

USING THE SUSTAINABLE LIVELIHOOD APPROACH TO INFORM THE
DEVELOPMENT OF A MULTISPECIES FISHERY MANAGEMENT PLAN

By

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Submitted in partial fulfillment of the requirements for the degree
of
Master of Marine Management

at

Dalhousie University,
Halifax, Nova Scotia

August 2011

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School: Marine Affairs Program, Faculty of Management

Degree: Master of Marine Management

Convocation: October

Year: 2011

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Table of Contents

List of Tables	ix
List of Figures	x
Abstract	xi
List of Abbreviations	xii
Acknowledgements	xiii
CHAPTER 1: Introduction	1
1.1. General Introduction	1
CHAPTER 2. Background	3
2.1. The Mi'kmaq Nation	3
2.1.1. R. v. Sparrow, 1990	5
2.1.2. Marshall I: R. v. Marshall, 1999	5
2.1.3. Marshall II: R v. Marshall, 1999	6
2.1.4. British Columbia v. Nuu-chah-nulth, 2009	7
2.2. Fishing and Canadian Fisheries	7
2.2.1. Fisheries Management and the Fishery Management Plan	10
2.3. Sustainable Livelihood Approach	12
2.3.1. Sustainable Livelihood Framework	14
2.4. Chapter Summary	15
CHAPTER 3: Research Methodology	16

3.1. Research Goal and Research Questions	16
3.2. Research Strategy	16
3.3. Interview Process	17
3.4. Fishery Management Plan	18
3.5. Paqtnkek Mi'kmaw Nation	19
CHAPTER 4: Sustainable Livelihood Framework Analysis	21
4.1. Paqtnkek Community Livelihood Fishery Goals	21
4.2. Global Context	21
4.2.1. Trends	22
4.2.1.1. Abundance of fish	22
4.2.1.2. Certification of Sustainable Fisheries	26
4.2.1.3. Weather patterns	26
4.2.1.4. International recognition of Aboriginal rights	29
4.2.2. Shocks	30
4.2.2.1. Fishery closures	30
4.2.2.2. Politics	31
4.2.2.3. Conflict between Native and Non-Natives	32
4.2.3. Seasonality	33
4.3. Paqtnkek Community Assets	34
4.3.1. Human Assets	35

4.3.2. Social Assets	36
4.3.3. Natural Assets	36
4.3.4. Physical Assets	37
4.3.5. Financial Assets	38
4.4. Factors Determining Access to Fisheries	38
4.4.1. Policies	38
4.4.1.1. The Indian Act, 1985	39
4.4.1.2. The Constitution Act, 1982	40
4.4.1.3. The Fisheries Act, 1985	41
4.4.2. Institutions	41
4.4.2.1. Fisheries and Oceans Canada (DFO)	42
4.4.2.2. Assessment of DFO Programs post-Marshall Decision	44
4.4.2.3. Aboriginal Affairs and Northern Development Canada	45
4.4.2.4. Mi'kmaq Grand Council and Paqtnekek Band Council	45
4.4.2.5. Environment Canada, Transport Canada and Canadian Food and Inspection Agency	46
4.4.3. Processes	46
4.5. Chapter summary	47
CHAPTER 5: Recommendations	49
5.1. Fishery Resources	49

5.1.1. Species fished	49
5.1.2. Fishing season	50
5.1.3. Fishing equipment	51
5.1.4. Habitat restoration and species conservation	51
5.2. Operational and Administrative	52
5.2.1. Fishery goals	52
5.2.2. Strategy to achieve fishery goals	53
5.2.3. Economic assessment	53
5.2.4. Fishery governance	54
5.2.5. Administrative system	54
5.2.6. Fishery monitoring	55
5.2.7. Communication and consultation	55
5.2.8. Integrate plan with coastal zone and fisheries policy and planning	56
5.2.9. Social, cultural and economic strategies	56
5.3. Fishery Regulations	57
5.3.1. Access to the fishery	57
5.3.2. Fishery catch regulations	57
5.3.3. Management of fishing pressures and human disturbance to the ecosystem ..	58
5.3.4. Allocation of fishery resources	59
CHAPTER 6: Moving Forward	60

References	64
Appendix A: FAO suggested fundamental principles for a fishery management plan	70
Appendix B: Interview Questions	71
Appendix C: Emergence of skill and technological concepts from the interviews	73
Appendix D: Knowledge concepts from the interviews	74

List of Tables

Table 2.1: Comparison of accumulation and livelihood fisheries (Davis, 1996)	8
Table 2.2: Advantages of small scale fisheries (FAO, 2005a)	8
Table 2.3: Development of the Paqtnkek livelihood fishery management plan from a combination of the FAO fishery management plan and the DFO fishery management plan (N/A= not assessed)	12
Table 3.1: Paqtnkek Livelihood Fishery Management Plan (FMP) sections and components	19
Table 4.1: FAO assessment of fish stocks in the Northwest Atlantic. (FAO, 2005b)	23

List of Figures

Figure 2.1: Traditional Mi'kmaq districts that include present day Nova Scotia, Prince Edward Island, northern and eastern New Brunswick and the southern and eastern shores of the Gaspé Peninsula of Quebec (from danielpaul.com).....	3
Figure 2.2: Sustainable livelihood framework (adapted from DFID, 1999b)	14
Figure 3.1: Location of Paqtnkek Mi'kmaw Nation, denoted by the star (adapted from google maps)	20
Figure 4.1: Lobster Fishing Areas in Atlantic Canada	24
Figure 4.2: Summary of Paqtnkek Mi'kmaw Nation fishery assets	35
Figure 4.3: Opportunities and challenges that impact the livelihood fishery management plan components	48

Abstract

Gauthier, A., 2011. Using the Sustainable Livelihood Approach to inform the development of a multispecies fishery management plan [graduate project]. Halifax, NS: Dalhousie University.

The Paqtnkek Mi'kmaw Nation would like to develop a livelihood fishery to sustain a moderate livelihood. The Sustainable Livelihood Framework guided the identification of challenges and opportunities that the Paqtnkek community may incur in the livelihood fishery development. The barriers and opportunities identified in the framework were mitigated and enhanced in the proposed fishery management plan for the livelihood fishery. The general decline in fish population and the financial investment required to develop the fishery were the most important challenges identified. However, the livelihood fishery can develop a sense of self reliance for the Paqtnkek community and provide the community knowledge and skills which can be transferred to other industries. As a result, the opportunities created as a result of the fishery outweigh the challenges that the Paqtnkek community may incur. Therefore, the Paqtnkek Mi'kmaw Nation should proceed and begin the process to develop their livelihood fishery.

Keywords: sustainable livelihood approach; Mi'kmaq Nation; fisheries; management; livelihood fishing; sustainability

List of Abbreviations

DFO: Fisheries and Oceans Canada

FAO: Food and Agricultural Organization

FMP: Fishery management plan

FSC: Food, social and ceremonial fishery

LFA: Lobster fishing area

MMFN: Mi'kmaq and Maliseet First Nations

PFE: Paqtnkek Fisheries Enterprise

SCC: Supreme Court of Canada

SLA: Sustainable Livelihood Approach

TAC: Total allowable catch

UNDRIP: United Nations Declaration on the Rights of Indigenous Peoples

Acknowledgements

I would like to thank my family and friends for all of their love and support throughout this past year. To my supervisor Chris Milley, thank you providing me the opportunity to work on the project and for guidance throughout the project. Thank you to the Paqtnkek Mi'kmaw community for welcoming me in my short stay in your community. To Chief Julian and the Paqtnkek Band Council, thank you for allowing me the opportunity to conduct the study within your community. I would like to thank Merina Sark for being my mentor during my internship. To Kerry Prosper, Robert Pictou and Albert Julian, thank you very much for sharing your stories and knowledge. Thank you to Becky Field for all of the random conversations throughout the past year; you truly are the beacon for the MAP students. A large thank you to the Marine Affairs Program faculty members, without your hard work and dedication, the program would not be a success. Finally, to my fellow classmates: WE MADE IT!

CHAPTER 1. Introduction

1.1. General Introduction

The Mi'kmaq Nation has inhabited Mi'kmak'ik (Atlantic Canada) since time immemorial and have developed the Netukulimk ethic to guide their use of natural resources. Netukulimk is a Mi'kmaq word which describes the relationship between Mi'kmaq and the Creator in which the Mi'kmaq use the resources provided by the Creator for self support and wellbeing of the individual and community. Netukulimk is achieving adequate standards of community nutrition and economic well-being without jeopardizing the integrity, diversity, or productivity of the environment (UINR, 2011).

In the 16th century, the British and French arrived and sought to conquer Mi'kmak'ik from the Mi'kmaq Nation. This occurred through fierce battles, rewards for 'scalped Indians' and through forced legislation and laws that restricted the Mi'kmaq. The forced reliance of the Mi'kmaq on the British was evident when the Canadian Parliament imposed *Indian Act, 1876*, which placed restrictions on Aboriginals and essentially made them 'wards of the Crown'. Now, the Mi'kmaq Nation, along with other Aboriginals in Canada have begun to explore avenues to assert their rights. These rights include, but are not limited to the access to adequate housing, health care, education and natural resources. In the past 20 years there has been tremendous progress in Aboriginals obtaining access to natural resources, including fisheries.

Through litigation, Aboriginals have the right to fish for food, social and ceremonial purposes (R v. Sparrow, 1990), the Mi'kmaq First Nation and the Maliseet First Nation have the right to access the fishery to sustain a moderate livelihood (R v. Marshall, 1999a) and five Nuu Chah Nulth First Nation's have the right to sell any

species of fish in their territories (with the exception of the geoduck fishery) (Isaac et al., 2009).

Paqtnekek Mi'kmaw Nation is exploring the possibility of developing a fishery for providing community members a moderate livelihood, herein known as a livelihood fishery. The Paqtnekek community's resource management knowledge and skills will be included in a fishery management plan which will provide guidance and support to manage the livelihood fishery. Fishery management plan recommendations are developed through an analysis of global trends, factors affecting Paqtnekek's access to fisheries and the Paqtnekek community assets. The Sustainable Livelihood Approach combines a framework with a set of principles to provide guidance on policy formulation and development process. The Sustainable Livelihood Framework (SLF) provides a holistic analysis on the opportunities and barriers to the development of the Paqtnekek Mi'kmaw Nation livelihood fishery. The fishery management plan recommendations include mitigation measures and approaches to enhance opportunities identified in the SLF.

CHAPTER 2. Background

To fully understand why the Paqtnkek Mi'kmaw Nation would like to develop a livelihood fishery, it is important to be aware of the history of Mi'kmaq rights. A review of fisheries management highlights the importance of a fishery management plan for the Paqtnkek livelihood fishery. Meanwhile, the Sustainable Livelihood Approach provides guidance to develop the recommendations for the fishery management plan.

2.1. The Mi'kmaq Nation

The Mi'kmaq Nation has inhabited the eastern coast of North America since time immemorial and has developed an intimate and ancient relationship with the land, Mi'kmak'ik, and sea (Berneshawi, 1997). Mi'kmak'ik encompasses over fifty thousand square miles covering present day Nova Scotia and Prince Edward Island, northern and eastern New Brunswick and the southern and eastern shores of the Gaspé Peninsula of Quebec (Upton, 1979) (figure 2.1).

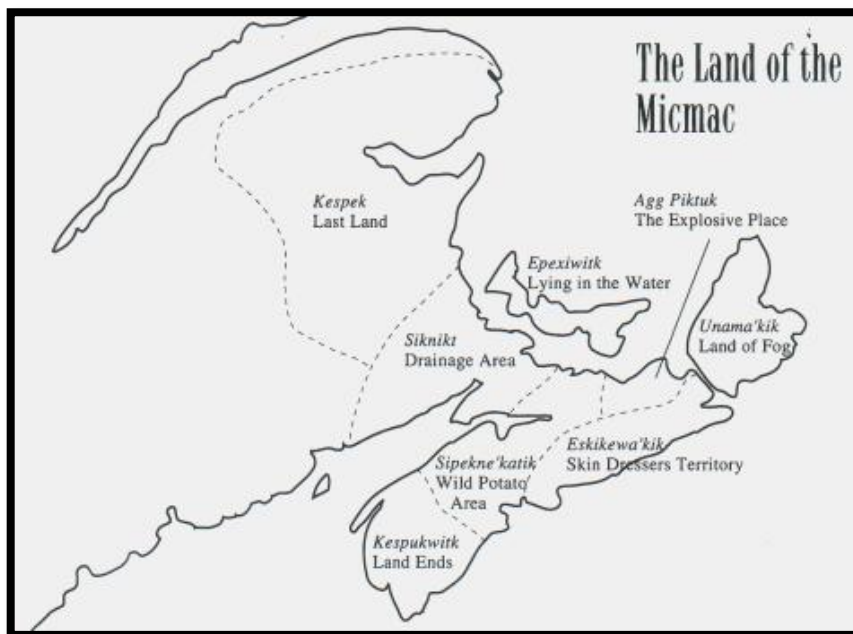


Figure 2.1: Traditional Mi'kmaq districts that include present day Nova Scotia, Prince Edward Island, northern and eastern New Brunswick and the southern and eastern shores of the Gaspé Peninsula of Quebec (from danielpaul.com).

It is believed that Mi'kmak'ik is inherited from the Mi'kmaq ancestors and does not belong to any particular person. Natural resources, renewable or non-renewable are considered gifts from the Creator that can neither be bought nor sold (Berneshawi, 1997). Consequently, neither the land nor its resources are viewed as a commodity, and the philosophy of responsible stewardship is practiced in accordance with the concept of Netukulimk (Barsh, 2002). Netukulimk can be considered the original form of resource management. Modern day resource management attempts to manage resources for extraction both today and in the future. However, current fishery management has been unsuccessful in managing marine resources as 85% of fisheries are exploited, overexploited, depleted or recovering from depletion (FAO, 2010).

While Aboriginals in Canada have always fished to supply food for themselves, in modern times (post colonization) they have largely been excluded from the fishery. The Canadian system of limited entry in fisheries, and the high capital cost of entry have made it difficult for the majority of people to obtain access to the fishery (McGaw, 2003). Also, the Canadian government has made Aboriginal entry into the fishery difficult through the establishment of the *Indian Act, 1876*, which made Aboriginals dependent on the Canadian government. However, Aboriginals, in particular First Nations have begun to reclaim their right to participate in the development and management of fisheries and other natural resources through litigation. Landmark court cases involve the Sparrow Decision (R. v. Sparrow, 1990) and the Marshall Decision (R. v. Marshall I, 1999a). Recently in 2009, the right of five Nuu-chah-nulth First Nations in British Columbia to harvest and sell fish was affirmed (Isaac et al., 2009).

2.1.1. R. v. Sparrow, 1990

Ronald Sparrow was charged under the *Fisheries Act, 1985* of fishing with a drift net longer than permitted by the terms of his Band's Indian food fishing license (R. v. Sparrow, 1990). In 1990, the Supreme Court ruled in favour of Sparrow and the 'Sparrow Decision' represents three main points. First, it holds that Aboriginal rights, such as the right to fish, are protected regardless of whether such specific rights are mentioned in a treaty. Second, it verifies the *Constitution Act, 1982* that recognizes and affirms existing aboriginal and treaty rights of aboriginal peoples of Canada. Finally the Sparrow Decision clarified that "existing Aboriginal rights" must be interpreted flexibly so as to permit the evolution of rights over time. Essentially, the Sparrow Decision signifies that Aboriginals have the right to fish for food, social and ceremonial (FSC) purposes and this fishery has precedence over commercial and recreational fisheries. Further information on R. v. Sparrow (1990) can be found in Lawrence and Macklem (2000). The question of whether or not Aboriginals had the right for access to the commercial fishery was decided in 1999 with the 'Marshall Decision'.

2.1.2. Marshall I: R. v. Marshall, 1999

Donald John Marshall, Jr. caught and sold 463 pounds of eel in the offseason and without a license in 1993 (R. v. Marshall, 1999a). Mr. Marshall stated that the Peace and Friendship Treaties signed in 1760-1761 between Mi'kmaq Nation and the British Crown allowed him to gather resources from Mi'kmak'ik free from non-Aboriginal regulatory constraints (Keay and Metcalf, 2004; R. v. Marshall, 1999a). The Supreme Court of Canada (SCC) ruled that the treaty signed in 1760 did give Marshall the right to commercially harvest resources to secure a moderate livelihood from Mi'kmaq territory, unless the Department of Fisheries and Oceans (DFO) could justify their infringement of

his treaty rights (Keay and Metcalf, 2004). The treaty right to fish was limited to securing a moderate livelihood and does not extend to an open accumulation of wealth which is understood within the meaning of section 35 of the Canadian *Constitution Act, 1982*.

The 'Marshall Decision' is important in the development to a livelihood fishery as the decision affirmed that the Mi'kmaq and Maliseet Nations have the right to access the commercial fishery to sustain a moderate livelihood. It is only after the Marshall Decision that the DFO began to negotiate fishing agreements with the Mi'kmaq First Nation and the Maliseet First Nation. Bear River Mi'kmaw Nation and Paqtnkek Mi'kmaw Nation did not sign fishing agreements with DFO. Therefore, Paqtnkek Mi'kmaw Nation would like to develop a livelihood fishery.

2.1.3. Marshall II: R v. Marshall, 1999

The 'Marshall Decision' brought fear and hope to non-natives and natives in Atlantic Canada. To alleviate confusion over the Marshall I ruling, the SCC released a new ruling on 17 November 1999, known as Marshall II. In the Marshall II decision, the SCC reinforced and expanded the government's ability to justifiably regulate Aboriginal resource rights with commercial aspects (R. v. Marshall, 1999b). The SCC confirmed that both the federal and provincial governments retained the ability to regulate the right on the basis of conservation, or other compelling and substantial public objectives. The regulations could be in the form of catch limits and closed seasons. The SCC also held that government regulations would not be expected to take Mi'kmaq fishermen below the moderate livelihood threshold would not infringe the right, and therefore, would not need to be justified.

2.1.4. British Columbia v. Nuu-chah-nulth, 2009

On 3 November 2009, the British Columbia Supreme Court recognized the right of five Nuu-chah-nulth First Nations to harvest and sell any species of fish in their territories (with the exception of the modern geoduck fishery). The British Columbia Supreme Court also examined whether Canada's fisheries legislation, regulations and policies infringed on those rights. The Court found that Canada's policies and legislations failed to support the Nuu-chah-nulth First Nations participation in the commercial fishery by focusing too much on integrated fishing (Isaac et al., 2009). Unlike the Marshall Decision, the Nuu-chah-nulth decision gave the Canadian government and the Nuu-chah-nulth First Nations two years to consult and negotiate a regulatory regime that balances their rights with the rights and interests of other Canadians.

2.2. Fishing and Canadian Fisheries

The majority of Canadian fisheries have a commercial and recreational component and some fisheries have an additional Aboriginal food, social and ceremonial (FSC) component. Commercial fishing can be divided into two broad categories based on the fisheries harvesting technique: accumulation and livelihood harvesting (table 2.1). Accumulation fishing is characteristic of an industrial approach to fishing, while a livelihood fishing is characteristic of a smaller-scale more selective harvesting technologies. Livelihood fishing is defined as fishermen fishing with the purpose of providing for oneself and their community.

Table 2.1: Comparison of accumulation and livelihood fisheries (Davis, 1996).

	Accumulation Fishery	Livelihood Fishery
Extraction	<ul style="list-style-type: none"> • Non-selective fishing technology • Mass harvesting practices 	<ul style="list-style-type: none"> • Selective fishing technology
Goals	<ul style="list-style-type: none"> • Returns on investments 	<ul style="list-style-type: none"> • Satisfy social and economic requirements of life in a community
Structure	<ul style="list-style-type: none"> • High level of capital investment and corporate centralization • Ownership of vessels to companies or nations 	<ul style="list-style-type: none"> • Contains the most people. Low level of investment, more human effort • Fishermen have some control over their labour processes and technology used to fish

Advantages of small-scale or livelihood fisheries (table 2.2) are that they have a lower running cost and fuel consumption, lower ecological impact, higher employment opportunities, higher versatility and they use less expensive technology (FAO, 2005a). With lower operation cost, livelihood fisheries provide the opportunity to catch less fish to make the same profit as accumulation fisheries. Clearly, this could lead a more sustainable fishery as less fish are required to be caught to cover fishery expenses and the fish are selectively caught which lowers bycatch (the unintentional catch of non-target species).

Table 2.2: Advantages of small scale fisheries (adapted from FAO, 2005a).

Advantage	Attribute
Low running costs and fuel consumption	Have less mechanical power, optimize human power and use more passive gear
Lower ecological impact	May use destructive fishing methods (poison and dynamite), however they normally use passive gears. They can still overfish available resources
Higher employment opportunities	Being more labour intensive, they provide employment in catching, processing and trade of fish and fishery products
High versatility	Smaller boats implies that they can operate from ports that are relatively close to the fished resource
Less expensive technology	Require low investment technology and equipment. Resources within the technical reach of small-scale sector are usually more profitably harvested with more returns on capital invested compared to industrial fishing

Two of the current issues in fisheries are overcapacity of fishing fleets and the inability of fisheries to control bycatch (FAO, 2010). Overcapacity in fishing fleets can occur through the use of too many fishing boats to fish a small quantity of fish or by a few extremely efficient fishing boats that can capture all the fish. Overcapacity in fisheries has led to a decrease in employment as many fishermen are unable to generate sufficient income from the fishery. Therefore, many countries have designed programmes to reduce fishing capacity and increase productivity through technical progress (FAO, 2010). In some of its fisheries, Canada has begun to reduce the amount of boats and in 1970 Canada began to buy back Pacific salmon licenses in British Columbia (Grafton and Nelson, 2005).

Increasing fishing productivity through advanced technical processes often requires money to be invested in fisheries. However, investing capital (money) in fisheries means that a fisherman or company needs to catch more fish to pay off the investment before they can make a profit. In fact, FAO determined that worldwide, fisheries were running at a deficit of \$22 billion a year in 1989 (Le Sann, 1998). Since 1989, fish stocks have generally declined (FAO, 2010) and Canada experienced the collapse of the Atlantic cod commercial fishery (Myers, Hutchings and Barrowman 1997). Improved technology is often characteristic of accumulation fisheries in which companies look to catch more fish, often not selectively, that may lead to an increase in bycatch.

Bycatch may be valuable, but often not, and in many cases it is dumped back into the sea as discards (Grafton and Nelson, 2005). The latest estimate of global discards in fisheries is about 7 million tonnes per year, a 9% discard rate of the 75.3 million tonnes

of fish provided by capture fisheries in 2009 (FAO, 2010). Currently, small-scale fishing contributes more than half of the world's marine and inland catch, almost all of which is destined for human consumption (FAO, 2010). Small-scale fishing implies fishing with a smaller vessel size and a lower level of technology compared to accumulation fishing (FAO, 2010). Finally, these fisheries, predominately in Asia, employ more than 90% of the world's fishermen (FAO, 2010). Although small scale fisheries employ the highest concentration of people, the average annual production per person is 2.4 tonnes. This is in contrast to countries with high level of technology where the annual production is 24 tonnes in Europe and more than 18 tonnes in North America (FAO, 2010).

Clearly, with the smaller operational cost and more selective fishing techniques compared to accumulation fishing, livelihood fishing could improve the current state of fisheries worldwide. It is possible to make a livelihood from an accumulation commercial fishery; however there may not be enough fish in the ocean to sustain the livelihood. Therefore accumulation fisheries may not promote a sustainable livelihood. It may be possible to make a sustainable livelihood from a livelihood fishery due to the lower operating costs and more selective fishing techniques.

2.2.1. Fisheries Management and the Fishery Management Plan

Fisheries management involves a complex and wide ranging set of tasks which collectively work towards the goal of receiving sustained benefits from the fishery. The Food and Agriculture Organization (FAO) defines fisheries management as:

The integrated process of information gathering, analysis, planning, consultation, decision-making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and the accomplishment of other fisheries objectives (Cochrane, 2002).

Currently, fisheries management has evolved to management with an ecosystem orientation, termed ecosystem based fisheries management (EBFM). FAO provides eight suggested fundamental principles of fisheries management and each principle is accomplished through a management function (APPENDIX A) (Cochrane, 2002). FAO recommends that these management functions are included in a fishery management plan. Further information on the principles can be found in Cochrane (2002).

Recommendations (table 2.3) for the Paqtnekek livelihood fishery management plan are based on a combination of the FAO principles of fisheries management (Cochrane, 2002) and the Fisheries and Oceans Canada (DFO) integrated fishery management plan (IFMP) (DFO, 2010a). The FAO FMP principles and DFO IFMP cover roughly the same components; however the FAO FMP principles are characteristic of a more cautious approach with more stakeholder involvement. The DFO IFMP is task oriented and includes steps to be accomplished to fulfil the FMP components. Through combining the DFO IFMP components and FAO FMP principles, the Paqtnekek livelihood fishery management plan is characteristic of a task oriented, cautious approach to fisheries management.

Table 2.3: Development of the Paqtnkek livelihood fishery management plan from a combination of the FAO fishery management plan principles and the DFO fishery management plan (N/A= not assessed).

FAO Fishery Management Plan Principles	DFO Integrated Fishery Management Plan Components	Paqtnkek Livelihood Integrated Fishery Management Plan Section
	Overview of fishery	N/A
Identify target reference points and biological constraints	Stock Assessments	Fishery Resources
	Social, Cultural and Economic Importance of the Fishery	Operational and Administrative
	Management issues	Fishery Regulations
Identify goals	Management objectives	Operational and Administrative
Management strategies	Management strategies	Fishery Regulations
Management plan	Tactical management measures for the duration of the plan	N/A
Access rights	Access and allocation	Fishery Regulations
	Shared stewardship arrangements	N/A
	Compliance plan	N/A
	Performance review	Operational and Administrative
	Monitoring	Operational and Administrative
	Plan enhancements	N/A
Communication and consultation		Operational and Administrative
Integrate FMP into coastal zone and fisheries policy and planning		Operational and Administrative
Environmental impacts of the fishery		N/A

2.3. Sustainable Livelihood Approach

The sustainable livelihood approach (SLA) has been in existence and evolving since the 1980s (Campbell, 1999). It has been used by a number of development agencies such as the United Nations Development Program and the United Kingdom Government's Department for International Development (DFID). The SLA is a way of

thinking about objectives, scope and priorities for development with the goal of poverty eradication (Campbell, 1999). The literature focuses on the assets of people how different patterns of asset holding (land, stock, food stores, savings) can make a difference to the ability of the family to withstand shocks (an immediate impact to the asset in question) (Swift, 1989). This set of concerns links to the concept of vulnerability that consists of external threats to livelihood security due to risk factors such as a change in the climate, markets or a sudden disaster (Chambers, 1989; Davis, 1996). Sustainability is defined as the ability of a system to maintain productivity in spite of a major disturbance (Conway, 1985). Disturbances may include natural events such as floods or droughts to manmade events such as explosions or war.

The concepts of resilience and sensitivity as livelihood attributes also originate in this context. Resilience refers to the ability of a livelihood system to bounce back from stress or shocks, while sensitivity refers to the magnitude of a system's response to an external disturbance (Allison and Ellis, 2001). The most robust livelihood system is one displaying high resilience and low sensitivity. The concept of a livelihood seeks to bring together the critical factors that affect the vulnerability or strength of individual or family survival strategies. These factors consist of the assets possessed by people, the activities in they engage in order to generate an adequate standard of living and satisfy other goals, and the factors that facilitate or inhibit people from gaining access to assets and activities. Therefore the following definition of livelihood is used:

A livelihood comprises the assets (natural, physical, human, financial and social capital), the activities and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household (Ellis, 2000, 10).

The sustainable livelihood framework (SLF) (figure 2.2) brings together the principle components that are thought to comply with the livelihood definition and demonstrate the interactions between them (Allison and Ellis, 2001). This is accomplished through the recognition of the seasonal and cyclical complexity of livelihood strategies, the removal of access constraints to assets and activities, and to identify ways of making livelihoods more able to cope with adverse trends or shocks (Allison and Ellis, 2001).

2.3.1. Sustainable Livelihood Framework

The SLA provides a framework (figure 2.2) to assist in the prioritization of the objectives, scope and priorities for development (DFID, 1999a). The framework, designed to understand and analyse the livelihoods of a community requires qualitative and participatory analysis at a local level (DFID, 1999a). The framework views people or community's operating in a context of vulnerability and within this context they have access to certain assets. These assets gain value and meaning through the prevailing social, institutional and organisational environment. The framework is divided into three main sections: the global (vulnerability) context, community assets and the factors affecting access to fisheries (transforming structures and processes).

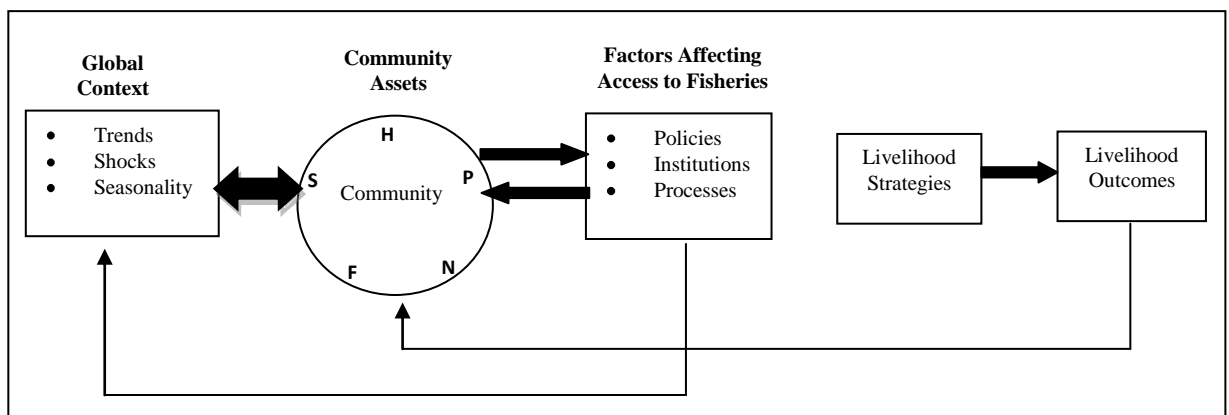


Figure 2.2: Sustainable livelihood framework (adapted from DFID, 1999b).

2.4. Chapter Summary

In correcting centuries of misconduct by Europeans, Aboriginals across Canada, including the Mi'kmaq Nation, are using litigation to assert their rights. The Sparrow Decision (R. v. Sparrow, 1990), the Marshall Decision (R. v. Marshall, 1999) and the Nuu-Chah-Nulth First Nations recent court victory (Isaac et al., 2009) indicate that this process may be working. As such, the Paqtnkek Mi'kmaw Nation is looking to exercise their right to sustain a moderate livelihood from a fishery. The majority of fish sold across the world originates in accumulation fisheries which often use sophisticated technology to locate and harvest fish in comparison to livelihood fisheries.

Sustainable and profitable fishing is often not synonymous with accumulation fishing as many of the current fisheries are overfished and in debt. In comparison to accumulation fisheries, livelihood fisheries have smaller operating costs and utilise selective harvesting techniques. Therefore it may be possible to have a sustainable and profitable livelihood fishery. The fishery management plan will provide the opportunity for Paqtnkek community members to combine their local fishing knowledge and skills with other resource management knowledge to manage a sustainable fishery.

The Sustainable Livelihood Framework guides the development of the fishery management plan through the identification and utilisation of the Paqtnkek community's assets and the challenges and opportunities to the livelihood fishery development. Recommendations for the Paqtnkek livelihood fishery management plan mitigate challenges and enhance opportunities identified in the Sustainable Livelihood Framework.

CHAPTER 3: Research Methodology

The development of informed recommendations for the Paqtnkek livelihood fishery was guided by four research questions. Interviews with Paqtnkek community members along with a desktop review provided the information required to analyse the Sustainable Livelihood Framework (SLF). The fishery management plan was developed and recommendations were provided to mitigate challenges and enhance opportunities identified in the SLF.

3.1. Research Goal and Research Questions

To achieve the goal of providing recommendations to develop a fishery management plan for a Paqtnkek livelihood fishery the research questions are:

1. What are the current goals in developing a multispecies livelihood fishery?
2. What are the opportunities and barriers (human, social, physical, financial and natural) to developing a livelihood fishery?
3. What are the management opportunities and barriers for First Nations in managing a livelihood fishery?
4. What are the institutions, organizations, policies and legislation that are required to develop a multispecies livelihood fishery?

3.2. Research Strategy

The sustainable livelihood framework (SLF) was analysed to answer the research questions and in turn inform recommendations for the development of the fishery management plan for the Paqtnkek livelihood fishery. The SLF goals were replaced with the livelihood fishery goals defined by community members in the interviews. This ensures that the application of the SLF is relevant to the Paqtnkek community. Primary sources of information collected for the SLF occurred during a four week internship at Paqtnkek Fisheries Enterprise which included interviews with community members. Secondary sources of information were identified through a desktop review.

Interviews (Appendix B) with Paqtnkek community members required both quantitative and qualitative assessment. In the interviews, community members ranked the importance of 14 goals on a scale of zero (not important) to ten (important) which determined the goals for the livelihood fishery. Participants were allowed to provide additional goals for the livelihood fishery. Goals selected for the fishery management plan received an average score of nine out of ten. The qualitative assessment of the interview uses grounded theory to analyse codes, concepts and trends in the answers. The grounded theory methodology used is described in Coffey and Atkinson (1996) and a critique is provided by Allan (2003).

3.3. Interview Process

Interviews were completed during an internship at Paqtnkek Fisheries Enterprise from 9 May 2011 to 3 June 2011. Ethics applications were submitted and approved from the Dalhousie Social Science Ethics Committee (Approval #2011-2419) and the Mi'kmaq Grand Council (approved 10 May 2011). Written approval was provided (18 May 2011) from the Paqtnkek Mi'kmaw Nation Chief to interview Paqtnkek community members. Paqtnkek community members were informed about the research being conducted in the community, through two information meetings held on 24 May 2011 and 31 May 2011. For community members that could not attend either meeting, an information flyer describing the study was placed in the Administration office on the reserve. Paqtnkek community members frequently visit the Administration building.

The number of participants invited to take part in the interviews was 25 individuals from the Paqtnkek Mi'kmaw Nation. The number of participants is roughly 5% of the Paq'tnkek First Nation population. This number conforms to an accepted social

science methodology as is to be expected that 25 participants will provide an adequate range of variation in the answers (Dr. R. Apostle, personal communication). Interview participants were required to be at least 16 years of age and a Paqtnkek Mi'kmaw community member. To ensure that an adequate representation of community members opinions in the research five community members were selected from each of the following sectors: councillors, Elders, fishermen, women and youth. Community members were identified with assistance from both Paqtnkek Fisheries Enterprise and the Paqtnkek Band council. The interview (Appendix B) length depended on the participant and lasted between 20 minutes to one hour place. Interviews took place at a location that the participant chose. In total, 19 Paqtnkek community members were interviewed (4 councillors, 3 Elders, 2 fishermen, 5 women and 5 youth).

3.4. Fishery Management Plan

Recommendations were developed to mitigate challenges and enhance opportunities that the Paqtnkek community may encounter in the development of a fishery management plan (FMP) for a livelihood fishery. The FMP used to form the recommendations for the project is a combination of the FAO FMP (Cochrane, 2002) and the DFO IFMP for the Maritimes Region (DFO, 2010a) (table 2.3). This allows the Paqtnkek FMP to incorporate aspects of both FMPs and develop the best possible FMP for the community. The three sections (fishery resources, operational and administrative and fishery regulations) were expanded into components to provide an outline for the recommendations (table 3.1).

Table 3.1: Paqtnkek Livelihood Fishery Management Plan (FMP) sections and components.

Paqtnkek Livelihood Fishery Management Plan Section	Paqtnkek Livelihood Integrated Fishery Management Plan Component
Fishery Resources	Species fished
	Fishing season
	Fishing equipment
	Habitat restoration and species conservation
Operational and Administrative	Fishery objectives
	Strategy to achieve objectives
	Economic assessment
	Fishery governance
	Administrative system
	Fishery monitoring
	Communication and consultation
	Integrate plan with coastal zone and fisheries policy and planning
	Social, cultural and economic strategies
	Fishery market
Fishery Regulations	Access to the fishery
	Fishery catch regulation
	Management of fishing pressures, human disturbance to ecosystem
	Allocation of fishery resources

3.5. Paqtnkek Mi'kmaw Nation

Paqtnkek Mi'kmaw Nation is located in present day Afton, Nova Scotia (figure 3.1). Paqtnkek is a small Mi'kmaw community that consists of 500 members, with one chief and five councillors. The Trans Canada Highway divides the reserve that Paqtnkek community members live on a 218 hectare reserve with an additional 43 hectares across the Trans Canada Highway (AANDC, 2011a). Paqtnkek community members have long relied on both land and ocean resources to provide for themselves and their community. Paqtnkek Mi'kmaw Nation did not sign fisheries agreements offered by the DFO after the Marshall decision and the community has an interest to open a livelihood fishery.



Figure 3.1: Location of Paqtnkek Mi'kmaw Nation, denoted by the star (adapted from google maps).

CHAPTER 4: Sustainable Livelihood Framework Analysis

Recommendations for the fishery management plan mitigate challenges and enhance opportunities identified in the Sustainable Livelihood Framework (SLF). The SLF analysis provides a global context which identifies the trends, shocks and seasonal factors related to fisheries, and a local context which lists policies, organizations and legislation relevant to fisheries. The analysis builds on the Paqtnkek community's assets and how they can be used in the development of a livelihood fishery.

4.1. Paqtnkek Community Livelihood Fishery Goals

Goals that Paqtnkek community members identified in interviews for the fishery livelihood are:

1. Sustainable fishery that is around for generations
2. Raise awareness about First Nations rights
3. Create jobs within the community
4. Have a positive impact on the community
5. Provide the opportunity for leadership within the community

This approach allows Paqtnkek Mi'kmaw Nation to guide the development of their livelihood fishery. The goals were broadly defined in the interview to allow the Paqtnkek community to further refine their goals as the livelihood fishery continues to develop. Subsequent analysis requires that the community provides quantifiable targets for each livelihood fishery goal. This allows the fishery committee to track the progress of the livelihood fishery and adjust management procedures to achieve the livelihood fishery goals.

4.2. Global Context

The global context identifies the insecurity or well being of individuals or communities in the face of changing environments in the form of long term trends, sudden shocks or seasonal cycles (Moser, 1996). The extent of vulnerability relates both

to the severity of the threat and to the community's ability to resist and recover from the external threats (Farrington, Ramasut and Walker, 2002).

4.2.1. Trends

To offset the general trend of a decline in fish stocks, fishery certification is thought to be a method to encourage fishery managers to become sustainable. Fishery certification requires fishery managers to comply with strict rules and regulations to receive special certification. In addition to fishery certification, climate change may influence fish stocks as fish are extremely susceptible to their environment. Meanwhile, the recent increase in Aboriginal rights recognition may assist in the development of the Paqtnkek livelihood fishery.

4.2.1.1. Abundance of fish

World capture fisheries (fish caught both in marine and inland waters) have remained relatively stable in the past 30 years between 80 to 90 million tonnes per year (FAO, 2010). However, currently 85% of fisheries are exploited, overexploited, depleted or recovering from depletion (FAO, 2010) which may be a sign that many fisheries are en route to collapse. Further worrisome is that in the northwest Atlantic Ocean and northeast Pacific Ocean, capture fisheries have declined (FAO, 2010). In comparison to other fishing regions in the world, the northwest Atlantic and northeast Pacific fishing areas have only produced 2.0 million tonnes and 2.6 million tonnes of fish respectively in 2008 (FAO, 2008). Canada fishes commercially and recreationally in these areas. The decline in capture fisheries production in the northwest Atlantic Ocean (where Paqtnkek Mi'kmaw Nation would fish) is a challenge to the development of a livelihood fishery.

In 2005 in the northwest Atlantic Ocean, the Atlantic cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*) stocks were depleted, the American lobster

(*Homarus americanus*) stock was fully exploited to overexploited and the Atlantic herring (*Clupea harengus*) stock was underexploited to recovering (table 4.1) (FAO, 2005b).

Table 4.1: FAO assessment of fish stocks in the Northwest Atlantic. (FAO, 2005b).

Species	Status	Main fishing countries	Tonnes caught
Atlantic cod <i>Gadus morhua</i>	Depleted	Canada, USA, Greenland	55,000
Haddock <i>Melanogrammus aeglefinus</i>	Depleted	Canada, USA	23,000
Atlantic herring <i>Clupea harengus</i>	Underexploited to recovering	Canada, USA	259,000
American lobster <i>Homarus americanus</i>	Fully exploited to overexploited	Canada, USA	82,000

The American lobster and Atlantic herring fisheries are examined and their potential to include these species in a Paqtnekek livelihood fishery discussed. These two species were chosen as the American lobster fishery is an established fishery in Atlantic Canada and the Atlantic herring fishery is not fully exploited.

The American lobster, herein known as lobster, in Nova Scotia is one of the more prominent Canadian fisheries. In Atlantic Canada, the lobster fishery is managed by DFO in three separate administrative regions: Maritimes (Nova Scotia, New Brunswick, Prince Edward Island), Laurentian (Quebec) and Newfoundland (Newfoundland and Labrador) (Charles, 1997). The Atlantic Canadian inshore lobster fishery consists of 12,000 licenses, in which lobster catches make up 60% to 80% of a fisher's total landed value of all species fished (FRCC, 1995). The lobster fishery is managed through limited entry to the fishery (licenses) and through effort controls (the number of lobster traps per license). In the early 1980s, the Atlantic Canada lobster region was divided into small-scale

Lobster Fishing Areas (LFAs) (figure 4.1). Paqtnekek Mi'kmaw Nation is located in LFA 26A, and the Paqtnekek Band council has expressed an interest in fishing in LFA 34 (near Bear River Mi'kmaw Nation). Therefore, catch statistics for both LFAs will be examined. The most recent stock assessments for LFA 26A and LFA 34 were completed in 2007 and 2006 respectively.

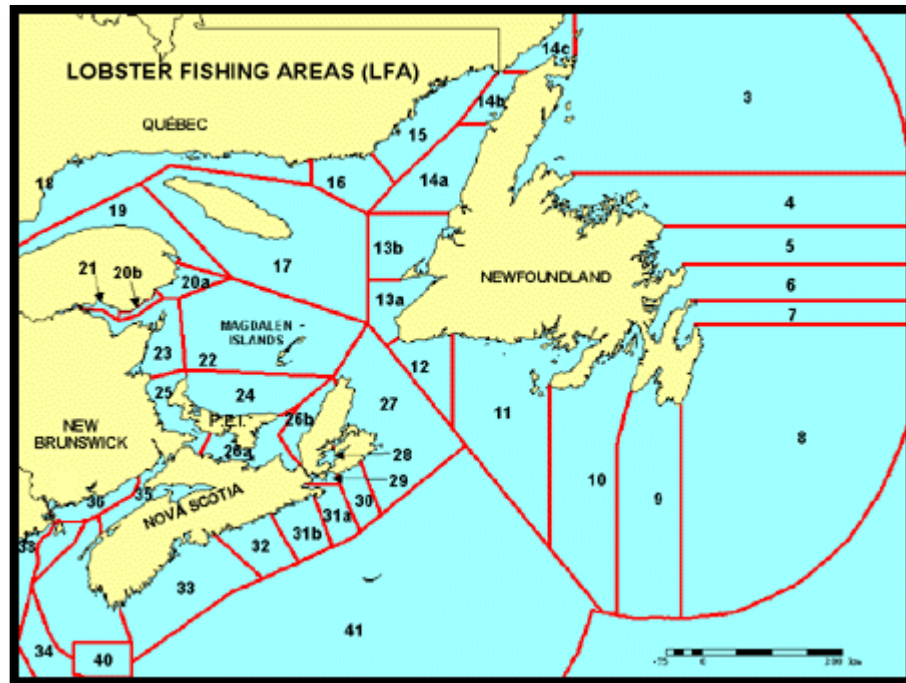


Figure 4.1: Lobster Fishing Areas in Atlantic Canada (from www.agr.gc.ca).

In LFA 26A, the fishing season is from May 1 to June 30 with 766 licenses that each have 300 traps. Abundance indicators for lobster based on landings (lobster that are caught and brought to the harbour) for legal size lobster are close to or above the long-term median. However an analysis of fishing pressure indicates that most of the catches consist of new recruits (lobsters that grow to commercial size and enter the fishery for the first time) which implies that the fishery is sensitive to events (weather or man-made) that could reduce the production of offspring (DFO, 2007a). Finally, evidence suggests that the fishing pressure is too high based on estimates that 50% of the traps are empty

(over the season) (DFO, 2007a). This could be a result that lobsters have changed their preferential habitat or that the fishery has reached its fishing effort capacity. In LFA 34 the fishing season is from the last Monday in November until May 31 and there are 967 licenses. The number of traps that fishermen can use varies depending on the time in the season. From the first day of the season until March 31, fishermen can use 375 traps per license. From April 1 to May 31, the number of traps per license increases to 400. LFA 34 has high exploitation rates and is heavily dependent on new recruits. This means that the fishery is susceptible to any changes in the level of recruitment. Based on the information, the lobster fishery, particularly in LFA 34 is appears to be a viable means to begin a livelihood fishery.

The Atlantic herring fishery consists of a spring fishery (January-June) and a fall fishery (July-December). The herring fishery is regulated by the Total Allowable Catch (TAC) for the two fisheries. In 2009, the TAC for the spring fishery was 2,500 tonnes and for the fall fishery 65,000 tonnes (DFO, 2010b). The Science Advisory Report for Atlantic herring in the Southern Gulf of St Lawrence found that the stock remains at a high level of abundance relative to the 1970s and early 1980s (DFO, 2010b).

After an initial assessment, the lobster fishery and herring fishery may be able to support a Paqtnekek livelihood fishery. It is recommended that the lobster fishery takes place in LFA 34 where the abundance of lobster is greater than in LFA 26A. Additionally, the herring fishery appears to be in good health with a high level of abundance. Subsequent assessments should apply the precautionary approach to ensure that the livelihood fishery does not contribute to the decline of the stocks.

4.2.1.2. Certification of Sustainable Fisheries

Recently, there has been a trend of consumers purchasing sustainably caught seafood. Many of the large non-governmental organizations (NGOs) urge consumers to buy sustainably caught seafood, from sustainable fisheries. The World Wildlife Fund (WWF) promotes the Marine Stewardship Council (MSC) as an organization that recognizes sustainable marine fisheries and their products through their certification program. In theory, consumers will support sustainable management practices by buying products carrying an 'eco-label' indicating that they are sourced from well-managed natural resources (Gulbrandsen, 2005).

This emerging trend in fisheries could be used as an advantage to assist in developing a livelihood Fishery for the Paqtnkek Mi'kmaw Nation. Sustainable seafood certification can increase the number of markets that Paqtnkek could sell their product to make a profit. Currently, the development of a new Aboriginal certification system, Fair Trade Fish is being explored. Fair Trade Fish is being looked at as a way to promote economic security, social harmony and environmentally friendly harvesting practices for (Aboriginal) fisheries (M. Delesalle, personal communication 15 June 2011). FTF is different than established certification systems (MSC, Friends of the Sea) as FTF ensures that the fishery is socially sustainable for the community. Fair Trade Fish and other certification systems provide multiple avenues for the Paqtnkek livelihood fishery to market and sell their fish.

4.2.1.3. Weather patterns

The environment, especially temperature has a large influence on marine ecosystems. Temperature is one way to measure ocean variability and it is an indicator of more complex ocean processes. Temperature can alter the oceanic circulation patterns

that are affected by changes in the direction and speed of the winds. The circulation patterns drive ocean currents and mix surface waters with deeper nutrient rich waters. These processes in turn affect the abundance and variety of plankton which are food for small fish. Most fish species have a fairly narrow range of optimum temperatures related both to their basic metabolism and the availability of food organisms (of which have their own optimum temperature ranges). This optimum temperature range may expand, shrink or be relocated when ocean conditions change. To properly understand the impacts of climate on fisheries, both the short term weather events (the El Nino Southern Oscillation and the North Atlantic Oscillation) and the long term weather events (climate change) are discussed.

The effects of short term weather events, in particular the El Nino Southern Oscillation (ENSO), are well known. In 1972, the ENSO was contributed as a factor in the Peruvian anchovy collapse. The ENSO has a cycle of three to five years with the event itself lasting from 12-18 months. The ENSO mainly affects the Pacific Ocean; however its affects are felt worldwide, including the northwest Atlantic Ocean (Stenseth et al., 2003). The North Atlantic Oscillation (NAO) influences weather patterns over the Atlantic between 40°N and 60°N and is most active in the winter (Stenseth et al., 2003). Significant changes in ocean surface temperature and heat content, ocean currents and their related heat transport, are induced by changes in the NAO (Hurrell and Deser, 2009). A positive NAO index is associated with a northward shift in Atlantic storm activity and above average temperatures for the western Atlantic Ocean (Stenseth et al., 2003).

Climate change is a highly contested topic in which some people believe that it exists, while others do not. For the clarity of the paper, climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods (IPCC, 2007). During the 19th century, global surface temperature has increased by 0.6°C (Folland and Karl, 2001). However, the Intergovernmental Panel on Climate Change (IPCC, 2007) and the International Union for the Conservation of Nature (Herr and Galland, 2009) study climate change and neither organization provides a quantitative prediction for the future global ocean temperature. However both organizations agree that ocean temperatures are increasing. To determine the effect of a warming ocean on individual fisheries is beyond the scope of the paper. However the impact of a potential warmer ocean will be broadly described for small pelagic finfish (herring, mackerel) and crustaceans (lobster and snow crab).

Hobday and colleagues (2009) found that pelagic species (herring, mackerel) have the ability to undergo large scale movements and therefore have a high ability to adapt to climate change. It is assumed that a similar impact will be observed in the Atlantic herring fishery and that the herring population will change their location as the ocean temperature increases. However the location where herring will migrate towards is unknown. In LFA 26A the environmental conditions are warming in the southern Gulf of St. Lawrence which may favour the expansion of the lobster distribution (DFO, 2007a). This would have a positive impact on the development of a livelihood fishery as Paqtnekek fishermen would now be able to fish in LFA 26A and not have to travel to the Bay of Fundy to fish in LFA 34.

4.2.1.4. International recognition of Aboriginal rights

The international recognition of Aboriginal rights has made considerable progress in the past several decades. The recognition of group rights began with the 1989 International Labour Organization (ILO) Convention No. 169 (ILO, 1989). The ILO C169 enforced the right of indigenous people to live and develop as distinct communities by their own designs. Then in 2007, the United Nations (UN) General Assembly voted in favour to adopt the United Nations Declaration on the Rights of Indigenous People (UNDRIP). The UNDRIP affirms the belief that indigenous people have the right to control their own destiny (UN, 2008). Canada became the last state to sign the UNDRIP on 12 November 2010. The UNDRIP, although a large step forward, is not binding in international law. However, national governments are recognizing the rights and values set forth within the UNDRIP. For example, in 2010, Peru adopted legislation recognizing indigenous peoples' consultation rights with any project or provision that affects their territory or communities (Salazar, 2011).

The international recognition of Aboriginal rights is seen as an advantage that can be enhanced while a livelihood fishery is developed. As nations and individuals become aware of Aboriginal peoples' rights, individuals may begin to support the affirmation of Aboriginal rights. In Canada, Section 35(1) of the *Constitution Act, 1982*, recognizes and affirms existing aboriginal and treaty rights of aboriginal peoples of Canada. As discussed in section 2.1.2 the SCC has recognized the right of Mi'kmaq and Maliseet Nations to access the fishery to make a moderate livelihood. When the Paqtnkek Mi'kmaw Nation decides to develop a livelihood fishery, they can use the media to gain support from both the Canadian and the international community. Meanwhile, the

Canadian government can use the livelihood fishery as a means to begin to fulfil the intent of the UNDRIP.

4.2.2. Shocks

Shocks to a community can be predicted based on the community's own sense of past events (severity) and how often they occur (frequency) (DFID, 1999b). Fishery closures as a result of overfishing would provide a large, sudden shock to the fishery. Meanwhile, political issues and confrontation with other fishermen and individuals provide an abrupt shock that can oftentimes be prevented.

4.2.2.1. Fishery closures

Closing a fishery, also known as a fishery closure can be a planned event that is written into the fishery management plan, or an unplanned event that is determined based on the current fishery condition. A planned fishery closure can arise from many reasons, occur on both a spatial and temporal time scale, and affect all types of fisheries. As previously discussed, bycatch is an issue in fisheries management and fishery closures are often used to mitigate bycatch. Normally, a cost-benefit analysis is completed to determine the trade-off between a reduction in bycatch and the loss of the main species targeted. This was the approach taken to reduce silky shark (*Carcharhinus falciformis*) bycatch in the eastern Pacific Ocean tuna fishery (Watson et al., 2008).

Fishery closures can be described in two categories based on how the fishery closure is implemented. A proactive fishery closure, also known as a planned closure can be implemented through fishing seasons and quotas. A proactive fishery closure protects the target species from being overfished and allows the species to maintain a minimum stock size to reproduce for the next season. Normally, proactive fishery closures do not cause shocks to a fishery as the closures are planned and fishermen can mitigate any

consequences as a result of the closure. On the other hand, reactive fishery closures can shock the fishery and impact individuals who rely on the fishery. Two well known examples of reactive fishery closures are the 1993 Atlantic (Newfoundland) cod collapse (Myers et al., 1997), and the 1972-1973 Peruvian anchovy collapse (Pfaff, Broad and Glantz, 1999). The Atlantic cod fishery closure is still in place today and the collapse appeared to be caused by overfishing (Hutchings and Myers, 1994). Meanwhile, the Peruvian Anchovy collapse was linked to the El Nino Southern Oscillation, and the fishery recovered by the 1990s (Pfaff et al., 1999). The economic impact of the 1972 Peruvian Anchovy collapse can be thought of as severe as the 1970 catch was 10.9 million metric tonnes and from 1972 to 1982, 0.5 to 3 million metric tonnes (Alheit and Niquen, 2004). The impact of the Newfoundland cod collapse is even greater as the fishery closure meant immediate unemployment for 40,000 people involved in the fishery (Greenpeace, n.d.).

The reactive type of fishery closures, as evident in the 1993 Newfoundland cod fishery and the 1972-73 Peruvian anchovy fishery have the potential to negatively impact a fishery. Therefore it is extremely important that the Paqtnkek livelihood fishery does not cause or contribute to the collapse of fish species and the fishery able to withstand the collapse of a fish stock.

4.2.2.2. Politics

Politics on a federal (Canadian), provincial (Nova Scotia) and local (Paqtnkek Band council) level directly affect the development of a livelihood fishery. Politics is a term that will be used to refer to politicians that have influence over legislation, Acts and policies. Therefore politics has the opportunity to both enable and restrict the development of the Paqtnkek livelihood fishery. The federal and provincial governments

have different political parties that want to represent their constituency. Each party has its own set of priorities with respect to Aboriginal rights and fisheries management.

Therefore, each time a federal or provincial election is held, the level of support or opposition to the development of a livelihood fishery can change. On a local level, Band council elections occur every two years (as mandated from the *Indian Act*). Just like federal and provincial politics, Band council elections can change the Paqtnekek community's priorities.

4.2.2.3. Conflict between Native and Non-Natives

The livelihood fishery development could lead to confrontation between individuals who are directly or indirectly connected to the livelihood fishery. Conflict between native and non-native's is not a frequent occurrence; however it does occur, mainly over the issue of Aboriginal rights. In 1999, after the Marshall Decision, a conflict broke out in Burnt Church, New Brunswick when Mi'kmaq people put lobster traps in the water after the DFO sanctioned fishing season was over. This action angered non-native fishermen and conflicts occurred along the coast and ranged from yelling matches on wharves throughout the region to vigilante violence at Burnt Church (Coates, 2000). Michael Belliveau of the Maritime Fishermen's Union declared "The commercial fishermen in that area who rely on that stock are being asked to shoulder 300 years of grievance of the native people" (Coates, 2000, 128). The development of a livelihood fishery may provide conditions similar to Burnt Church which may lead to conflict between natives and non-natives. Therefore it should be expected that there would be some form of conflict at some point in the development of the fishery. The conflict could range in scale from a few disgruntled people at a community information meeting about

the fishery, to confrontation at the wharf. Steps should be taken to mitigate the severity and impact of any conflict.

4.2.3. Seasonality

Seasonality is related to the price fluctuations for the catch, seasonal shifts in employment opportunities and food availability (DFID, 1999b). Oftentimes, the community cannot control the seasonality factors which impact their livelihood (Ahmed et al., 2009).

If the Paqtnkek community decides to sell some of its catch from the livelihood fishery, then the price that they receive for their catch is important. The financial considerations that follow are for the lobster fishery; however the scenarios can apply to any fishery. In Atlantic Canada, the price of lobster in 2010 dipped to below \$3 a pound, a 20 year low (Gustafson, 2010). Currently, the price of lobster is around \$4 a pound. The price of lobster is influenced by the value of the Canadian dollar, the worldwide recession, and the price of fuel and bait. To assist in the revitalization of the lobster fishery, in February 2010, Fisheries and Oceans Canada Minister Gail Shea announced a federal grant of \$352,000 to develop a comprehensive marketing strategy for Atlantic Canada's lobster fishery. In addition, the Lobster Council of Canada was formed in 2009 and it represents all of the Atlantic Provinces and its partner organizations include fishermen, buyers, processors, First Nations, as well as provincial and federal government representatives (Gustafson, 2010).

The Paqtnkek Livelihood Fishery has two main options to determine how they would sell their lobster. Paqtnkek could sell their lobster in the same market that Atlantic Canadian fishermen use, or they could develop their own market to sell lobsters. To use the same market that other Atlantic fishermen use would provide access to an established

market. If Paqtnkek would develop their own market, then it would provide consumers with a ‘sea to table’ lobster experience. This would allow Paqtnkek fishermen to ask a higher price for their lobsters, as they would sell their lobster direct to consumers.

The seasonal shift in unemployment is evident in the fishing industry as many fishermen may fish for a certain amount of time for one or two species. The rest of the time fishermen may have land based jobs to supplement their income (Mark Timmons, personal communication, July 2, 2011). Therefore alternative employment opportunities are important to provide a stable livelihood for Paqtnkek fishermen.

4.3. Paqtnkek Community Assets

The presence or absence of various components of the community assets can facilitate or hinder the development of a livelihood fishery. The sustainable livelihood framework draws attention to five types of assets upon which a community’s livelihood depends on: human, social, natural, physical and financial assets. A summary of assets present in the Paqtnkek community is provided in figure 4.2. o

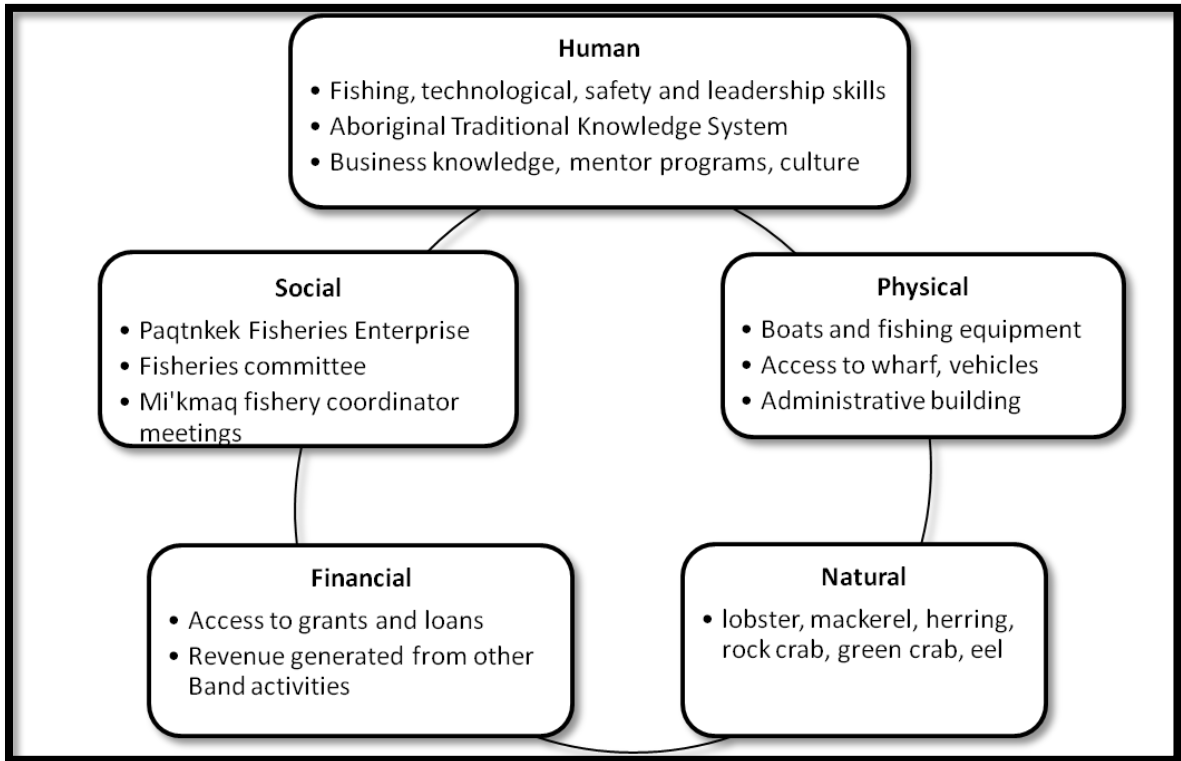


Figure 4.2: Summary of Paqtnkek Mi'kmaw Nation fishery assets

4.3.1. Human Assets

Human assets represents the skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives. As well as being of intrinsic value, human capital is required in order to make use of any of the four other types of assets.

The fishing skills concepts present in the interviews include fishing skills, safety skills, traditional fishing skills, management skills, experience, understanding, leadership skills and technological skills (Appendix C). The interviews brought forth seven knowledge concepts: fishery knowledge, knowledge about Mi'kmaq culture, business knowledge, sustainability, mentor programs, fishing safety knowledge, and conservation knowledge (Appendix D). Many interview participants believe that the Paqtnkek

community does have the knowledge required for a livelihood fishery, but that the knowledge base needs to expand to have an effective livelihood fishery.

4.3.2. Social Assets

Social assets consist of the social resources upon which a community uses in pursuit of their livelihood objectives. Social capital is created and enhanced through networks and connectedness within and outside the community. Like other types of capital, social capital can make important contributions to people's sense of well-being through identity, honour and belonging (DFID, 1999b).

Current groups within the Paqtnkek community that could be utilised in the livelihood fishery development include the fisheries committee and the youth committee. Paqtnkek Mi'kmaw Nation currently operates Paqtnkek Fisheries Enterprise (PFE) that coordinates its commercial fishery. External to the community, Paqtnkek fishers used to attend Fishermen's Association meeting in Antigonish, Nova Scotia area. The Atlantic Policy Congress Secretariat for First Nations Chiefs (APC) holds fishery coordinator meetings where the fishery managers for each Mi'kmaq Band would attend. Finally, the organization, the Mi'kmaq Rights Initiative provides assistance and guidance for Mi'kmaq Bands that want to find ways to assert their rights.

4.3.3. Natural Assets

Natural assets consist of the natural resource stocks from which resource flows and services useful for livelihoods are derived (DFID, 1999b). Natural capital is important to people who derive their livelihood from resource-based activities. In addition, natural capital provides environmental services and food, which are both essential for people. The natural resources that are relevant to a livelihood fishery are the fish and invertebrate species located close to Paqtnkek Mi'kmaw Nation. Species that

require large vessels to travel to the fishing grounds or to harvest the fish are excluded from the discussion as these species would require more capital investment from the community to buy larger boats and equipment. The primary marine species that have a commercial fishery are discussed in section 4.2.1.1. Additional species located near Paqtnekek include the American eel (*Anguilla rostrata*), the green crab (*Carcinides maenas*), rock crab (*Cancer irroratus*), and Atlantic mackerel (*Scomber scombus*). Currently, there are Canadian fisheries for the rock crab and Atlantic mackerel.

The number and type of species that are included in the Paqtnekek livelihood fishery would need to be determined by consultation with the community. It is suggested that the livelihood fishery initially consists of species that can be caught with the boats that PFE owns. In addition, the fishery should contain multiple species to limit the dependence on a particular species.

4.3.4. Physical Assets

Physical assets comprise the basic infrastructure and producer goods needed to support livelihoods. Infrastructure consists of changes to the physical environment that help people to meet their basic needs and to be more productive (DFID, 1999b). Currently, the Paqtnekek Fisheries Enterprise owns two trucks that are used for the recreational fishery. Paqtnekek fishermen have access to a wharf in Bayfield, Nova Scotia which is five kilometres away from Paqtnekek Mi'kmaw Nation. Paqtnekek Mi'kmaw Nation owns five boats that range in size from 32 to 44 feet. Currently, Paqtnekek Fisheries Enterprise has the gear required for lobster, snow crab and herring fishing (Igor Vlasichev, personal communication, August 9, 2011). Finally, Paqtnekek Mi'kmaw Nation has its own Administrative Building that contains PFE and other organizations within the community.

It is suggested that the livelihood fishery can work within the existing capacity of the Paqtnkek community until the fishery makes a profit that can be invested in the fishery.

4.3.5. Financial Assets

Financial assets denote the financial resources that people use to achieve their livelihood objectives. In the SLA, there are two sources of financial capital: available stocks and regular inflows of money. Available stocks consist of savings that do not have liabilities attached and rely on others (cash, bank deposits) and a regular inflow of money consists of earned income, pensions, other transfers from the state and remittances (DFID, 1999b).

Like many Mi'kmaw Nations, Paqtnkek Mi'kmaw Nation relies on funding from various sources to run programs. Therefore it is suggested that the livelihood fishery does not require a large investment or costs a lot to operate.

4.4. Factors Determining Access to Fisheries

Factors which determine access to fisheries (transforming structures and processes) within the livelihoods framework are the policies, institutions and processes relevant to fisheries. In addition, these factors determine the terms of exchange between different types of assets and the return (economic and otherwise) for a livelihood activity.

4.4.1. Policies

Policies inform the development of new legislation and provide a framework for their implementation (DFID, 1999b). Policies are implemented through a range of institutional structures and frameworks- traditional or modern, formal or informal, governmental, non-governmental, quasi-governmental or private sector. These may act either as facilitators in improving the livelihoods and quality of life of the community or

as filters in reducing their access to positive discrimination or support policies. They also often serve to enforce legislation/regulations curtailing the community's access to the natural resources that form the bases of their livelihoods. The *Indian Act (1867)* abolished the Mi'kmaq Nation's self-regulating authority, which in turn made the Mi'kmaq Nation dependent on the Canadian government. Meanwhile, the *Constitution Act (1982)* was the first Canadian Act or legislation that recognized and protected Aboriginal rights that were in existence in 1982. Finally, the *Fisheries Act (1985)* does not provide any support for Aboriginal fisheries.

4.4.1.1. The Indian Act, 1985

The *Indian Act* was created by the Parliament of Canada under the provisions of Section 91(24) of the Constitution Act, 1876, that provided Canada's federal government exclusive authority to legislate in relation to "Indians and Lands Reserved for Indians". The *Indian Act* essentially made the Mi'kmaq Nation, along with other Aboriginals wards of the Crown. The Crown was given the authority to regulate Aboriginal lives with the intent to assimilate Aboriginals into the Canadian culture. Regulations ranged from how Aboriginals would elect leaders to their children's education (residential schools). In the early 1900s, the Federal government created Indian reserves which grouped native people together in small communities.

The *Indian Act* has been amended several times since 1876, with the latest amendment occurring in 1985. Presently, there are 35 Mi'kmaq and Maliseet First Nation communities in Atlantic Canada and each community has its own elected leadership which is made up of a Chief and councillors (one councillor for everyone 100 community members). Mi'kmaq communities hold elections every two years and follow the regulations provided by the *Indian Act*. The Government of Canada recognizes the

autonomy of each First Nation which means that each community has the right to make its own decisions on some local matters. However, each community must also present Band Council Resolutions (BCR) to the federal government for money for housing and other programs (CMM, 2007). The Minister of Indian Affairs has the power to accept or reject the BCR.

The *Indian Act* has greatly limited the Mi'kmaq Nation ability to manage their resources as the *Act* tried to remove Mi'kmaq culture and it made Mi'kmaq people property of and dependent on the government. In addition, the *Act* moved the Mi'kmaq Nation onto many reserves and disrupted the Mi'kmaq traditional governance structure. This allowed the Canadian government to divide and conquer the Mi'kmaq Nation on a community by community basis.

4.4.1.2. The Constitution Act, 1982

Section 35(1) of the *Constitution Act*, recognizes Aboriginal treaty rights and legally protects Aboriginal rights that were in existence when the Act came into force on 17 April 1982. However, the *Constitution Act* does not protect Aboriginal rights that were extinguished prior to its establishment. There are four subsections of section 35. Section 35(1) recognizes and affirms existing aboriginal and treaty rights of aboriginal peoples of Canada. Section 35(2) states that 'aboriginal peoples of Canada' includes Indian, Inuit and Métis peoples of Canada. Section 35(3) clarifies that subsection (1) treaty rights includes rights that now exist by way of land claims agreements or may be so acquired. Section 35(4) confirms that the aboriginal and treaty rights referred to in subsection (1) are guaranteed equally to male and female persons.

The *Constitution Act* is important to livelihood fishing as it provides precedence that Aboriginal rights are both recognized and affirmed in Canada. The *Constitution Act*

was a key piece of legislature used in the *R v. Sparrow* (1990) and *R v. Marshall* (1999) court decisions. Despite being a seemingly positive piece of legislature, the *Constitution Act* does not protect Aboriginal rights that were supposedly abolished by the Canadian government prior to 1982, nor does it clearly define what constitutes an Aboriginal right.

4.4.1.3. The Fisheries Act, 1985

The Fisheries Act is designed to manage and protect the fishing resources in Canada's fishing zones, territorial seas and inland waters and is binding on all levels of Canadian government. The *Fisheries Act* dates back to the Confederation of 1867 and has been amended over the years to extend regulations to new provinces of Canada, to repeal outdated provisions, to expand and further detail the act's scope and to delegate duties and authorities to new government bodies. After Confederation, one of the first amendments to the *Fisheries Act* was to regulate the Aboriginal food fishery through the issuing of licenses to Indians to allow them to catch fish for their own use (Mills, 1997). This process continued over the years which led to the precursor, inadequate fishery access, to both the Sparrow Decision and the Marshall Decision. In 1993, after the Sparrow Decision the *Fisheries Act* developed Aboriginal Communal Fishing Licenses Regulations as a part of the Allocation Transfer Program (section 4.4.2.1).

4.4.2. Institutions

Institutions both regulate and develop policies and legislation relevant to fisheries. Therefore it is important to understand the role and responsibilities of institutions which impact fisheries. Fisheries and Oceans Canada is the primary federal department responsible for the management of Canada's fisheries, while the department of Aboriginal Affairs and Northern Development Canada provides programs for Aboriginals. Meanwhile, within the Paqtnkek Mi'kmaw Nation, the Mi'kmaq Grand

Council assumes an advisory role for the Mi'kmaq Nation while the Paqtnkek Band Council provides support and guidance for the Paqtnkek community. Finally, additional federal departments may have rules and regulations which indirectly impact the livelihood fishery.

4.4.2.1. Fisheries and Oceans Canada (DFO)

Under the *Fisheries Act, 1985*, Fisheries and Oceans Canada (DFO), alongside the Canadian Coast Guard are responsible to ensure the sustainable use and development of Canada's waterways and aquatic resources. The DFO is a federally run organization and is the lead agency responsible for managing the fisheries across Canada. After the Sparrow Decision and the Marshall Decision, the DFO developed strategies and programs to comply with the decisions. The Aboriginal Fisheries Strategy, the Allocation Transfer Program and the Aboriginal Aquatic Resource and Ocean Management program were developed after the Sparrow Decision while the Marshall Response Initiative and the Atlantic Integrated Commercial Fisheries Initiative were provided in response to the Marshall Decision.

The Aboriginal Fisheries Strategy (AFS) provides financial support to Aboriginals entering the fishery through annual agreements for food, social and ceremonial (FSC) fishing licenses (McGaw, 2003; DFO, 2003). The strategy, adopted in 1992 was meant to establish a social contract among Aboriginal people, the government and non-Aboriginal fishing groups (DFO, 1992 as in Allain and Frechette, 1993). However, the opposite outcome was observed in 1992 when DFO permitted 57 Bands in British Columbia to issue fishing licenses and monitor catches, which was perceived as a threat to non-Aboriginals (Allain and Frechette, 1993).

In the Allocation Transfer Program (ATP) the DFO acquires commercial fishing licenses and quota from non-natives and transfers the quota to Aboriginal communities in the form of ‘communal commercial fishing licenses’ (CCFL) (DFO, 2004). To receive a CCFL, the ATP requires that Aboriginal groups have a current AFS agreement with the DFO or else the DFO would issue a CCFL with established terms and conditions (DFO, 2008). Paqtnekek Mi’kmaw Nation has two CCFL that were provided to them by the DFO (Paqtnekek Mi’kmaw Nation did not sign an AFS) (Merina Sark, personal communication, May 18, 2011). The ATP provides the opportunity for Aboriginal communities to gain experience in the fishery, albeit under the DFO rules.

The Aboriginal Aquatic Resource and Ocean Management (AAROM) program began in 2004 provides the steps for Aboriginal access to fisheries for food, social and ceremonial purposes, consistent with the 1990 Sparrow decision. The AAROM program is designed to bring Aboriginal groups together at a broad watershed or ecosystem level and build capacity to participate in the decision-making processes used for aquatic resources and oceans management (DFO, 2008).

The Marshall Response Initiative (MRI) was developed in 2000 in response to the Marshall Decision. The MRI program, which concluded in 2007, consisted of negotiated interim fisheries agreements that provided Mi’kmaq and Maliseet First Nations with access to the commercial fisheries. Licences to fish for various species, as well as vessels, gear and equipment, capacity building, and training and infrastructure were provided to the 32 of 34 Mi’kmaq and Maliseet First Nations (MMFN) that signed Fisheries Agreements (DFO, 2008). There are 35 MMFN in Atlantic Canada; however the DFO does not provide the Miawpukek First Nation in Newfoundland and Labrador access to

the benefits from the Marshall Decision. Paqtnkek Mi'kmaw Nation and Bear River Mi'kmaw Nation did not sign Fisheries Agreements.

The Atlantic Integrated Commercial Fisheries Initiative (AICFI) program created in 2007 is designed to maximize potential from existing access and strengthen the accountability and transparency of fishing enterprises (DFO, 2007b). The AICFI program consists of four components that provide assistance with fishery governance, management, co-management and diversification to Aboriginal communities (DFO, 2007b). Paqtnkek Mi'kmaw Nation is currently using the AICFI program for its commercial fishing licenses (M. Sark, personal communication, 1 June 2010). The AICFI program will end in 2012 and there has been no indication that the AICFI program will be extended.

4.4.2.2. Assessment of DFO Programs post-Marshall Decision

The Atlantic Policy Congress of First Nations Chiefs Secretariat commissioned a report that looked at the progress that the MMFN made in fisheries since the Marshall decision. The report, 'Marshall: 10 years later', concluded that "First Nations believe that the spirit and intent of the Marshall decision is yet to be fulfilled by Canada" (APCFNCS, 2009, 49). However the report did acknowledge that the programs by the DFO led to the creation of jobs and the generation of wealth that is being used to support community objectives and fisheries re-investment (APCFNCS, 2009).

The programs developed after the Marshall Decision has led to a reduction in the unemployment rate and has increased the fishing economic return per household (APCFNCS, 2009). However, the average employment income for First Nations is lower than Atlantic Canada (APCFNCS, 2009). It is discouraging that 75% of First Nations have inactive licenses (APCFNCS, 2009) which, if used, would increase the employment

rate, the fishing economic return per household and the average employment income. None of the programs discussed provide the opportunity for MMFN to develop their own management plans outside of the DFO framework. This limits the ability of MMFN to incorporate their knowledge and methods of fishing that reflect their history in the fishery.

4.4.2.3. *Aboriginal Affairs and Northern Development Canada*

Aboriginal Affairs and Northern Development Canada (AANDC), originally the Department of Indian and Northern Affairs Canada (INAC) was developed in 1880 and was responsible to enforce the *Indian Act, 1985*. Over the years, AANDC has evolved into a department that supports Aboriginal people (Inuit, First Nations and Métis) and northern communities to become self-sufficient, healthy and safe. AANDC offers economic programs designed to support economic development in Aboriginal communities by providing funding to communities (AANDC, 2011b). Additionally in 2009 AANDC launched the Aboriginal Business Canada program that provides assistance to Aboriginal entrepreneurs starting their own business (AANDC, 2011b). Funding opportunities present in AANDC provide the opportunity to receive financial support in the development of the Paqtnkek livelihood fishery.

4.4.2.4. *Mi'kmaq Grand Council and Paqtnkek Band Council*

As previously discussed the Mi'kmaq Grand Council is responsible for the oversight of the Mi'kmaq Nation. The Grand Council discusses issues that affect the Mi'kmaq Nation and the Grand Council must reach an agreement on issues through a consensus decision, not a majority decision. The *Indian Act, 1985*, introduced the elected chief and council for each Band, and has changed the role of the Grand Council. The federal government insists to deal only with an elected chief and Band council, which in

turn has reduced the power of the Mi'kmaq Grand Council. Although the Grand Council is non-political, council members are still viewed with great respect in the Mi'kmaq community and the Grand Council is able to influence important issues in an advisory capacity. The Grand Council can impact the development of a Paqtnekek livelihood fishery through their influence on the different components of the fishery.

4.4.2.5. Environment Canada, Transport Canada and Canadian Food and Inspection Agency

Environment Canada (EC) monitors water quality across Canada, while Transport Canada (TC) provides rules for marine vessels and the Canadian Food and Inspection Agency (CFIA) establishes food quality guidelines. The purpose of the Paqtnekek livelihood fishery is to provide fish for the Paqtnekek community and possibly sell the fish to make a profit. In order for this to occur, Paqtnekek livelihood fishery would need to ensure that their fishermen have the requirements to operate a boat safely. These requirements could parallel TC requirements and how their fishermen acquire the requirements could be at the discretion of the fishery coordinator. Additionally, Paqtnekek would need to ensure that the food they catch (particularly shellfish which can accumulate toxins present in their environment) is healthy to eat (through EC water quality monitoring). If Paqtnekek decides to sell their fish in a facility, it would need to pass health standards set by the CFIA. Therefore EC, TC and CFIA influence the process and sale of the fish.

4.4.3. Processes

Currently, there are no institutional processes in place by the Mi'kmaq Nation, federal government or provincial government to develop a livelihood fishery. The absence of a process to develop a livelihood fishery is not a surprise. Livelihood fishing,

albeit has been occurring for many years in the Mi'kmaq community, has just recently come to the forefront as a viable economic opportunity as a result of the Marshall Decision. Therefore it is reasonable to expect that the Paqtnekek Mi'kmaw community would not have processes in place for developing a livelihood fishery. On the other hand, if DFO truly wanted to adhere to the Marshall Decision then DFO should work alongside the Mi'kmaq Nation and the Maliseet Nation to assist them in the development of a livelihood fishery so they can earn a moderate livelihood. Instead, DFO developed the Marshall Response Initiative designed to integrate Mi'kmaq communities into the DFO system.

4.5. Chapter summary

The challenges and opportunities identified in the sustainable livelihood framework (figure 4.3) are addressed in the recommendations for the livelihood fishery management plan (chapter 5). The fishery management plan will mitigate challenges and enhance opportunities that the Paqtnekek Mi'kmaw community may encounter in the development of their livelihood fishery.

Livelihood Fishery Management Plan Components		Challenges and Opportunities Identified from the Sustainable Livelihood Framework																		
		Challenges							Opportunities											
Fishery Resources	Species fished	Fish decline	Fishery collapse	Reactive fishery	Closure	Politics	Confrontation between fishermen	Seasonal employment	No current process to develop livelihood fishing	Limited DFO involvement	Fisheries Act	Indian Act	Sustainable seafood	International recognition of Aboriginal rights	Increase in ocean temperature	Politics	Fishing market development	Support from AANDC	Section 35 of Constitution Act	
	Fishing season																			
	Fishing equipment																			
	Habitat restoration and species conservation																			
	Fishery goals																			
	Strategy to achieve fishery goals																			
	Economic assessment																			
	Fishery governance																			
	Administrative system																			
	Fishery monitoring																			
Operational and Administrative	Communication and consultation																			
	Integrate with coastal and fisheries policy and Social, cultural and economic strategies																			
	Access to the fishery																			
	Catch regulations																			
Fishery Regulations	Manage fishing pressure																			
	Fishery resource allocation																			

Figure 4.3: Opportunities and challenges that impact the livelihood fishery management plan components.

CHAPTER 5: Recommendations

The fishery management plan components (section 3.4) form the outline for the recommendations which incorporate the Paqtnkek community assets and either mitigate challenges or enhance opportunities identified in the Sustainable Livelihood Framework analysis (section 4.5).

5.1. Fishery Resources

To ensure that the fishery is around for future generation's sufficient management plans must be put in place. Management plans include a description of what species are fished, when and how the species is fished and how much of the fish can be caught. The management plan should include habitat restoration and species conservation plans to support the rehabilitation of the environment and species.

5.1.1. Species fished

To mitigate the effects of decreasing fish populations and to limit the possibility of a fishery collapse, the Paqtnkek livelihood fishery should be a multi-species fishery. The fish species selected will need to be decided upon consultation with the Paqtnkek Mi'kmaw community. However, it is suggested that the fishery contain three species that can fulfill the three categories: an established fishery, a marine plant fishery, and a developing fishery in Canada with an established international market. This format will allow the multispecies livelihood fishery to have access to an established Canadian fish market while either developing or branching into international markets. One aspect of a multi-species fishery is that the fishery requires different types of fishing gear to fish the various species. Therefore it is suggested that the fishing methods for the species are currently used by Paqtnkek fishermen or have a low cost to acquire the equipment.

Recommended species for the Paqtnkek multispecies livelihood fishery include lobster, herring, Irish moss (*Chondrus crispus*) and the green crab (*Carcinides maenas*). There are established lobster and herring fisheries in Canada, and the lobster fishery in LFA 26A is predicted to increase as a result of an increase in ocean temperature. Meanwhile, Irish moss plant growth is cyclical and currently the Gulf of St. Lawrence Irish moss industry has declined since the early 1990s (Morry and Sharp, 2005). Currently there is no Canadian commercial fishery for the green crab, however a study conducted found that a relatively high yield of green crab meat (50%) is possible and it is economically viable to process green crab (Galetti, 2010). An analysis of the green crab abundance in eastern Nova Scotia and the Bras d'Or Lakes found that between the years 2000-2005 the relative abundance decreased a little or did not change (Tremblay, Thompson and Paul, 2006). Europe has a commercial fishery for green crab and has a stable market for the product.

The development of a multispecies livelihood fishery with different fishing seasons for each species will decrease the length of unemployment for Paqtnkek fishermen. Additionally, jobs developed as a result of the fishery (fishing gear construction, fish processing, etc.) can extend into the fishing offseason and decrease unemployment.

5.1.2. Fishing season

The fishing season duration for the species in the livelihood fishery should be determined by three main factors: accessibility of the species, market demand for the species and conservation issues. However many fishery management plans may just incorporate species accessibility and conservation concerns into determining the fishing season. It is encouraged that Paqtnkek Mi'kmaw Nation exercises its right affirmed by

the *Constitution Act* and the Marshall Decision to fish outside of the DFO sanctioned fishing seasons. This may increase the length of employment and reduce the impacts of seasonal employment. Additionally, in creating its own fishing seasons, the management plan could incorporate benefits of global warming, such as a potential increase in lobster populations in LFA 26A. Finally, by harvesting fish in the ‘offseason’, the catch could generate a higher profit. This would require less fish to be caught to make the same profit as fishing in the ‘in season’.

5.1.3. Fishing equipment

The type of fishing equipment used for the multispecies livelihood fishery will vary according to the species being fished. As the species that will be included in the fishery are unknown, general recommendations about the type of fishing equipment is provided. Livelihood fishing (section one) consist of using fishing technology that is selective and oftentimes requires more human effort compared to accumulation fisheries. The Paqtnekek livelihood fishery fishing equipment should adhere to this recommendation. This will ensure that Paqtnekek Mi'kmaw Nation does not need to invest a large amount of money to begin fishing. In turn using selective fishing equipment will limit the impact of the fishery on non-target fish species (bycatch). Additionally, by using more sustainable fishing equipment, the livelihood fishery could look into attaining sustainable seafood certification. Fishery certification would provide access to new markets which may increase the price received for the catch.

5.1.4. Habitat restoration and species conservation

It is imperative that both the habitat of the target species and their prey in the fishery should be protected and restored (if applicable). Both proactive (protective habitat management) and reactive (habitat restoration) options should be explored to conserve

the fishing habitat from the impacts of fishing methods (Turner et al., 2001). For a species habitat to be effectively conserved or restored attention needs to be focused on identification of the species habitat and essential habitat (Miller and Hobbs, 2007). Essential habitat includes the area that species use to spawn, breed, feed or grow to maturity. These actions may facilitate the recovery of some commercial species and prevent the decline of species in the Paqtnkek livelihood fishery.

5.2. Operational and Administrative

A company or committee is often responsible to ensure that the management plan is relevant and in compliance with fishery goals. This can be accomplished through a proper governance system to manage the fishery and an administrative system that monitors the fishery. Decisions which impact the fishery should be made with the best available biological, social, economic and environmental knowledge and include extensive community consultation. Finally, the Paqtnkek livelihood fishery management plan can be integrated within larger management plans to ensure that the management plans are harmonious and do not conflict.

5.2.1. Fishery goals

The Paqtnkek community identified their own goal for the community livelihood fishery in the interviews. The goals are community oriented and do not mention accumulating wealth, even though 'income generation' was an option for a livelihood fishery goal provided to the interview participants. Job development was selected as a goal, but it was after goals surround a sustainable fishery and education. The goals identified by the Paqtnkek community members are:

1. Sustainable fishery that is around for generations
2. Raise awareness about First Nations rights
3. Create jobs within the community
4. Have a positive impact on the community
5. Provide the opportunity for leadership within the community

In general, goals identified by the Paqtnekek community adhere to the general concept of livelihood fishing: a socially oriented and sustainable fishery. These goals, if achieved should prevent the collapse of a fish stock as the number one goal is a sustainable fishery. As well the opportunity and severity of confrontation between fishermen should be limited or decreased through education about First Nations rights.

5.2.2. Strategy to achieve fishery goals

Throughout the livelihood fishery development process, the fishery coordinator should routinely refer back to the fishery goals and make that the fishery management plan reflects the fishery goals. The fishery goals should be refined to provide quantifiable goals that can direct fishery development. The goals and strategies must be developed with participation from the Paqtnekek Mi'kmaw Nation community.

5.2.3. Economic assessment

The majority of First Nation communities across Canada receive some form of economic assistance, often referred to as contributions. These contributions primarily come from programs from Canadian government departments (Aboriginal Affairs and Northern Development Canada, Fisheries and Oceans Canada, etc.). Contributions can be sought to assist in the development of a business to manage the livelihood fishery. Paqtnekek currently owns boats and fishing gear, so the initial investment would be in a business to manage the fishery. Therefore to limit the initial investment cost for the livelihood fishery, the species fished and fishing gear should already be fished by

Paqtnekek fishermen. A small portion of funds could be set aside for the expansion of the fishery into different species.

5.2.4. Fishery governance

The concept of governance has been discussed in depth by a number of international organizations including the World Bank (1991), the United Nations through the United Nations Development Programme (UNDP, 2011), and the Fisheries and Agriculture Organization (FAO) (Cochrane, 2002). Governance can be thought of as the legal, social, economic and political arrangements through the establishment of institutions, policies and processes to manage fisheries. In fact, the lacklustre state of fisheries in the world is often due to the failure of fishery governance (Cochrane, 2002). Therefore it is imperative that the development of the livelihood fishery governance structure takes into account the failures and success of other governance systems. One of the main issues with governance is the absence of communication between people or departments, also known as the ‘silo effect’. The governance structure for the Paqtnekek livelihood fishery should include individuals from the Mi’kmaq Grand Council, Paqtnekek Mi’kmaw Nation Band council, Fisheries and Oceans Canada, the private sector and the Paqtnekek community. In addition, the structure should be flexible to respond to changes in the natural, political, economic and social environments.

5.2.5. Administrative system

Effective fishery governance is more likely to occur under the management of a well structured and comprehensive administrative system. The administrative system can be developed with contributions from Aboriginal Affairs and Northern Development Canada through one of its programs supporting Aboriginal business development. The company created to manage the fishery is responsible for developing an administrative

system to record the fishing activity, environmental conditions, Paqtnkek community requirements and the fishery operating costs. A detailed list of fishery data requirements can be found in Cochrane (2002).

5.2.6. Fishery monitoring

The governance and administrative system should include processes to monitor the fishery. This monitoring would include, but is not limited to, the fishing effort (the number of fishermen, the type of boat and gear used), the fishery output (type and quantity of species caught) and the cost of running the fishery. Efficient fishery monitoring would decrease the possibility of a fishery collapse as the fishery manager would have the required information to make an informed decision. Monitoring the fishery would provide jobs for community members and build capacity within the community.

5.2.7 Communication and consultation

Fisheries management often lacks communication within the organization and with stakeholders. The 'silo effect' is synonymous with fisheries management in which people within the same organization or between organizations do not communicate with individuals outside of their 'speciality'. For example, individuals who determine how what quantity of fish to catch may not talk with the economist that is involved with the price that the fishermen receive for the catch. Communication with Paqtnkek fishermen about how the fishery is run is important so that when changes to the fishery occur, the fishermen will be able to understand the reason for the change. Communication with individuals external to the Paqtnkek livelihood fishery allows the opportunity for education about livelihood fishing and the Mi'kmaq Nation rights. Also, communication may decrease the likelihood of confrontation between Paqtnkek and non-Paqtnkek

fishermen. Finally, the DFO should be consulted in the development process to prevent the connotation of a ‘sneak attack’ livelihood fishery. Working with instead of against the DFO, in developing the livelihood fishery it would provide the opportunity for collaborative discussions. This positive rapport could be transferred to other areas and the two sides could begin to work together to manage fisheries.

5.2.8. Integrate plan with coastal zone and fisheries policy and planning

Integrated coastal zone management is advocated at all levels of governance as a means to deliver sustainable development in coastal areas (O’Hagan and Ballinger, 2010). Nova Scotia is currently in the process of developing its integrated coastal zone management strategy through the Provincial Oceans Network (NS, 2009). The DFO also has established five Large Ocean Management Areas (LOMAs) to advance “collaborative management amongst all levels of government, Aboriginal groups, industry organizations, environmental and community groups and academia” (DFO, 2011). The Paqtnkek livelihood fishery (if established where Paqtnkek Mi’kmaw Nation is located) would occur within the Gulf of St. Lawrence LOMA which does not have a management plan established (DFO, 2011). The fishery coordinator of the Paqtnkek livelihood fishery should become involved in the development of the Gulf of St. Lawrence LOMA and other integrated management plans relevant to the livelihood fishery.

5.2.9. Social, cultural and economic strategies

The strategies to achieve the fishery goals include social, cultural and economic components. The social and cultural strategies will need to be developed with input from the Paqtnkek community. These strategies could include incorporating their cultural knowledge into the fishery and reduce seasonal employment through the developing jobs external to the fishery (fishery equipment repair, seafood pounds, market development).

The economic component of the fishery is extremely important as it could change fisheries management from a mass production of fish that saturate the market and yield little economic return to a moderate supply of fish to the global market while yielding a higher economic return. This strategy would improve the fish stock health as less fish are caught it will allow fishermen to fish less while making the same profit.

5.3. Fishery Regulations

Fisheries management uses regulations to ensure a safe and sustainable fishery.

These regulations include requirements on who can fish and how much fish they can fish, and mitigation measures to decrease the impact of fishing on the ecosystem.

5.3.1. Access to the fishery

It is generally accepted that open access fisheries are biologically, economically and socially damaging and that fishermen should meet certain requirements to access the fishery (Cochrane, 2002). The *Constitution Act, 1982*, in conjunction with the Marshall Decision affirmed that the Mi'kmaq Nation has the right to access the commercial fishery for a moderate livelihood. Therefore it is recommended that access rights be applied to the livelihood fishery. Access to the fishery can be limited to members of the Paqtnkek community or access can be opened to the non-native community. The type of access rights should be decided upon with input from the Paqtnkek community.

5.3.2. Fishery catch regulations

Once access to the fishery is determined, those rights are distributed through either input (fishing effort) and output (quantity of fish caught) controls to regulate the fishery. The input and output controls are normally set on the basis of one of three basic harvesting strategies: constant catch; constant proportion or constant harvest rate; and constant escapement. A constant catch strategy results in no change in catch from year to

year, and the fishery manager must set the catch low enough to apply in bad years as well as in good years. In a constant proportion strategy, the fishing effort remains constant over the years which results in uncertainty about future catches for the fishermen. A constant escapement strategy ensures that a constant biomass, sufficient to maintain recruitment is left at the end of every fishing season. This strategy requires the most involvement from the fishery manager to determine how much fish are left in the ocean while accounting for environmental variability. It is recommended that the Paqtneke livelihood fishery employs a constant catch strategy as this strategy allows for environmental and fish stock variability while maintaining a constant catch (therefore income) for fishermen. The combination of a closed fishery in which access must be attained with a harvest strategy that incorporates biological and environmental variability may provide the opportunity for a sustainable livelihood fishery.

5.3.3. Management of fishing pressures and human disturbance to the ecosystem

Managing fishing pressures and the extent of human disturbance from fishing to the ecosystem is important for a sustainable fishery. Fishing pressure is the amount of fishing effort exerted on the fishery. A fishery may have excess fishing pressure if the fishery is yielding less than its maximum potential production. However it is important that a fishery does not have more fishing pressure than it can sustain. Excess fishing pressure may cause the fishery to become unsustainable which can lead to fishery closures. To effectively manage fishing pressure, scientific knowledge systems must be combined with aboriginal knowledge systems to provide the most comprehensive knowledge available. This in turn, may lead to a sustainable livelihood fishery.

5.3.4. Allocation of fishery resources

The goal of livelihood fishing (section 2.1) is for fishermen to provide for themselves and their community. Therefore there should be a consultation with community members on what method the livelihood fishery should use to distribute fish and other resources to the community. This distribution method could consist of a certain allocation of fish per household, through monetary reimbursements from the profit generated from the fishery, or for projects built for the community.

CHAPTER 6: Moving Forward

Livelihood fishing uses selective harvest techniques which provide the opportunity for a sustainable fishery. In 1999, the Mi'kmaq Nation, after years of being viewed as 'wards of the state', had their right to collect a moderate income from fishing affirmed (R v. Marshall, 1999). Paqtnkek Mi'kmaw Nation is interested in developing a livelihood fishery so that its community members can receive a moderate income from fishing.

Paqtnkek community members identified the importance of having a sustainable fishery and increasing the awareness of First Nation rights as goals for their livelihood fishery. The general decline in fish populations provides the most important challenge to developing a livelihood fishery. Ensuring that the fishery relies on multiple species that are currently not overfished can decrease the reliance on a single species. The fishermen could then catch a small quantity of fish, but catch different species. To develop an efficient and sustainable livelihood fishery, a fishing committee should be established within the community. The livelihood fishing committee and management organization should keep in contact with the federal and provincial governments and the residents that live near the Paqtnkek community. Currently, neither Canada nor Paqtnkek Mi'kmaw Nation has regulations or legislations for livelihood fishing. Canada and Paqtnkek Mi'kmaw Nation have institutions (Fisheries and Oceans Canada and Paqtnkek Fisheries Enterprise) that can assist in the development of required regulations and legislations to have a sustainable livelihood fishery.

Analysis of the Sustainable Livelihood Framework (fig. 4.3) lists the challenges and opportunities that Paqtnkek Mi'kmaw Nation may incur in the development of the livelihood fishery. All of the identified challenges were mitigated and opportunities

enhanced in the fishery management plan components (chapter VI). However, it is uncertain if Paqtnkek Mi'kmaw Nation has the financial capacity to develop and run a livelihood fishery. Nonetheless, Paqtnkek Mi'kmaw Nation currently owns five boats, has the fishing gear for lobster, snow crab and herring and the community has local fishing knowledge. A financial budget which includes development and operating costs should be completed to determine if Paqtnkek Mi'kmaw Nation has the financial capacity to develop and run the livelihood fishery. Also, Paqtnkek Fisheries Enterprise currently manages Paqtnkek's commercial fishing operation which can be expanded to include the livelihood fishery.

Opportunities and benefits that the Paqtnkek community may experience in developing and running the livelihood fishery may range from individuals becoming self sufficient to encouraging community engagement. Benefits received from the livelihood fishery can expand into Mi'kmaq, Aboriginal and non-Aboriginal communities. Expanding the livelihood fishery would include additional Mi'kmaq and Maliseet communities across Atlantic Canada. This experience would promote self sufficiency and skills learned from the livelihood fishery can be transferred to other industries. Aboriginal communities across Canada and the world could use Paqtnkek developing their livelihood fishery as a guide to develop their own businesses (fisheries, logging, tourism and mineral extraction). Finally, non-Aboriginal communities will benefit from the educational opportunities about Aboriginal rights and livelihood fishing when the livelihood fishery is developed.

It is recommended that Paqtnkek Mi'kmaw Nation proceed with developing their livelihood fishery as the opportunities outweigh the challenges the Paqtnkek community

may incur while developing their livelihood fishery. This is the first project to assess the feasibility of developing a Mi'kmaq livelihood fishery in Canada. Being a pilot project, there are limitations to the project scope, design and results. The problem assessed is complex in its nature and the project was designed to provide a variety of information relevant to the livelihood fishery management. Typically, a fisheries committee takes several years to develop a fishery management plan. Therefore, the recommendations provide a platform for further research that would need to be conducted to assist in the development of a fishery management plan.

In addition to being the first project to assess livelihood fishing in the Mi'kmaq community, this is the first time the Sustainable Livelihood Approach (SLA) was used in Canada for fisheries management. The SLA was originally developed to assist developing countries in understanding the capability of rural communities to cope with crisis. Despite its origins, the Sustainable Livelihood Framework (SLF) is designed to understand how access to community assets are enabled or hindered by policies, institutions and external factors. Thus, the SLF is applicable in any context, despite being primarily used in developing countries. To ensure that the recommendations are relevant for the Paqtnkek community, the community identified their goals for the livelihood fishery. This demonstrates that the SLF will provide proper guidance regardless of the context it is used in. Recently, the SLF was used to better understand the role and function of the inshore fisheries sector in the wider coastal economy in northern Europe (Allison, 2004).

Livelihood fishing, despite being widely used in developing countries, can be used in developed countries as well. The Paqtnkek livelihood fishery can demonstrate

that livelihood fishing in Canada can be sustainable and profitable, and support fishermen and their community. Perhaps, when governments observe a livelihood fishery operating sustainably and generating a profit, they may consider changing their accumulation fishery to a livelihood fishery.

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Appendix A: FAO suggested fundamental principles for a fishery management plan

Principle		Management function
1	<ul style="list-style-type: none"> Fish stocks and communities are finite and biological production constrains the potential yield from a fishery 	<ul style="list-style-type: none"> Estimate potential yield Identify biological constraints
2	<ul style="list-style-type: none"> Biological production of a stock is a function of the size of the stock and it is also a function of the ecological environment. 	<ul style="list-style-type: none"> Collect data and fisheries assessment to set reference points Identify and monitor environmental impacts. Adjust the management strategy as necessary
3	<ul style="list-style-type: none"> Human consumptive demands on fish resources are fundamentally in conflict with the constraint of maintaining a low risk to the resource 	<ul style="list-style-type: none"> Set realistic goals and objectives Set controls on fishing effort and capacity
4	<ul style="list-style-type: none"> In a multispecies fishery it is impossible to maximise the yield from all fisheries simultaneously 	<ul style="list-style-type: none"> Establish realistic goals and objectives across ecosystems
5	<ul style="list-style-type: none"> Uncertainty pervades fisheries management and hinders informed decision-making 	<ul style="list-style-type: none"> Risk assessment and management must be done in development and implementation of management plans, measures and strategies
6	<ul style="list-style-type: none"> Short-term dependency of society on a fishery will determine the relative priority of the social and/or economic goals in relation to sustainable utilisation 	<ul style="list-style-type: none"> Integrate fishery management into coastal zone and fisheries policy and planning and national policies
7	<ul style="list-style-type: none"> Sense of ownership and a long-term stake in the resource for those with access are most conducive to maintaining responsible fisheries 	<ul style="list-style-type: none"> Appropriate access rights must be established and enforced
8	<ul style="list-style-type: none"> Genuine participation in the management process by fully-informed users 	<ul style="list-style-type: none"> Communication, consultation and co-management

Appendix B: Interview Questions

1) Goals of the Fishery

1.1) Please rate the following in accordance with what you consider to be the goals of the multispecies livelihood fishery? (0= not important, 10=important)

- a) build capacity in the community
- b) create/foster relationships (personal and work) within the Band
- c) create/foster relationships (personal and work) between Bands
- d) create/foster relationships (personal and work) outside the community
- e) food security
- f) habitat restoration
- g) create jobs
- h) positive impact on the community
- i) provide leadership within the community
- j) raise awareness about First Nation Rights
- k) revenue generated
- l) social connection of the fishery with the community
- m) sustainable fishery
- n) traditional fishing methods are incorporated within the fishery

1.2) please list goals not listed which you think should be included in the multispecies livelihood fishery.

2) Skills and Knowledge

2.1) what do you consider to be the important skills needed for a multispecies livelihood fishery? Does the Paq'tnkek First Nation have these skills?
(for example: fishing techniques and methods)

2.2) what do you consider to be the important knowledge needed for a multispecies livelihood fishery? Does the Paq'tnkek First Nation have this knowledge?
(for example: knowledge of species habitat, species migration patterns)

3) Training and Infrastructure

3.1) what training is needed to have a safe multispecies livelihood fishery?
Please rate each type of training on a scale of 0 (not needed) to 10 (needed)

- a) To drive the boat:
- b) To operate fishing equipment on the boat:
- c) To process the catch:
- d) CPR:

3.2) what training do you think the community would need, but does not currently receive or have access to?

3.3) please rate the following infrastructure on its level of importance to a multispecies livelihood fishery

Please rate each type of infrastructure on a scale of 0 (not needed) to 10 (needed)

a) harbour:

b) boats:

c) fishing equipment:

d) cars or trucks to move catch from the harbour:

e) facility to sell or process catch:

3.4) what infrastructure does the community not have that you think it should have for a safe multispecies fishery?

4) **Benefits of the Fishery**

4.1) what do you think will be the benefits of the fishery?

4.2) what do you want to be the benefits of the fishery?

4.3) is it important to share the benefits of a multispecies livelihood fishery? If so, what mechanisms would need to be put in place to share the benefits of the multispecies livelihood fishery?

5) **Fishery Requirements**

5.1) what entrance requirements should be applied for access to the multispecies livelihood fishery?

5.2) should the fishery have an input (effort based) or output (total allowable catch) regulated system?

6) **Fishery Governance**

6.1) who should manage the bands multispecies livelihood fishery?

6.2) does the band have the ability to manage the multispecies livelihood fishery?

6.3) do the institutions or organizations exist that could assist in managing the bands multispecies livelihood fishery? If so, what are the institutions or organizations? If not, what type of organization do you think is needed?

7) **Networks and Relationships**

7.1) what networks and relationships exist within the Band that would enable the development of a multispecies livelihood fishery?

7.2) what networks and relationships exist between Bands that would enable the development of a multispecies livelihood fishery?

7.3) what networks and relationships exist outside the Band that would enable the development of a multispecies livelihood fishery?

7.4) are there any networks or relationships that are currently not established that you think would enable the development of a multispecies livelihood fishery?

Appendix C: Emergence of skill and technological concepts from the interviews

Id	Key Point	Code	Concept
A1	Find where the fish are	Fish location	Fishing skills
B1	Know where you come from	History	History
C1	Traditional techniques need to be passed down	Traditional fishing techniques	Traditional fishing
C2	Skill that fishermen have to know the fishing grounds	Area knowledge	Fishing skills
D1	Safety	Safety	Safety skills
D2	Fishing	Fishing	Fishing skills
E1	Good management	Management	Management skills
E2	Skilled fishermen	Fishing	Fishing skills
E3	Combine traditional fishing techniques with modern techniques	Traditional fishing techniques Modern techniques	Traditional fishing skills Fishing skills
F1	Safety on the boat	Boat safety	Safety skills
F2	Know your fishing equipment	Fishing equipment	Fishing skills
H1	Hands on learning	Experience	Experience
I1	General knowledge in the fishery	Fishery knowledge	Fishing skills
I2	Understanding	Understanding	Understanding
K1	Leadership skills	Leadership	Leadership skills
K2	Fishing skills	Fishing skills	Fishing skills
K3	Navigation skills	Technology skills	Technology skills
R1	Training	Training	Training skills
S1	Method of fishing	Fishing technology	Technology skills
S2	Fishing location	Fish location	Fishing skills
L-Q1	Operate the fishing equipment	Technology skills	Technology skills
L-Q2	Where to fish	Fish location	Fishing skills
L-Q3	Ability to work the GPS	Technology skills	Technology skills

Appendix D: Knowledge concepts from the interviews

Id	Key Point	Code	Concept
A1	Fishery statistics to keep track of progress	Fishery statistics	Fishery knowledge
A2	Knowledge is starting to grow	Knowledge growth	Increase knowledge *
B1	Knowledge of culture	Culture	Culture
B2	Understand how we are connected as an indigenous group of people	Connection Indigenous	Culture
B3	Understand cost of running a fishery	Fishery cost	Business knowledge
B4	Know and understand the technology	Technology	Fishery knowledge
B5	Being able to develop a sustainable fishery	Sustainable	Sustainable
C1	Traditional and modern knowledge	Traditional and modern	Culture Fishery knowledge
C2	Mentor programs	Mentor programs	Mentor programs
D1	Knowledge about seasons, habitats, local practices from other fishermen	Seasons Habitats Local practices	Fishery knowledge
D2	Safe operation of boats	Boat operations	Safety knowledge
D3	We're still learning	Still learning	Increase knowledge *
E1	Know how our ancestors fished and apply the knowledge now	Ancestors fished Application of knowledge	Culture Fishery knowledge
F1	Know where your fishing from and territory	Fishing practice	Fishery knowledge
G1	Conservation	Conservation	Conservation
H1	Water navigation	Navigation	Fishery knowledge
H2	Grandfathering is just as good	Mentor programs	Mentor program
I1	Knowledge of procedures to catch a fish	Fishing procedures	Fishery knowledge
I2	Financial motive between commercial to livelihood	Financial costs	Business knowledge
I3	With knowledge becomes years of experience in the fishery	Experience	Mentor program
K1	Traditional knowledge	Traditional knowledge	Culture
K2	Economy knowledge	Financial knowledge	Business knowledge
K3	Leadership knowledge	Leadership knowledge	Mentor program

Id	Key Point	Code	Concept
K4	Basic fishery knowledge	Fishery knowledge	Fishery knowledge
R1	Showing them how to fish	Display how to fish	Fishery knowledge
S1	Fishing techniques	Fishing techniques	Fishery knowledge
L-Q1	Bait for fish	Fishery knowledge	Fishery knowledge
L-Q2	Know how to drive a boat	Boat operation	Safety knowledge