

Incorporating Concerns of Coastal Communities in Planning and Management: The Case Study
of Port Joli and Lessons Learned from the Eastport Marine Protected Areas

By

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Dedications

*Whether you turn to the right or to the left, your ears will hear a voice behind you, saying,
"This is the way; walk in it." (Isaiah 30:21)*

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Abstract

Marine environment and resources are experiencing the degradation in Canada. Since *Oceans Act* was established in 1996, the Fisheries and Oceans Canada (DFO) has tried to engage a broader view of participatory governance. However, the evolution of engaging community has taken a long process to improve. This project examined the willingness to collaborate with federal governmental agencies (e.g. DFO, Park Canada, Environment Canada) in the Port Joli community, Nova Scotia (N.S.), and shared lessons learned from two Eastport Marine Protected Areas (MPAs), Newfoundland (N.L.). Data was conducted using the survey distributed to households in the Port Joli area, and interviews were used to collect experiences of the Eastport MPAs management team. The findings from this study indicated that the Port Joli community had major concerns in the decline of fish stocks, aquaculture development, and decreasing water quality. The community agreed that management approach such as community engagement, and tools, citizen science and MPAs, are important to be applied to address these issues. However, some challenges the respondents faced are the limited attempt by governmental agencies to address these concerns and their ability to provide long-term support for community-based initiatives. Based on the lessons learned from the Eastport MPA management process, respect local knowledge, information sharing and coordinator liaison are encouraged to be involved from the government's perspectives. On the other hand, the Port Joli community is recommended to engage in capacity build and public awareness. Overall, participatory governance is based on a trust relationship between governmental agencies and communities, and the community engagement is a recognized approach to address marine and coastal concerns.

Keywords: Port Joli, Eastport, Community engagement, Citizen science, Marine Protected Area

List of Acronyms

AOI	Areas of Interest
CAFSAC	Canadian Atlantic Fisheries Scientific Advisory Committee
CB-CRM	Community-based coastal resource management
CBM	Community-based management
Co-management	Collaborative management
CPAWS-NS	N. S. chapter of Canadian Parks and Wilderness Society
DFO	Fisheries and Oceans Canada
EBSA	Ecologically and Biologically Significant Area
eNGO	Environmental Non-Governmental Organization
EPLMA	Eastport Peninsula Lobster Management Areas
EPLPC	Eastport Peninsula Lobster Committee
FPMB	Friends of Port Mouton Bay
FRCC	Fisheries Resource Conservation Council
IUCN	International Union for Conservation of Nature
LEK	Local ecological knowledge
MPA	Marine Protected Area
MUN	Memorial University of Newfoundland
N. L.	Newfoundland and Labrador
N. S.	Nova Scotia
NGOs	Non-Governmental Organizations
TNNP	Terra Nova National Park
UNEP	United Nations Environment Programme

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Chapter 1.0 Introduction

The different levels of government in Canada have faced challenges managing the diverse range of human uses in coastal areas. For example, resources which communities rely on for their social, cultural, and economic well-being are subject to a mix of jurisdictions—municipal, provincial and federal, as well as First Nations. Coastal communities confront issues occurring at the interface where land meets the sea. Issues such as declining resources, erosion, flooding, marine pollution from land-based sources, sensitive intertidal habitats, and public coastal access have immediate impacts on their livelihoods. In addition, coastal communities and marine resource harvester who are users in the “frontline”, facing environmental and socioeconomic changes, are relatively sensitive and vulnerable of any changes. These communities are highly complex and vulnerable, formed by the interdependency of people who live in a close geographical area which contributes to developing their identity, sense of meaning, values and economic well-being (Kearney, Berkes, Charles, Pinkerton & Wiber, 2007).

Historically, in Atlantic Canada, groundfish dominated the landing quantities as the prominent commercial species harvested. However, by the 1980s, shellfish fisheries have constituted more than half the landed value (Parson, 1993). Since the Northern Cod fishery was placed under moratoria by 1992, there has been significant debate about the reasons for the collapse. Some argued that overfishing was the primary reason for stock collapse, while others have suggested that the collapse was caused by a combination of overfishing and detrimental environmental conditions that reduced the stock’s productivity. For example, harsh environmental conditions provided evidence that ocean climate conditions and water temperatures played an important role in the decline of cod. Additionally, not only the cod, other groundfish stocks and various shellfish species also experienced negative effects due to the influences of climate change (Parson, 1993).

The federal government therefore has started to search for solutions for the decreasing fishing industries and looked to Fisheries and Oceans Canada (DFO) to play a key role in addressing this problem. Under the *Constitution Act* established in 1867, federal jurisdiction encompasses all Canadian waters, both marine and inland. The federal government is given the authority to regulate the conservation and preservation of fisheries resources, which includes fishing gear type, limits on the amount of catch, seasonal closures, and the species and size of

fish that may be caught (Department of Justice Canada, 1867). The Minister of Fisheries and Oceans has certain responsibilities under the *Fisheries Act* (Department of Justice Canada, 1985), *Oceans Act* (Department of Justice Canada, 1996) and *Species at Risk Act* (2002). These include the power to regulate access to the resource, to license, and to impose conditions on harvesting and the enforcement of regulations.

In 1993, the federal government established a new body, the Fisheries Resource Conservation Council (FRCC), to provide independent and public advice on Atlantic fisheries conservation matters to the Minister. Initially, the FRCC was restricted to conservation, focusing on groundfish and was represented from the fishing industry or academe background, as well as provincial delegates and federal fisheries officials as *ex-officio* members. On the other hand, the federal Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC) was dissolved and replaced by a local-level regional advisory process in each DFO region. This approach provided for greater involvement in the stock assessment process by fishing industry participants and contributions from interested academics (Parson, 1993).

1.1 Management problem

The coastal fisheries support over 550 coastal communities across the Maritimes region- the province of Nova Scotia (N.S.), New Brunswick, and Prince Edward Island on the Canada's Atlantic coast. The major fishing industries include groundfish, shellfish and pelagic fisheries, and many other economic activities which depend on fisheries, such as boat-building, tourism, and aquaculture, supporting the livelihood of the coastal communities. However, the centralized power of the federal government excluded fishermen from taking part in management decisions, which in turn led to limited compliance and acceptance of regulations by fishing communities. As such a situation was created, whereby enforcement efforts were unable to prevent overfishing and/or improve conservation (Charles, Bull, Kearney & Milley, 2007). As these dysfunctional situations continued, DFO eventually recognized that marine and coastal management cannot operate well without local engagement. DFO then moved towards a consultative management approach by discussing management measures with fishing communities before the implementation. However, many communities felt that by attending consultations did not equate to decision-making power, and consequently government-driven regulations did not receive broad acceptance (Charles et al., 2007).

Community engagement is more than consultation. It implies the creation of appropriate institutions where stakeholders and different levels of government agencies work together to develop and enforce regulations (Charles et al., 2007). Today, several cases of community-driven initiatives have empowered local communities through decision-making participation. For example, the Fundy Fixed Gear Council (Kearney, 2003) and Atlantic Coastal Action Program (Ellsworth, Hildebrand & Glover, 1997) are quite successful programs that bring coastal communities to fisheries and conservation management. These programs provide opportunities to share communities' local knowledge and empower all stakeholders to be involved in the planning process and make decisions on their own.

Yet these initiatives are the minority. A number of marine and coastal management plans lack involvement from local communities and so do not have adequate partnership with DFO. From a governance perspective, there is little flexibility available to balance existing jurisdictional structures or to allow communities to have their own power of control (Kearney et al., 2007). In addition, the level of financial and human efforts required to meaningfully engage communities makes it difficult for a partner like DFO to develop innovative approaches that move beyond regular operational activities. While communities are looking for more engagement with DFO, some activities such as scientific assessments and follow-up monitoring are long-term commitments that they expect to be undertaken by governmental agencies. Overall, local communities not only want to be informed, but also expect to be more involved in the management process and as such, be empowered by building partnerships with DFO.

The objective of participatory governance is to achieve changes through actions that are more effective and equitable than normally possible through representative government and bureaucratic administration. Through this approach, government bodies invite citizens to be involved in a deep and sustained participation in decision making (Kearney et al., 2007). Within the context of marine and coastal governance, fishing communities are key elements involved in the management process and collaborating with the federal government, such as DFO and other related departments.

Since the Oceans Act was established, the federal government has introduced new concepts and management approaches, to try and include a broader view of participation. However, the evolution of community engagement in the marine and coastal management has taken a long time to improve. The implementation of the Oceans Act has resulted in some steps toward

participatory governance, but it has not adequately provided the mechanisms for a strong role for community integration (Kearney et al., 2007).

Using a case-study approach, this research seeks to identify the challenges and benefits of community engagement in participatory governance, with the intent of sharing lessons on how coastal communities in Atlantic Canada can maximize these benefits and overcome the challenges. It does so by first, identifying a coastal community with considerable experience in participatory governance (Eastport, Newfoundland and Labrador) and one at the early stages of engagement in this process (Port Joli, Nova Scotia); and secondly, by conducting research at both locations to determine how lessons learned from the first site could inform community engagement at the second site.

There are seven fishing communities distributed along the Eastport Peninsula of Bonavista Bay., The central town is Eastport, and in 2011 had a population of 482 (Statistics Canada, 2011). Fishing is the major economic activity in Newfoundland, and fishermen have a strong sense of union based on the patriarchy system embedded in their fishing history (Neis, 1999). In contrast, Port Joli is a small-scale fishing community with only 60 households (Canada Post, 2012) located in southwest Nova Scotia where has shared leadership within different groups and neighbouring communities (Kearney, 1989). The cultural difference makes the lessons learned from the Eastport Marine Protected Areas (MPAs) may not be able to comprehensively transfer to the Port Joli community. However, in the same context of Canada's Atlantic fisheries, these two sites have similarities relating to fishing activities and development. Therefore the purpose of this research is to compile experiences from the Eastport MPA management team, and determined how these lessons can be transferred to the Port Joli area and vice-versa.

1.2 Background on the study sites

This project focuses on the Port Joli area which has an established bird sanctuary and the potential to form an MPA due to the area's ecological and biological significance (Gromack, Allard, Fenton, Johnston & Ford, 2010). On the other hand, the Eastport communities have gone through the process of building a partnership with DFO and are involved in the management of two MPAs. Therefore, the experience of the operation of Eastport MPAs was seen as potentially having lessons to share with Port Joli in order to address its environmental concerns. This section

briefly introduces the background of Eastport and Port Joli communities, and the challenges they faced when dealing with marine and coastal issues.

1.2.1 Background of the Eastport community

The Eastport Peninsula is located in Bonavista Bay, the eastern edge of the province of Newfoundland and Labrador (N.L.). The Peninsula is home to seven communities, the town of Salvage, Eastport, Happy Adventure, Sandy Cove, Burnside, St. Chad's, and Sandringham (DFO, 2007). The population of the Eastport town was 482 in 2011 (Statistics Canada, 2011). The Eastport Peninsula has relied heavily on fishing for generations. During the summer, high biomass of marine species are found in the water surrounding the Peninsula, including capelin, jellyfish, and herring. Crab, lobsters, eelgrass, and Irish moss are also harvested commercially at certain times and locations. In terms of the tourism and recreation, Terra Nova National Park (TNNP) which is adjacent to the Peninsula often attracts many visitors (DFO, 2007).

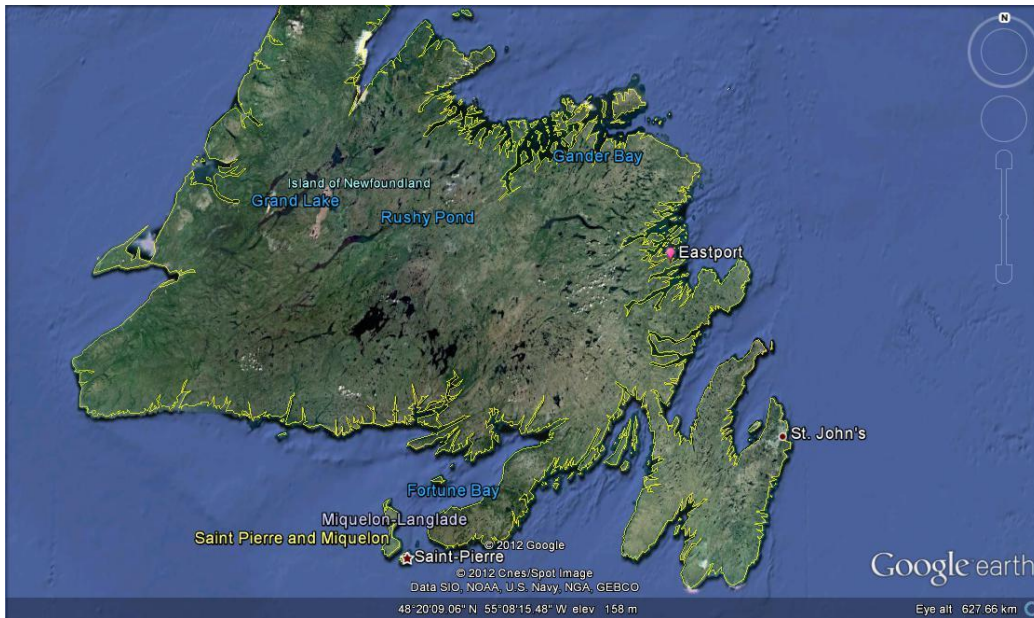


Figure 1-1 The map of Newfoundland showing location of Eastport

Since the decline of the cod fishery in 1990s, fishers in the Peninsula have shifted from the groundfish to a lobster fishery, resulting in increased pressures in the coastal environment (Power & Mercer, 2000). In 1993, the FRCC noted that lobster stocks had decreased rapidly, and there was a high proportion of immature lobsters being harvested (Murray, Bavington & Neis,

2005). With declining stocks, fishers in the Peninsula grew concerned about the increasing encroachment of outsiders within their lobster grounds (Murray et al., 2005).

In 1995, the Eastport Peninsula Lobster Protection Committee (EPLPC) was established by the Eastport communities, as a means to protect the marine environment and maintain the local lobster fishery (Murray et al., 2005). By collaborating with the federal government, academic researchers and local communities, the fishermen established the partnership with DFO, and participated in lobster stock monitoring with academic researchers (Rowe, 2001).

In 1997, the EPLPC negotiated with DFO and neighboring communities to set up a fishing zone that excluded outside harvesters, but also accommodated harvesters who have been traditionally fishing around the Peninsula. Approximately 400 km² of lobster fishing area was divided into three zones. The inner area only allows harvesters from the Peninsula, whereas the outer area is opened to other harvesters. The buffer zone is in between the inner and outer areas and is opened to both groups. However, harvesters from Eastport cannot fish outside the outer boundary of the buffer zone, while the other fishermen cannot fish inside of the inner boundary of the buffer zone (Davis, Whalen & Neis, 2006).

In 1999, the EPLPC submitted a proposal to DFO requesting that two nearby islands also be considered as part of the agency's MPA Program. On October 13, 2000, following an internal review of the proposal, Round Island and Duck Islands were identified as Areas of Interest (AOI) or pilot projects (Power & Mercer, 2000). In 2005, the two Islands were officially designated as Eastport MPAs under Canada's *Oceans Act* and have since greatly contributed to the conservation of lobster and other marine species in the area (Charles & Wilson, 2009). The Eastport MPAs Steering/Advisory Committee was therefore formed to provide advice to both DFO and the provincial government. It is co-chaired by one member of the Committee and one representative from DFO (DFO, 2007).

1.2.2 Current development and issues in Eastport

Though the two Eastport MPAs have been managed through the collaboration of DFO and local communities for more than a decade, some challenges still remain. Invited by the Chair of the Eastport MPAs Steering/Advisory Committee, researchers from Memorial University of Newfoundland (MUN) conducted face-to-face and tape-recorded interviews to document the historical evolution and ongoing operations of the Eastport initiative (Davis et al., 2006).

As an outcome of the interviews, several issues were identified. A major concern among harvesters was that not enough research had been carried out to determine how successful conservation measures had been. Also, fishermen were concerned that people from outside of the Eastport Peninsula have increased their fishing efforts in the buffer zone. On the other hand, some interviewees believed the exploitation rate for lobster was still too high, noting that unpredictable ecological fluctuations play a role in affecting the biomass. Yet, fish harvesters generally did not agree to reduce the number of licenses or pots per license.

Some fishermen argued that the enforcement officers were not given sufficient time and funding to do adequate surveillance in the lobster fishery. The officers had too many other responsibilities and consequently they relied heavily on self-policing. Some fishermen were also concerned that the establishment of the MPAs allowed DFO to increase regulations above the original plan, and that the communities may lose control of the resources.

Overall, the operation of the Committee relied on a few key leaders and volunteers. Furthermore, it was not easy to engage the whole communities and maintain dialogues with the federal government in a long-term. In addition, non-stable funding limited the research, interrupting ongoing projects and leaving significant data gaps (Davis et al., 2006). Despite these challenges, the Eastport MPAs have been successful in contributing to the conservation of lobster and other marine resources and their management has been cited as a successful example of participatory governance between coastal communities and the federal government.

1.2.3 Background of the Port Joli community

Located on the southwest of N.S., Port Joli is a fishing community relying on small-scale fisheries. The year-round population of Port Joli is between 20-25 people, but it increases to approximately 100 people in the summer months. There are 60 household in Port Joli, although some houses are only occupied in the summer (Canada Post, 2012). The Kejimkujik National Park of Canada Seaside is located between Port Joli. Other adjacent communities include Port Mouton and the Thomas H. Raddall Provincial Park, which is situated south of Port Joli and next to Port L'Hebert.

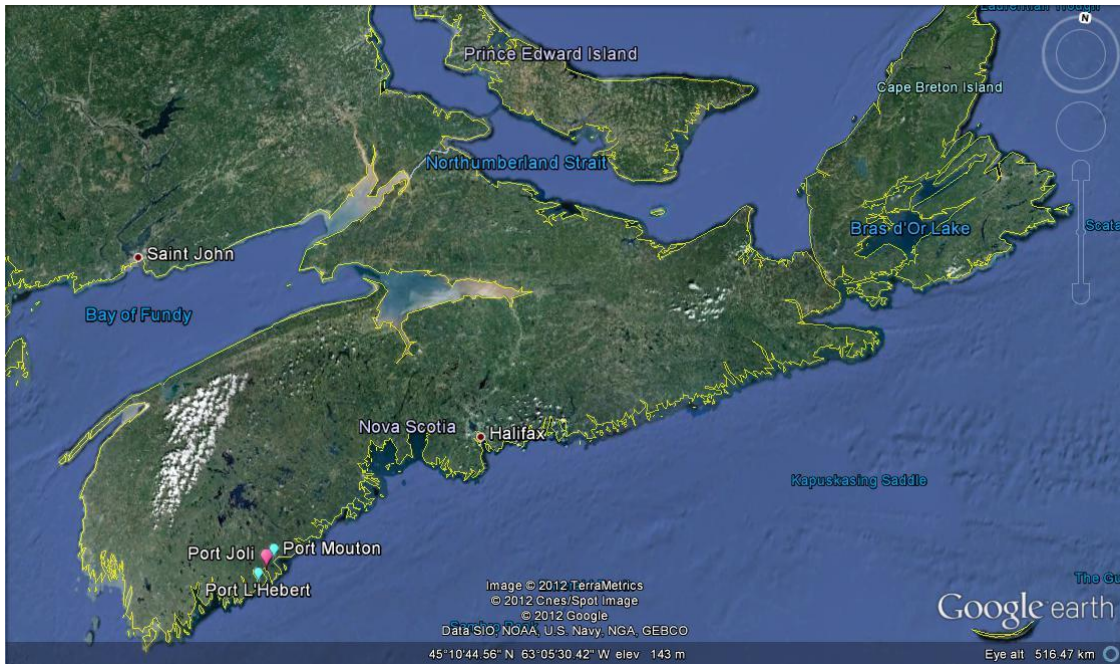


Figure 1-2 The map of Nova Scotia showing the locations of Port Joli, Port Mouton, and Port L’Hebert

Coastal habitats within Port Joli include sand beaches, salt marshes, and intertidal muds and sand (The nature history of Nova Scotia, n.d.), which helps to create high biodiversity. This has led to the area being identified as an Ecologically and Biologically Significant Area (EBSA) (Gromack et al., 2010). Port Joli is also a “geese or other waterfowl” bird sanctuary since 1915 (MacKinnon, Amirault & Hicks, 1994) and is part of the Port Joli Federal Migratory Bird Sanctuary providing wintering areas for the Canada goose, Harlequin duck, and a breeding area for endangered species, such as the Piping Plover (Doherty & Horsman, 2007). There is also an important herring spawning area around Little Hope Island, which is in between Port Joli and Port Mouton (Queens County Times, 2010).

1.2.4 Current development and issues in Port Joli

Port Joli has minimal development, and maintains relatively pristine bird and marine habitats. The fishing activities in the area are small-scale relative to the rest of N.S. The main fisheries are herring roe and lobster fishery, with only 12 boats in the immediate area. Other small scale commercial fisheries include quahog, blood worm, periwinkles, green crab, rock crab, rockweed, and Irish moss (Gromack et al., 2010). There has been interest in hydraulic dredging for clams in Port Joli in the past, but community opposition prevented the activity (Gromack et

al., 2010). However, the area is still included in the Inshore Hydraulic Dredge Hardshell Clam Areas in southwestern N.S. (DFO, 2008). Due to low and sporadic effort in this fishery, information on the stocks and sustainable exploitation rates of clam species is limited. As such there has been a call for a hardshell biomass survey to be conducted by local fishing vessels to enhance management efforts (DFO, 2008).

Research on the invasive species, Green crab (*Carcinus maenas*), was conducted in Little Port Joli Bay, a south shore lagoon of the Kejimikujik Seaside National Park. The Bay is a mudflat, sandy, lagoon system that has enriched eelgrass and soft-shelled clams. Eelgrass has been declining for a time, and the reasons are unknown. However, some research suggests that the ecological behaviour of the green crab may have a negative effect on the eelgrass habitat. While green crabs are not directly attracted to eelgrass, they tend to burrow around the eelgrass, disrupting the roots and allowing the eelgrass to float away (DFO, 2011). Green crabs also prey on a wide variety of marine organisms including commercially important species. The effects of green crabs have been of particular concern to shellfish, eel, and other fisheries. Control efforts have included fencing, trapping and poisoning (Klassen & Locke, 2007).

According to research conducted by DFO, the ecological attributes of Port Joli are recognized as a high priority for conservation by federal and provincial government agencies. However, there have been some noted ecological changes in the area. For example in comparison with previous research, the biomass of herring spawning has been gradually declining, but there is not enough information to support the accuracy of this data (DFO, 2009). In terms of management plans and strategies, so far, Port Joli does not have a comprehensive municipal planning strategy or land use bylaws. Conservation of migratory birds is the main focus in this area (Gromack et al., 2010).

There are two local environmental non-governmental organizations (eNGOs) working on conservation efforts in Port Joli (The Port Joli Basin Conservation Society and the Friends of Port Mouton Bay). The Port Joli Basin Conservation Society was founded in the early 1990s. The purpose of this eNGO is to help bring landowners and agencies with a shared interest in the natural history of the Basin together, so that their resources, knowledge, and expertise could be focused and coordinated. The Society has engaged students from Dalhousie University to survey marine and terrestrial habitats in the Basin. It has also worked with the federal government to study the feasibility of establishing a field research and education centre (Harrison Lewis Coastal

Discovery) in the area (Port Joli Basin Conservation Society, n.d.). Currently the Centre provides opportunities for the communities to conduct environmental research and present seminar discussions (Harrison Lewis Coastal Discovery Centre, 2012). Although the Centre is located at Sandy Beach, East Port L'Hebert, these efforts also contribute towards the conservation of Port Joli Basin.

The Friends of Port Mouton Bay (FPMB) was formed by local residents, fishers, property and business owners, and summer visitors who had serious concerns relating to finfish farming in the Port Mouton Bay (FPMB, 2012). The current fish farm has been operating in Port Mouton for over 15 years (started from 1995), and since then the community has insisted on suspending any new finfish aquaculture operations by calling for a moratorium (Anonymous, 2009). As a community-driven group, members of the FPMB have worked with academic researchers to evaluate the far-field impacts of aquaculture (Grant, 2010). In addition, the FPMB has also worked with the N.S. chapter of Canadian Parks And Wilderness Society (CPAWS-NS) in establishing sediment monitoring programs. More recently, the FPMB has worked on outreach, and science monitoring with academics, and establishing communications with DFO and the fish farm company (FPMB, 2012). Although this eNGO is not located within the Port Joli community, residents who live or visit Port Joli have joined the group. As such, the FPMB has been fairly influential in helping to change the communities' perspective on marine and coastal issues at this larger geographic scale.

1.3 Research question

Based on the background and experiences of Port Joli and Eastport areas and their environmental concerns, the main aim of this project is to analyze whether the experiences of community engagement in Eastport can be utilized in Port Joli, given that marine and coastal management are in their early planning stages and that community engagement and collaboration with government agencies is considered essential for success. The research objective is designed to identify the strength and weakness of community engagement in Eastport, and utilize the experiences to develop collaboration between the federal government and the local community in managing coastal issues in Port Joli. The research begins by assuming the experiences of community engagement in Eastport are relatively successful and can provide lessons learned to

Port Joli. Therefore, the detailed research questions are designed to compare and contrast these two coastal communities. The three key questions are:

1. What are the opportunities to collaborate with the federal government, and challenges which may be encountered in attempting to get the community engaged in coastal management in Port Joli?
2. What are the benefits and challenges of community engagement in MPAs and fisheries management in Eastport?
3. How can lessons learned from Eastport provide recommendations to Port Joli in developing community engagement in the marine and coastal management?

New knowledge is also anticipated as an outcome of the study which includes:

1. Understanding the community's willingness to participate in marine and coastal management by collaborating with governmental agencies (e.g. Fisheries and Oceans Canada, Parks Canada and Environment Canada) in the Port Joli area.
2. Understanding community's willingness to collaborate with DFO, scientists and academic professionals in fisheries management in the Port Joli area.
3. Providing potential opportunities and barriers to community engagement in Port Joli.
4. Providing insights regarding the development of the two MPAs and the operation of the two Committees in Eastport.
5. Providing an analysis of community engagement in the Eastport MPAs management that can be utilized as an opportunity to involve the community in the possible establishment of an MPA in the Port Joli area.
6. Determining if the outcomes from analysing data from Port Joli can provide potential lessons to improve Eastport MPAs management.

1.4 Thesis format

This thesis has six chapters: introduction, literature review, methodology, main findings, discussion, recommendations and conclusion. In the first chapter, problems relating to marine and coastal management issues faced by DFO and East Canadian fishing communities (specifically Port Joli and the Eastport area) are introduced.

Chapter two provides a literature review of current approaches for engaging communities in participatory governance. The third chapter describes the methods used to conduct this study,

including the distributing the survey in the Port Joli area and interviewing stakeholders in the Eastport MPA management. Chapter four presents the results from the survey and interview data while Chapter five discusses the interpretation of the results and provides answers to the three research questions and six anticipated outcomes of new knowledge. Finally, the sixth chapter provides recommendations for improving marine and coastal management by enhancing participatory governance through community engagement in Port Joli and Eastport.

Chapter 2.0 Literature Review

This chapter reviews the literature for three marine and coastal management approaches that can play a role in enhancing participatory governance tools: community engagement, citizen science, and the creation of a marine protected area. The first section explains the original concept of community engagement as a “ladder of citizen participation”, and the key components within this concept. The next section introduces the concept of citizen science and discusses its benefits and challenges. The third section reviews the utilization of community engagement and citizen science in MPA management as well as approaches drawn from DFO’s experiences.

2.1 Community engagement

Community engagement is “a planned process with the specific purpose of working with identified groups of people, whether they are connected by geographic location, special interest or affiliation, to address issues affecting their well-being” (Moyne Shire Council, 2007, p.4). It is one of the approaches used in marine and coastal management that empowers communities rather than a “command and central, top-down” approach which limits community involvement. Basically, it is a general term that describes the process and levels of involvement by the community in local issues. Community engagement can happen in any community and may be used to deal with different issues. For example, located at the southeast coast of Australia, the Moyne Shire Council has developed the community engagement framework, supporting a broad range of interactions between the Council and its communities (Moyne Shire Council, 2007). In 1960s, a framework referred to as a “ladder of citizen participation” (Arnstein, 1969) was published as an embryonic concept which has evolved to include a number of ideas, such as community-based management and collaborative management (co-management) (Head, 2007).

The “ladder of citizen participation” proposes eight levels of involvement from no-participation to the degree of citizen power (Arnstein, 1969). The following section introduces “citizen participation” as the first approach to community engagement and illustrates three key components of community engagement: stakeholder participation, capacity building and community empowerment. This section also briefly describes the concepts of community-based management and co-management.

2.1.1 A ladder of citizen participation

According to Arnstein (1969), citizen participation is a categorical term for citizen power, which creates participation mechanisms within existing political structures. Arnstein suggests that the metaphor of a ‘ladder of citizen participation’ begins at the lowest rung with manipulation to the ascending citizen control (Bishop & Davis, 2002; Reed, 2008).

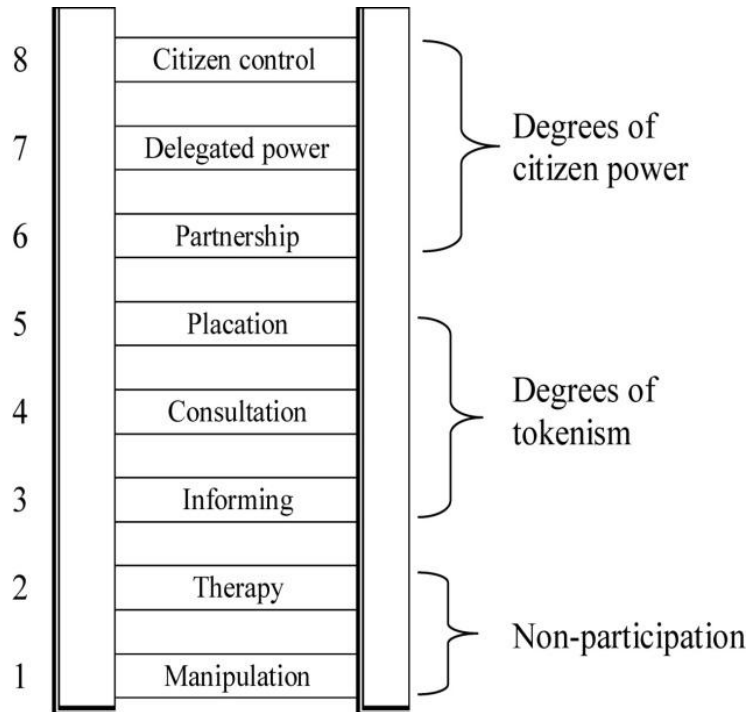


Figure 2-1: A ladder of citizen participation (adopted from Arnstein, 1969)

The bottom rungs of the ladder are “manipulation” and “therapy”. These two rungs describe levels of “non-participation” that only enable power-holders to “educate” or “cure” the participants. In rung 1, people are placed on advisory boards for the express purpose of “educating” them or engineering their support. In rung 2, citizen participation is masked as “therapy” that power-holders only focus on curing citizens’ “pathology” (Arnstein, 1969).

The stages of “informing” and “consultation” allow citizens to be heard and to have a voice. However, under these two conditions, citizens lack the power to ensure their views are heeded by decision makers. In rung 3, citizens are informed of their rights, responsibilities, and options. This process can be the most important first step toward legitimate citizen participation, however access to support feedback and negotiations are also needed. In rung 4, citizens are consulted to

express their opinions as a legitimate step towards their full participation. The most frequent methods used for consultations are attitude surveys, neighborhood meetings, and public hearings but citizens do not have actual involvement in the process of decision making. Placation as rung 5 allows citizens to be advised, but retains the continued right for power-holders to decide. Generally, these three rungs, informing, consultation, and placation, are called the degree of tokenism where power-holders start to release some degree of their control (Arnstein, 1969).

Upper levels of the ladder show the higher degree of citizen power. Rung 6, partnership, enables citizens to negotiate and engage in trade-offs with power-holders who agree to share planning and decision-making responsibilities with the citizenry. In rung 7, citizens obtain the majority of decision-making power, while power-holders start the bargaining process rather than passively respond to pressure from citizens. Another objective of delegated power is to separate and parallel groups of citizens and power-holders. This can be a co-management model for citizen groups to engage in joint planning (Head, 2007). In rung 8, citizens can simply demand the degree of power (or control) which implies that participants are fully engaged in policy and managerial aspects, and be able to negotiate the conditions with power-holders as an equal controller (Arnstein, 1969).

A ladder of citizen participation represents the level of community engagement from zero participation to citizen control. It is important to notice that different levels of engagement are likely to be appropriate in different contexts. The objective of the work and the capacity for stakeholders to influence outcomes also needs to be taken into consideration (Reed, 2008).

a) Stakeholder participation

Within the degree of tokenism in a “ladder of citizen participation”, participation is often employed as part of a top-down management process that includes people in passive forms of cooption and consultation, rather than as active agents (Arnstein, 1969). In some circumstances, passive participatory approaches have been used to pay lip-service to develop calls for community engagement. These situations, however, are managed strategically in order to exert control over communities’ knowledge and action by power-holders (Brown, 2002).

In higher levels of the ladder, the number of benefits to be gained indicates that stakeholder participation is an appropriate management tool. For example, through consultations and negotiations with communities, trust among the players can be gained. Nevertheless, stakeholder

participation does not take place in the absence of power. As such, it needs to be underpinned on the basis of empowerment, equity, trust and learning. It should also be considered as early as possible and throughout the process. Eventually, some researchers suggest that long-term stakeholder participation needs to be institutionalised and be legally binding (Reed, 2008).

b) Capacity building

According to the definition from United Nations Environment Programme (UNEP), capacity building is the development of abilities, relationships and values that enable organizations, groups and individuals to improve the performance in achieving development goals (UNEP, 2002). It is one of the supportive tools in community-based management (CBM) that enhances people's skills and institutions' capacity through education and training processes (Wescott, 2002). Generally, capacity building supports the empowerment of communities by building competencies in local resource management (Crabbe, Martinez, Carcia, Chub, Castro & Guy, 2010).

One of the challenges of capacity building is the complexity of building a good relationship with those that manage and those that use the resources. Therefore, collaboration, transparency, and accountability are necessary to form a learning environment for every stakeholder. In addition, communities are encouraged to collect empirical data that records historical development and current issues they have faced in order to build up the local capacity (Cuthill & Fien, 2005). Overall, capacity building is a fundamental shift from a top-down control towards a bottom-up collaboration that engages communities to participate in the CBM (Berkes, 2004).

c) Community empowerment

Empowerment is generally understood as a process by which people, especially local communities, are enabled to take more control over their lives, to secure a better livelihood, and have ownership of productive assets (Brown, 2002). From the perspective of fisheries management, empowerment can be defined as a mechanism to give people within the fishing communities a chance to address their concerns and influence their own future (Raakjær-Nielsen et al., 2003). Many studies, however, have overlooked the complexity of empowerment in CBM, because it is possible that some problems are exacerbated (or new ones created) which further marginalized some sections of communities while others are empowered. Therefore, in order to

maintain long-term management, communities have to be empowered to not only make decisions and influence policy makers, but also to implement decisions (Brown, 2002).

Education is an essential element of community empowerment. For example, local fishermen benefit from academic disciplines such as education, social work, and psychology, whereas the researchers can also participate in the fishing communities through a co-learning process (Wiber, Charles, Kearney & Berkes, 2009). Nevertheless, empowering communities has been shown to have a number of limitations. First, stakeholders are not expected to look out for interests and concerns outside of their own. Secondly, the central government has power on legislations and financial control that local communities do not. Third, communities may not be able to provide equitable transparency without a democratic governmental approach (Jentoft, 2005).

2.1.2 Community-based coastal resource management (CB-CRM)

CB-CRM is “a comprehensive strategy that seeks to address the multi-faceted issues affecting the coastal environment through the active and meaningful participation of coastal communities (Balgos, 2005, p. 978).” It represents a high level of control in the resource management within communities themselves (Balgos, 2005). Some studies, for example, suggest that CB-CRM is a localized co-management system that small-scale fishermen take up a dominant role in the fisheries management (Mulekom, 1999). As one approach to marine and coastal management tools, the CBM is often applied within the bottom-up governance regime when decision-making is decentralized, or community-rights activism is strong (Christie & White, 2007).

The main feature of CB-CRM is empowerment which asserts rightful access and management control to community for the resources. Also, equity is attained for both commercial and artisanal fishermen to have equal opportunities in developing, protecting, and managing coastal resources. Furthermore, the CBM highlights the respect for traditional/indigenous knowledge that is encouraged to be adopted in addressing local and First Nations issues. In addition, unique roles and contributions of both men and women reflect the gender fairness in the CBM (Balgos, 2005).

As a bottom-up approach, CBM has a number of advantages. This management tool tends to engage resource users through a sense of trust, collaboration, and partnership among participants

that works more effectively than a top-down method. The CBM is also responsive to local conditions since resource users know environmental changes from daily experiences. Eventually, this bottom-up approach leads to a long-term management regime with the full support and participation of communities (Christie & White, 2007).

Although the CBM benefits local users, several challenges still remain. For example, the CBM may be destabilized when some residents in a community or neighboring communities do not support initiatives. Also, it is difficult to address large-scale issues (e.g. climate change, over fishing, or nonpoint source pollution) in a community-based scale (Christie & White, 2007). Therefore, in order to enhance communities' capacity, education and public awareness are essential to assist various stakeholders during the negotiating and collaborating process (Balgos, 2005).

2.1.3 Co-management

The fundamental principle of co-management is the collaboration between resource users and formal policy makers (e.g. the federal government) in a process of joint decision-making. It is usually one of the CBM outcomes that resource users and policy makers (or other entities such as private sectors) have comparable influence and willingness to collaborate (Christie & White, 2007). As a middle ground between top-down and bottom-up regimes, co-management potentially represents the best model of two management approaches, engaging two parties in an equitable and transparent planning and management process (Jones, 2002). Co-management usually begins with an internal problem that the communities and stakeholders suffered from a governing failure, and then interactive and informal conversations start between stakeholders, management authorities, non-governmental organizations (NGOs), donors etc. (Chuenpagdee & Jentoft, 2007). Furthermore, this pre-process of co-management is either formed by existing ideas and research initiatives, or evolved from an informal practice at a local level without any government intervention (Chuenpagdee & Jentoft, 2007).

a) The opportunities of co-management

There are a number of advantages to co-management as a tool to address marine and coastal issues. First of all, co-management brings different kind of skills and knowledge together with various capacities to deal with tasks. Secondly, the collaboration between stakeholders benefits

resource (e.g. technology, information) exchanges. The network is built to support every player. Third, co-management links different types and levels of organizations. Hence, the flow of information is faster and more effective to address problems in an appropriate level and transaction costs and risks can be shared in a collaborative network. The establishment of co-management systems may also function as a conflict resolution mechanism between resource users and governmental agencies (Carlsson & Berkes, 2005).

b) The role of the government in co-management

With regards to marine and coastal management, generally, governments have not perceived co-management as a means to introduce more democratic principles into the management, but have recognized co-management as an instrument to reach certain objectives more efficiently by involving communities (Christie & White, 2007). However, within this joint relationship, communities are more willing to share their opinions and be involved in a management plan if the decision makers delegate their power. As such, government is encouraged to share authority and to legitimize community management with communities. Also, in order to provide enabling conditions, the government should also assist with issues that are beyond the capacity at the local level, such as providing services (i.e. administrative, technical and financial) to support the operation of the joint relations. Moreover, the government should serve as a coordinating role, offering a communication platform for various stakeholders (Pomeroy & Berkes, 1997).

In a co-managed regime, the long-term goal of power-sharing is established as the different interests and needs between government and fishers are reconciled. The decisions are then made based on the capabilities of communities to handle certain management functions and the degree of users' participation. For example, the devolution of control by government should start with a phased-in approach, while communities gain experience and capabilities. At each step of co-management, adaption and learning-by-doing processes are critically important. Generally, in a co-management relationship, the government and a community have two equal statuses, sharing the same responsibilities. However, sometimes, it may be possible that the communities' role is at the advisory level but the government still holds the final authority (Pomeroy & Berkes, 1997).

2.2 Citizen science

Science monitoring is a tool to support scientific research. The process evaluates the accuracy of prediction, and assesses whether the results obtained are exceed or below the estimated hypothesis. Monitoring also assists with enforcing regulations and implementing corrective actions, such as the surveillance of fishing activities (Hunsberger, Gibson & Wismer, 2005). Since comprehensive data collection is often constrained due to the lack of monitoring initiatives by professional scientists and government agencies, citizen science is an approach that encourages the public to participate in scientific thinking and data collection (Dickinson, Zuckerberg & Bonter, 2010). This approach is now being used more often to help facilitate monitoring stock populations, tracking migratory species, and protecting natural resources. Collaborations between eNGOs and communities has emerged as a means to help track environmental and ecological trends, and to use the data for more effective planning, management, and stewardship of natural resources (Conrad & Hilchey, 2011). Citizen science can be applied to a variety of science monitoring. For example, some focus on environmental quality (e.g. water quality), while others pay more attentions to biological species monitoring (e.g. invasive species monitoring) (Conrad & Hilchey, 2011). In addition, citizen science can contribute to specific-target monitoring as well as to other types of monitoring at the broader ecosystem level (Devictor, Whittaker & Beltrame, 2010).

A successful citizen science monitoring program should have interactive connections between scientists and citizens. . For example, collaborative connections between the two groups, (with sufficient information exchange and bottom-up citizen participatory approaches) could help define the problem initiate data collection and support the analysis of issues that are of concern to both parties (Devictor et al., 2010). Several key factors are suggested in a successful citizen science monitoring initiative. First of all, the objectives and methods of monitoring must be easy and simple to explain and be understood by citizens. Secondly, a well-designed and standardized protocol is needed. Scientists must ensure the protocol matches what the communities can and want to collect. Third, there is a need for transparency and accountability of the data analysis process to encourage trust building, ownership and credibility. Fourth, a communication strategy is crucial to recruit new participants and to gain the credence of the people involved. Finally, a citizen-based monitoring program needs to ensure that the data

collected is actually contributing to proper scientific analyses and publications (Devitor et al., 2010).

a) Benefits of citizen science

The collaboration of citizens and scientists promotes both scientific accuracy and social legitimacy to inform decision-making processes (Couvet, Jiguet, Julliard, Levrel & Teyssedre, 2008). The unique benefit of citizen science is that it can be used in large geographical scales and long-term monitoring, which are impossible to sample extensively using only professional scientific (Dickson et al., 2010). In the field of biodiversity, citizen science facilitates data collection and underpins the importance of monitoring through positive or negative feedback and the enhancement of public participation. People therefore have more public awareness of conservation by being involved (Couvet et al., 2008). In local ecological knowledge (LEK) research, citizen science helps scientists understand local fisheries' rules and how their effectiveness and enforcement interacts with environmental changes and practices (Murray et al., 2005).

Citizen science is flexible able to operate at a variety of temporal and spatial scales. It is also adaptive in the context of environmental changes and can be a critical component of research (Murray et al., 2005; Cooper, Dickinson, Phillips & Bonny, 2007). For example, volunteer data collected on the lobster fishery in the Gulf of Maine, through citizen science provides, opportunities for a cost-effective and long-term monitoring program, over a wide geographical range (Ellis and Cowan, 2001).

b) Challenges of citizen science

Although citizen science provides benefits for ecological, environmental and biodiversity assessments as well as, LEK and fisheries monitoring, it is also constrained by costs and risks. First, the credibility of citizen science is undermined by scientific suspicions that individual volunteers or citizen groups may bias their monitoring data in order to achieve particular purposes. In contrast, citizens may also harbour their own suspicions that science will favour conservation or, alternatively, exploit resources (Hunsberger et al., 2005). Secondly, the complexity, transparency, and embeddedness of LEK present challenges when seeking to incorporate it with scientific research. For example, a fisher who stands up and claims (based on

his or her experience) that there are no more fish, is not often given the same authoritative weight as a scientist, who can present a graph showing steady abundances (Hunsberger et al., 2005). Third, long-term and stable funding is critical to the success of citizen science. Available grants tend to be short-term, directed at projects that are expected to be completed within a certain time frame. For the long-term monitoring programs, citizens may seek different kinds of funding within one project. Moreover, sponsoring organizations may set inappropriate priorities or unduly high expectations for their support. For example, the scientific methods and evaluation criteria of research programs prepared by non-locals may have conflicts with aboriginal worldviews and undermine their values (Hunsberger et al., 2005). Finally, citizen scientists vary in ability, experiences and type of training. The age of an observer is also an important determinant of monitoring the quality of the data. . For example, volunteers with at least two years of university education are better able to correctly identify both the species and the age of crabs, compared to younger students or people with less experiences (Dickson et al., 2010). Therefore, in order to avoid these drawbacks, establishing a partnership with scientific experts, governmental agencies and communities from the earliest stage can help build up understanding, trust and respect, and allow for a collaborative information exchange (Hunsberger et al., 2005).

2.3 Marine Protected Areas

According to the International Union for Conservation of Nature (IUCN), the term MPA is defined as: any area of intertidal or sub-tidal terrain, together with its overlying water, associated flora, fauna, and historical and cultural features, which have been reserved by law or other effective means to protect part or all of the enclosed environment (IUCN, 2008). Based on the *Oceans Act*, MPAs will be established in order to conserve and protect commercial and non-commercial fishery resources as well as endangered or threatened marine species and their habitats (Department of Justice Canada, 1996). MPAs also support unique habitats and marine areas of high biodiversity or biological productivity (Nicholls, 1998). Finally, MPAs are established for the socio-economic purposes that maintain or enhance a resource base for human use, and for protecting certain species or habitats especially in no-take zones (Jentoft, van Son & Bjorkan, 2007).

Based on the literature previously presented (i.e.. CB-CRM and co-management), MPAs can be governed by different forms of power control mechanisms (such as . top-down or bottom-up

approaches). Given the objective of this research, it is assumed that MPAs are established within a context of community-based or co-management governance. The next section illustrates the DFO perspective on how to engage communities, and the utilization of community engagement in the MPA management.

2.3.1 Engaging communities from DFO's perspectives

From a DFO perspective, the first process for establishing an MPA is the release of the national and regional MPA documents to the public. Next, roundtable meetings on MPA system planning are held with stakeholders representing a variety of interests. DFO then consults with communities in order to develop AOIs as the first step to form an MPA. In order to share plans and objectives in a MPA management process, the regular communication between communities and DFO is important. As communities also bring to the table significant experiences in terms of traditional knowledge, active stewardship and guidance for management, open and relaxed dialogues, face-to-face meetings, and plain language descriptions are seen as necessary to engage and maintain community involvement (Fenton, Macnab, Simms & Duggan, 2000).

The difference of geography, livelihoods, culture and society in each region can influence the process of the MPA management. Since experiences of communities involved in the resource management, environmental protection and government involvement are highly variable, different communities have either positive or negative responses to MPA concepts and proposals. Nevertheless, a number of common themes are suggested when engaging communities to participate in the MPA management process. First of all, building trust between government and community interests is the first step of collaboration. Secondly, working with existing fisheries management structures helps communities be easily involved. Lastly, identifying and linking similar community based protected areas programs can provide meaningful outreach sharing experiences between different communities (Fenton et al., 2000).

2.3.2 The utilization of community engagement in the MPA management

One of the major problems in establishing MPAs is the multiplicity of governmental agencies occurring at different jurisdictional levels. Also, insufficient knowledge of local community structures, regional marine biogeography, and socio-economic resource-use factors make planning a MPA difficult. Potentially by engaging communities into the planning process

could be helpful to address aspects of these problems. However, this diversity (e.g. biogeography, resource use, socio-economics etc.) may result in communities having a very different view and expectation of the MPA and management objectives. For example, small-scaled and place-based fishermen may expect an MPA to protect the resources they have relied on, while commercial fishermen do not want to be limited by extra regulations, such as no take zones. Furthermore, an absence of comprehensive long-term monitoring programs is one of the major issues and challenges facing MPA planning and management (Nicholls, 1998).

As noted previously, the establishment and maintenance of MPAs is usually difficult for many reasons. However, the situation may be changing and MPAs can now be established in a way that facilitates balancing conservation goals and human needs (Nicholls, 1998). However, MPAs are seldom a quick-fix for marine conservation and management, but instead, should be considered as a tool, that requires carefully, well-balanced, institutional design, with the broadest possible stakeholder participation (Jentoft et al., 2007).

Chapter 3.0 Methodology

The research approach taken for this project consisted of three main steps – Literature review, data collection and data analysis. The first step in this process was to conduct a desk-top literature review to (a) summarize the progress and process of community engagement in the fishing industries in Canada, and (b) provide back-ground information on the socio-economic factors, environmental concerns, and management issues affecting Port Joli and Eastport communities. The literature review identified key stakeholders and established context for this study, which helped guide the development of interview and survey questions used to collect data for this research.

The second step in the research design is the data collection prior to this step, approval was sought and received from the Research and Ethics Board, Dalhousie University. For Port Joli participants, the survey (Appendix I), including a pre-paid return envelope was distributed to all households in the area. The purpose of the survey was to determine the level of knowledge and acceptability of the community to engage in coastal management. The survey also attempted to gauge stakeholder interests and capacity with respect to collaborating with governmental agencies and eNGOs in the region.

For Eastport participants, a semi-structured interview protocol was developed (Appendix II). Phone interviews were conducted with the main stakeholders who were involved in the Eastport MPA management and focused on their experience. Each interview lasted approximately 60 minutes, with some information also collected via email.

As time and budget were limiting factors, the survey was only distributed to the Port Joli area, although the original plan was to collect data in person from both study areas (Port Joli and Port Mouton). The recruitment process for the Port Joli area included a recruitment letter (Appendix III), and poster (Appendix VI). A consent form (Appendix V) was also included with the survey.

The third step of the research design was to analyze the data collected from Port Joli and Eastport. The results were analyzed to provide lessons learned from Eastport and to obtain an assessment of the community's willingness to engage in coastal management issues in Port Joli. The data also assessed to what extent experiences from Eastport may be applied to enhance the

development of community engagement in Port Joli. Further information on data collection and analysis is provided in the following sections 3.1 and 3.2

3.1 Port Joli

For the Port Joli area, questionnaires were distributed by the principal investigator in order to gather information and feedback from the community. The following five sections provide details on stakeholder identification, participant recruitment, data collection/ analysis, and assuring confidentiality and minimizing risks to the respondents.

3.1.1 Stakeholder identification

The study population for the surveys was members of households in the community, including local and summer residents. The questionnaires were available to all residents or stakeholders in Port Joli. There were no specific exclusion practices associated with the survey, other than a minimize age requirement. Adults above the age of 19 years, from both genders and any profession were encouraged to respond to this survey. A total of 91 questionnaires were distributed to households in the Port Joli area and 19 were fully completed and returned.

3.1.2 Recruitment

The recruitment techniques included in-person visits and posting flyers around the community. The eNGO, CPAWS-NS, also supported the recruitment effort by identifying local stakeholders based on previous research in Port Joli. During the first visit, the principal investigator focused on introducing the purpose of the survey, explained how it contributed to the academic graduate project, and encouraged people to participate. The recruitment letter and survey poster were posted on the notice board of the community centre in Port Mouton. The follow-up visit to Port Joli was approximately three weeks after the first visit. The questionnaires, with a self-addressed stamped envelope enclosed, were distributed by the principal investigator to each household in Port Joli. In addition, recruitment letters and posters were put on notice boards at the Port Mouton post office and the administration building of Kejimikujik National Park, inviting residents' participation. The purpose of this in-person visit was to encourage the community to answer the questionnaires and to respond by the due date. The third visit to Port

Joli was four weeks after the previous trip, focusing on the area of the boundary between Port Joli and Port L'Hebert. The recruitment letters and posters were also posted on notice boards of the Port Joli post office and the Harrison Lewis Coastal Discovery Centre where Port Joli Basin Conservation Society is located. The purpose of this visit was to encourage residents who lived close to the boundary to also participate in the survey.

3.1.3 Data collection

The principal investigator visited Port Mouton as the first approach to community members from Port Mouton, Port Joli, Port L'Hebert and other nearby areas by attending the field trip of the 'People in Places' Conference, held by Coastal CURA (Coastal CURA, 2011). The recruitment letter and poster were posted, but no data was collected during this trip. During the second and third visit to the Port Joli area, the principal investigator was accompanied by the academic supervisor, who assisted in introducing the purpose of the survey to potential respondents and the posting of flyers.

Survey participants were asked to respond using a paper copy questionnaire which consisted mainly of closed questions. Approximately 20-30 minutes was estimated to complete the questionnaire, including time for the participants to read the consent form and to ask any clarification questions. The responses of the questionnaires were completed in the participants' home but these could also be completed at any location desirable to the participants. In the final step of data collection, the responses and the signature pages of consent forms were sent back to the principal investigator via self-addressed stamped envelopes.

3.1.4 Data Analysis

The responses of questionnaires were conducted and analyzed quantitatively. The analysis and reporting of the data included means, standard deviations, and percentages.

3.1.5 Confidentiality and data storage

The survey consent form was attached with each questionnaire. The research procedures, potential risks and benefits, and other related information were provided in the consent form. Participants could also contact the principal investigator through emails or by phone if they had

questions. Personal information of respondents was coded after the principal investigator received the questionnaires so as to ensure confidentiality. The responses will be stored in a locked cabinet and on a password protected personal computer to which only the principal investigator and the supervisor have access.

3.2 Eastport

For Eastport participants, phone and email interviews were conducted with people who were involved the Eastport MPA management. Respondents were asked to share their experiences of working with communities in the establishment and ongoing management of the MPAs. The five sections below provide details in stakeholder identification, participant recruitment, data collection/ analysis, and assuring confidentiality and minimizing risks to the respondents.

3.2.1 Stakeholder identification

The study population in Eastport focused on the main stakeholders who were involved in the Eastport MPA management. A total of 18 people were invited and 11 participated in the interviews, including the 2 co-chairs from the Eastport MPA Steering/Advisory Committee, fish harvesters around the Eastport Peninsula and representatives from governmental agencies at the federal, provincial, and municipal levels. The interviewees were selected because of their in-depth knowledge of the process that was undertaken in Eastport and their understanding of day-to-day operations and consequences of the MPAs to the community.

3.2.2 Recruitment

Phone calls and emails were used to recruit potential interviewees. The recruitment letter (Appendix VI), consent form (Appendix VII) and interview schedule were sent to most of the main stakeholders by emails. The rest of the stakeholders who did not have email addresses were contacted by telephone and were sent the three documents by regular mail. Invited participants who agreed to take part in the study then chose the interview approach that they were comfortable with, either via telephone or by returning a written response.

3.2.3 Data collection

Due to financial considerations, the Eastport interviews were conducted by telephone or by return mail. Participants were located in their place of work or at their homes during the interviews. For telephone interviews, the data was recorded by the principal investigator on a digital audio recorder and then transcribed into a Word document. An estimated time for either the phone interview or completing a written response was approximately 60 minutes. The participants were given time to read the consent form prior to doing an interview and to ask any clarification questions, and then spent approximately 45 minutes answering questions.

In the final step of data collection, the signature pages of consent forms were sent back to the principal investigator as an email attachment or using regular mail.

3.2.4 Data Analysis

The interview responses were transcribed and a qualitative analysis (coding) was used to determine general trends. Key findings were presented in the form of direct quotations (with consent from the interviewees), and summarizing of emergent concepts, and themes

3.2.5 Confidentiality and data storage

Similar to the survey consent form for Port Joli participants, the interview consent form included the research procedures, potential risks and benefits, and other related information. At the beginning of each telephone interview, consent to record the interview was sought. Participants were asked if they wished to receive follow-up communication about the study at the end of interviews. A written summary of results was promised to be available to the respondents upon completion of the project.

Efforts were made to ensure confidentiality of the respondents' feedback. Interviewees' real names were not used at any point during data collection, transcription, or communication of results. The transcripts, interview records and all other research documentation will be kept in a locked filing cabinet and on the principle researcher's password protected personal laptop for at least 5 years after the publication of the project.

Chapter 4.0 Results and Main Findings

This chapter presents the main findings of this project. Results from the Port Joli survey are discussed in Section 4.1, under the following sub-sections: respondents profile; area of concerns; appropriateness of management tools, willingness of involved, and the nature of community participation. The purpose of this section is to assess the opportunities and challenges for Port Joli community members who would like to be engaged in marine and coastal management. The second section (4.2) of this chapter describes the results of the Eastport interviews. The data was analyzed to gain insights into the planning and management process that led to the establishment of the two Eastport MPAs. This section discuss the benefits and challenges that the Eastport team dealt with during the application of the following three management tools: community engagement, citizen science, and a MPAs approach. Lessons learned from their experiences could be beneficial for the Port Joli community.

4.1 Port Joli survey results

Ninety-one questionnaires were distributed in Port Joli during two site visits conducted in July and August, 2011. The first trip targeted the Port Joli area from St. Catherine River Road to Thomas H. Raddall Provincial Park. During this trip, 63 questionnaires were distributed. Nineteen surveys were returned: 17 were completed; one was partially completed and one was not filled. The second trip extended down to E. Port L'Hebert Road and included the Sandy Bay Landings, which is close to the boundary between Port Joli and Port L'Hebert. Twenty-eight questionnaires were distributed and only two were returned, completed. Of the 91 questionnaires distributed to households in the study site, 19 were fully completed by residents in the area: two from Port Mouton, 15 from Port Joli and 2 from Port L'Hebert. The respondent rate was 20.8 %. Although this is a fairly low return, information from participants who shared their concerns for marine environment issues and viewpoints on collaborating with governmental agencies was quite rich and informative.

4.1.1 Respondents' profile

Based on the responses from questionnaires in the Port Joli area, 80% of participants are permanent residents. Only 10% of all respondents are under 40 years, while 80% are over 50 years. From the participants who responded to the questionnaires, 85% have lived in Port Joli for more than 10 years, and around one-third of the residents are partially self-employed (defined as having a permanent job as well as business owner)..

In terms of the economic sectors (Figure 4-1), primary activities and services account for most of the employment. The former are mostly involved in fishing activities, such as the commercial groundfish fishery and lobster fishery, while the latter mainly includes educational facilities and local business owners who provide services to tourists. Summer residents and retired seniors are categorized in the sector identified as 'others'. Overall, Port Joli is an aging coastal community with limited opportunities for development; however, primary sector activities are still very important for supporting community livelihoods

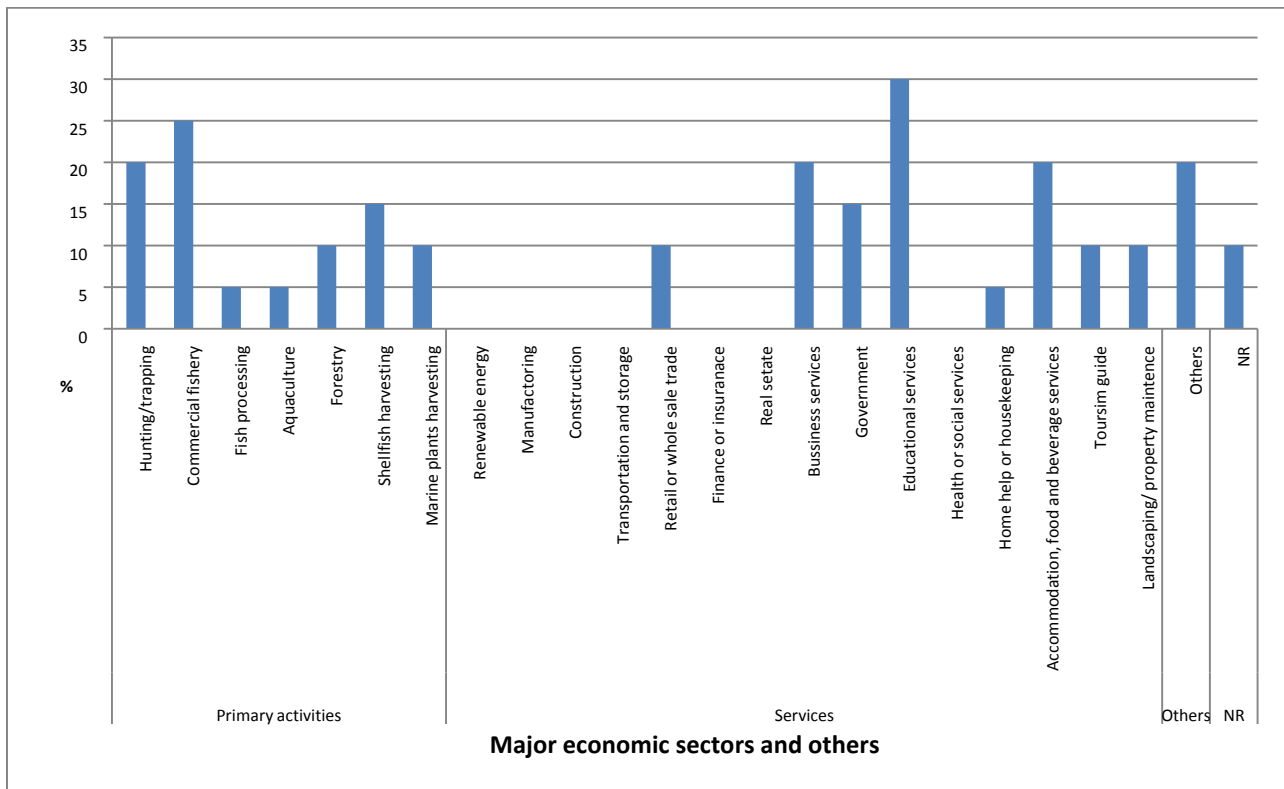


Figure 4-1 Economic sectors of local residents in the Port Joli area

4.1.2 Area of concerns

Walking, visiting the beach and swimming are the major ways that participants utilize the coastal and marine environment. Most respondents, who checked walking as a use, also visit the beach and go swimming. As least 40% of respondents go hiking, bird watching, and participate in recreational boating and fishing activities in the Port Joli area. As there is high diversity and number of activities that people are participating in, there is also some concern for the health of the marine environment and the declining abundance of marine resources in this area. Fifty-five percent of respondents rate the marine environment as very healthy and healthy, while only 35% of respondents (of the 55%) think that the abundance of marine resources is very healthy and healthy.. This reflects some of the environmental issues and problems that are of concern to the community, such as declining fish stocks. Figure 4-2 presents an overview of the environment issues identified by the respondents, of which the decline of fish stocks and current aquaculture development were the two major areas of concern.

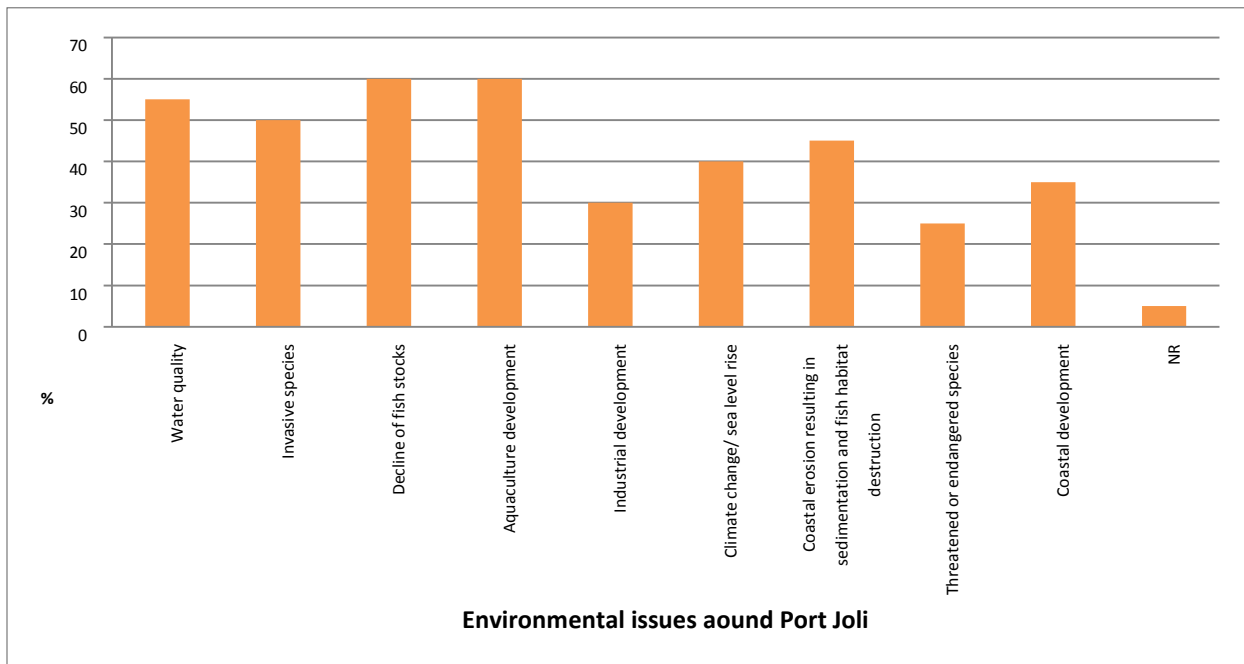


Figure 4-2 Environmental issues of concern by residents in the Port Joli area

Due to massive commercial harvesting over 10 years, the depletion of haddock, mackerel, surf clams, mussels, shellfish, and water fowls has had huge impacts on fisheries. On the other hand, lobster stock has increased gradually. One of the reasons could be because there are fewer

national predators as the groundfish has been seriously depletion (survey respondent, pers. comm.).

With regard to the issue of aquaculture, there are no fish farms in Port Joli itself. However, 6 miles away, the community of Port Mouton has inshore salmon farms that have been operating for more than 10 years. Since the two communities are nearby, it is possible that the water quality in Port Joli has been affected by the pollution from the farms (Grant, 2010). Some of the residents of Port Joli have joined a local Port Mouton eNGO, called the “Friends of the Port Mouton Bay”, as a way to protect both Port Mouton and Port Joli from further and/or future aquaculture development.

The invasive species, green crab (*Carcinus maenus*), has been associated with the declining eelgrass in Little Port Joli Basin, based on large proportion of dislodged whole plants that show signs of being shredded or have neatly clipped sheaths with signs of green crab damage (Neckles, Hanson, Colarusso, Buchsbaum & Short, 2009). There are fewer concerns with human development on the coast; however, those that are there include industrial development. Respondents also think that climate change as a natural effect may cause coastal erosion and result in sedimentation and fish habitat destruction. There did not appear to be much concern for threatened and endangered marine fauna. This may be because the community does not recognize the threat of resource depletion due to the lack of scientific knowledge, or because there could be no species that are threaten species at the moment. While the waterfowl, Piping Plover (*Charadrius melodus*), is listed as an endangered species, the condition and status of other marine species perhaps needs more research.

The concern that some members of the community have for environmental issues influenced their decision to establish and join local eNGOs. The Port Joli Basin Conservation Society and the FPMB are two main eNGOs in local areas. Though they are not exactly located in Port Joli, residents have also joined the groups in nearby East Port L’Hebert and Port Mouton. More than one of the third of permanent residents who responded to the survey has joined a local eNGOs, while half of the seasonal residents (comprising 20% of all respondents) have also joined at least one local group. Respondents who generally do not join eNGOs are retired seniors and some summer residents who only have limited time and/or the effort to do so.

Overall, Port Joli has a relatively pristine marine environment when compared with other ports and harbours in southwest N.S. However, since the groundfish fisheries have seriously

declined, there are limited economic opportunities for young people. Some of the primary activities that play a part in supporting the local economy include residents offering cottages and recreational activities to attract tourists, as well as regular summer residents. . The two local eNGOs are quite active in the community's. Even so, for long-term small-scale research there will be a need for financial and technical support that could potentially be met through the involvement of governmental agencies and academic institutions.

4.1.3 Appropriateness of management tools

Based on the research questions, the questionnaire then asked participants for their understanding of concepts of community engagement, citizen science, and MPA in order to determine whether these tools were acceptable to the community for further marine and coastal management.

Participants were first asked if they were familiar with the concepts of community engagement, citizen science, and MPA. Following this question definitions were then provided for each concept and participants were asked whether they thought that these strategies were appropriate management practices for responding to environmental issues and concerns. The responses provided after they were given the definitions differed from their earlier because more details were described in each concept.

Respondents were asked to indicate their familiarity with the concepts using a ranking approach of 'very familiar, familiar, neutral, not familiar, not at all familiar, and no response'. More than 40% of respondents were very familiar and familiar with the concept of MPA's prior to being provided with the definition, whereas 45% of respondents were not at all familiar with the concept of citizen science. However, after being provided with the definition for each concept, respondents indicated that citizen science (CS) was the most appropriate tool to address marine and coastal environmental issues (Figure 4-3). The MPA tool was ranked second and community engagement (CE) ranked last. The lack of awareness of citizen science and community engagement as appropriate tools for addressing coastal issues may be because respondents have been exposed to efforts aimed at the promotion of MPAs by government and eNGOs through public education. In contrast, respondents were not familiar with the term "citizen science". These results indicate that explaining and informing communities through

public education may help local people to understand the terms, and determine an appropriate tool to manage the environment issues that they are concern about.

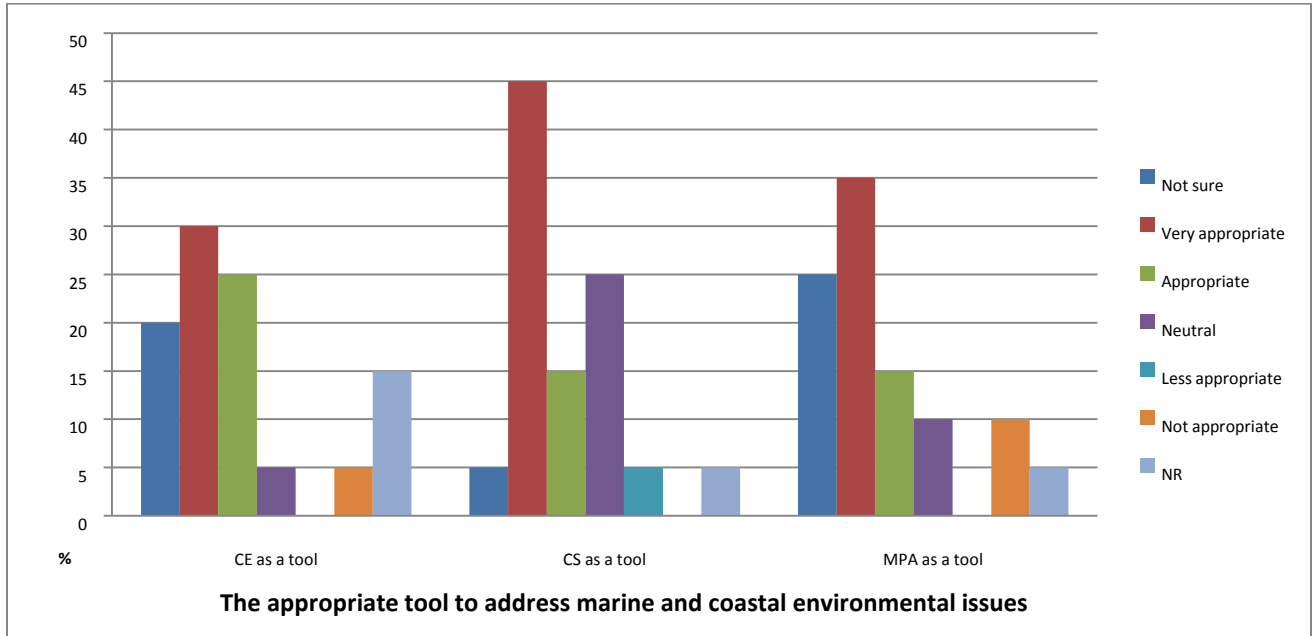


Figure 4-3 Ranking of the most appropriate tools to address marine and coastal environmental issues in Port Joli once definitions were provided

Though community engagement was the tool respondents rated as least appropriate, it stood out from the other two when participants were asked to identify which tool might benefit the community. Respondents emphasized that the community was knowledgeable within the local area because they have spent most of their livelihood there and were aware of daily changes.

When asked if there were any negative aspects from each management tool, community engagement and MPAs were rated much higher than citizen science. In the case of community engagement, respondents indicated that the community may have limited information and expertise to address environmental issues. Also, few community members were willing to contribute large amount of time and efforts to lead a group of people. Additionally, some respondents thought that conducting too many studies in the marine and coastal areas might disturb the natural environment.

In terms of the negative aspects of MPAs, respondents noted that DFO and external investors failed to keep their commitments because of political infighting. Furthermore,

respondents were also concerned that the community might lose power to manage their own area since establishing an MPA could close off access to people and reduce job opportunities.

Most respondents gave citizen science the highest rate of “not sure” when asked whether this approach had benefits or negative aspects for the community. Nevertheless, respondents did imply that the tool of citizen science needed further support to increase the expertise and education of this approach for the general public in this community.

4.1.4 Willingness to participate in management

The next section of the questionnaire focused on the Port Joli community’s willingness to be involved in marine and coastal management in terms of collaborating with three governmental agencies (e.g. DFO, Environment Canada, Parks Canada, or Nova Scotia Department of Fisheries and Aquaculture) and academics. The questionnaire sought to gain insights into the degree of willingness for collaboration using three categories: support, importance of community involvement, and personal participation. The category of ‘support’ indicated that respondents generally agreed to be informed with decisions made by governmental agencies, but still remained concerned. The category of ‘the importance of community’s involvement’ indicated that respondents are willing to give advice and have conversations with governmental agencies. In the highest level of willingness, the category of ‘personal participation’ implied that respondents were willing to be personally involved, working with governmental agencies in applying one or more of the three management tools.

a) Community Engagement

Figure 4-4 indicates that 60% of respondents either fully supported or supported building a partnership with federal/provincial governmental agencies and the community. However, some 30% of respondents were concerned about whether the partnership would be based on a relatively equal agreement. The respondents mentioned the poor reputation of governmental agencies arising from previous experiences with the public that suggested they were primarily paper exercises.

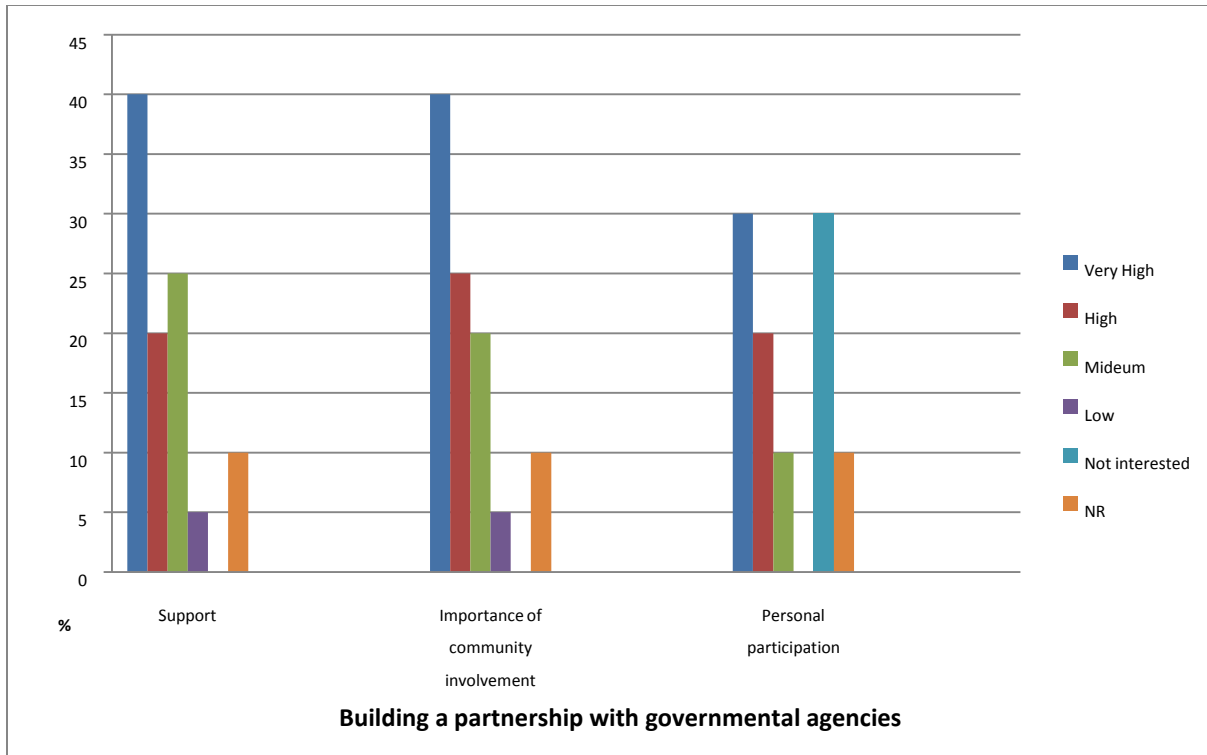


Figure 4-4 Support for building a partnership with governmental agencies in Port Joli

In terms of the importance for the community to build a partnership with governmental agencies, 65% of the respondents thought it was important, while 25% had some concerns and questioned as to whether the real purpose for building a partnership, was purely from the government’s perspective. Thirty percent of respondents were very interested to participate in the process of collaborating with governmental agencies. However, there were also a similar number of respondents (30%) who had no interest to participate, especially the seasonal residents who have limited time to do so. Respondents were also concerned that building a partnership with governmental agencies should not only be a “paper exercise”, but could really benefit the community.

b) Citizen Science

Figure 4-5 indicates that 50% of respondents thought it was very important for the community to be involved in citizen science with governmental scientific research. However, the relatively low rate of support and personal participation implied that respondents were worried that governmental scientific research was based on changing policies and that the community

might have little influence on the final decision. Moreover, respondents pointed out scientific researchers from governmental agencies had less local knowledge than the community, but touted themselves as experts. The respondents suggested scientific research mixed with the government, academic and relevant stakeholders could provide a better research outcome.

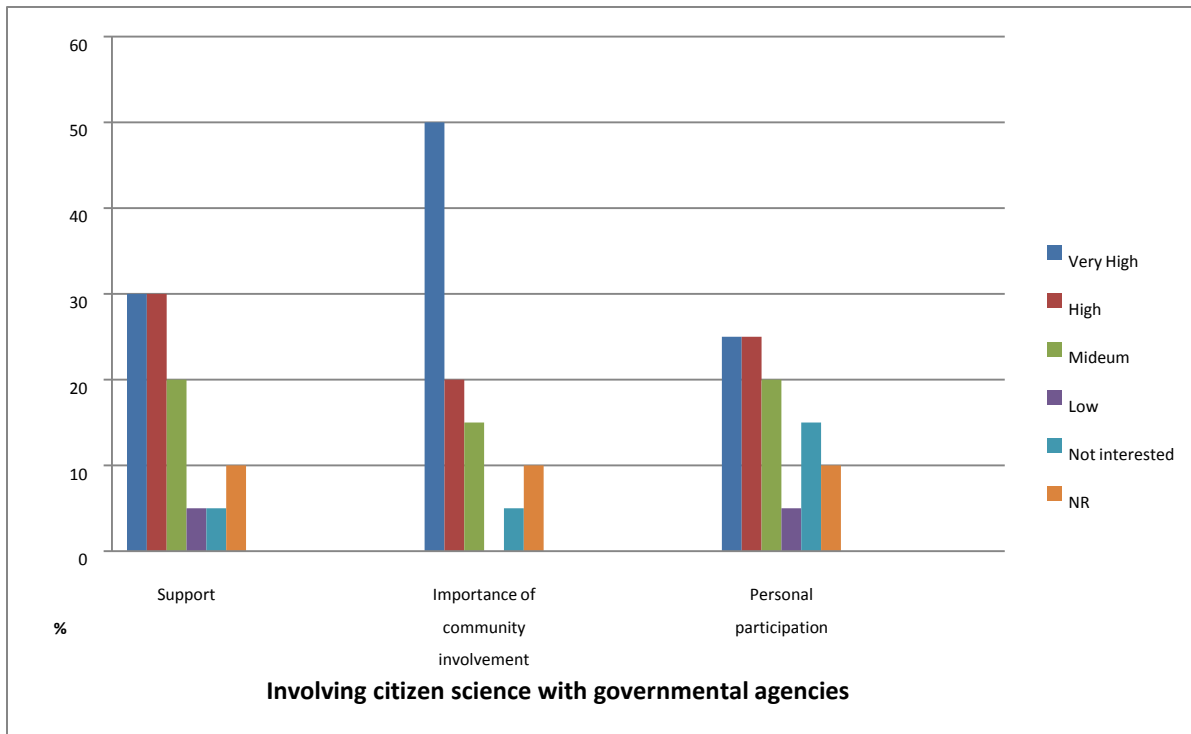


Figure 4-5 Degree of involving citizen science with governmental agencies

Figure 4-6 shows that compared to the involvement with governmental scientific research, respondents were more willing to support and participate in academic research to advance citizen science. The two local eNGOs had previous experiences in cooperating with academic research projects and were willing to support further studies. Respondents also pointed out that academic research without connections or backing with a company or an industry was more acceptable than those with private sector connectors. Respondents considered it was very important for the community to be involved with the government in understanding citizen science. There were some concerns that academic research might not fit in with ‘real life’ which was more complex than concepts on paper. This response suggests that communication between governmental science and local communities and information exchange are needed to build up trust and better collaboration between the two sides.

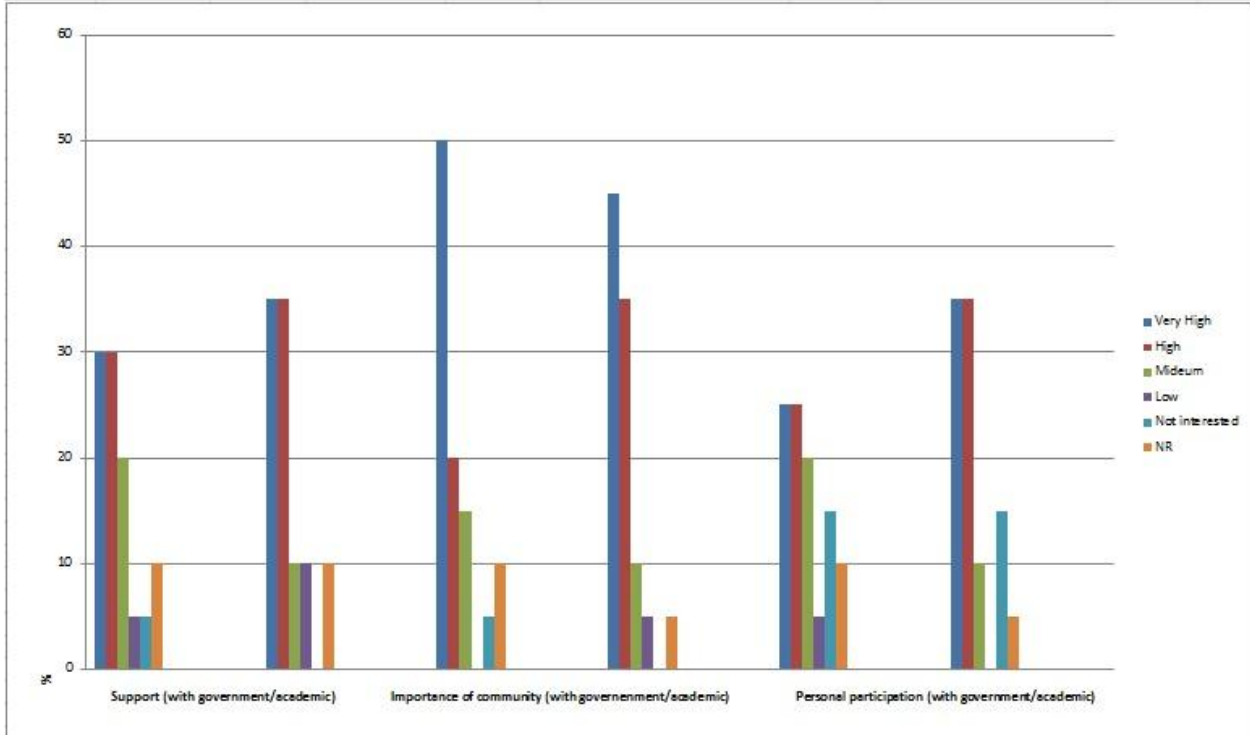


Figure 4-6 Comparison of community’s willingness to involve in citizen science with governmental scientific research or academic research

c) Marine Protected Area Management Tool

Figure 4-7 presents the perspective of respondents with regards to establishing an MPA. Ranging from high to very high, sixty percent of the respondents considered supporting the establishment of an MPA. An even higher percent of respondents considered that it was important for the community to be involved in the planning and management of an MPA.

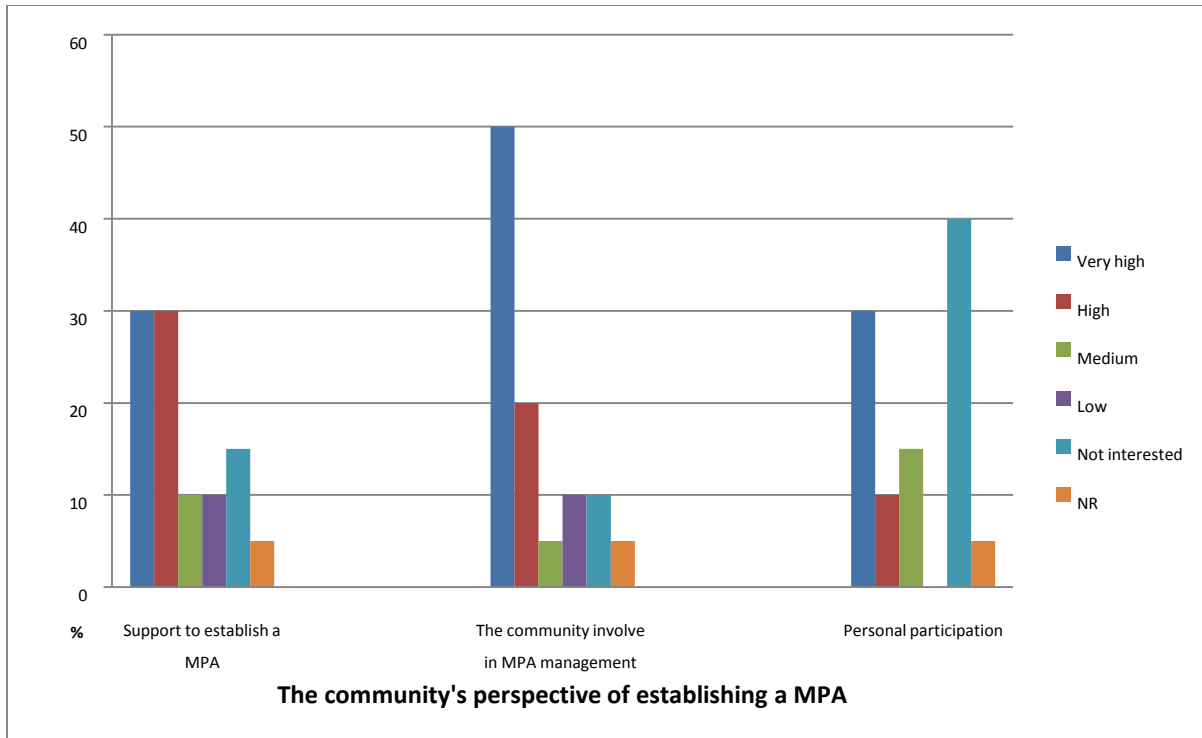


Figure 4-7 The community’s perspective of establishing an MPA in Port Joli

However, when asked about personal interests to participate in the working process, only 30% of respondents experienced a high level of willingness while 40% of all respondents showed no interested at all. The benefits of marine environment and resource protection from establishing a MPA seemed to be well known to the local residents. However, the local community expressed a lack of trust in collaborating with governmental agencies, which could lead to misunderstanding about the design and usage of a MPA. Respondents implied that MPA management had too much power exercised by those who did not live in the community. The fear was that the local residents could lose their ability to use and/or access local resources.

The establishment of an MPA as a no-take zone is another community concern. From the comments of respondents, local residents were concerned that their livelihoods could be taken away as areas around fishing locations could be regulated, thereby potentially destroying their ability to make a livelihood in the future. Other reasons that could account for respondents not having an interest in participating in MPA management included limited time and efforts from seasonal residents and retired seniors. Though there was less willingness of personal participation in the establishment process and management of an MPA, some respondents did point out an MPA could possibly bring sustainable marine resources to the community. However,

respondents who were willing to support and participate in the MPA management did not provide enough comments to explain their reasoning, and this could be an area for further studies to better understand the underpinning factors.

4.1.5 Nature of Community Participation

Participants were asked to discuss in what capacity they were interested in participating in marine and coastal management, regardless of the tool being used. Figure 4-8 shows that 45% of respondents were interested in promotion, outreach and education. This is followed by 35% of respondents who were willing to be involved in an advisory capacity and 30% who expressed willingness for compliance monitoring. Fewer respondents were interested in scientific monitoring, enforcement and funding. Only 25% of respondents expressed no willingness to participate in marine and coastal management.

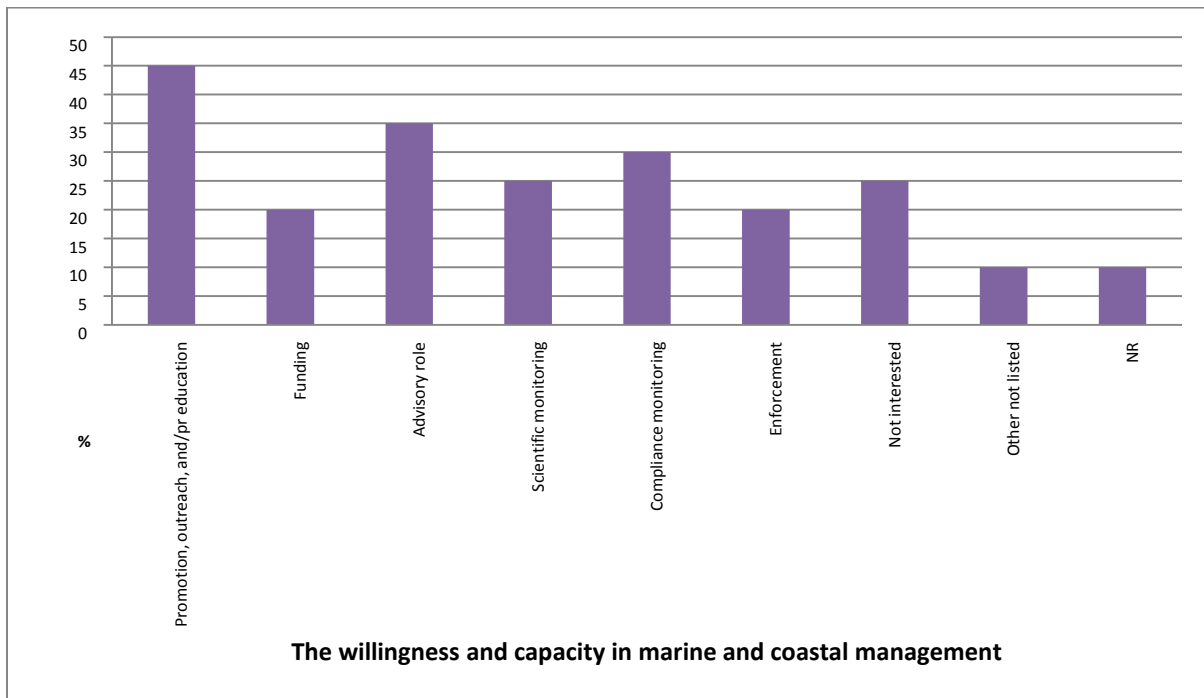


Figure 4-8 The willingness and capacity of the community in participating in marine and coastal management

The results illustrated in figure 4-8 suggest that the community was willing to support outreach and share local knowledge. However, a lack of professional expertise and financial support were areas of concern for the community. For the option, ‘other not listed’, respondents suggested an impact assessment was needed to estimate whether the community would be

affected and to what degree the community should consider building partnerships with governmental agencies and/or to establish an MPA.

4.2 Eastport interview results

Over a period of three months (August - October, 2011), interviews were conducted with the main stakeholders of the Eastport MPAs. A total of 18 people were invited to participate and 11 responded positively, for a response rate of 61%. Five were telephone interviews and six were written responses (via emails). The interviewees were a mix of community members and officers from different levels of governmental agencies.

4.2.1 Community engagement in the EPLPC

This section discusses the respondents' view of community engagement and how this management tool was applied to the lobster conservation plan for the Eastport area. The following results focus on the definition of community engagement as defined by the respondents, the use of this management tool from the perspective of local communities and governmental agencies, and the overall benefits of applying community engagement in the EPLPC.

a) Nature of community engagement as defined by the respondents

From the responses, community engagement was defined as a bottom-up management approach that encourages communities to work collaboratively and build relationships through "learning and doing" processes. Respondents suggested that it allowed communities to eventually take ownership and could result in positive changes to local people's livelihood. Community engagement was also named as a public awareness tool that brought all stakeholders together to be involved in managing the resources on which their livelihood depended. The key component of community engagement was identified as the connection between the leadership from local communities that were willing to contribute time and effort to address local issues, and governmental agencies that respected communications from all aspects and supported transparent working processes.

From the government's perspective, stakeholder consultation was seen as the first step that

gathered communities and other affected parties in developing a management plan. The whole process of community engagement included consultations, feedback meetings, community empowerment, and consistently keeping communities informed on science monitoring and enforcement progress. Although community engagement often involved the complexity of diverse opinions that could slow down the management plan, it was seen as necessary to bring communities' perspective into decision making process. The thinking was that once people were knowledgeable of the issues and how these affected communities, it gave them a reason to be more willing to follow regulations and policies.

Since fisheries are very complicated and ever changing, there are a number of challenges for using community engagement as a management tool. For example, when the wider community is engaged, the original intentions to engage communities could be twisted by different viewpoints and be eventually changed. Nevertheless, broad community engagement in fisheries management appeared to have brought benefits to Eastport. The local-based group, EPLC, was formed to protect the lobster population, and eventually collaborated with DFO, to establish the two MPAs to protect the marine environment.

b) The EPLPC relationship with local communities

In 1995, the EPLPC was formed by local communities to address resource conservation focusing mainly on lobsters as fishermen recognized that the lobster population was decreasing. The EPLPC engaged lobster harvesters in the Eastport communities and those communities in the outlying areas through public consultations and information sessions to support community engagement. There was unanimous support by lobster license holders and representatives from each of the 7 communities on the Eastport Peninsula. A self-policing of fishing activities was also set-up by the fishermen, named "fishermen watch fishermen".

The EPLPC has been supported by community awareness of sustainability and stewardship of the lobster resource that contributed knowledge and experiences from each fish harvester. The EPLPC has also cooperated with local schools, focusing on the youth. For example, teachers in grades 9 and 10 use the EPLPC experience as a teaching tool in economic and social science classes. It was noted that since there were less opportunities for children in fishing communities to participate in the fishery, the learning experience from the EPLEC was seen as important learning process for the next generation. Overall, positive relationships exist between

communities and local interest groups. The fishermen formed the EPLPC by themselves and invited DFO to set up the management area in 1997.

c) The EPLPC relationship with governmental agencies

In the early stage of the EPLPC, DFO functioned basically as the enforcement agency responsible for the management of lobster resource. Since DFO suspected non-compliance of the regulations and possible poaching by fishers, the EPLPC held open meetings with enforcement officers, to put everything “on the table”, as a means of starting the first step of building trust. The DFO was also willing to be involved in the surveillance and to help facilitate communities’ self-policing.

In terms of the relationship with DFO, it was noted that there was good collaboration with fisheries managers, scientist, fishery officers, and Eastport communities. Generally, decisions were made by local fishermen and DFO respected the suggestions from the communities. From DFO’s perspective, the intentions of the EPLPC were consistent with DFO core objectives of conservation, sustainability and viability. Hence, DFO was looking in the same direction as the EPLPC. From the perspective of the provincial government, the Fisheries and Aquaculture Department exercised limited power, only providing general inputs and serving as an ex-officio representative in the EPLPC. Overall, DFO was seen as the major governmental agency collaborating with the Eastport communities and other stakeholders.

d) Benefits of applying community engagement in the EPLPC

Before the EPLPC was established, there was evidence suggesting some harmful activities such as poaching was going on for years around the communities. Fishermen were trying to maximize the fishing efforts, leading to the lobster stock depletion. After the EPLPC was formed, communities had an agreement (since 1995) that marine resources needed to be protected in order to sustain their livelihood. The majority of fishermen became involved in self-policing and conducted educational meetings that eliminated the practices of retaining undersize lobster for sale or personal consumption, and the exceeding of legal pot limits. Fishermen also implemented a large scale v-notching program to monitor the population and improve conservation measures.

Furthermore, the Eastport Peninsula Lobster Management Areas (EPLMA) was also set up to manage fishing access, avoid harvesting certain species and support of stock recruitment and egg production. The EPLMA has been shown to be beneficial for lobster conservation. Local fishermen found that while the commercial catch per unit effort in the EPLMA remained stable over the past several years, the lobster population declined outside of this area. Moreover, the good recruitment of lobster seemed to have spread out to larger areas, and the biomass of lobsters appeared to have become stronger. Respondents suggested that the management plan not only benefited the lobster fishery, but also enhance the wider marine environment.

In terms of principles and limitations, there were more regulations implemented after the establishment of the EPLPC and EPLMA. For example, at the two core areas of the EPLMA, Round Island and Duck Islands, fishing activities were banned, and there was strong enforcement around the areas. Nevertheless, there were no apparent changes in harbour operations and tourism development before and after the EPLPC was formed. Most of the fishermen were satisfied with the management plan. In addition, small contract work has increased especially in terms of monitoring and administration activities. There are also some tourists who come to visit the EPLMA and a few jobs have been created to support the follow-up research. A small amount of money from this spun off activity has benefited the communities, giving local residents some tourism business.

4.2.2 The shift from the EPLPC to the Eastport MPAs Steering/Advisory Committee

In 1999, the EPLPC approached DFO to explore the potential for establishing an MPA under *Oceans Act*. The Eastport MPAs Steering/Advisory Committee was established in 2002 in order to facilitate the consultative process. The difference between the EPLPC and Eastport MPAs Committee centered around the fact that the former was only involved in v-notching and basic lobster stock monitoring, while the later went one step further, focusing on the establishment of the MPAs . Basically, the two Committees still remain in place. However, some members in the EPLPC have joined the MPA Committee; while others who did not agree with or were influenced by the creation no-take zones within their fishing areas did not join the MPA Committee. Generally, the role of each group is connected but not equivalent.

4.2.3 The two MPAs and the Eastport MPAs Steering/Advisory Committee

Since the two MPAs were established, there has not been much change in most fishing activities, the harbour operation and tourism development as a result of the regulations arising from establishment of the Eastport MPAs. The following sections discuss the nature of MPAs and illustrate the collaboration efforts of the Committee with DFO, the Committee members and other related stakeholders.

a) Nature of MPAs defined by respondents

Generally, the interviewees agreed with the purposes for establishing an MPA under the definition of *Oceans Act* (defined in Chapter 2.3). However, the term MPA has been confusing to local communities because it covers multiple meanings. Some respondents defined an MPA as a no-take zone that nourishes the whole marine resources, while others defined an MPA as excluding the commercial fishing, and allowing only scientific research. In terms of the two MPAs in the Eastport area, respondents indicated that these have nourished marine species, especially by increasing the lobster population and have contributed to the commercial fisheries in a sustainable manner.

b) The functions of Eastport MPAs Steering/Advisory Committee

The Eastport MPA Committee includes stakeholders from fish harvesters, the harbour authority, tourism industries and governmental representatives. The Committee usually meets one to four times a year when there are issues that need to be discussed, such as reviewing scientific research, addressing enforcement concerns and promoting public awareness. The function of Eastport MPA Committee is to keep communities informed of the marine resource management effort within the Peninsula. The Committee has also raised public awareness on these issues and encouraged residents to be cautious of what they are doing on the water.

The coordinator who currently bridges communications between the Committee and DFO was noted as playing an important role in supporting the MPA management. In these 12 interviews, most of interviewees pointed out that the coordinator provided strong support to the Committee. Since the coordinator's role is to gather information and provide the contact with governmental agencies, members of the Committee do not need to do this. On the other hand, the

Committee also works behind the scene. For example, while fishermen do not have time to attend regular meetings, the Committee members who are fishers share information when they go fishing together.

Since people are satisfied and understand what the Committee is working on, and the Committee has a good relationship with fishermen around communities. However, some respondents mentioned the limitation of the Committee, as a grassroots driven group that focuses only on conservation, and cannot reflect the whole picture of the livelihoods on the Eastport Peninsula. Overall, the Eastport MPA Committee helps the DFO ensure that the objectives of conservation, stewardship and sustainability are being achieved.

4.2.4 The utilization of citizen science in the lobster conservation plan

Respondents indicated that the DFO lead scientific research and monitoring programs, including specifying protocols, methods and indicators. DFO conducted training of the fishing crews, enter the data, and perform preliminary analyses. Based on the criteria designed by DFO, the data is collected by fishermen volunteers who have been involved in first-hand data collection, such as v-notching on egg-bearing lobsters, post seasonal tagging (from September 1st to 21st), and log book recording during the fishing season.

As lobster populations have been unstable, DFO scientists have tried to measure whether the two MPAs (though the implementation of no-take zones) have been beneficial for lobster population. For example, fishermen with previous training have collected data on how many (a) lobsters were tagged inside and outside the MPA, (b) were spawning individuals, (c) were egg-bearing females, and (d) were under sized. In addition, the academic community has also been involved in the research of MPAs. For example, some graduate students from the MUN did their theses on these marine habitats or followed tagging data to better understand lobster migration patterns. Research was also done by researchers from the MUN in collaboration with DFO.

The collected data is then analyzed by DFO and the findings presented back to the communities. Following this presentation, The Eastport MPA Committee then has discussions relating to any issues they will focus on in the coming season, and the level of adequate funding that is needed and/or is available.

Overall, the respondents indicated that fishermen were satisfied with how data was collected, analyzed and published. The Committee works well with DFO and ideas are usually

exchange ideas on a regular base. It was noted that scientists offered information and also took traditional knowledge into account when making decisions regarding their analyses.

4.2.5 The challenges and lessons learned from the Eastport MPA management process

The following sections discuss the challenges that (a) stakeholders faced during the different stages of planning and managing the two MPAs, (b) the general responses to those challenges, and (c) the factors that were considered key for maintaining the success of the Eastport MPA Committee. This section concludes with a summary of the experiences of different key players (including communities' who were engaged in marine and coastal management, representatives from governmental agencies, local committee, and the members of communities).

a) Challenges with establishing the two MPAs

Respondents noted that when the idea for establishing a MPA was first introduced to the community, fishermen had reservations. This was partly because local residents were unfamiliar with this concept, hence making the early process steps difficult. For example, some residents had issues with not being able to use areas for certain activities, while others preferred not to join discussions. In the planning process for establishing the MPAs, the Eastport MPA Committee conducted many meetings which generated long discussions. Some of these issues highlighted included fishermen who argued that the two core areas of EPLMA should not prohibited any fishing activities. Whereas other fishermen who fished outside the Eastport area but close to the MPA area were concerned with potential regulatory impacts to their activities following the establishment of the MPAs'

From the government's perspective, in the beginning, the governmental agencies were looking for an additional and much expanded region as a marine conservation area which connected with nearby TNNP.

From the government's perspective, their goal was to greatly expand the current area to form a marine conservation area that would connect with the nearby TNNP. As this region enclosed a large area of the community's fishing grounds, fishermen were initially very reluctant to give up this area. Complicating matters further, in the past government agencies did not have a good record for engaging community stakeholders, so there was a significant amount of distrust between the two groups. There was also a general lack of communication and collaboration

between different governmental agencies, which resulted in enforcement gaps and unclear responsibility issues within and across departments.

b) Challenges in maintaining the two MPAs

Respondents identified funding and the continuous involvement of communities as being the main challenges to maintaining the two MPAs. Most of the funding comes from DFO which supports science and enforcement monitoring programs as well as education outreach. In recent years, funding has been changed to in-kind support from DFO programs, such as dedicating scientific researchers and providing technical support. The coordinator of the Eastport MPAs Committee is also paid by DFO. Due to the limited budget, the coordinator can only work from summer till early fall (approximately 20 weeks) with the communities. The MUN has also provided funding for various research projects, and some funding coming from private or civil society (e.g. NGO). However this funding is not considered sufficient to undertake all the required tasks. A point that was raised by interviewees was that the annual budget decision is done at the busiest time of fishing season, when fishermen are harvesting crabs and getting ready for lobsters.

Some interviewees reflected that it was getting harder to recruit new committee members and volunteers in this aging rural area. Furthermore, the frequent turnover of DFO staff also influences the operation of the Committee because it takes time for every staff to understand and get involved in the MPA management process.

From an ecological and economic perspective, in terms of lobster recruitment, some fishermen are disappointed about the MPAs because the stocks have not really “boomed” as much as they had expected. A few fishermen also still do not believe in v-notching, because it excludes large-size lobsters that are sold to the market.

c) Challenges in collaborating with DFO with the respect to citizen science

According to the responses, the interviewees were satisfied in the collaboration with DFO, specifically with the scientific research and monitoring programs. Based on these initiatives a good working relationship has been built between the Eastport communities and DFO. Nevertheless, one of the serious challenges is maintaining funding for scientific research, which is always being cut back, and having to be replaced by research that can only be supported in-

kind by DFO and local volunteers. However, because of the aging population in Eastport, the number of volunteers is being greatly reduced each year.

With regards to enforcement, fishermen expected a more dedicated effort from DFO. At first, the communities were not given the patrol tools they should have received, so DFO promised to do regular patrols for the MPAs, with the aim of avoiding illegal fishing.

d) Responding to the general challenges

In order to minimize impacts on local fisheries during the process of establishing MPAs, the Eastport MPA Committee explained to fishermen that these parks would serve to benefit the whole community. For example, the Committee brought fishermen, related stakeholders and DFO together to express their point of views. Consultations and meetings were held, which opened communications between different groups and helped move the process forward. From the perspective of government initiatives, they realized that the MPA would not be successful without community support. Therefore, they collaborated with the Committee, to promote to local residents the importance of rebuilding lobster populations and encouraging fishermen to collect v-notching data.

With regards to the extension of a marine conservation area, neither the EPLPC nor the Eastport MPA Committee supported the idea, so the plan was subsequently dropped. Eventually, the MPAs were comprised of two Islands not connected.

Regarding rules for participating on the Committee, federal and provincial governmental representatives can attend meetings as ex-officio members, but do not have voting right. One of the two co-chairs on the Committee is from DFO, but the rest of the voting members are mostly fish harvesters from the communities.

Since the two Islands were AOI for 4 or 5 year, fishermen have expressed less opposition for MPAs establishment. Although it took a long time for the establishment of these two MPAs, this approach worked because it allowed all the participants to discuss and collectively agree on management issues and provide recommendations. Currently, the Committee holds a public meeting once a year so that anyone from the community can ask questions and offer opinions, and share information. Outcomes from these meetings are also shared with others who could not be there by word of mouth and to these who could not attend regular meetings.

e) Key success factors to maintain the operation of the Committee

From the communities' perspective, the Eastport MPA Committee is required to keep everyone informed about the activities in the lobster fishery. The Committee also needs to make sure that concerns from all stakeholders are heard and acted upon by relevant governmental agencies. Meetings are held when needed but not so many as to "burn out" participants. Also, the coordinator of Eastport MPAs management is a liaison between the Committee, local stakeholders and the DFO, thus keeping all members informed and moving issues forward. The continuously support of resources from DFO is one of the key factors that helps maintain the operation of the Committee.

With regards to the Eastport communities, the fundamental goal of MPAs management needs to be clearly confirmed, i.e. the two MPAs are not only a reserve for lobsters, but also provide shelter for all of the marine resources. In terms of contributing to this initiative, a good example is the volunteer-driven group of fishermen who have dedicated time and effort to self-police their fishing area and marine resources. Last but not least, the most important factor to maintain the operation and success of the Committee is trust building between different groups and cooperating with all parties.

f) Experiences of community engagement in marine and coastal management that can be shared with other communities

According to the respondents, a number of suggestions are proposed that should be shared with other communities involved in marine and coastal management. Firstly, both governmental representatives and the community need to be open minded and transparent with each other. The committees should hold many public meetings to communicate everyone's plans and ideas, and invite all stakeholder groups to participate. The whole process is long, so being patient is extremely important.

Secondly, from the government's perspective, the level of local commitment and support are extremely important. Governmental agencies (e.g. DFO, Parks Canada, and Environment Canada) should be up front with the community and highlight the opportunities and challenges that could arise. ... A face-to-face meeting is considered helpful to gather most of community members and start conversations. Also, government should establish science and enforcement monitoring programs and provided support for adequate long-term resources.

Third, from a local committee's perspective, involving all members allows each person to play an important role in managing resources. A leader of the local community and the coordinator from the collaborated agency should help facilitate the process of management.

Finally, from the aspect of community members, the respondents suggested that everyone should try to see beyond one's self-interests and think outside the box. Education outreach can be conducted to raise public awareness and keep every community member informed and involved.

Chapter 5.0 Discussion

This chapter discusses the main findings in terms of the communities' willingness to participate in marine and coastal management, and their collaboration with governmental agencies and academic partners. Also discussed are the challenges and opportunities in regard of engagement, and where perhaps lessons learned from the East Port experience could be applied to the Port Joli area. This chapter concludes with a discussion on the main findings and how these address the three research questions that this study sought to answer.

5.1 Understanding the community's willingness to participate in marine and coastal management by collaborating with governmental agencies (e.g. Fisheries and Oceans Canada, Parks Canada and Environment Canada) in the Port Joli area

A community's willingness to participate in marine and coastal management by collaborating with governmental agencies is referred to as community engagement in this report. This term also refers to "community-based management", "joint management", "the partnership" and "collaborative management" (Salm, Clark & Siirila, 2000). Community engagement is one of the best practices in marine and coastal management that empowers communities, as opposed to top-down control.

According to the research conducted, 60% of respondents were either fully supportive or supportive of building partnerships with federal and provincial governmental agencies to address environmental issues. However, some respondents mentioned that the poor reputation of governmental agencies generated concern as to whether the partnership would be based on a relatively equal agreement. In terms of importance for the community to build the partnership with governmental agencies, 65% of participants thought it was either very important or important, while 25% of respondents questioned the real intention of building a partnership from the government's perspective.

With regards to personal participation, 30% of respondents were very interested to participate in the process of collaborating with governmental agencies. However, 30% of respondents had no interest in collaboration, especially the seasonal residents with limited time

to do so. Respondents also pointed out that building a partnership with governmental agencies should not only be just a “paper exercise”, but should dedicate efforts to marine conservation in the Port Joli area.

When asked about the use of a specific tool, such as an MPA, to address marine conservation concerns, 60% of respondents highly agreed to support the establishment of a MPA. An even higher percent of respondents considered it is important for the community to be involved in the planning and management process of an MPA. However, only 30% of respondents ranked the degree “very high” in terms of having a personal interest to participate in the process, while 40% of respondents showed no interest at all.

The benefits of marine environment and resource protection of a MPA may be well known to local residents. However, the local community expressed a lack of trust in collaborating with governmental agencies. For example, respondents thought that MPA management was influenced by a strong external power exercised by those who did not live in the community. As such, the local residents feared losing their ability to use local resources. Furthermore, an MPA as a no-take zone is another concern from the community. Although an MPA may differ in the size, design and the level of protection it is given (IUCN, 2008), local residents are still considered their livelihoods would be taken away if an MPA was established.

5.2 Understanding community’s willingness to collaborate with DFO, scientists and academic professionals in fisheries management in the Port Joli area

Citizen science is the process whereby citizens are involved in science as researchers and has also been referred to as community science (Conrad & Hilchey, 2011). A community’s willingness to collaborate with governmental scientists and academic professionals is referred to in this discussion as the term for citizen science.

In this study, 50% of respondents thought it was important for the community to be involved in citizen science with governmental scientists. However, the relatively low rate of support and personal participation imply that respondents were worried that governmental scientific research may be based on changing policies and that the community’s benefits will be affected in the decision making. Moreover, respondents pointed out researchers from governmental agencies have less local knowledge than the community, but thought themselves as experts. Some

respondents suggested scientific research mixed with the government, academic and relevant stakeholders could provide a better research outcome. On the other hand, compared to involvement with governmental scientific research, respondents were more willing to support and participate in academic research as citizen science. Respondents also pointed out that academic research without connection to a company or an industry is acceptable. However, there were some concerns that academic research may not fit in with practicalities of the real life as the reality of this is often more complex than theories or paper.

In terms of the nature of community participation, 45% of all respondents were interested in promotion, outreach and education, 35% of all respondents were willing to be involved in an advisory capacity, and 30% expressed willingness for compliance monitoring. Fewer respondents were interested in scientific monitoring, enforcement and fund raising. These results further suggest that the community was willing to support outreach and share local knowledge, but the lack of professional expertise and financial support may be a concern for residents to want to be personally involved with an initiative.

5.3 Providing potential opportunities and barriers to community engagement in Port Joli

Port Joli is an aging community with small-scale fisheries and locally-own business, which could limit development options. For example, some respondents were not interested in any type of participation, because they were summer residents or retired seniors who had limited time, ability or efforts to do so. Also, the lack of an educational outreach resulted in residents having less knowledge of current research. For example, 40% of respondents rated MPA's as a concept they were familiar with, and 45% of respondents were not at all familiar with the concept of citizen science prior to the definitions being provided. However, after being made aware of these definitions, respondents identified citizen science as being the most appropriate tool to address environmental issues. Although there are two local eNGOs (The Port Joli Basin Conservation Society and the FPBM) involved in marine conservation outreach and research, residents still looked for support from governmental agencies, due to the perception that these agencies have relatively stable budgeting processes and the availability of professional staff.

Generally, there are both opportunities and barriers to community engagement in the Port Joli area. One of the opportunities relates to the fact that the community have noticed a decline in

fish stocks. Based on this observation, management tools (i.e. community engagement, citizen science, MPA) have the potential to address this concern. Concerns relating to aquaculture development and water quality have also inspired the community to be more involved in marine and coastal management. This proactive approach could possibly address problems such as water pollution which may affect their livelihoods in the future. However, when asked whether they are willing to dedicate time and effort, there was some hesitancy based on previous experiences of working with governmental agencies. For example, some respondents pointed out the establishment of a MPA can bring sustainable marine resources to the community. Yet, they are afraid that local access and use of these resources may be reduced or taken away based on the intervention of governmental agencies and through new regulations.

In summary, community members have noticed the degradation of the marine environment and associated resources, and are willing to look for external support.. As such clear communications and public hearings may be needed to build good working relationships between the community and other related stakeholders.

5.4 Providing insights regarding the development of the two MPAs and the operation of the two Committees in Eastport

Since the EPLPC was formed in 1995, the seven communities around the Eastport Peninsula have been involved in marine and coastal management so as to protect their marine resources, especially the lobster stock. Initially, community engagement was the first approach to gather various stakeholders together to address the issue of decreasing lobster stock. Next, citizen science was applied to monitoring the lobster population as a scientific collaboration between DFO and fishermen. Finally, the establishment of the two MPAs could be seen as the successful outcomes of communities' involvement in the lobster conservation plan. Consequently, community engagement was the very first step leading fishermen towards the final conservation goal, the establishment of the two MPAs.

Based on the interview data, many participants believed that the term community engagement implies bringing communities' perspectives into the decision making process. It is also a public awareness tool that can bring stakeholders together to participate in resource management that relates to their livelihoods. However, when the community is engaged, the complexity of diverse opinions is revealed and can often be expected to slow down the

management process. At this point, the connection and trust between local leadership and the government's support is important. As a self-driven group, the EPLPC built the partnership with the DFO, by facilitating frequent discussions between local stakeholders and the federal government. As such, the DFO understood the fishermen's needs, and were more likely to provide adequate financial/scientific support to these communities. In this relationship, both sides have devoted effort and time to be involved in conservation management and the relationship between the two is fairly equal. As such it could be said that in this case, community engagement has been successfully applied as a management tool for the Eastport' fishery.

Citizen science is the other approach to address the issue of decreasing lobster populations. Since DFO has been involved, the v-notching method has been applied to track the egg-bearing lobsters. Other monitoring activities, such as post-seasonal tagging and log book recording during the fishing season were also applied to monitor the population of lobsters in the Eastport area. Through first-hand monitoring and data collection by fishermen, information on ecological changes within the lobsters stock (i.e. spawning, egg-bearing and size) , were sent to DFO for scientific assessment. The results of the analysis are published by, DFO and discussed with the communities. These discussions also inform monitoring plans and community engagement for the up-coming year. Through this collaboration with DFO and Eastport fishermen, the communities had a clear understanding of how data is collected, analyzed, utilized and published. So far the communities are satisfied with their interaction and there is general agreement that citizen science is an appropriate tool to help improve the lobster population.

The process of establishing an MPA usually takes a long time. Before the two Eastport MPAs were established, the islands, Round Island and Duck Island, were AOIs for 4 to 5 years, which allowed the community to have more time to be made aware of the function of an MPA and what is needed in terms of management. This process was conducted through a number of meetings and discussions. Initially, when the DFO was approached to consider declaring these areas as a MPA, the communities had different views from the governmental agency on the size and function of the MPA. On one hand, the governmental agency was considering an area, covering the whole Eastport fishing area, which would connect with the TNNP territorial reserve, However, the communities were only in agreement to have designated two small islands as MPAs , which were also at a distance from their regular fishing area. In the end, the two groups were able to have positive discussions, and the governmental agency respected the local

perspective. The final outcome resulted with the two islands being defined as core areas, and the rest of the area zoned as three different regulatory sections that provide different usages for fishermen both inside and outside of the Eastport fishing region. The success in applying an MPA as a management tool can be seen within the interviews responses, as more and more of the participants now believe in the value of the two MPA as reserves. The MPAs exclude commercial fisheries and help to enhance and nourish the surrounding marine environment.

The success of the Eastport MPAs (establishment and management) is in part, because the communities were engaged early and there was an enabling environment which allowed for the sharing of different opinions with governmental agencies. Following the establishment of the MPAs, the Eastport MPA Committee was formed to collaborate with governmental and academic scientists, further supported by the DFO coordinator, and local fishermen working together. Since the communities are satisfied and understand what the Committee is doing, the Committee had a good relationship with local residents as well as governmental agencies.

5.5 Providing an analysis of community engagement in the Eastport MPAs management that can be utilized as an opportunity to involve the community in the possible establishment of an MPA in the Port Joli area

There are several components which can be utilized from the Eastport MPA management experience that could provide opportunities for community members in the Port Joli area to become involved in marine and coastal management with governmental agencies. Firstly, education outreach is needed to introduce current science/social knowledge studies to the community. The governmental agencies and eNGOs should hold meetings and presentations in order to inform the community of the current trend in marine and coastal management tools. Secondly, consultations and public hearings serve to help the community to understand issues they face, and how other stakeholders can help them with addressing these problems. For example, governmental agencies need to have frequent conversations with the local stakeholders. Building and implementing a good communication plan is the first step to start exploring opportunities for collaboration.

Thirdly, information transparency is needed in order to share ideas between both sides. The governmental agencies need to be willing to clearly define what policies and strategies they are considering, when seeking to address specific problems. Similarly the community also needs to share their opinions based on their daily experiences and local knowledge. Sharing information respectfully brings different stakeholders together so that conversations are more interactive and diverse. For example, fishermen in the Eastport area did not want an MPA which would greatly constrain their fishing capacity, whereas DFO had plans for a much larger area. Positive negotiations helped the two sides' compromise, resulting in the establishment of two small no-take areas and three regulated zones. A coordinator who connects the local and governmental agencies is also very helpful when facilitating and maintaining these conversations. In the Eastport MPA management experience, the coordinator (worked on most of the administrative tasks, and local fishermen relied on the facilitating role undertaken by this person. For example, when fishermen thought there was a problem arising, they often talked first with the coordinator, who then took the concern to the DFO officers for further discussions.

Overall one of the most the important action component needed for engagement and understanding is “learning by doing”. As the EPLPC is a self-driven group that was established to protect the lobster fishery, Eastport communities were willing to approach DFO to initiative conversations focusing on the health of their fishery. Based on previous negative experiences, although the Port Joli community does not fully trust governmental agencies, perhaps through “trial and error” experiments potentially this may lead to future \ positive discussions and engagement. Once respectful and meaningful collaborations with different stakeholders have started, there are potential possibilities for other initiatives beyond just addressing the environmental issues that are affecting the community.

5.6 Determining if the outcomes from analysing data from Port Joli can provide potential lessons to improve Eastport MPAs management

Although Port Joli has not been involved too much with marine and coastal management, there are still a few lessons which could be adapted for the Eastport MPAs. For example, the study of aquaculture impacts in Port Mouton could also be applied to address potential impacts of fish farms in the Eastport area. According to the *Eastport Marine Protected Areas Regulations* (Department of Justice Canada, 2005), aquaculture operations would be prohibited within the

two MPA. However, the opportunity does exist as there is a large area bordering the MPAs, which is available for potential aquaculture development. Currently there are no farm sites within the Eastport fishing area; however, a few small sites (Cod/Trout farms) are situated approximately 60 km away from the two MPAs. So far, impacts to the Eastport MPA from these fish farms are not evident. However, the potential is there that outputs from these fish farms could affect the local marine environment and species in the future. The FPMB have extensive skills with fish farm monitoring, outreach and communications with the DFO, and the aquaculture sector. Based on their experiences and recommendations regarding the situation in their own area, a precautionary study on the potential impacts of these fish farms should be made as high priority for all MPA stakeholders (FPMB, 2012).

5.7 Answering the three research questions

The following sections address the three research questions that guided this study. The focus of this section is to firstly discuss the opportunities and challenges associated with addressing environmental issues faced by the Port Joli community, and in collaboration with the federal government. This is followed with a discussion on the benefits and challenges of community engagement with the establishment of the MPAs and enhanced fisheries management in Eastport. The third section presents lessons learned from the Eastport MPAs management that could be adapted by the Port Joli community to develop good community engagement that is aimed at addressing marine and coastal management issues in their area.

5.7.1. What are the opportunities to collaborate with the federal government, and challenges which may be encountered in attempting to get the community engaged in coastal management in Port Joli?

As an aging community with small-scale fisheries and locally-owned business, some residents in the Port Joli area are not interested in participating in marine and coastal management because most of them are summer residents or retired seniors who have limited time, ability or the effort required to engage. A lack of educational outreach opportunities may also contribute to residents having less awareness of current research findings in both science and social science fields. For example, many residents suspected that an MPA will highly affect the community's livelihood, even though a definition was given to explain the zoning system of

an MPA. Furthermore, although there are two local eNGOs involved in marine conservation research, the community also expects to be recognized and supported by professionals from governmental agencies.

In terms of the willingness to be involved in marine and coastal management through the collaboration with the federal government, the community lacks the trust needed to build the partnership with these governmental agencies. The low rate of support and personal participation in the three management approaches, suggests that changing policies and centrally-controlled power often affect the community's benefits from being realized in the decision making process. Finally, there is a lack of financial support and leadership to facilitate marine conservation in the Port Joli area. While doing the research for this study, it was noted that there was limited information available in governmental publications and academic journals. However, based on research from the DFO, Port Joli was defined as an EBSA that has the potential to establish an MPA. This situation suggests that DFO and other related departments do not pay enough attention to Port Joli. For example, financial support and encouragement by governmental and local leaderships to guide marine and coastal management was not evident in the study area. It should however be cautioned that leadership at the community level may be different to identify because of the time constraints of this study and the nature of community relations in rural N.S. communities (J. Kearney, pers. comm.).

Negative changes in the marine environment and its resources have been noticed, and there are several challenges identified by the community. However, there is also an indication that the three proposed management tools may be of some value to address these concerns. With regard to the usage of specific management tools, more than half of the respondents highly agreed to support the establishment of a MPA. The respondents showed even higher support regarding the importance of community engagement in the planning and management process of an MPA. These findings indicate that the community potentially thinks the establishment of a MPA can bring about sustainable marine resources, supporting local economic development. However, more research is needed to examine this conclusion.

In terms of personal participation, one third of respondents are very interested in engaging in the process of collaborating with governmental agencies. As such, the community are willing to support outreach initiatives and share local knowledge, as well as compliance and scientific monitoring. Overall, the community have enough awareness of environmental issues, and are

interested in further exploring and supporting these three management tools. As such the community would be willing to collaborate with governmental agencies and is willing to devote adequate efforts and support for this collaboration.

5.7.2. What are the benefits and challenges of community engagement in MPAs and fisheries management in Eastport?

According to interviews conducted in a previous study (Davis et al., 2006), the researchers pointed out several challenges for the management of the Eastport MPA. This study has addressed some of these issues; however others still remain as they were beyond the scope of this research. The major concern in both Davis et al. (2006) and this research is that funding for the Eastport MPA management is neither stable nor sufficient. The participants in this study mentioned that budgets for scientific research were cut, and financial support from DFO was changed to in-kind. The other challenge which was indicated in both studies was that maintaining long-term involvement with the community and governmental agencies is not easy. For example, the aging population in the communities has made the recruitment of new volunteers harder.

The other challenge both studies identified was the negotiation process between DFO and fishermen about the size of two MPAs. In the beginning, DFO expected to include the whole Eastport fishing area as a MPA, but communities only wanted the no-take areas to be limited to two small islands, which were some distance from the fishing area. Though a final decision was made based on the communities' suggestion, a few interviewees in this study still think the original plan was twisted by governmental agencies because the rest of the area is now divided into three zones, impacting fishermen from outside the Eastport area. Therefore, another group, the Eastport MPA Committee was formed to actively manage the MPAs, while the initial committee, the EPLPC, concentrated on paying more attention to science monitoring only. There is some overlap of members between the two committees. However, some members in the EPLEC still think that the MPA deviated too far from the original idea, thus decreasing the fishing opportunities for fishermen outside the Eastport area.

Both studies note that fishermen have questioned how successful the MPA is as a conservation measure and whether it truly benefits the fishery. Davis et al. (2006) noted that the scientists believed the lobster exploitation rate was still too high, but fishermen did not agree to

reduce the number of licences or pots per licence. In this research, fishermen were disappointed that the lobster stock did not increase as rapidly as they expected. Nevertheless, this study shows that fishermen have continued with monitoring the stock and there are signs of improvement. For example, stock monitoring data from other academic studies shows that lobster populations have spread outside of the Eastport fishing area.

There are also some concerns which remained questioned till more explanations were provided by the interviewees in this study. For example, Davis et al. (2006) noted that fishermen from outside of the Peninsula had increased their fishing efforts in the buffer zone. However, only few participants in this study mentioned that fishermen from outside of the Eastport area had increased their effort.

While interviewees in both studies mentioned the enforcement responsibility between DFO and local communities, in the earlier study, fishermen criticized the fact that they were not given enough power and financial support to undertake surveillance required to support regulating poaching. However, in the current study, interviewees said DFO promised to do most of the surveillance, and the communities agreed and were satisfied with this decision. These two examples highlight that after the MPAs were established, the communities still maintained a good working relationship with neighbouring communities and governmental agencies. Although some interviewees suggested that maintaining long-term engagement with governmental agencies is not an easy job, in this case most of the issues were generally addressed and solved because of the collaboration.

In this study, interviewees also explained how they responded to problems and overcame challenges. For example, in the early stage of forming the MPAs, the communities were concerned as to whether these would have an impact on their fishing capacity and would it really benefit the lobster stock. Nevertheless, the communities agreed to protect marine resources, devoting their time and efforts to protect the lobster fishery. Both the EPLEC and the Eastport MPA Committee have been involved in marine and coastal management, gathering all stakeholders in the process of discussions and consultations. DFO has also offered financial and technical support in order to build a partnership with the communities. The coordinator as liaison connects both sides and this has helped facilitate the conversations between them.

Other governmental officers are invited to attend Eastport MPA committee meetings as ex-officio representatives who can observe, but have no voting rights on final decisions. In addition,

to the fishermen, their families have also supported this initiative as volunteers, dedicating time and efforts in tagging lobsters and being involved in education outreach. Overall, in the case of the Eastport area, - community engagement, citizen science, and MPA's have been applied as management tools to support marine and coastal resources. Although some challenges still remain, most of the main ones have been either mitigated or addressed.

Through the interviews, the benefits of the Eastport MPA and its supportive management structure have been positively recognized by respondents. Some examples include, firstly, based on the fishermen's experiences and data collected from stock assessments, they noted that lobster catch per unit effort in the EPLMA is stable. . Successful lobster recruitment has also seemed to have extended beyond the MPAs and benefited fishermen who fish outside of the Eastport area. Secondly, small contract work and tourism has increased. Though the two MPAs are small and not easily accessible, some tourists and students have come to visit. Reasons for these visits include learning about, and experiencing MPA management and to conduct habitat studies. Finally, the key benefit of marine and coastal management in the MPA establishment has been to raise public awareness, especially with the younger generation. Since there are lot less young people involved in fisheries, the Eastport MPAs experience teaches them about local knowledge and the importance of conservation management. The Eastport MPAs has not only provided an overarching management framework for the surrounding marine ecosystem, but has also encouraged the whole community towards supporting a sustainable local fishery.

5.7.3 How can lessons learned from Eastport provide recommendations to Port Joli in developing community engagement in the marine and coastal management?

Based on the experiences from the Eastport MAP area and management, there are some significant lessons on the potential opportunities and challenges for collaborating with governmental agencies in the Port Joli area. Firstly, the local residents should be open minded, and be able to think beyond individual interests, and see the larger picture of sustainable benefits for both the human and marine environment. For example, although fishing capacity was somehow affected by the two Eastport MPAs, communities from both inside and outside of the Eastport area were also willing to compromise further by agreeing with the regulations for the three fishing zones. Based on science monitoring, the lobster stock appears to be spreading outside of the management area (Rowe, 2002). This was beneficial for fishermen from outside of

the Eastport area as they eventually benefited beyond their original interest by this spill-over effect. Secondly, building a trust relationship is the key to starting and maintaining the collaboration. Trust is not only needed in building a partnership with stakeholders, but also between members within the community and neighbouring communities, thus building up the confidence of community members to collaborate with others. For instance, interviewees from the Eastport MPA stakeholders suggest a face-to-face meeting is easier to build good working relationships than by using online approaches. People may be more willing to be involved with a project if the initially contact is done in person, as most fishermen are more comfortable with this informal approach rather than through a written medium. Face-to-face meetings will also help the Port Joli community better understand the different tools for addressing environmental issues, while governmental representatives can help raise awareness of specific issues in this type of setting.

When the partnership is built, the management process can still take a long time. The respondents from the interviews stressed that being patient and providing long-term support are necessary. In addition, the support from governmental agencies and local volunteers are also truly needed to maintain an active collaboration. The role of leadership is also very important. Within the Eastport MPA management, the EPLPC, Eastport MPA Committee, and the coordinator from DFO have worked together, building a good connection between the government/local leaderships. In the community of Port Joli, this role can be conducted by either of the two eNGOs. However, these two eNGOs need a broader sense of marine and coastal management, and to not just focus on certain issues. Additionally, it may be necessary to recognize that in rural N.S., leadership may be more dispersed and shared than in rural communities in N.L., due to cultural differences (J. Kearney pers. comm.).

Last but not least, the three management tools if applied to the Port Joli area will help raise public awareness of sustainable fisheries and other economic development activities. While addressing environmental issues, the actions remind people to conserve marine resources for the next generations. Based on the lessons learned from the Eastport MPA management process, the potential opportunities for applying these marine and coastal management tools can eventually benefit sustainable economic development and allow for maintaining adequate resources in the future.

Chapter 6.0 Recommendations and Conclusions

As noted in Chapter 5, participants were in agreement with the three management approaches (community engagement, citizen science, and MPA establishment) as means for addressing environmental issues. However, there were also other issues raised. For example in many fishing communities, collaboration between the federal government and local stakeholders has always been a serious concern. From the government's perspective, changing policies and a high personnel turnover rate make committing to long-term support difficult. From a local community's point of view, lack of trust and education outreach make communities less willing to collaborate with governmental agencies. Based on this study's finding, analysis and discussion chapters, the following recommendations are provided to assist governmental agencies and communities in the Port Joli and the Eastport areas.

6.1 Recommendations for the governmental agencies

Based on this research, Recommendations 1-7 are provided for the following national agencies: DFO, Parks Canada, and Environment Canada, as they are the main governmental bodies involved in marine and coastal management plans. The focus of these recommendations is to help these agencies facilitate collaboration process with the Port Joli community to address identified environmental issues.

Recommendation #1

In order to build a good relationship with local stakeholders, the governmental agencies should be more active to engage the communities. With reference to the 'ladder of citizen participation' framework, governmental agencies are suggested to start by informing communities through meaningful consultative meetings so as to provide an opportunity for better understanding of the concerns and perspectives of people who will be impacted by their decisions. Furthermore, governmental agencies are encouraged to build a partnership with the community, thus enabling the community to negotiate and be involve in negotiating trade-offs with decision makers in planning and management processes (Arnstein, 1969). Although it may take time to build a stable relationship with the Port Joli community, past studies have shown

that when a policy is supported by communities, there is a greater possibility that the implementation and overall process is more efficient, which in turn leads to a more successful and comprehensive outcome. . Therefore, it is important that the governmental agencies build a good relationship with the community.

Recommendation #2

The benefits of citizen science (discussed in Chapter 2.2) and the successful lobster monitoring plan in the Eastport MPA operation, demonstrates that scientific research undertaken by DFO should also be complemented with respect for, and input of data using traditional/local knowledge sources. As such it is recommended that given their interest and concerns in their surrounding environment, Port Joli community members should also help contribute to the data collection of fish stocks and coastal water quality.

Recommendation #3

As noted during this research there appeared to be few science and social- science studies for the Port Joli area. It is therefore recommended that governmental agencies and academia need to be more engaged and share information with local communities. For example, participants in Port Joli suggested that environmental assessment and stock monitoring studies need to be done prior to the development of an MPA plan in the area. Given the urgency of data needs and the possibility of coastal issues arising in the near future, this research also found the need for social and economic studies to support management plans.

It is also recommended that following the completion of studies by governmental agencies and academic institutions, the results of these assessments should be presented back to the community for their information and for comments. As not all community members may/are able to participate in data collection studies, it is important that information is shared, so that there is a transparent and efficient process in place. Thus community members have a good sense of what is going on in their environment and a better understanding of the types of studies that are taking place. By sharing information on both processes and outcomes, this allows for all interested parties to join these discussions and provide their opinions on issues of concern.

Recommendation #4

In the management process, long-term support by government bodies is one of the most critical factors affecting the reputation of governmental agencies' and their relationship with local communities. The community may have less willingness to collaborate with governmental agencies due to previous experiences, and as such a management plan or other initiatives will not be supported by them in the long-term. Therefore, it is important that the governmental agencies provide an adequate budget annually and regularly update the management plan with the community. However, long-term financial support cannot be committed when governmental agencies face budget cuts or have a high staff turnover rate. Therefore it is recommended that governmental agencies should, as much as possible, inform communities prior to these issues occurring, and discuss means to mitigate these changes to an original plan.

Recommendation #5

It is recommended that a well-supported coordinator who connects communities and a governmental agency is helpful to maintain long-term working relationships between all interested parties. As communities' members are usually engaged in their work and daily jobs they may not have sufficient time and effort to collaborate with governmental agencies on the design and implementation of a management plan. Therefore, a full-time coordinator can help this process by facilitating ideas between different parties. As the coordinator will spend time working with communities, overtime, he or she will find it easier to build a trusting relationship with local members. This relationship helps facilitates the communications between local citizens and a governmental agency, which the coordinator belongs to.

Recommendation #6

As the communities of Port Joli and Port Mouton are neighbours, residents in Port Joli also have concerns relating to aquaculture development in Port Mouton and the impact this might have on the marine environment. This is an issue of high concern and needs to be addressed by the Fish Farm Company, DFO and Nova Scotia Fisheries and Aquaculture Department prior to design and implementation of a marine and coastal management plan for the communities. However, it is encouraging to note that governmental agencies have already invited communities'

members to develop a management plan which includes addressing the fish farm issue. Once the issue is discussed and negotiated in more detail, community members may be more willing to collaborate with governmental agencies, as they see this process as a positive step towards addressing their environmental concerns.

Recommendation #7

Collaboration between different governmental agencies at the federal level is important. For example, the three governmental agencies (DFO, Parks Canada, and Environment Canada) may have different objectives within their own mandate. However, while their plans all focus in the same area, jurisdictional boundaries overlap and/or there are gaps in enforcement due to policy uncertainties. . In addition, since most policies are made at the federal level, provincial and municipal governments who work more closely with local communities have less power to support communities. Therefore, horizontal and vertical integration is often suggested as a way forward. However, it is not always that simple. As such it is recommended that in addition to ecological, social and economic assessments, a policy analysis also be conducted so as to better understand the different levels of policy and agency complexity that underpin the development and implementation of a MPA plan.

6.2 Recommendations for the Port Joli area

Based on findings from this research, Recommendations 8-10, not only reflect the community's willingness to collaborate with governmental agencies, but also incorporates their concerns from past experiences (e.g. limited support, lack of trust and education outreach). The following recommendations are provided for members of the Port Joli community to help with facilitating their collaborating efforts with governmental agencies to address marine and coastal issues.

Recommendation #8

Capacity building is an approach that can help develop local abilities and support actions towards meeting community goals (UNEP, 2000). Given the apparent lack of studies about the area, in addition to community members being able to access this research, it is highly

recommended that both academic institutions and the two local eNGO's help support capacity building of the Port Joli community. Specific issues could include marine conservation (e.g. MPA's), fish farms in Port Mouton and a wider understanding of the connectivity of marine ecosystems and related resources.

Capacity building and educational outreach are activities that can also be led by community members and local NGO's, in addition to governmental agencies and academic institutions. As such, it is also recommended that Port Joli community members and the local NGO's share their experiences, studies and research initiatives with other communities and interested parties to help build a network and/or community of practise to address coastal and marine management issues.

Recommendation #9

Strong local leadership has the potential to greatly influence and encourage a community's participation in initiatives and projects. However, recognizing how leadership is exercised is also very important. For example, the power of leadership may be shared in rural N.S., while it may be concentrated as unions in rural N.L. Therefore it is highly recommended that to better understand how leadership on marine and coastal conservation can emerge and be supported, further studies focusing on the cultural norms of the Port Joli area need to be undertaken.

Recommendation #10

Many respondents agreed that it is important for the community to be involved in marine and coastal management processes through tools such as citizen science and MPA's. Respondents also agreed that although they had some concerns about collaborating with governmental agencies, there were also benefits associated with maintaining a good working relationship at this level. For example, support by Federal agencies could be favourably looked upon by investors and other professional sectors, who might be interested in providing additional support for initiatives in this area. Therefore it is recommended that a "learning by doing" experimental approach by the Port Joli community could help with establishing/sustaining collaboration networks with governmental agencies and other interested parties.

6.3 Recommendations for the Eastport area

Overall, the Eastport MPA management was assessed as being quite successful. The positive experiences of collaborating with DFO have provided lessons that other coastal communities could learn from as they prepare their first step towards a participatory governance approach with governmental agencies. Based on this research two recommendations 11 and 12 are presented.

Recommendation #11

As the Eastport MPAs have been operating for (would put the number here), community members who have been involved in this initiative are familiar with the plan, processes and daily management routines. Nevertheless, in order to maintain best operational practises for the established MPAs, DFO and the two committees need to maintain financial and technical support required to support enforcement of regulations and the continual monitoring of the lobster stock. As such, maintaining regular meetings and keeping everyone up-to-date on stock data and other management issues is highly recommended.

Recommendation #12

Given the potential for the further expansion of fish farms within the near proximity of the MPAs, and the experiences of the Port Mouton community, it is highly recommended that MPA management personnel and the DFO conduct an impact assessment on the effects of large scale aquaculture development in this area.

6.4 Conclusion

After the incident of Northern Cod collapse, the federal government has started to collaborate with local communities and other fisheries-related stakeholders to address the degradation of marine resources. This project focused on two main areas: firstly to assess and identify approaches that could help the Port Joli community become more involved in marine planning and management and secondly identify processes that were used in the establishment of the Eastport MPA's and how lessons learned through this initiative could be adapted by Port Joli communities. Based on this research, the findings suggested that the lobster fishery in the

Eastport area has become more stable after the establishment of the MPAs. Socio-economic benefits have included an increase in contract jobs and tourism. A key factor that contributed towards these successful outcomes has been the development of trust, which helped to establish and maintain good working relationships between the community, government agencies, academics and other interested parties. Approaches to building trust based on the lessons from Eastport, suggest that Port Joli communities would benefit from governmental agencies by (a) conservation initiatives being supported in the long-term (b) respect for, and incorporation of their local and traditional knowledge, (c) information sharing between different parties, (d) a dedicated and well supported coordinator and (e) overall governmental agencies being more integrated at the higher level (e.g. policies and mandates). For the Port Joli area, internal support could include capacity building; educational outreach and experimental learning by doing approaches that could greatly benefit local conservation initiatives. Finally, given the current status of natural resources and constricting boundaries of management authorities, the overall outcomes of this project indicate the need for on-going community engagement, and that it is recognized by governmental agencies as an appropriate and justifiable approach to addresses marine and coastal management issues that underpin and enhance sustainable fisheries and economic development.

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Appendix I: The Port Joli/ Port Mouton stakeholder questionnaire

Stakeholder Questionnaire

Who can take this Questionnaire?

Stakeholders of the Port Joli/ Port Mouton area are invited to complete this survey. Stakeholders include individuals or groups that are affected by or depend on the resources of the area to carry out activities. These individuals include: residents of the area, recreationists who use the area, fishermen, individuals who work or own businesses in the area, and members of stewardship, fishermen, Aboriginal, business or development organizations and associations.

Why take part in this Questionnaire?

By taking part in this survey you will be helping a Master of Marine Management student, Ting-Yu Lin, answer part of her primary research question, which is to determine the community's familiarity with and acceptability of community engagement, citizen science and marine protected areas; the questionnaire will also help gauge the community's interest and capacity in participating in marine and coastal management.

There is currently no proposed marine protected area planned for the Port Joli/ Port Mouton area. The study is academic in nature; the researcher has no affiliations with the federal or provincial government. This project is intended to build upon earlier research that examined the potential for conservation and protection of Port Joli (Gromack et. al, 2010 & Gromack, 2008) as well as efforts made by CPAWS-NS to engage the community in 2009.

1. Are you a..... ? Please circle the most appropriate answer.

- a. Permanent resident of Port Mouton
- b. Permanent resident of Central Port Mouton
- c. Permanent resident of South West Port Mouton
- d. Permanent resident of Port Mouton Island
- e. Permanent resident in the Kejimikujik National Park Seaside
- f. Permanent resident of Port Joli
- g. Seasonal resident of Port Mouton
- h. Seasonal resident of Central Port Mouton
- i. Seasonal resident of South West Port Mouton
- j. Seasonal resident of Port Mouton Island
- k. Seasonal resident in the Kejimikujik National Park Seaside
- l. Seasonal resident of Port Joli
- m. Regular visitor to Port Joli/ Port Mouton area
- n. Tourist
- o. Other (please explain) _____

2. **How long have you lived in the Port Joli/ Port Mouton area? Circle those that apply.**

- a. All of my life
- b. 0-10 years
- c. 11-30 years
- d. 30 or more years
- e. I am not a resident

3. **What age category do you belong to?**

- a. 19-29
- b. 30-39
- c. 40-49
- d. 50-59
- e. 60 -69
- f. 70 and more

4. **In which economic sectors have you recently been involved? (Circle all that apply)**

- a. Hunting/trapping
- b. Commercial fishery
- c. Fish processing
- d. Aquaculture
- e. Forestry
- f. Renewable energy
- g. Manufacturing
- h. Construction
- i. Transportation and storage
- j. Retail or wholesale trade
- k. Finance or insurance
- l. Real estate
- m. Business services
- n. Government (federal, provincial, or municipal)
- o. Educational services
- p. Health or social services
- q. Home help or housekeeping
- r. Accommodation, food and beverage services
- s. Tourism guide (i.e. whale or bird watching tours)
- t. Landscaping/property maintenance
- u. Shellfish harvesting
- v. Other(s) _____

5. **Are you self-employed?**

- a. Yes
- b. No

c. Other _____

6. Are you a member of one of the following stakeholder groups in the Port Joli/ Port Mouton area? Circle the ones that apply, and add any others that apply that are not in the list.

- a. Resident
- b. Resident of (or affiliated with) the Mi'kmaq First Nation
- c. Recreational boater (sail or motor boat)
- d. Recreational fisherman
- e. Commercial fishermen
- f. Coastal Community University Research Alliance (Coastal CURA)
- g. CPAWS (Canadian Parks and Wilderness Society)
- h. Friends of Port Mouton Bay
- i. Volunteer Fire Department
- j. Other(s) not on list: _____

7. Identify the ways that you use the marine environment and resources surrounding the Port Joli/ Port Mouton area. Please circle those that apply and add any other uses not on the list.

- a. Swimming
- b. Diving
- c. Snorkeling
- d. Canoeing/ Kayaking
- e. Walking
- f. Hiking
- g. Bird watching
- h. Whale watching
- i. Camping
- j. Visit the beach
- k. Recreational boating (including sail or motor boats)
- l. Hunting
- m. Recreational fishing
- n. Commercial fishing
- o. Shellfish harvesting
- p. Marine plant harvesting
- q. Other(s) not on list _____

8. Is your livelihood completely or partially dependent on the health of the marine environment in the Port Joli/ Port Mouton area?

- a. Yes
 - b. No
- Further details _____

9. Is your livelihood dependent on abundance of marine resources in the Port Joli/ Port Mouton area?

a. Yes

b. No

Further details _____

10. In your opinion how would you rate the state of health of the marine environment in the Port Joli/ Port Mouton area?

Please circle a number or select 'Not Sure' to indicate how you view the health of the marine environment surrounding Port Joli/ Port Mouton.

Very Healthy

Unhealthy

Not Sure

1

2

3

4

5

o

Add details if you wish to explain further: _____

11. In your opinion how would you rate abundance of marine resources in the Port Joli/ Port Mouton area?

Please circle a number or select 'Not Sure' to indicate how you view the abundance of the marine resources surrounding Port Joil/ Port Mouton.

Very Healthy

Unhealthy

Not Sure

1

2

3

4

5

o

Add details if you wish to explain further: _____

12. Has there been a change in the abundance of marine resources in the Port Joli/ Port Mouton area over the years?

a. Yes

b. No

Further details _____

13. Circle all environmental issues that you are concerned with related to the Port Joli/Port Mouton area:

- a. Water quality
- b. Invasive species
- c. Decline of fish stocks
- d. Aquaculture development
- e. Industrial development
- f. Climate change and/or sea level rise
- g. Coastal erosion resulting in sedimentation and fish habitat destruction
- h. Threatened or endangered species
- i. Coastal development
- j. Other issue(s) you are concerned with that are not on the list: _____

14. Are you familiar with the concept of community engagement?

Please circle a number to show how familiar you are with the concept of community engagement.				
Very Familiar				Not at all Familiar
1	2	3	4	5

Add details if you wish to explain further: _____

Community engagement is a one of the best practices in marine and coastal management that empowers communities more than commends them from top-down control. This term also refers to “community-based management”, “joint management”, “the partnership” and “collaborative management”.

Community engagement includes networking, forging linkages to community leaders, local law enforcement officers, private business, and national agencies like tourist authorities and environmental and fishery agencies (Salm, Clark & Siirila, 2000).

15. Do you think the community engagement is an appropriate management practice responding to any of the environmental issues identified above (in question 13)?

Please circle a number or select ‘Not Sure’.					
Very Appropriate			Not Appropriate		Not Sure
1	2	3	4	5	o

Add details if you wish to explain further: _____

16. Can you identify any benefits that would result from community engagement in the Port Joli/ Port Mouton area?

- a. No
- b. Not sure
- c. Yes. Please explain or list any potential benefits below. _____

17. Can you identify any negative aspects that would result from community engagement in the Port Joli/ Port Mouton area?

- a. No
- b. Not sure
- c. Yes. Please explain or list any potential negative aspects below. _____

18. Would you support to build a partnership with federal and provincial governmental agencies (e.g. Fisheries and Oceans Canada/ Environment Canada/ Parks Canada/ Nova Scotia Department of Fisheries and Aquaculture) with communities in the Port Joli/ Port Mouton area?

Please circle a number to show your level of support.				
Full Support				Do Not Support
1	2	3	4	5

Add details if you wish to explain further: _____

19. Would you consider it important for the community to build a partnership with federal and provincial governmental agencies (e.g. Fisheries and Oceans Canada/ Environment Canada/ Parks Canada/ Nova Scotia Department of Fisheries and Aquaculture) in the Port Joli/ Port Mouton area?

Please circle a number to show how important this is to you.				
Very Important				Not important
1	2	3	4	5

Add details if you wish to explain further: _____

20. Would you be interested in participating in the process of collaborating with federal and provincial governmental agencies (e.g. Fisheries and Oceans Canada/ Environment Canada/ Parks Canada/ Nova Scotia Department of Fisheries and Aquaculture)?

Please circle a number to show how interested you are in participating in this process.				
Very Interested				Not Interested
1	2	3	4	5

Add details if you wish to explain further: _____

21. Are you familiar with the concept of citizen science?

Please circle a number to show how familiar you are with the concept of citizen science.				
Very Familiar				Not at all Familiar
1	2	3	4	5

Add details if you wish to explain further: _____

Citizen science is the process whereby citizens are involved in science as researchers and has also been referred to as community science (Conrad & Hilchey, 2011). Citizen science includes community-based monitoring and citizen involvement. The former can be defined as “a process where concerned citizens, government agencies, industry, academia, community groups, and local institutions collaborate to monitor, track and respond to issues of common community concern” (Whitelaw et al., 2003), and the later represents acts to enhance scientific understanding and democratize science by providing participants with opportunities to generate scientific knowledge themselves in the science monitoring (Pollock & Whitelaw, 2005).

22. Do you think the citizen science is an appropriate management practice responding to any of the environmental issues identified above (in question 13)?

Please circle a number or select ‘Not Sure’.					
Very Appropriate			Not Appropriate		Not Sure
1	2	3	4	5	o

Add details if you wish to explain further: _____

23. Can you identify any benefits that would result from the citizen science in the Port Joli/ Port Mouton area?

- a. No
- b. Not sure
- c. Yes. Please explain or list any potential benefits below. _____

24. Can you identify any negative aspects that would result from the citizen science in the Port Joli/ Port Mouton area?

- a. No
- b. Not sure
- c. Yes. Please explain or list any potential negative aspects below. _____

25. Would you support the collaboration with governmental scientific researchers for the Port Joli/ Port Mouton area?

Please circle a number to show your level of support.

Full Support

Do Not Support

1

2

3

4

5

Add details if you wish to explain further: _____

26. Would you consider it important for the community to be involved in the citizen science with governmental scientific researchers for the Port Joli/ Port Mouton area?

Please circle a number to show how important this concern is to you.

Very Important

Not important

1

2

3

4

5

Add details if you wish to explain further: _____

27. Would you be interested in collaboration with governmental scientific researchers?

Please circle a number to show how interested you are in participating in this process.

Very Interested

Not Interested

1

2

3

4

5

Add details if you wish to explain further: _____

28. Would you support collaboration with academic scientific researchers for the Port Joli/ Port Mouton area?

Please circle a number to show your level of support.

Full Support

Do Not Support

1

2

3

4

5

Add details if you wish to explain further: _____

29. Would you consider it important for the community to be involved in citizen science with academic scientific researchers for the Port Joli/ Port Mouton area?

Please circle a number to show how important this concern is to you.

Very Important

Not important

1

2

3

4

5

Add details if you wish to explain further: _____

30. Would you be interested in collaboration with academic scientific researchers?

Please circle a number to show how interested you are in participating in this process.

Very Interested

Not Interested

1

2

3

4

5

Add details if you wish to explain further: _____

31. Are you familiar with the concept of marine protected areas?

Please circle a number to show how familiar you are with the concept of marine protected areas.				
Very Familiar				Not at all Familiar
1	2	3	4	5

Add details if you wish to explain further: _____

Marine Protected Areas (MPAs) are one type of management tool that can help protect, maintain and restore fragile, biologically productive areas. The International Union for the conservation of Nature (IUCN, 2008, p.3) has defined MPAs (and other protected areas) as:

"A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values".

MPAs can differ in the size, design and the level of protection they are given. They may consist of areas that are completely closed to human activity or they may consist of areas that have different levels of protection, allowing for multiple uses throughout the entire or majority of the protected area.

32. Do you think the creation of an MPA is an appropriate management response to any of the environmental issues identified above (in question 13)?

Please circle a number or select 'Not Sure' to show how appropriate you think the creation of an MPA is.					
Very Appropriate			Not Appropriate		Not Sure
1	2	3	4	5	o

Add details if you wish to explain further: _____

33. Can you identify any benefits that would result from the establishment of an MPA in the Port Joli/ Port Mouton area?

- a. No
- b. Not sure
- c. Yes. Please explain or list any potential benefits below. _____

34. Can you identify any negative aspects that would result from the establishment of an MPA in the Port Joli/ Port Mouton area?

- a. No
- b. Not sure
- c. Yes. Please explain or list any potential negative aspects below. _____

35. Would you support the establishment of an MPA for the Port Joli/ Port Mouton area?

Please circle a number to show your level of support.				
Full Support				Do Not Support
1	2	3	4	5

Add details if you wish to explain further: _____

36. Would you consider it important for the community to be involved in the planning and management of an MPA in the Port Joli/ Port Mouton area?

Please circle a number to show how important this concern is to you.				
Very Important				Not important
1	2	3	4	5

Add details if you wish to explain further: _____

37. Would you be interested in participating in the establishment process and management of an MPA?

Please circle a number to show how interested you are in participating in this process.				
Very Interested				Not Interested
1	2	3	4	5

Add details if you wish to explain further: _____

38. In what capacity would you be interested in participating in marine and coastal management (considering community engagement, citizen science and MPA establishment) in the Port Joli/ Port Mouton area? Circle all that apply.

- a. Promotion, outreach, and/or education
- b. Advisory role
- c. Funding
- d. Scientific monitoring
- e. Compliance monitoring
- f. Enforcement
- g. Not interested
- h. Other not listed: _____

Thank you for participating in this Questionnaire

Appendix II: Interview protocol for managers and stakeholders of Eastport Marine Protected Areas

Manager and Stakeholder Interview Schedule – Eastport, NL

Study Title: Incorporating concerns of coastal communities in planning and management: The case studies of Eastport and the Port Joli/Port Mouton areas.

Interviewee ID Code:

Date and Time of Interview:

- 1. What is your view about community engagement?**
2. How would you define “community engagement” in your viewpoint?
3. Do you think “community engagement” has influence (benefits/challenges) on fisheries and other local economic development, and how?

- 4. Do you think EPLPC involves “community engagement”?**
5. Has the EPLPC built up a good partnership with the fishers?
6. Has the EPLPC built up a good partnership with DFO?
7. What is the difference of lobster fishery management before and after the EPLPC was set up?
8. Have you noticed more regulations involved in the lobster fishery that ensures the development of local economy after EPLPC was set up?
9. Have you noticed if there is any difference of harbour operation before and after the EPLPC was set up?
10. Have you noticed if there is any difference in tourism development before and after the EPLPC was set up?

- 11. What is the meaning of the Eastport MPA Steering Committee for you?**
12. How would you define a “Marine Protected Area” in your viewpoint?
13. Were there any the challenges you faced and heard when planning to set up the two MPAs?
14. How did you response to those problems?
15. What are key components to maintain the operation of the Committee?
16. Where does funding come from? Is the funding adequate and sufficient?
17. Have you noticed if there is any difference of harbour operation and tourism development before and after the MPA Committee were set up?

- 18. Are you involved in the scientific research and monitoring and how?**
19. Have you faced any challenge when collaborating with governmental agencies (e.g. Fisheries and Oceans Canada, Environment Canada, and Park Canada)?
 - If so, how did you response to those problems?

20. Have you faced any challenge when collaborating with eNGOs?
 - If so, how did you response to those problems?
21. Do you know how the data is collected, analyzed and published? Are you satisfied with that?
22. **Overall, what are experiences you would like to share with other community members in N.S. who are interested in community engagement in marine and coastal management?**

Appendix III: Recruitment letter for the survey participants

Date, 2011

Dear Prospective Survey Participant:

I am a student at Dalhousie University in the Marine Affairs Program conducting research for my graduate project on the community engagement of marine and coastal management. I intend to conduct survey questionnaires with community members in the Port Joli/ Port Mouton area.

Specifically, the individuals over **19** years of age who are local community members, summer residents and all the other stakeholders in the Port Joli/ Port Mouton area are eligible to participate in the study.

Would you please consider being one of my survey participants for this study? The questionnaire should take no longer than 20 minutes. To help you decide if you wish to participate in the study, I will send copies of both the list of questions that I intend to ask, and the survey consent form, which provides more information about the study to each residence through a regular mail. Before sending out questionnaires, I will visit the area to post flyers, and will also provide an oral explanation to help completing the survey if needed in the follow-up visits. If you have any questions or concerns, please feel free to contact me by email or by phone.

Thank you,

Ting-Yu Tina Lin

Ting-Yu Tina Lin
Master of Marine Management Candidate
Marine Affairs Program
Dalhousie University, Halifax
1-902-452-6806
tn536237@dal.ca

Appendix VI: The survey poster



Survey: Marine and coastal management

If you are an adult community member (over the age of 19 years) of the Port Joli/ Port Mouton area, please share your perspective. I am a graduate student from Dalhousie University in the Master of Marine Management degree program conducting a **survey** in order to better understand residents' familiarity with **the community engagement, citizen science and marine protected areas** as well as to gauge how accepted these management tools are applied to the coastal and marine management. The questionnaire will be sent out through a regular mail to residences in the area. I encourage you to complete the survey and send it back to me.

All responses are anonymous and will only be seen by the student working on the survey. The survey is designed to answer academic questions. If you have any questions, please contact Ting-Yu (Tina) Lin by email at tn536237@dal.ca or by phone at **902-452-6806**.

<p>Tina Lin Tel: 902-452-6806 Email: tn536237@dal.ca</p>
<p>Tina Lin Tel: 902-452-6806 Email: tn536237@dal.ca</p>
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<p>Tina Lin Tel: 902-452-6806 Email: tn536237@dal.ca</p>

Appendix V: Consent form and signature Page for the Port Joli/ Port Mouton area stakeholder survey

Paper Questionnaire Consent Form for the Port Joli/ Port Mouton Area
Stakeholders



Faculty of Management ***Marine Affairs Program***

Title of Study:

Incorporating concerns of coastal communities in planning and management: The case studies of Eastport and the Port Joli/Port Mouton areas.

Principal Investigator

Ting-Yu Lin, BSc.
Master of Marine Management Candidate
Marine Affairs Program
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Kenneth C. Rowe Management Building
6100 University Ave, Suite 2127
Halifax, Nova Scotia, Canada, B3H 3J5
Telephone: 902-452-6806
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Supervisor

Dr. Lucia Fanning
Director, Marine Affairs Program
Dalhousie University
Kenneth C. Rowe Management Building
6100 University Avenue, Suite 2127
Halifax, Nova Scotia, Canada, B3H 3J5
Telephone: 902-494-8390
Fax: 902-494-1001
Email: Lucia.Fanning@dal.ca

Contact Person

If you require any additional information or have any questions regarding this study please direct them to Ting-Yu Lin, the Principal Investigator.

Introduction

You are invited to take part in a research study being conducted by Ting-Yu Lin, who is a graduate student at Dalhousie University, as part of her Master of Marine Management Degree Program. The final report will also be provided to the Canadian Parks and Wilderness Society Nova Scotia Chapter (CPAWS-NS), graduate internship host organization the Principal Investigator. The CPAWS-NS is a charitable environmental Non-Governmental Organization working collaboratively with stakeholders to protect the rich natural diversity of N.S.. The purpose of the internship with the CPAWS-NS is to contribute to enhancing the organization's

knowledge of communities' engagement in planning and management of coastal issues. Your participation in this study is voluntary and you may withdraw from the study at any time; this will in no way impact negatively on you, nor will it affect Ting-Yu Lin's performance evaluation. The study is described below. This description tells you about the risks, inconvenience, or discomfort which you might experience. Participating in the study may or may not benefit you, but we might learn things that will benefit others. You should discuss any questions you have about this study with Ting-Yu Lin.

Purpose of the Study

The purpose of this study is to determine how stakeholders are involved in the governance and management of Eastport marine protected areas, and analyze whether these experiences can be utilized to marine and coastal management in the Port Joli/ Port Mouton area. This project is intended to build upon earlier research that examined the potential for conservation and protection of Port Joli (Gromack et.al 2010 & Gromack, 2008) as well as efforts made by CPAWS-NS to engage the community in 2009.

Study Design

This study contains three parts. The first part includes a literature review to understand the social, economic and environmental context of Eastport and the Port Joli/ Port Mouton area. The second part involves email or phone interviews with managers and stakeholders from the Eastport MPAs Steering Committee. The purpose of the interview is to determine the current roles of stakeholders and the level of stakeholder involvement in Eastport MPAs. In the third part of the study, surveys will be distributed to residents and stakeholders in the Port Joli/ Port Mouton area. This survey will help to determine the level of familiarity and acceptance of the community engagement in marine and coastal management. The outcomes of the survey will also be compared and contrasted with the MPA management in Eastport.

Who can participate in this Survey?

You may participate in this interview if you are a stakeholder of the Port Joli/ Port Mouton area. For this study, the Port Joli/ Port Mouton area stakeholders include individuals or groups that are affected by or depend on the resources of the area to carry out their activities. Examples of such activities could include: recreation, business, stewardship, or residence. You are a probably a stakeholder if you

- are a resident of the Port Joli/ Port Mouton area,
- fish recreationally, for subsistence or commercially in the area,
- belong to a stewardship, development or business organization in the area,
- belong to an Aboriginal group or organization in the area,
- belong to a fishermen's group or organization in the area,
- work in the area or own a local business
- are a recreationist that uses the area

Who will be conducting the Research?

The principal investigator, Ting-Yu Lin, will be conducting the research.

What you will be asked to do

As a participant of the stakeholder questionnaire, you will be asked to complete the questionnaire at a time and place convenient to you. It is estimated that this will take 20 minutes to complete. The stamped addressed envelope will be provided with the questionnaire, and participants are encouraged to reply it to the principal investigator.

Data Withdrawal and Possible Risks or Discomforts

This study poses minimal risk to participants. You may experience some distress if you have negative feelings towards the community engagement in the marine and coastal management. You may also think that the questionnaire confirms that a marine protected area proposal is being developed for the region; however, this is not accurate. The principal investigator has no affiliation with governmental organizations and the study is only part of an academic research project.

Possible Benefits

No direct benefits of participation to the participants are expected. An anticipated indirect benefit of the study is the contribution of new knowledge. Outcomes of questionnaires will provide a preliminary understanding of: how familiar stakeholders are with community engagement, citizen science and marine protected areas, and willingness to be involved in the marine and coastal management.

Compensation/Expense Reimbursement

There will be no compensation or expense reimbursement for your participation in this questionnaire.

Confidentiality and Anonymity

When participating in this questionnaire you will remain anonymous. You will not be identified by name in any publications and your name and contact information will not be connected to the answers you submit to this questionnaire. The principle researcher will ensure that your questionnaire responses are kept confidential and will be stored in a locked cabinet and on a password protected personal computer to which only the principle investigator and her supervisory committee have access.

Data Retention

Data will be securely retained for five years using the methods described above following publication of the project.

Plans to Provide Results of the Study to Participants

A short written summary of study results will be made available to the study participants at the time of the study's completion upon request. Digital copies of the entire project will also be made available to study participants upon request.

Plans to Provide Final Report

Copies of the final report will be provided to the CPAWS-NS and other organizations on a request basis to the principal investigator.

Questions

If you have any questions regarding this research project or interview please feel free to contact the principal investigator, Ting-Yu Lin, by email (tn536237@dal.ca) or by phone (902-452-6806).

Problems or Concerns

In the event that you have any difficulties with, or wish to voice concern about any aspect of your participation in this study, you may contact Catherine Connors, Director of Dalhousie University's Office of Human Research Ethics Administration for assistance: (902) 494-1462, catherine.connors@dal.ca

SIGNATURE PAGE



Study Title:

Incorporating concerns of coastal communities in planning and management: The case studies of Eastport and the Port Joli/Port Mouton areas.

1. Consent to participate in the study

I _____ have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study. However, I realize that my participation is voluntary and that I am free to withdraw from the study at any time.

Participant Signature _____ **Date** _____

Principal Investigator's Signature _____ **Date** _____

Appendix VI: Recruitment letter for interview participants

Date, 2011

Dear Prospective Interview Participant:

I am a student at Dalhousie University in the Marine Affairs Program conducting research for my graduate project on stakeholder involvement in the management of Eastport marine protected areas (MPAs). I intend to conduct semi-structured interviews with stakeholders and managers from the Eastport MPAs Steering Committee.

Specifically, the individuals I am seeking will be managers and stakeholders who have been involved in the establishment and management of Eastport MPAs. The participants can chose the interview approach that they are comfortable with, either via phone calls or emails.

Would you please consider being one of my interview participants for this study? Interviews should take no longer than 60 minutes. To help you decide if you wish to participate in the study, I have attached copies of both the list of questions that I intend to ask in the interview, and the interview consent form, which provides more information about the study. I will call or email you in the next several days to answer any questions that you may have, and to confirm whether or not you are interested in participating in this study. Should you be interested in participating, I will ask to set up an interview time that is convenient for you.

Thank you,

Ting-Yu Tina Lin

Ting-Yu Tina Lin
Master of Marine Management Candidate
Marine Affairs Program
Dalhousie University, Halifax
1-902-452-6806
tn536237@dal.ca

Appendix VII: Consent form and signature page for interview participants

Interview Consent Form for Managers and Stakeholders of Eastport Marine Protected Areas



Faculty of Management **Marine Affairs Program**

Title of Study:

Incorporating concerns of coastal communities in planning and management: The case studies of Eastport and the Port Joli/Port Mouton areas.

Principal Investigator

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Supervisor

Dr. Lucia Fanning
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Telephone: 902-494-8390
Fax: 902-494-1001
Email: Lucia.Fanning@dal.ca

Contact Person

If you require any additional information or have any questions regarding this study please direct them to Ting-Yu Lin, the principal investigator.

Introduction

You are invited to take part in a research study being conducted by Ting-Yu Lin, who is a graduate student at Dalhousie University, as part of her Master of Marine Management Degree Program. The final report will also be provided to the Canadian Parks and Wilderness Society Nova Scotia Chapter (CPAWS-NS), the graduate internship host organization the Principal Investigator. The CPAWS-NS is a charitable environmental Non-Governmental Organization (ENGO) working collaboratively with stakeholders to protect the rich natural diversity of N.S. The purpose of the internship with the CPAWS-NS is to enhance the organization's knowledge of communities' engagement in planning and management of coastal issues. Your participation

in this study is voluntary and you may withdraw from the study at any time; this will in no way impact negatively on you, nor will it affect Ting-Yu Lin's performance evaluation. The study is described below. This description tells you about the risks, inconvenience, or discomfort which you might experience. Participating in the study may or may not benefit you, but we might learn things that will benefit others. You should discuss any questions you have about this study with Ting-Yu Lin.

Purpose of the Study

The purpose of this study is to determine how stakeholders are involved in the governance and management of Eastport marine protected areas, and analyze whether these experiences can be utilized to marine and coastal management in the Port Joli/ Port Mouton area.

Study Design

This study contains three parts. The first part includes a literature review to understand the social, economic and environmental context of Eastport and the Port Joli/ Port Mouton area. The second part involves email or phone interviews with managers and stakeholders from the Eastport MPAs Steering Committee. The purpose of the interview is to determine the current roles of stakeholders and the level of stakeholder involvement in Eastport MPAs. In the third part of the study, surveys will be distributed to residents and stakeholders in the Port Joli/ Port Mouton area. This survey will help to determine the level of familiarity and acceptance of the community engagement in marine and coastal management. The outcomes of the survey will also be compared and contrasted with MPA management in Eastport.

Who Can Participate in this Interview?

You may participate in this interview if you are a manager or a stakeholder involved in the establishment and management of two Eastport Marine Protected Areas.

Who will be conducting the Research?

The principal investigator, Ting-Yu Lin, will be conducting the research.

What you will be asked to do

As an interview participant, you will be asked to answer a series of semi-structured questions by the principal investigator, over the phone or through an email. This process will take approximately 60 minutes. The interview will be conducted at a time that is convenient for you. With your consent, the phone interview will be recorded by an audio recorder. Additionally, your consent to use quotations and your affiliation in the final report will be requested.

Data Withdrawal and Possible Risks or Discomforts

No risks or discomforts to the interview participants have been identified; however, if at any point during the interview you decide that you no longer wish to take part in the study you can choose to stop the interview. If you complete the interview and later decide that you no longer wish to take part in study you also have the possibility of withdrawing any data you provided. If you wish to withdraw your data, contact the principal investigator with this intention prior to analysis and reporting of the data.

Possible Benefits

No direct benefits of participation to the participants are expected. An anticipated indirect benefit of the study is the contribution of new knowledge. Also, insights regarding stakeholder participation in the management and governance of Eastport marine protected areas may be drawn from the case study examined and applied to other potential MPA sites.

Compensation/Expense Reimbursement

There will be no compensation or expense reimbursement for your participation in this interview.

Confidentiality and Anonymity

When participating in this interview, you may choose to remain anonymous. If you choose to remain anonymous, you will not be identified by name in any publications. The consent form will also ask you whether the answers you give during the interview can be affiliated with the marine protected area that you are involved with and the organization that you are involved with. The principal researcher will ensure that your interview responses are kept confidential and will be stored in a locked cabinet and on a password protected personal laptop to which only the principal investigator and her supervisory committee have access.

Data Retention

Data will be securely retained for five years using the methods described above following publication of the project.

Plans to Provide Results of the Study to Participants

A short written summary of study results will be made available to the study participants at the time of the study's completion upon request. Digital copies of the entire project will also be made available to study participants upon request.

Plans to Provide Final Report

In addition to the submission for the Master of Marine Management degree, copies of the final report will be provided to the CPAWS-NS and other organizations on a request basis to the principal investigator.

Questions

If you have any questions regarding this research project or interview please feel free to contact the principal investigator, Ting-Yu Lin, by email (tn536237@dal.ca) or by phone (902-452-6806).

Problems or Concerns

In the event that you have any difficulties with, or wish to voice concern about any aspect of your participation in this study, you may contact Catherine Connors, Director of Dalhousie University's Office of Human Research Ethics Administration for assistance: (902) 494-1462, catherine.connors@dal.ca

SIGNATURE PAGE



Study Title:

Incorporating concerns of coastal communities in planning and management: The case studies of Eastport and the Port Joli/Port Mouton areas.

1. Consent to participate in the study

I _____ have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study. However, I realize that my participation is voluntary and that I am free to withdraw from the study at any time.

Participant Signature _____ **Date** _____

2. Consent for audio-recording, use of quotations, and your affiliation

Please initial beside each line if you give consent to:

_____ have the phone interview audio-recorded

_____ use direct quotations in the final paper, upon submission of the prepared quote for approval by the interviewee.

_____ associate your answers with the organization/department that you are involved with

Participant Signature _____ **Date** _____

Principal Investigator's Signature _____ **Date** _____