for wildlife in Newfoundland were implemented through this agreement. These institutions are the Torngat Joint Fisheries Board and the Torngat Wildlife and Plants Co-management Board, which is also known as the Torngat Wildlife, Plant and Fisheries Secretariat (Boudreau, Postcards from the Postdoc: Fisheries Co-Management in the Canadian North, n.d.).

The Torngat Wildlife and Plants Co-management Board is a public body comprised of seven elected members and a chairperson (Kavamanga Government, 2019). This governing body encompasses the traditional co-management framework as the board members are appointed by the Nunatsiavut Government, Provincial Minister of Environment and Conservation, and Federal Minister of Fisheries The Torngat Wildlife and Plants Co-Management Board has the power to monitor and regulate, when required, total harvesting limits for all wildlife (Kavamanga Government, 2019). However, the governing powers of this body do not cover migratory birds, caribou, and plants. These members are permitted to provide their professional opinion regarding total allowable harvests for migratory birds and caribou to the corresponding minister (Kavamanga Government, 2019). The Secretariat may also provide useful information regarding biological, scientific, Inuit Knowledge, consultations, or social science for these governing bodies during the policymaking process (Boudreau, Postcards from the Postdoc: Fisheries Co-Management in the Canadian North, n.d.). Coupled with providing valuable data, the Secretariat also provides administrative advice and support. Relying on information that considers both the

overall wellbeing of wildlife and the cultural significance of using such resources in the Indigenous practices is necessary for the success of this co-management initiative. For instance, the significant relationship between plants and fishing within the Inuit community of Makkovik, a band within Nunatsiavut, that is ingrained in their cultural practice and day-to-day life is often overlooked or misinterpreted by the general public (Oberndorfer *et al.,* 2017). Along with supporting various perspectives during decision making, these governing bodies also monitor the conservation of species and habitat, and the management of commercial fisheries within the Labrador Inuit Settlement Area.

The Torngat Joint Fisheries Board is also comprised of seven members; three are selected by the Nunatsiavut Government, two are selected by the Canadian Government, and one is selected by the Provincial Government (Torngat Wildlife Plants and Fisheries Secretariat, n.d.). Unlike other members, the chairperson is independent from the board and is chosen by the Minister of Fisheries and Oceans Canada. The current members of this board were born in, or are quite familiarized with, Newfoundland and Labrador or Nunatsiavut. It is required of the board members to meet whenever necessary for business purposes and are expected to allocate additional time to review new materials and prepare for meetings (Independent Appointments Commission, n.d.). These meetings are held minimally on a quarterly basis, unless unforeseen issues arise in the local fisheries. Similar to the Torngat Wildlife and Plants Co-management Board, this public body's primary responsibility is to make recommendations on the management of fisheries in the Labrador Inuit Settlement Area. Given that these recommendations are focused on improving the preservation and sustainability of the region's natural resources, they are often accepted if deemed viable. The Torngat Joint Fisheries Board is also focused on improving the preservation of species, fish populations, aquatic plants, and fish

habitat (Torngat Wildlife Plants and Fisheries Secretariat, n.d.). For instance, this board submitted a review on the northern shrimp management in Nunatsiavut for 2012. This review was concluded with two recommendations from the board members. The first one is that the priority of sharing data under Annex F of the 2007 Northern Shrimp Management Plan should be applied with transparency whenever there are fluctuations in the natural resource and total allowable catch (Torngat Joint Fisheries Board, 2012). The second being that Indigenous treaty rights should not supersede management policies on the resources as they should be held second to conservation and constitutional responsibilities (Torngat Joint Fisheries Board, 2012).

Based on the seafood industry review for Newfoundland that was released in 2017, it is evident that these governing bodies are, and continue to, assess current harvesting limits for the region's fisheries. This may be demonstrated as the overall populations of the Snow Crab, Northern Shrimp, and Cod have been severely impacted by fisheries. It has been noted in fishery reviews that the supply of Snow Crab has been steadily declining as the demand for this resource continues to increase. Consequently, the total allowable catch in the Snow Crab fishery was set at 35, 419 tonnes as it was reduced by 22 per cent from 2016 (Newfoundland Labrador Government, 2017). The total biomass of Northern Shrimp in southern regions have also declined from historically high levels over the past decade. As a result, the total allowable catch in shrimp fishing area six has been reduced by 63 per cent from 27, 825 tonnes in 2016 to 10, 400 tonnes in 2017 (Newfoundland Labrador Government, 2017). Notably, in recent years, shellfish stocks like Snow Crab and Shrimp continued to decline as the groundfish began dominating the ecosystem. However, this increase in groundfish stocks does not particularly indicate that these populations are flourishing to their greatest capability per se. For instance, even though the overall stock biomass for Cod has increased by 600 per cent during this past

decade, these levels are still below previously recorded levels (Newfoundland Labrador Government, 2017).

3.4. British Columbia – First Nations Fisheries Council:

The steady decline in salmon populations in British Columbia have often resulted from owners of vessels not having any sociopolitical connection or dependence on this particular species or area of concern (Pinkerton E. , 1999). In response to this, the British Columbia First Nations Fisheries Action Plan was implemented in 2006 to set the foundation of the province's co-management framework for sustainably harvesting fish and wildlife. The First Nations Fisheries Council of British Columbia was later formed in 2007 through the collaboration of British Columbia's Assembly of First Nations, the Union of British Columbia's Indian Chiefs, and the First Nations Summit (First Nations Technology Council, n.d.). The council is comprised of 14 delegates from various geographic regions in British Columbia embodying a range of expertise, priorities, fisheries, and ecosystems throughout the province (First Nations Technology Council, n.d.). The Indigenous communities that are consulted or represented through this co-management project includes Northern Transboundary, Haida Gwaii, Upper Fraser, Upper Skeena, North Coast, Central Coast, Mid-Fraser, Transboundary Columbia, Fraser Valley, Lower Mainland, South and North Island/Mainland Inlets, and West Coast Vancouver Island (First Nations Fisheries Council of British Columbia, n.d.).

An overall improved involvement of various Indigenous community members in fisheries management and decision making is one of the primary goals for this council. The First Nations Fisheries Council of British Columbia achieves this objective through working alongside Indigenous community members and recognizing their inherent rights regarding the sustainable

allocation of local resources (First Nations Technology Council, n.d.). This framework also aims to acquire democratization, social empowerment, power sharing, and decentralization between the Canadian Government and Indigenous community members (First Nations Fisheries Council of British Columbia, n.d.). Notably, the province's co-management initiatives may succeed if it is able to develop an adequate government-to-government relationship between Indigenous Nations and the Government of Canada. The relationships between Indigenous community members and the government in this arrangement requires joint decision-making amongst both parties. It also requires the government to acknowledge the local Indigenous band's jurisdiction, management authority, and responsibility (First Nations Fisheries Council of British Columbia, n.d.). Like other co-management initiatives, this arrangement is strengthened by local Indigenous community members sharing their language, ritual, and spiritual beliefs with the government (Pinkerton, 1994). These components may provide valuable insight as they are the foundation of their knowledge on the local natural resources. This co-management initiative could be crucial for determining the overall quality of life for Indigenous persons as the fish and aquatic resources are predominantly used for various social, cultural, economic, and food purposes.

Unfortunately, British Columbia's salmon fisheries have been continuously experiencing a variety of biological, economic, and political issues (Pinkerton, 1994).Even though the Canadian Government has been continuously trying to address the pressing issue of decreasing salmon stocks in British Columbia, through initiatives like co-management projects, is simply not enough. To this day, salmon in British Columbia are left vulnerable to continued economic development, climate change, and population growth. This may be illustrated as a ban was placed on commercial and recreational fishing within Vancouver's Fraser River because of the near depletion of salmon stocks (Labelle, 2009).

3.5. James Bay, Northern Quebec – James Bay and Northern Quebec Agreement (JBNQA):

The JBNQA is the foundation of a collective action framework that considers the advice of all parties affected before making wildlife management decisions. The consultation process of the JBNQA was developed to provide benefits for the province of Quebec, the Cree of the Eastern James Bay Region, and the Inuit of Northern Quebec. This process is carried out through the division of these regions into three separate categories. The first category encompasses 14,000 km^2 throughout Indigenous communities that are governed solely by residents (Price & Craik, 2015). The second category consists of Crown land that is shared with 70, 000 km^2 of Cree land and 81,600 km^2 of Inuit land (Price & Craik, 2015). Notably, the divided lands within category two has been categorized as hunting, fishing, and trapping territories for the local Indigenous community members. The third category allocated 1,000,000 km^2 for exclusive rights of Aboriginal persons for the usage of traditional hunting and harvesting practices (Price & Craik, 2015).

The JBNQA has been often regarded as Canada's most progressive and extensive land-claim settlement (Kirkey, 2015). This settlement established a co-management institution called the Hunting, Fishing, Trapping Coordinating Committee under Section 24 of the hunting, fishing and trapping regime of the agreement (Indigenous and Northern Affairs Canada, 2018). The goal of creating a co-management framework like this committee was to balance the powers of representatives for the wildlife administration and regulations amongst the Cree, Inuit, Innu, Quebec, and the Canadian government. This was achieved by ensuring equal numbers of voting members in Indigenous and central government with a chair member who oversees the negotiations. If the members are unable to come to an overall consensus during the decision-

making process, it is up to the chair member to consult each representative to reach a collective agreement (Mulrennan & Scott, 2005). Additionally, the environmental protection regime within Section 22 of the JBNQA was also designed to alleviate any concerns that may arise during resource exploitation (Vincelli & Wilkinson, 1995). More specifically, this section is designed to protect the Cree community's economic development and wildlife resources. Defending these components are crucial to these individual's overall wellbeing and quality of life as they heavily rely on such resources. Fortunately, the Indigenous economies were often able to adapt whenever there were any further changes made to settlement agreements like this. Being able to effectively conform to significant changes throughout history has further prepared these Indigenous communities to deal with any future land developments and disturbances (Brody, 1983; Kayahna Area Tribal Council, 1985). The resilience of the Indigenous economy and cultural practices shows how imperative it is for the Canadian government to promote co-management practices for natural resources that are at risk of depletion.

As fishery trends within the James Bay and surrounding areas have been studied, rising concerns are quite apparent with the Lake Sturgeon populations. More specifically, the Lake Sturgeon has been classified as a special concern within this area by the Committee on the Status of Endangered Wildlife in Canada (Government of Canada, 2018). It has been found that 18 out of the total of 25 species of sturgeon have been identified as critically endangered (Thiem *et al*., 2013). Notably, Lake Sturgeon populations may be considerably impacted by direct and indirect effects from dams. The production of dams inevitably result in habitat loss and destruction, unstable water systems, and may expose the fish stocks to untimely mortality by entrainment in turbines (Government of Canada, 2018). With this in mind, the overall success of spawning of Lake Sturgeon is correlated to the diminishing quality and quantity of their habitats due to the

effects of dams (Haxton 2006; Bennion and Manny 2014). Correspondingly, undesirable changes made to spawning habitats has been recognized as a limiting factor for encouraging stable Lake Sturgeon population growth (Lyttle 2008; Randall 2008; Bennion and Manny 2014). The overuse of commercial fishing has also historically caused substantial drops in the Lake Sturgeon populations. Additionally, this specific type of species is quite susceptible to various threats that may include contaminants, poaching, the introduction of non-native species (Government of Canada, 2018). To this day, it has been found that these populations are still unable to fully recover from being exposed to such contributing factors (Government of Canada, 2018).

3.6. Summation of Examples Explored:

Notably, all these examples have been encountering severe depletion of fish stocks within their fisheries. Experiencing significant declines in fish populations could be one of the primary reasons why these areas have decided to adopt a new management framework, like co-management. With this in mind, the overall trends in each of these fisheries could have forced governing officials and community members to address the issue at hand through collective action. The implementation of these co-management agreements also originated from treaties, land claim agreements, and court cases that reaffirmed and upheld the right of Indigenous fisheries. By doing this, the co-management frameworks include essential components regarding inherent Indigenous rights for land use and natural resources that could have been overlooked before. Considering the terms from previously agreed upon settlements provided a foundation, while also encouraging applicable amendments to improve the fisheries management for these areas. As outlined in the provided examples, these changes included ensuring fair representation of the local Indigenous bands as an effort to promote collaboration between Indigenous and non-Indigenous fishers. Consulting Indigenous band members or their appointed delegates in the

area would also often provide the government with insightful knowledge on the local resources. According to the examples explored, this consultation process is directed towards a committee of band representatives, along with other local resource users, government officials, stakeholders, and external agents. Having a committee that is comprised of various actors that could provide sufficient advice and information regarding the sustainable management of their local fishery is essential for an effective co-management strategy.

4. Methods and Procedures:

In order to properly assess the current state of the Lake Nipissing fishery, I will be examining its geographical setting, trends in the fishery, institutional setting, and its overall success. Briefly describing the area's geographical characteristics for this co-managed fishery will provide the historical context needed to understand the potential for co-management of its fisheries. By exploring the history of the fisheries, I will identify key factors that initiated the implementation of co-management for the fishery. For instance, the co-management of a specific region could be entirely based on the Indigenous treaty and, when applicable, its corresponding traditional territory. The geographical setting also needs to be taken into consideration when assessing the degree to which co-management may be effective. Co-management might be constrained based on the population density of the area, size of the fishery and its surrounding region. Current management practices for the Lake Nipissing fishery is also being challenged by competing interests or rights by the Algonquins to fish the lake (Tabachnick, 2018). The larger the region being managed, the more difficult it could be to effectively implement, monitor, and maintain co-managed fisheries. Tracing the trends in Lake Nipissing's fishery will also help explain why the governing institution decided to implement a co-management framework. In fact, if there is an overall trend of decreased fish stocks over a period of time in a certain area,

governing officials will almost be forced to address the issue. This may include adopting new governing frameworks, such as co-management, as an effort to carefully monitor certain fish stocks. However, it should be noted that this is not always the reason as to why co-management was implemented for some fisheries.

An examination of the institutional setting will clarify why managers for Lake Nipissing advocated for the adoption of collective action strategies like co-management for its fishery. Understanding the governance structure will help explain what made co-management feasible this case study. This analysis will explore the entire process of adopting collective action arrangements, ranging from its implementation to maintaining it. Moreover, drawing from Lake Nipissing's institutional settings could provide the foundation of future co-management frameworks. Other factors following these criteria could also be drawn from the other examples previously explored, and applied to Lake Nipissing, or other institutions that are currently practicing co-managed fisheries. This will only be applicable if the adoption of co-management was generally effective for the case studies that were previously evaluated.

Determining the overall success of co-managed fisheries in these examples might be more difficult than initially anticipated. It would be ideal to evaluate the success of this case study through how the governing bodies measure their success and how they were able to meet their set-out goals. Unfortunately, the reviewed literature has revealed that it is rare for the institutions to disclose specific goals and achievements for the monitored fish stocks. For this reason, a conceptual model will be used as a tool to measure the success of the Lake Nipissing fishery. The measurement of success is focusing on the outcomes like fish populations along with the decision making process for managing the fishery. This framework has been adapted from a conceptual model of managed retreat for natural hazards that was developed by Hino,

Field, and Mach (2017). This conceptual model identified the key sociopolitical attributes that would either promote or impede the adoption of managed retreat for natural hazards through four quadrants. The horizontal and vertical axes created quadrants that reflect the perspectives and motivations of the residents and implementing party for a managed retreat (Hino, Field, & Mach, 2017).

The structure of this framework was then adapted to measure the success of fisheries that are being co-managed (Figure 2). This was accomplished through combining the framework of a conceptual model of managed retreat by Hino, Field and Mach (2017) with the continuum of co-management that was developed by Hoggarth *et al.* (1999). As previously mentioned, collective action initiatives like co-management would ideally be adopted in the middle of fully centralized government management, and completely independent bottom-up self-management by communities. Having a sufficient degree of acceptance from community members would also be required for a successful co-management framework. Thus, identifying where Lake Nipissing falls on this model will help illustrate and determine the overall success of its co-managed fishery.

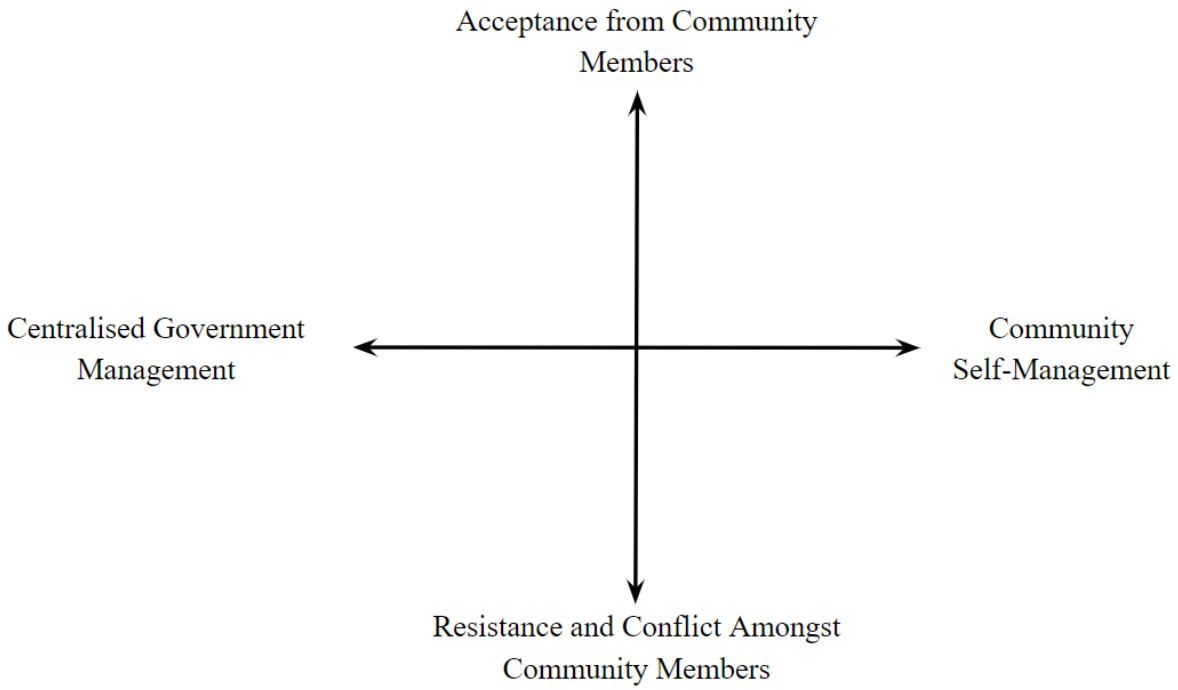

Figure 2. The conceptual model used to measure the overall success of co-management arrangements for the Lake Nipissing fishery.

5. Lake Nipissing:

Being one of the largest inland lakes that is entirely within the province of Ontario, Lake Nipissing plays a significant role in providing resources for recreational, commercial, and subsistence fishing activities for Indigenous and non-Indigenous persons. Lake Nipissing's ecosystem supports 42 species of fish such as walleye, yellow perch, northern pike, bass, muskellunge, lake herring, and lake whitefish (Ontario Ministry of Natural Resources and Forestry, 2014). There is a long history of human use of the Lake Nipissing fisheries, which started with the Indigenous use of the lake's resources for subsistence fishing. To this day, Lake Nipissing's fisheries are of nutritional, economic and spiritual importance to the local Indigenous inhabitants (Goulais B. , 2015). The Robinson-Huron Treaty of 1850 reserves the rights of both

the Nipissing First Nation and the Dokis First Nation to fish Lake Nipissing for food (Surtees, 1986).

It was also later recognized that these Indigenous members may also commercially fish the lake through one of the first court cases that asserted Indigenous resource rights. *R. v. Commanda* (1990) was the first caselaw that recognized the Indigenous right to commercially fish within Lake Nipissing (Government of Ontario, 2019). Before this case, the Indigenous right to commercially fish was not always acknowledged, or upheld, by the provincial and federal law. *R. v. Commanda* (1990) was a summary conviction appeal for the charges laid on the members of the Nipissing First Nation under the federal *Fisheries Act* and their subsequent sentences under the Ontario Fisheries Regulations (Quicklaw, 2012). The defendants of this case were not concerned with whether the MNRF could restrict Indigenous treaty rights regarding harvesting fish for sustainable management. Instead, the appeal was pertaining to whether the restrictions enforced by the MNRF were reasonable and if provincial licencing was needed for commercial fishing by Indigenous users. It was also argued that the Indigenous treaty rights for fishing that are outlined in sections 35 and 50 of the *Constitution Act* (1982) were unfairly weighed by the judge during the initial trial. For example, the Provincial Court Judge did not take the time to consider, or validate, the defendant's inherent right to have primary access to the resources in the Lake Nipissing fishery (R.v.Commanda, 1990). After considering these arguments and the treaty rights of Indigenous persons, the Ontario Court of Appeal in the Nipissing District quashed the convictions placed on the Nipissing First Nation members. This decision now obliges the legislative authorities to recognize and uphold, the collective inherent and treaty rights of First Nations to fish for food, cultural, and commercial purposes (Martino, 2016). The Nipissing First Nation members now operate commercial fisheries for walleye, whitefish, and northern pike

(Ontario Ministry of Natural Resources, 2014). As of 2014, it was estimated by Chief Marianna Couchie that there were six crews of between two and four gill netters, which are active commercial fishers, (Young G. , 2014).

In addition to the Indigenous users, the lake also supported recreational fishing activities for all users since the early 1900s (Ontario Ministry of Natural Resources and Forestry, 2014). The recreational fishing in Lake Nipissing provides the North Bay community with significant economic and social revenues through the promotion of a strong tourist industry. For instance, the local recreational fishing and tourism industry for Lake Nipissing generates approximately $69 to $125 million annually for the region (Ontario Ministry of Natural Resources and Forestry, 2014). Lake Nipissing has been recognized as the seventh most fished lake in Ontario as it accounted for 5 per cent of the total fishing activities in the province in 2010 (Taulu, 2017). Thus, the Lake Nipissing fishery is an important economic and social generator for the region and for local communities as it is a relatively large lake that supports a great deal of fishing activities.

5.1. Geographic Setting:

At 87,325 hectares, Lake Nipissing is the third largest inland lake that is entirely within the province of Ontario (Ontario Ministry of Natural Resources and Forestry, 2014). The lake extends 65 kilometres in an east-west direction and drains southwest into Georgian Bay through the French River as it cuts through the Precambrian shield (Leatherdale, 1978). Lake Nipissing is also surrounded by a population of approximately 75000, which includes the larger municipalities of North Bay, West Nipissing, Callander, Dokis First Nation, and Nipissing First Nation (Ontario Ministry of Natural Resources and Forestry, 2014). Lake Nipissing is located on the traditional territory of the Anishinaabe of Ojibway and Algonquin descent, which is a

part of the Three Fires of Confederacy (Corbiere, 2013). The two Indigenous communities located along Lake Nipissing are the Nipissing First Nation on the north shore and the Dokis First Nation in the south (Government of Ontario, 2019). Despite its size, early Indigenous communities often referred to Lake Nipissing as *N'bisiing*, or little water, as they compared it to the size of the Great Lakes (Taulu, 2017).

Lake Nipissing and North Bay are in one of Ontario's 20 Fisheries Management Zones (FMZs). Geographically demarcating Ontario's fisheries into FMZs helps the provincial government to manage the individual needs and nature of the fisheries in different areas. Each zone has their own customized catch limits and seasons as an effort to allow more fishing in thriving fisheries, protect vulnerable fisheries, re-establish fish populations, and adjust fishing seasons for different climates (Government of Ontario, 2019). Located in northeast Ontario, Fisheries Management Zone 11 (FMZ 11) is the smallest area of the northern Ontario FMZs (Figure 3). Zones that are comprised of important lakes and rivers may require more careful management, which are referred to as provincially significant inland fisheries. Correspondingly, Lake Nipissing has been classified as a Specially Designated Water (SDW) within FMZ11, as it is an important water body to the broader region or province (Ontario Ministry of Natural Resources and Forestry, 2014)Waterbodies that are categorized as Specially Designated Waters often have their own unique challenges for sustainably managing the fisheries that need further monitoring and planning compared to the broader FMZ.

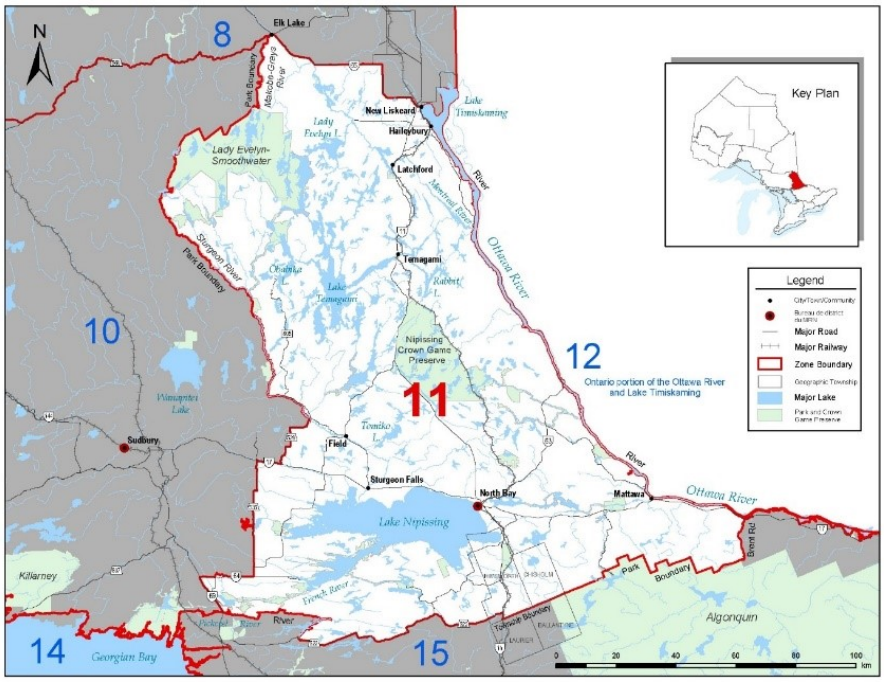

Figure 3. Location and Boundary Map for Fisheries Management Zone 11 (Government of Ontario, Lake Nipissing Management Plan Fact Sheet, 2019)

5.2. Institutional Setting:

Fisheries management in Ontario falls under the federal jurisdiction of Fisheries and Oceans Canada and the provincial jurisdiction of the MNRF. Section 91 of the *Constitution Act* (1867) outlines the legislative authority of the federal government for the conservation and protection of Sea Coast and Inland Fisheries (Environment and Climate Change Canada, 2013). However, the federal jurisdiction over beds of freshwater rivers and lakes are limited as it does not provide this level of government any authority regarding property and civil rights (n.d., Fisheries and Oceans Canada). Additionally, the federal legislation that covers fisheries management also falls under the *Fisheries Act* and the *Species at Risk Act*, while the provincial legislation is the *Fish and Wildlife Conservation Act* and the *Endangered Species Act* (Ontario Ministry of Natural Resources and Forestry, 2014). The MNRF also has authority for fisheries

management through other provincial statutes that were established to protect and perpetuate the province's fish stocks. These statutes are the *Natural Resources Act* (1990), *Crown Forest Sustainability Act* (2019)*, Public Lands Act* (2017)*, Lakes and Rivers Improvement Act* (2019), and the *Environmental Assessment Act* (2010). The MNRF is the leading governing body for fisheries management in Ontario as is it responsible for policy, planning, and program development; the allocation of sport, commercial, tourist and baitfish fisheries through regulation and licensing; fish culture and stocking programs; species at risk and invasive species management (Government of Ontario, 2019). However, it should be noted that the MNRF and any other Ontario Ministries are required to obey all federal legislation that protects fish and fish habitat through integrated resources management and planning projects.

As previously mentioned, Ontario is divided into 20 FMZs as an effort to appropriately monitor and manage every fishery in the province. Monitoring the province's fisheries through FMZs helps fisheries managers make informed decisions, report on the state of fisheries, and measure any progress toward planning goals (Government of Ontario, 2019). For example, monitoring could be used to estimate the overall status, trends, and changes in specific fish stocks and habitats in a fishery. Every five years, the broad-scale monitoring approach is conducted to report on the condition of Ontario's fisheries and help officials make adequate management decisions. This is to show the overall state of Ontario's FMZs to see how their performance is doing in a broader context.

Significant inland fisheries, like Lake Nipissing, require intensive monitoring strategies rather than most commonly used broad-scale monitoring methods. Lake Nipissing is monitored and managed on an individual lake basis due to its significance as a Specially Designated Waterbody. Intensive monitoring is often used on large lakes with high levels of fishing pressure

to investigate the waterbodies in greater detail and over longer periods of time along with supporting and interpreting the results of broad-scale monitoring (Government of Ontario, 2019). Lake Nipissing has four different monitoring activities that were tailored and established to assess the fishery's condition. These monitoring programs are the annual Fall Walleye Index Netting (FWIN) surveys, annual creel surveys, annual Walleye spawning assessments at major spawning sites, and other annual supplemental research initiatives (Ontario Ministry of Natural Resources and Forestry, 2014).

Coupled with these intensive monitoring strategies, Lake Nipissing also has its own management plan that is intended to address any issues that the fisheries might be experiencing. In 2014, the Lake Nipissing Fisheries Management Plan was developed by the MNRF and will be in effect for 20 years (Ontario Ministry of Natural Resources and Forestry, 2014). The MNRF developed this management plan based on the input provided by Lake Nipissing Fisheries Management Plan Advisory Council (LNFMPAC), First Nations, and the broader public through consultation and deliberation meetings. A review assessing the progress of this management plan against its agreed upon goals will also occur once every five years. This fisheries management plan is only applicable to the recreational fishery, however, collaboration with the Indigenous commercial fisheries will be encouraged when the fisheries overlap (Boudreau & Fanning, Fisheries Management and Decision Making in Canada's Inland Waterways of Ontario (Marine Affairs Program Technical Report #13), 2016). This fisheries management plan was created as a broader approach that emphasizes the significance of all components of the fishery and managing them effectively, rather than just focusing on an individual species that may be at risk. The core principle for this strategy is to recognize that diversity is crucial for adequate ecosystem function and resilience. By addressing the

sustainability of the fish stocks and overall condition of the lake, this plan will hopefully promote the diverse fishing opportunities of Lake Nipissing (Government of Ontario, 2019). One of the strategies from this management plan that has been implemented to achieve these objectives deals with adjusting fishing restrictions. For example, enforcing new fishing regulations for other species, such as the yellow perch, has been adopted in hopes of encouraging the recovery of the walleye stocks in Lake Nipissing. The limits for catch and possession of yellow perch in Lake Nipissing have been increased as of January 1, 2014 (Government of Ontario, 2019). This new fishing regulation was accepted as it should improve the fishing opportunities on the lake, while also helping the young walleye to survive their spawning age.

The monitoring and management strategies from the Lake Nipissing Fisheries Management Plan have been developed by the MNRF with the input and advice from the LNFMPAC and the broader public. This advisory council encourages a collaborative approach amongst the MNRF and the community when developing strategies to maintain the fish stocks in Lake Nipissing. With this in mind, the LNFMPAC is comprised of 10 to 15 volunteers that represent various stakeholder groups, advisors and representatives from other governmental agencies that are all interested with sustainably managing the Lake Nipissing fisheries (Ontario Ministry of Natural Resources and Forestry, 2014). The representatives of this advisory committee range from local Indigenous community members from the Dokis First Nation and Nipissing First Nation to stakeholders like the North Bay Hunters and Anglers. The advisory council's key participation with fisheries management consists of sharing ideas and expertise with the MNRF, helping the development and implementation of management approaches, along with maintaining communication with the local and fishing community members (Government of Ontario, 2019).

As previously stated, regulations pertaining to the monitoring and management of the commercial fisheries in Lake Nipissing must recognize the Nipissing First Nations constitutional rights that were outlined in *R.v. Commanda* (1990). In hopes of establishing sustainable harvest levels, reporting and net marking, the MNRF created an Aboriginal Communal Fishing Licence that was to be used by Indigenous commercial fishers of Lake Nipissing (DeMille & Quinney, 2012). Unfortunately, this initiative was unsuccessful as the Nipissing First Nation members ended up rejecting the idea. The Nipissing First Nation did not accept or negotiate an Aboriginal Communal Fishing Licence as the band wanted to continue managing its commercial gillnet fishery independently.

Instances like this have resulted in the Nipissing First Nation to be politically recognized as a leader for their resistance and refusal of Crown assertions of sovereignty over the Nipissing region (Anishinabek News, 2016). Correspondingly, the Nipissing First Nation developed their own Fisheries Law and Regulations s in 2005. These community-determined laws were implemented through hiring a former MNRF biologist, opening a fish processing plant, marketing facility, and certification standards, and developed an adaptive fisheries management program, compliance initiatives, and a restorative justice process (Casey , 2009). These laws also required Nipissing First Nation fishers to adjust their harvest levels according to previously recorded harvest levels (DeMille & Quinney, 2012).

For example, these Fisheries Laws were amended by the Nipissing First Nation in 2015 in response to the declining fish populations and the shortened fishing seasons (McLeod, 2015). These new regulations were extended into the spring moratorium on gillnetting, the introduction of a temporary moratorium on the cultural practice of spear fishing, reduced number of permitted gillnets from five panels to three, and increased minimum gillnet mesh size from 3.5 inches to

3.75 inches (Nipissing First Nation, 2019). The Chief and Council are also required to reassess the set regulations and limits annually based on collected harvest data to promote sustainable harvest levels in the commercial fishery. This includes determining if closing the commercial fishery early is necessary, which was the case in August 2015, 2016, and 2017 and in September 2018 (Nipissing First Nation, 2019).

There is, however, a third-party not-for-profit organization called the Anishinabek/Ontario Fisheries Resource Centre (A/OFRC) that conducts research and provides critical data on the Lake Nipissing fishery. The Anishinabek Nation represents 40 First Nations throughout the province of Ontario, with its head office situated in Nipissing First Nation (Anishnabek Nation, n.d.). Some of the program and services that the Anishinabek Nation provides for Indigenous communities are policy and communications, lands and resources, and economic development. As the fisheries in Ontario began to experience stressors and declining fish stocks, the Anishinabek Nation collaborated with non-Indigenous community members to develop the Anishinabek/Ontario Fisheries Resource Centre (A/OFRC) in 1995. The A/OFRC is a collaborative organization as it is run by a board with equal representation from Indigenous and non-Indigenous Directors. The Ontario Minister of Natural Resources and the Grand Chief of the Anishinabek Nation must collectively approve the four directors and the chairperson for the A/OFRC (Anishinabek/Ontario Fisheries Resource Centre, n.d.). This resource centre was established to serve as an independent data source of information on fisheries assessment, conservation and management, and promoting the value of both western science and traditional ecological knowledge (Anishinabek/Ontario Fisheries Resource Centre, n.d.). The data collected is used to report on stock status, evaluate stresses on fish populations and habitats, offer management recommendations, and facilitate information sharing and participation amongst

stakeholders to encourage sustainable fisheries and resolve conflict (Anishinabek/Ontario Fisheries Resource Centre, n.d.).

Unfortunately, the work that is conducted by the A/OFRC, in partnership with helping Indigenous members, to protect wildlife and resources is going to be severely hampered by the recently disclosed funding cuts by the provincial government of Ontario. The A/OFRC is facing a 70 per cent budget cut in the second year of a three-year agreement (Frangione, 2019). Initially promised funding of $860000 for the agreed upon timeframe has been slashed to $ 250000, with no funding commitments for the following year (Allen, 2019). Such a severe budget cut like this will significantly threaten the centre's capacity to provide support, training, and technology through their research programs. Future projects will also have to be considered on a case to case basis as there is simply not enough funding to carry out all proposed initiatives. The general manager of A/OFRC, Peter Meisenheimer, noted other projects that are already implemented, including the projects on Manitoulin Island, will also be hindered (Sasvari, 2019). This budget cut has also affected the office staff as the A/OFRC initially had 12 employees on hand, but are now down to four employees (Sasvari, 2019). All hiring for future permanent positions has also been suspended for the remaining years of the MNRF funding agreement with the A/OFRC. With this in mind, the A/OFRC will be running on a reduced basis for the period of 2019 and 2020 due to the organization having to focus on implementing planning based changes in accordance with its new funding restrictions (Frangione, 2019).

5.3. Trends in the Fishery:

As previously mentioned, Lake Nipissing is a valuable natural resource as it offers a wide variety of fishing opportunities since its ecosystem supports a diverse fish community. The dominant, and most sought after, species of this lake are walleye, yellow perch, northern pike,

and white sucker (Ontario Ministry of Natural Resources and Forestry, 2014). Other significant species that have been documented in Lake Nipissing are smallmouth bass, largemouth bass, and lake sturgeon (Ontario Ministry of Natural Resources and Forestry, 2014). Even though Lake Nipissing has over 40 different types of species, walleye has been consistently the most favourable fish to be harvested by both recreational and commercial users. In fact, more than 70 per cent of recreational fishing efforts and approximately 90 per cent of commercial fishing efforts that occur every year in Lake Nipissing fisheries specifically target walleye (Ontario Ministry of Natural Resources and Forestry, 2014). It has been estimated that the lake has had harvest levels at, or even above, 100,000 kg of walleye annually (Ontario Ministry of Natural Resources and Forestry, 2014). Lake Nipissing is considered to be outstandingly productive in regards of ideal habitat for walleye (Casey , 2009), however, severe fishing pressure posed on the species has threatened its population health (Latulippe, 2017).

Despite efforts for implementing and maintaining monitoring strategies by fisheries managers, the walleye fish stocks have been steadily decreasing since the 1980s (Smith, 2017). Over the past five decades, the decline in the number of adult walleye, (five years or older), ranged from 30 per cent to 55 per cent (Government of Ontario, 2019). It has also been found that overfishing of walleye has left the species population in a vulnerable state as it is now too low to support previously established harvest levels (Government of Ontario, 2019). Since the 1990s, close monitoring strategies adopted to help stabilize and restore the walleye population consisted of increasing the restrictions imposed onto recreational fishers such as shorter seasons, lower limits, and a protected slot size. Other management plans, like the Lake Nipissing Fisheries Management Plan of 2014, have also been implemented to prevent further overexploitation of walleye.

Unfortunately, recent reviews continue to express concerns about overfishing and misuse on Lake Nipissing (Morgan, 2013; Jones *et al*., 2016). Even after the adoption of stricter regulations and heavier enforcement, illegal gill nets are still being found in Lake Nipissing (Hunt, 2014). Instances like this continue to diminish the availability of natural resources as the nets kill large quantities of fish if abandoned. For example, during the year of 2014, the MNRF had found their fifth unmarked gill net that had dead fish within it by July 11 (Canadian Broadcasting Corporation, 2014). These nets were properly set up, yet were left unattended for approximately three to ten days, collecting fish for their inevitable death. The MNRF could not identify the owners of these nets as there were no markings on them stating otherwise. In cases like this, all of the fish that is rotting in the gill net must be disposed of since it is unsuitable for human consumption (Canadian Broadcasting Corporation, 2017). Thus, not only are the fish stocks in Lake Nipissing are experiencing stress from recreational, sport and commercial fishing, but also the illegal use of mass fishing products like gill nets.

5.4. Perspectives on Current State of Lake Nipissing Fishery:

A decrease of fish stocks and concerns regarding the allocation of such resources often results in disputes over current management practices, how they are applied, and treaty obligations. Lake Nipissing has been encountering increasing conflict amongst fishers due to decreasing walleye populations, mutual mistrust between Indigenous and non-Indigenous fishers, and varying treaty interpretations that lead to the uneven application of management measures. In other words, Indigenous fishers often blame over-fishing on tourists, while business relying on the Lake Nipissing fishery blames the Indigenous commercial fishery (White E. , The Many Perspectives of the Lake Nipissing Prickerel Dispute, 2017). Even though climate and other environmental stressors continue to severely impact on aquatic ecosystems and fish populations,

overharvesting has been identified as the main cause for the decline of walleye stocks in Lake Nipissing (Smith, 2017).The tensions related to the current state of the Lake Nipissing fishery is starting to become apparent to local community members and governing officials as it has been covered by several news broadcasters. A review of local news articles has revealed the undeniable animosity that has been festering between Indigenous and non-Indigenous fishers when discussing the factors that may be affecting the drop of walleye in Lake Nipissing (White, 2017; Hamilton-McCharles, 2017; Dale, 2012; Montgomery, 2017). For instance, the recent discovery that gill nets are being used illegally, and abandoned, has provoked a debate on who is to blame for the decrease of fish stocks in Lake Nipissing.

Since gill nets are primarily used for commercial purposes, non-Indigenous community members have been placing blame on Indigenous fishers. For example, local Indigenous commercial fishers have been frequently receiving severe backlash at their place of business from non-Indigenous community members (Young, 2017). As tensions regarding the state of Lake Nipissing's resources are rising, commercial fishers are experiencing more conflict with others when trying to sell their harvested fish. Local commercial fisher from Nipissing First Nation, Stevens, has continuously experienced non-Indigenous persons go to his place of business just to accuse him of destroying the fish supply in Lake Nipissing (Young, 2017).

The tensions related to Indigenous fishers were also so bad at one point that it provoked outright racism by a non-Indigenous community member. An operator of an ice hut rental company, Marc David Hyndman, posted an ad that refused to provide his services to any status cardholders (Canadian Broadcasting Corporation, 2017). This racist ad was prompted by the ice hut operator blaming the Nipissing First Nation for the decline of the walleye population and the provincial government for denying his operator's licence. Instances like this are not uncommon

in the area as other local community members are aware that Marc David Hyman is not the only person that share similar feelings regarding the Lake Nipissing fishery (Hamilton-McCharles J. , 2017). As an effort to move forward as a community and focus on the issue at hand for the fishery, Nipissing First Nation Chief Scott McLeod has accepted the apology that was later offered by the ice hut operator.

Tensions regarding the current state of the Lake Nipissing fishery has also carried over to negative interactions between the government on local Indigenous fishers. Confrontations with governing bodies and Indigenous fishers regarding the Lake Nipissing fishery are frequently tied to interpretations of their inherent treaty rights. Commercial fishers in Lake Nipissing have been feeling harassed by local authorities as interactions with the MNRF often result in the confiscation of their nets and harvested fish (Young, 2017). These situations also typically escalate by the enforcement officers with threats to lay charges for disobeying the fishing laws and regulations set out for the Lake Nipissing fishery. As previously mentioned, the Nipissing First Nation and the Dokis First Nation members rely on Lake Nipissing's supply of fish stocks for commercial, subsistence and cultural uses. With this in mind, these Indigenous members would not take any infringements of their inherent rights regarding harvesting fish from Lake Nipissing lightly.

This was evident during a interaction that occurred in 2016 between officers with the MNRF and Nipissing First Nation fishers using gillnets. The situation quickly became confrontational as the officers were trying to confiscate the commercial fisher's nets and the fish that they had caught that day (Turl, 2016). These fishers did not surrender their catch and nets as it would interfere with their Indigenous treaty rights and their way of life. Upon refusing to give up the fish caught the Indigenous fishers offered to meet with the officers at their community

dock to discuss the issue further. However, the enforcement personnel did not take up the offer by the Indigenous fishers to mend this issue by further discussing what occurred during the interaction. This confrontation also highlights another issue surrounding tensions within the Lake Nipissing fishery as it occurred ten days after the gill net fishing was officially closed for the season (Turl, 2016). Instances like this show how not all band members of Nipissing First Nation and Dokis First Nation agree with all of the fishing regulations for the Lake Nipissing fishery that they must adhere to.

Disputes within the Indigenous community have also been emerging as band members refuse to abide by their own agreed-upon regulations. Recent concerns have been raised by multiple band members from Nipissing Indigenous communities regarding the new regulations established by the provincial Memorandum of Understanding. This agreement was first developed and signed by Nipissing First Nation and the MNRF in 2016 as an effort to address the decline of Lake Nipissing's walleye stocks (Canadian Government News, 2018). It is the first agreement in Ontario that has the provincial government recognizing the Nipissing First Nation's Chi-Naaknigewin Constitution and Fisheries Law (Nipissing First Nation, 2019). The Memorandum of Understanding was essentially created to strengthen the relationship between the Nipissing First Nation and MNRF. This will be done through sharing their data and resources about the harvests and fish stocks, sharing resources and costs for fisheries assessments, provide training on fisheries management, and provide direct assistance with enforcement of Nipissing First Nation fishing laws (Almaguin News, 2016).

However, local Indigenous band members have been expressing their apprehensions regarding the agreement's more stringent regulations and enforcement protocols for the commercial fishery in Lake Nipissing. Some Indigenous fishers disapprove of the joint

enforcement arrangement between the MNRF and Nipissing First Nation natural resource representatives as it was an unwelcomed move of "higher levels of government control" (Turl, 2016). These members do not support the fact that Indigenous fishers can be charged by the MNRF if they are caught disobeying the fishing regulations set out by their chief and council (White E. , 2017). Indigenous fishers that are charged by the MNRF for not adhering to the Nipissing First Nation fishing laws have been subsequently filing lawsuits. These cases are essentially arguing that the Indigenous fishers were improperly charged under the Memorandum of Understanding. Correspondingly, the plaintiffs believe that the First Nations governments have no authority over their own people (White, 2017; Tabachnick, 2018). They are also challenging the validity of the member's fishing rights that are outlined in the 1850 Robinson-Huron Treaty. The plaintiffs argue that the treaty is invalid as it was initially signed by leaders appointed by the colonial authorities, making the traditional collective decision-making process broken (White E. , 2017). Thus, the plaintiffs insist that their people have never actually surrendered any territory under the treaty. In turn, the fishers argue that they are not subject to its terms and hence any charges laid against them for harvesting fish from Lake Nipissing are infringing their inherent rights (Tabachnick, 2018).

It should be noted though, that the Memorandum of Understanding has also been found to promote effective fishery management activities through its financial and technical support (Nipissing First Nation, 2019). This initiative is thought to improve the walleye stocks in Lake Nipissing, even though it is still in recovery, by setting sustainable harvest maximums (Ministry of Natural Resources and Forestry, 2019). By also maintaining their commitment to compliance and enforcement through the Memorandum of Understanding, the MNRF and Nipissing First Nation has also been receiving positive assessments. For example, Nipissing First Nation and

MNRF are recipients of the Gold Deloitte Public Sector Leadership Award for their collaboration and shared resource stewardship efforts on Lake Nipissing in 2018 (Deloitte, 2018). It has also been recognized as "an historic first", "a new approach", and "a trailblazing activity" as it ensured the capacity support for Nipissing First Nation to establish its Fisheries Laws and Regulations (Learn, 2016; Nipissing First Nation, 2016; Hamilton-McCharles, 2015).

5.5. Literature on Lake Nipissing Relations

As tensions amongst Indigenous and non-Indigenous users of the Lake Nipissing fishery continue to worsen, scholars have also been gaining interest in further understanding the dynamics of these relations. Research initiatives, such as Fish-WIKS, are now focusing on how to improve the overall sustainability of Canadian fisheries through utilizing both Western and Indigenous knowledge on local natural resources (Fish-WIKS, 2006). As a PhD student for the Inland regions of this national research partnership, Latulippe (2017) has conducted a study on the knowledge, governance, and human-fish relations of the Nipissing First Nation in the Lake Nipissing fishery. The main research objective of her study is to analyze the different relationships between key actors for the Lake Nipissing fishery including knowledge holders, fishers, and policy makers (Latulippe, 2017). Latulippe was also able to thoroughly examine the current management framework of the fishery, and identifying areas that require improvements, by exploring the relations stemming from the ongoing issues related to the preservation of fish stocks in Lake Nipissing. Enhancing the inclusion of Nipissing First Nation's treaty, and inherent rights, pertaining to their commercial and conventional fisheries in current management practices for Lake Nipissing could help mend conflicts regarding the allocation of its resources (Latulippe, 2017).

The current state of the Lake Nipissing fishery could easily be defined by the persisting tensions between Indigenous and non-Indigenous users. Notably, this could be a feature of co-management as different stakeholders and Indigenous users try to find a common ground when trying to reach an agreement during decision making processes. Correspondingly, Latulippe (2017) recognizes that conflict has been an ongoing issue as Lake Nipissing fishers are divided by ethnicity, social class, geography, and purpose. As stated earlier, Lake Nipissing has been encountering increasing conflict amongst fishers due to decreasing walleye populations, mutual mistrust between Indigenous and non-Indigenous anglers, and varying treaty interpretations that lead to the uneven application of management measures. Accusations regarding over-harvesting of fish stocks amongst fishers will continue, and is often coupled with, colonial ideologies that blame Indigenous persons for the depletion of natural resources (Lawrence, 2000). Latulippe (2017) thus concluded that conflicts regarding the allocation of fish stocks will inevitably occur between Indigenous fishers and the Crown. Tensions amongst fishers will continue festering as long as the Crown continues to claim jurisdiction over lands and natural resources that Indigenous persons are dependent on. This has been found to be correlated to the Crown maintaining historic settler-colonialism ideologies that often results in the rationalization of racist ideologies by non-Indigenous persons (Latulippe, 2017). Latulippe (2017) suggests that implementing a governance structure like Nipissing law could be a viable solution; however, Latulippe (2017) argues that the current relations amongst Indigenous fishers, non-Indigenous fishers, and the government is evidently ill-prepared for this.

5.6. Measurement of Success:

The analysis of Lake Nipissing's institutional setting for its fishery has revealed that there are steady efforts made by governing officials and community members for achieving

sustainable management. Lake Nipissing's institutional setting for its fishery is in the middle of fully centralised government management, and completely bottom-up self-management by the community. The responsibility for monitoring and managing the Lake Nipissing fishery is shared equally amongst the provincial government of Ontario and local Indigenous community members. For example, Fisheries management in Ontario falls under the federal jurisdiction of Fisheries and Oceans Canada and the provincial jurisdiction of the MNRF. Even though the MNRF has the authority to manage the Lake Nipissing fishery, other initiatives that work alongside local Indigenous Nations. For example, the Lake Nipissing Management Plan was developed by the MNRF in 2014 and is still being carried out in collaboration with local Indigenous community members and various stakeholders. The Nipissing First Nation also established their own fishing laws in 2005 that regulates the commercial fisheries. A Memorandum of understanding was also created in 2016 that allows the MNRF to enforce the laws that are set out by their chief and council. All these initiatives demonstrate the balance of monitoring, enforcement, and management of the Lake Nipissing fishery between the MNRF and the Nipissing First Nation.

Even though there are continuous efforts to strengthen relationships being made by the provincial government of Ontario and local Indigenous community members, tension within the Lake Nipissing fishery remains. Blame for the decrease in walleye populations for Lake Nipissing is being continuously tossed between non-Indigenous fishers, Indigenous commercial fishers, and governing bodies. Conflict amongst fishers has been an issue in the Lake Nipissing fishery due to mutual mistrust between Indigenous and non-Indigenous fishers, and varying treaty interpretations that lead to the uneven application of management measures. For instance, the discovery of abandoned gill nets throughout Lake Nipissing has left Indigenous fishers

receiving critical backlash by non-Indigenous fishers. Confrontations between Indigenous fishers and governing officials that are enforcing fishing laws have also been occurring within the Lake Nipissing fishery. Instances like this have also resulted in Indigenous fishers challenging the fishing laws mandated by their chief and council. Lawsuits challenging these regulations have been consequently filed by Indigenous members who have previously been charged by the MNRF under the Nipissing First Nation fishing laws. However, it should be noted that the resistance regarding the fishery management for Lake Nipissing represents the minority of community members.

With this in mind, there is a community buy in by the majority and only some resistance by the minority of community members. This overall support to work towards restoring the walleye fish stocks in Lake Nipissing is demonstrated through the general acceptance of the implementation and maintenance of the Memorandum of Understanding (2014). As previously mentioned, this agreement allowed the MNRF and the Nipissing First Nation to work alongside each other when enforcing fishing laws and regulations. Community members and governing officials are generally pleased with the collaboration efforts that is encourage through this agreement. This notion may be supported through the MNRF receiving the Gold award in 2018 (Nipissing First Nation, 2019). There is also an indirect acceptance from local Indigenous community members through the election of Nipissing First Nation's chief. Scott McLeod won the election for Chief of the Nipissing First Nation in 2015 and was later re-elected by community members for a second term in 2018 (Bay Today Staff, 2018). The election of this Chief is important as it illustrates the general acceptance by band members for the current management practices for Lake Nipissing. Chief McLeod often sides with the crown when it comes to managing the fishery as he is an advocate for collaboration between the MNRF and

Nipissing First Nation members. This is evident as he also supported the Memorandum of Understanding as it encouraged the Nipissing First Nation members working closely with the MNRF when enforcing fishing laws and regulations. Taking all of these factors into consideration, perspectives on the current state of Lake Nipissing's fishery would be plotted just below the middle of the vertical axis, where there is minimal resistance and conflict amongst community members.

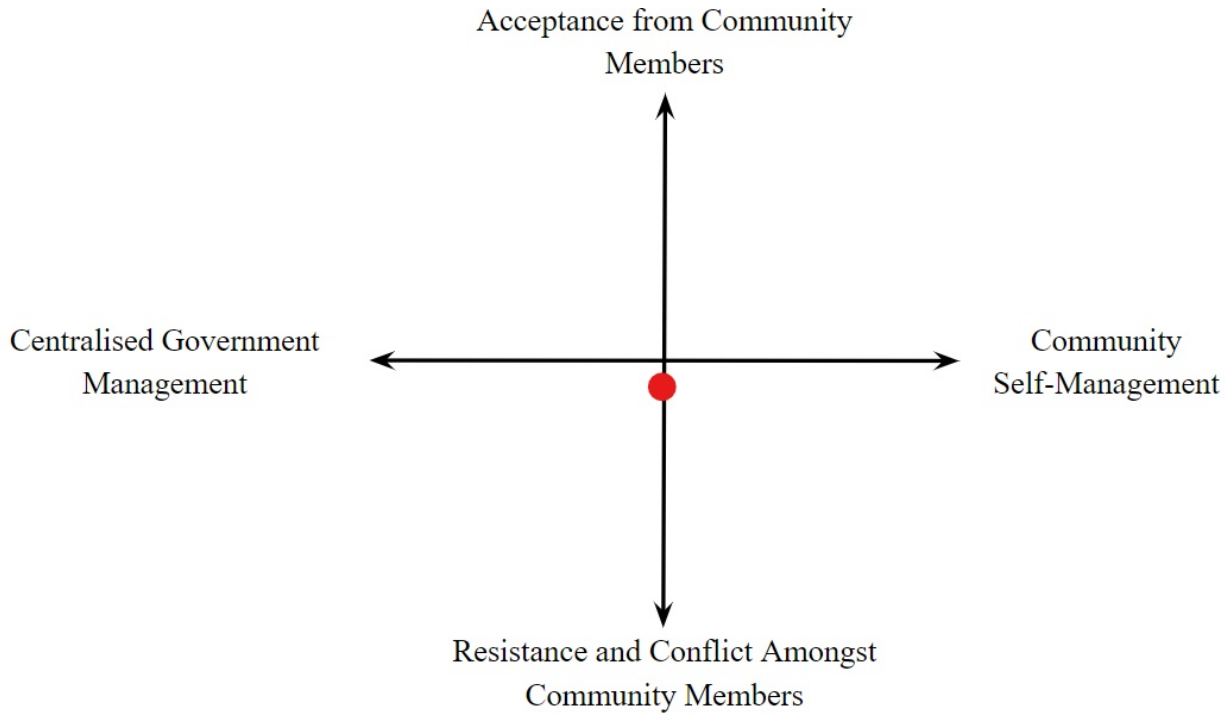

Figure 4. Measurement of success for Lake Nipissing fishery, plotted on conceptual model

6. Conclusion

The implementation of all the co-management agreements explored in this paper originated from previous treaties or land claim settlements regarding the use of natural resources for the Indigenous communities in the surrounding area of the fisheries. As a result, the co-

management frameworks include essential components regarding inherent Indigenous rights for land use and natural resources that could have been overlooked before. This has been done to provide the government with an outlying foundation for new agreements that amended previous ones. Changes in these arrangements often included more representation of local Indigenous Nations to encourage future collaboration between Indigenous and non-Indigenous fishers. Consultation with Indigenous community members or their appointed representatives in the co-managed fisheries was also prioritized. Maintaining contact with local Indigenous fishers was done to mend relations between them and the government. Once the trust is built, communication between these parties will grow, and insightful knowledge on local natural resources will then be exchanged. According to the examples explored, consulting is often directed towards a committee of band representatives, along with other local resource users, government officials, stakeholders, and external agents. Within these advisory councils, adequate advice and information regarding the sustainable management of local fisheries is provided to the government; which is essential for an effective co-management strategy.

Even though there are different initiatives focused on strengthening the relationships between fishers and sustainable management of natural resources, the Lake Nipissing fishery has a long road ahead of it to reach such objectives. The analysis has confirmed that disputes are increasing between users regarding current management practices, how they are applied, and treaty obligations. Tension seems to be lingering, and persisting, amongst fishers due to the decreasing walleye populations, mutual mistrust between Indigenous and non-Indigenous fishers, and varying treaty interpretations that are resulting in the uneven application of management measures. It is evident that the current state of the Lake Nipissing fishery and the conflict between fishers is a complex, and most importantly, a sensitive issue. The conflicts that have

been occurring throughout Lake Nipissing also seem to be predominantly directed towards the Indigenous commercial fishery. Considering these factors, future initiatives should be geared towards further mending the relationships between Indigenous fishers, non-Indigenous fishers, Indigenous Nations leadership, and the government. Strengthening the relationships amongst Lake Nipissing users will obviously not occur overnight, however, achieving some level of neutrality must be a priority. Current management practices for the Lake Nipissing fishery ensures a co-management framework, however, there is limited data publicly available to determine how well this data sharing and adaptation is occurring in this practice.

As previously explained, co-management requires a partnership agreement amongst the community of local resource users, government officials, other stakeholders, and external agents to share the responsibility and authority for the management of a fishery (Pomeroy, Rivera-Guieb, & C.A.B. International, 2006).Currently, the LNFMPAC key participation with fisheries management for Lake Nipissing consists of sharing ideas and expertise with the MNRF, helping the development and implementation of management approaches, along with maintaining communication with the local and fishing community members (Government of Ontario, 2019). According to the Lake Nipissing Fisheries Management Plan, the maintenance of consultation from the broader public only occurs at the initial stages of the decision-making process. Inviting the broader public to review the management plan and provide feedback is a key component for an effective co-management framework. In fact, Hoggarth *et al*. (1990) found that people would be more inclined to obey fishing regulations if they were involved throughout the entire process. Pinkerton (1994) agrees with this statement, as collaboration with local fishers in co-management arrangements have often encouraged effective conflict resolution. Thus,

maintaining communication with the broader public throughout the 20-year term for the Lake Nipissing Fisheries Management Plan would also be quite beneficial.

Similar to the North Bay committee and council meetings that occur on a bi-weekly basis, I suggest that information and consultation sessions regarding the Lake Nipissing fishery should be hosted on a regular basis as well. The North Bay committee and council meetings are held at the local City Hall and are open to the broader public. These meetings are also videotaped and may be accessed online, either during livestream or later on the city's YouTube channel, by the public through the City of North Bay website. Committee and council meetings also allows community members to speak to any item or topic within the jurisdiction and mandate of council during the allotted time for open forum (City of North Bay, n.d.). Topics regarding significant changes to the regions, such as industrial developments and local environmental protection would be discussed during these meetings. For instance, multiple committee and council meetings were held publicly to deliberate on whether there should be further wetland development on the south end of North Bay. Local community members expressed their concerns pertaining to the plan to build a new casino in an area where Blanding's turtles are believed to primarily inhabit (White, 2019).

If local committee and council meetings can discuss matters that are sensitive issues in a civil manner, then it could also be a suitable setting to discuss sustainably managing the Lake Nipissing fishery. Shedding light on this issue by providing credible information and encouraging communication amongst community members might just be a step in the right direction for the fishery. Maintaining contact with community members and considering their input on the ongoing issue at hand would strengthen the co-management plan that is in place for the Lake Nipissing fishery. Given that this topic has been the root cause of countless disputes, it

is not expected that these gathering would always proceed with sole neutrality from community members. With this in mind, mediation would be a useful tool that could be utilized to promote effective, courteous discussion. Mediation is a form of dispute resolution for two or more interacting parties that is conducted by third parties who do not impose an outcome (Wall, Stark, & Standifer, 2001). Meditation is not only one of the oldest forms of conflict resolution, but it is also used internationally. This tool has been applied and studies in international relations (Bercovitch, 1996), labor-management negotiations (Mumpower & Rohrbaugh, 1996), community disputes (Pruitt *et al*., 1993), and legal disputes (Riskin, 1996). Meditation has been found to be an effective tool as a 2009 study into Mediation in Victoria, Australia found that 80 per cent of individuals felt satisfied with the mediation process and how it was handled (Hollier & Hart, 2009).

Maintaining contact with the community to receive constructive feedback and concerns that may have recently arose amongst its members could be beneficial for the government. For instance, a research initiative was prompted in Nunavut by local fishers voicing their concerns about declining run rates of the Arctic Char along the Coppermine River. These community members wanted to understand what might be causing the steady decline of the Arctic Char fish stocks and how to alleviate the issue (Geddes, 2018). In response, a researcher from the University of Waterloo will work with the Kugluktuk Hunter and Trappers Organization to analyze the migratory patterns and overwintering habits of Arctic Char (Geddes, 2018). This research initiative was also granted $1.2 million as it is focused on restoring the fish stocks in the Coppermine River and other river systems surrounding Kugluktuk. The funding was provided from the federal government's $75 million Coastal Restoration Fund, which is a part of the $1.5 billion Ocean Protections Plan (Quinn, 2018). If the government did not listen to the concerns

raised by local fishers and community members regarding the declining run rates of the Arctic Char, then the issue could have persisted and subsequently worsened over time. The funding from the federal government could have also been allocated to other projects for less pressing issues.

Along with improving the efforts for consulting and communicating with the local Indigenous and non-Indigenous community members, the government should also continue endorsing additional projects. These initiatives could be focused on enhancing the research, monitoring, or management strategies that are geared towards restoring the Lake Nipissing fishery. As previously stated, the current advisory council for the Lake Nipissing Fisheries Management Plan is only primarily consulted during the project's initial implantation stages. In turn, it could be quite beneficial to have more involvement between the advisory council and the government for restoring the Lake Nipissing fishery. Maintaining effective consultation and communication between the government and a co-managed advisory council is best demonstrated in British Columbia. For instance, the provincial government of British Columbia continues to work alongside the First Nations Fisheries Council when making decisions regarding sustainable wildlife management. The provincial advisory council has recently developed a 230-page proposed report on a series of immediate and long-term recommendations to protect the salmon stocks in British Columbia (Canadian Broadcasting Corporation, 2018). The council worked on this report for 18 months in partnership with representatives from the aquaculture industry, academia, and local Indigenous communities. In response to this report, the provincial government has agreed to consider the proposed recommendations while reviewing the renewals of 20 fish-farm tenures in the Broughton Archipelago, off northern Vancouver Island (Canadian Broadcasting Corporation, 2018). This was imperative as one of

the top recommendations of the report was that fish farm companies should be required to have agreements in place with local Indigenous communities before the province can approve any new or replacement tenures (Canadian Broadcasting Corporation, 2018). Initiatives like this not only achieves continued projects that focus on sustainable management of the fishery, but it also improves the relations amongst local Indigenous members and the government.

There also seems to be insufficient funding, and consequently resources, being allocated for managing and monitoring the Lake Nipissing fishery. This is evident as projects focused on protecting wildlife and resources that are conducted by the A/OFRC is going to be severely hampered by the recently disclosed funding cuts by the provincial government of Ontario. This resource centre serves as an independent data source of information on fisheries assessment, conservation and management, promoting the value of both western science and traditional ecological knowledge (Anishinabek/Ontario Fisheries Resource Centre, n.d.). Once the funding cuts are executed, there will be very limited research projects that are focused on addressing the diminishing fish stocks in the Lake Nipissing fishery. This is a significant issue as ensuring adequate funding to run these initiatives is also a vital component to restoring, and later maintaining, a fishery with depleting resources. The importance of securing funding to support research initiatives that are focused on improving fisheries could be demonstrated in Nunavut.

The federal government has recently invested more than $2.5 million over four years to support two research and training projects in Nunavut (Blake, 2018). The first research project will be run by the Nunavut Fisheries Association to examine the commercial viability of porcupine crab, offshore and inshore turbot, and look at improving trawling technology off the coast of Baffin Island (Blake, 2018). The other research project is going to create an inshore turbot fishery in Qikiqtarjuaq, Nunavut. This research project was favoured by governing

officials as it is expected to create more employment opportunities for those living in Northern communities (Canadian Northern Economic Development Agency, 2019). For instance, experienced Pangnirtung will provide workshops on the topic as an effort to ensure adequate training. The revenue from the development of this inshore fishery will also be used to improve the equipment available, such as the installation of a walk-in, energy-efficient freezer to store fish. This funding is not only going to help sustainably monitor and restore the fisheries in Nunavut, but it will also provide the area with economic improvements.

It is evident that the Lake Nipissing fishery is experiencing severe depletion of walleye stocks and tensions amongst its users. I understand that holding meetings to inform and encourage discussion for the public is not going to build strong communal relationships overnight. However, for the Lake Nipissing fishery to see some progress there needs to be more communication amongst the users to address the "finger pointing" that has been an ongoing issue. The fishery could also benefit from receiving more funding for future research projects that are focused on filling the gap of data collection on the fish stocks. The gap in data collection stems from research initiatives for the Lake Nipissing fishery continues to primarily focus on overharvesting. For instance, research on this issue often concludes that preservation of the walleye fish stocks in the lake could be upheld through addressing overfishing by implementing intensive management strategies (Smith, 2017). Primarily focusing on fishing trends in the lake could be due to the issue being one of the easiest stressors affecting the walleye stocks to identify and manage. However, all components that impact the overall sustainability of the fishery must be explored to ensure the complete restoration of the walleye fish stocks. Some serious environmental concerns that should be studied may include anthropogenic and temporal influences. For instance, a stressor that has been found to negatively effect the Lake Nipissing

fishery that is linked to anthropogenic influences is the increase of aquatic invasive species like the spiny water flea. The impacts of climate change should also be studied as temperature fluctuation will have more of an impact on fish species as Lake Nipissing a relatively shallow waterbody (Smith, 2017). Broadening the perspective of also considering all of these factors that could also be affecting the drop in walleye populations is necessary for restoration of the fishery. In the end, by working together, we can focus on the issue at hand and truly help restore the Lake Nipissing fishery.

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