

WHAT COUNTS IN MAKING MARINE PROTECTED AREAS (MPAs) COUNT?  
THE ROLE OF LEGITIMACY AS A CONTRIBUTOR TO PERCEIVED MPA  
SUCCESS IN CANADA.

By

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

at

Dalhousie University  
Halifax, Nova Scotia

December 2016

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## **LIST OF ABBREVIATIONS**

MPA: Marine Protected Area

DFO: Department of Fisheries and Oceans

PEI: Prince Edward Island

NB: New Brunswick

CBD: Convention on Biological Diversity

NGOs: Non-Governmental Organization

CCNB: Conservation Council of New Brunswick

NCC: Nature Conservancy of Canada

CPAWS: Canadian Parks and Wilderness Society

BHLECC: Basin Head Lagoon Ecosystem Conservation Committee

## ACKNOWLEDGEMENTS

This research was undertaken as part of the Canadian Healthy Ocean Network (CHONe) Strategic Research Program and was funded by the Natural Science and Engineering Research Council of Canada.

To all those who participated in interviews for this study, thank you for being so friendly and for sharing your opinions, experiences, and knowledge with me. To my internship hosts, Dr. Peter Lawton and Dr. Andrew Cooper, thank you for taking me on as an intern this past summer and providing your advice on the development of this project.

To all the faculty of the Marine Affairs Program, thank you for the opportunity to complete my MMM degree and for providing knowledge, encouragement, and assistance over the past 16 months. To Megan Bailey, thank you for co-supervising me and contributing to the development of this project.

To my supervisor, Lucia Fanning, thank you for taking me on as a student and providing me with unlimited guidance, advice, and support throughout this project. I admire you and I truly could not have done this without you.

To my classmates, thank you for being a constant support system to me over the past 16 months in both the difficult times and the great times we have shared.

To my family, thank you for supporting me in this journey and for making it possible for me to follow my dreams. Jenny, thank you for your endless love and positivity from the moment I considered pursuing this degree – I know you will read this entire report. Finally, to Bryn, thank you from the bottom of my heart for being supportive of me moving across the country to be with the whales instead of you, for all the airport pick-ups, the spaghetti dinners, the encouragement and love.

Dehens, L.A., 2016. What counts in making MPAs count: The role of legitimacy as a contributor to perceived MPA success in Canada. [graduate project]. Halifax, NS: Dalhousie University.

## ABSTRACT

Marine protected areas (MPAs) are powerful management tools used worldwide for conserving marine species and habitats. Yet, many MPAs fail to achieve their management objectives because of shortfalls in understanding stakeholders' perceptions on the level of legitimacy they afford to an MPA, which can negatively impact an MPA's effectiveness. The purpose of this study was to determine the importance of various factors in shaping different stakeholders' and managers' perceptions on MPA effectiveness and the level of legitimacy they afford to an MPA. Interviews were conducted with various stakeholders from two coastal MPAs in Atlantic Canada: Musquash MPA in New Brunswick, and Basin Head MPA in Prince Edward Island. Results indicated that most factors for legitimacy are important to stakeholders for MPA effectiveness, however some differences in perceptions were evident between and within different stakeholder groups, and among stakeholders and managers. Consensus was shared across case studies on the importance of community leadership and the establishment of trust. A novel legitimacy framework, as well as a more refined suite of indicators vetted by stakeholders for obtaining MPA legitimacy are presented and recommended for use by MPA managers in establishing/assessing the legitimacy of Canada's future coastal MPAs. The results of this research allow for an increased understanding of stakeholder perceptions of legitimacy and help to simplify the task Canadian MPA managers have of establishing legitimate and ultimately effective MPAs during their efforts to reach Canada's national targets of having covering 10% of national oceans in MPAs by 2020.

**Keywords:** *marine protected areas, MPA effectiveness, legitimacy, stakeholder perceptions, Canada*



## CHAPTER 1. INTRODUCTION

### 1.0 The Management Problem

In the face of alarming marine biodiversity loss, the need for increased protection of Earth's oceans has reached the forefront of marine management issues (Agardy et al., 2003; Worm et al., 2006). Fortunately, marine protected areas (MPAs) have become one of the most powerful marine spatial management tools used around the globe for conserving species and habitats, maintaining ecosystem functioning, and ensuring sustainable use of marine resources (Agardy et al., 2011; Bennett & Dearden, 2014). Despite many examples of their proven potential, the question of how truly effective MPAs are has continually challenged marine managers and scientists (Angulo-Valdez & Hatcher, 2010). Many MPAs worldwide amount to nothing more than “paper parks”, in which they legally exist on paper but in reality do nothing for conservation (Jameson, Tupper, & Ridley, 2002). In fact, it has been estimated that only 31% of MPAs globally are effective, meaning that most protected areas fail to achieve their management goals and objectives (Kelleher, Bleakley, & Wells, 1995; Pomeroy et al., 2005).

Many researchers claim that these failures in MPA effectiveness are primarily due to inadequate consideration of the social dimension in relation to the ecological dimension when establishing and managing an MPA (Abecasis et al., 2013; Carcamo, Garay-Fluhmann, & Gaymer, 2014; Jentoft et al., 2012; Voyer, Gladstone, & Goodall, 2012). More specifically, because MPAs are linked social-ecological systems that have the potential to affect a wide range of stakeholders, it is becoming widely recognized that an MPA's success depends heavily upon its ability to acquire a significant level of acceptance and support – or “legitimacy” – from these stakeholders (Hard et al., 2012;

Hoelting et al., 2013; Lankhorst, Bailey, & Bush, *pers. comm.*). The idea of legitimacy refers to the ability of a political action, in this case an MPA, to be perceived as right and just by the various people who are involved, interested, and/or affected by it (Carcamo, Garay-Fluhmann, & Gaymer, 2014; Rantala, 2012). Ultimately, the level of legitimacy afforded by stakeholders towards an MPA influences the degree to which the stakeholders are satisfied with the MPA, comply with its regulations, and overall perceive it as an effective initiative (Jentoft et al., 2012; Lankhorst, Bailey, & Bush, *pers. comm.*; Rantala, 2012). This has led to the assumption that if an MPA does not have legitimacy, it will likely not be effective at achieving its management objectives (Hard et al., 2012; Hoelting et al., 2013; Lankhorst, Bailey, & Bush, *pers. comm.*).

As a result, some researchers have recently developed a suite of indicators as an attempt to help managers implement MPAs such that they are legitimate, perceived as effective, and in turn, more successful at achieving their conservation goals (Lankhorst, Bailey, & Bush, *pers. comm.*; Rantala, 2012). The researchers argue that managers must pay attention to all of these prescribed indicators in order to establish legitimacy for an MPA (Lankhorst, Bailey, & Bush, *pers. comm.*). However, despite these research efforts, it often remains a struggle for managers to accurately understand what stakeholders' true expectations are from an MPA in order for them to afford it legitimacy and perceive it as effective. Particularly, it is unknown whether or not all of these indicators for legitimacy defined in the literature actually matter to stakeholders, or the extent to which they shape stakeholders' perceptions on the effectiveness of a particular MPA. For example, some stakeholders may support an MPA and perceive it as effective, but at the same time place little importance on many of these indicators that researchers argued to be essential for obtaining legitimacy. Because MPAs are highly social institutions that are contingent on

stakeholder support for success, being able to accurately understand stakeholder perceptions and desires towards an MPA is crucial; failure to do so can easily undermine the effectiveness of management efforts (Hoelting et al., 2013; Jentoft et al., 2012).

## **1.1 Project Purpose and Importance**

The purpose of this study is to increase our understanding of legitimacy as a key factor affecting stakeholders' perceptions of MPA effectiveness in Canada. Specifically, this research will explore various factors, or indicators, that shape stakeholders' perceptions of MPA effectiveness, and determine the extent to which these factors contribute to the level of legitimacy different stakeholders give towards an MPA. An underlying assumption of this research is that the better MPA managers understand the role legitimacy plays in shaping stakeholders' perceptions on what constitutes an effective MPA, the easier it will be for them to establish legitimate MPAs in the future. In turn, the more confident managers can be in knowing that these MPAs will be effective.

Specifically, this research aims to answer the following overarching question and sub-questions:

*Overarching Research Question:*

How, and to what extent, do the theoretical indicators of legitimacy identified in literature reflect stakeholder perceptions of MPA effectiveness in Canada?

*Sub-Questions:*

- 1) According to the academic literature, what constitutes MPA effectiveness, and what are the indicators regarded as necessary for assessing MPA effectiveness, in terms of legitimacy?

- 2) What are different stakeholder and manager perceptions of MPA effectiveness and legitimacy in general, and with respect to two specific MPA case studies under study?
- 3) What are the perceptions of all of these indicators for legitimacy by different stakeholders and managers, in terms of the level of importance they place on them for affording an MPA legitimacy?
- 4) What is the level of consistency between the literature, managers' opinions, and different stakeholders' perceptions on legitimacy in general, and on the specific indicators for legitimacy?

Ultimately, the goal of this research is to deliver valuable recommendations to those involved in the establishment and management of Canada's current and future MPAs on how to better recognize, obtain, and measure legitimacy as an important component of an MPA's effectiveness. Without this knowledge, Canada runs the risk of establishing MPAs in the future that lack legitimacy and are ineffective, resulting in more valueless "paper parks" which would have serious implications for the future of Canada's oceans.

Under the 1992 Convention on Biological Diversity (CBD), Canada is committed to having 10% of its coastal and marine areas protected by the year 2020 (UNEP, 2010). With only 0.88% protected to date, Canada's Department of Fisheries and Oceans (DFO) will likely be implementing several new MPAs over the next four years, with eight sites currently underway for designation (Fisheries and Oceans, 2016). Therefore, this current urgency for Canada to implement new MPAs makes it more crucial now than ever before to ensure managers have the knowledge necessary to establish legitimate and effective MPAs that will yield genuine conservation outcomes for our marine ecosystems.

## CHAPTER 2. LITERATURE REVIEW

### 2.0 Marine Protected Areas

By definition, marine protected areas are clearly defined geographical ocean spaces that are recognized and managed through legal or other effective means with the intent to conserve nature over the long-term (Dudley et al., 2010). The urgency to conserve more of the Earth's coastal and marine environments using MPAs is becoming ever more important due to the increasing human dependency and utilization of the marine environment, which has resulted in extensive habitat loss and degradation, over-harvesting, species extinction, pollution, and more (Agardy et al., 2011; Costello & Ballantine, 2015). Specifically, MPAs are promoted around the world as being one of the most powerful ecosystem-based marine management tools to combat these anthropogenic impacts, by conserving ecosystems and habitats, maintaining or restoring ecosystem functioning and resilience, preserving biodiversity, managing fisheries, and generally safeguarding marine areas from an assortment of human uses such as commercial fishing, industrial development, aquaculture, and recreation (Agardy et al., 2011; Bennet & Dearden, 2014; Mascia, 2003).

Around the globe, the conservation successes stemming from MPAs have been plentiful and have not gone unnoticed (Agardy et al., 2003). For example, in a Florida Keys MPA, densities of yellowtail snapper (*Ocyurus chrysurus*) increased more than 15 times over just four years within the MPA (Gell & Roberts, 2003). Further, in the Caribbean, coral reef cover increased by 0.5% within MPAs, while it decreased by 0.27% in adjacent non-protected areas within the same year (Selig & Bruno, 2010). As well, in a no-trawl zone in the Isle of Man marine protected area in the Irish Sea, the overall density

of scallops was approximately five times higher, and their reproductive potential was approximately 13 times higher, inside the MPA than in the fished areas (Beukers-Stewart et al., 2005). More locally to Canada, The Gulley MPA located in the Scotian Shelf, off the coast of Nova Scotia, has minimized the number of anthropogenic impacts to the Northern Bottlenose Whale population, successfully preventing any decline in their population since the MPA was designated in 2004 (O'Brien & Whitehead, 2013).

Today, MPAs have become widespread, with practically every coastal country in the world having established some form of marine protected area (Agardy et al., 2003). However, the actual amount of the Earth's oceans under protection remains minimal, and as of 2014, only 2.8% of the global oceans were protected through MPAs (UNEP, 2014). This realization has led to much international pressure over the past decade calling for coastal countries to develop more MPAs (Rossiter & Levine, 2013). Specifically, in 2010, the CBD Conference of the Parties adopted the Strategic Plan, in which over 168 countries worldwide, including Canada, signed an agreement to a global target for "at least 10% of coastal and marine areas protected, especially areas of importance for biodiversity and ecosystem services, conserved through effectively and equitably managed, ecologically representative and well-connected systems of MPAs by the year 2020" (UNEP, 2010). Since then, many countries have come close or have already reached this target. For example, 10.13% of territorial seas are protected in Australia, 28.39% are protected in the United States, and 8.91% are protected in Russia (UNEP-WCMC, 2015). Unfortunately, despite having the longest coastline in the world and one of the largest oceans of any country, Canada's marine protected area system remains inadequate relative to other countries, with only approximately 0.88% of our territorial

seas in protected areas to date (Fisheries and Oceans, 2016; Gardner, Bicego, & Jessen, 2008).

Despite this, the legislative capacity for the development of MPAs in Canada came about in 1996, through the inauguration of Canada's *Oceans Act* (*Oceans Act*, S.C. 1996). Under the *Oceans Act* Section 35(2), the Minister of the Department of Fisheries and Oceans is given sole responsibility for leading the development and implementation of a national system of marine protected areas on behalf of the Government of Canada [*Oceans Act*, S.C. 1996, c.31, s. 35(2)]. From this, the very first marine protected area designated by DFO, called the Endeavour Hydrothermal Vents MPA, was designated on Canada's west coast in 2003 (Fisheries and Oceans, 2016). Since then, only seven other marine protected areas have been designated, while eight sites are currently underway for future designation, including St. Ann's Bank in Cape Breton, Laurentian Channel in Newfoundland, and the St. Lawrence Estuary (Fisheries and Oceans, 2016). With only 0.88% of Canada's oceans in MPAs to date, Canada will be focusing heavily on establishing many more MPAs over the next four years to reach the CBD target (Fisheries and Oceans, 2016). However, in addition to DFO, other Canadian government agencies, including Parks Canada, and Environment and Climate Change Canada have designated MPAs for Canada's oceans (Fisheries and Oceans, 2016)

## **2.1 The Concept of MPA Effectiveness**

With the establishment of MPAs increasing greatly around the world, there also comes an increasing realization that MPAs need to be evaluated, in order to provide evidence of their success and to quantify how, and to what extent, they are generating actual conservation benefits for the marine environment (Bennet & Dearden, 2014;

Pomeroy et al., 2005). As a result, MPA effectiveness is defined as the degree to which the management actions at an MPA are achieving the goals and objectives initially laid out for the MPA (Pomeroy et al., 2005). Understanding the effectiveness of an MPA is critical for MPA managers to remain accountable, obtain feedback on the MPAs progress, identify areas of weakness, and to determine future needs within the MPA (Pomeroy et al., 2005). With this understanding, the existing management actions of an MPA can be adapted and improved to ensure that genuine conservation outcomes are being generated (Bennet & Dearden, 2015; Pomeroy et al., 2005).

However, despite the proven conservation potential of MPAs, as demonstrated previously, and the global consensus on their use as marine management tools, one major doubt that exists among MPA managers, scientists, and academics is how truly effective marine protected areas are (Angulo-Valdes & Hatcher, 2010; Chuenpagdee et al., 2013; Jameson, Tupper, & Ridley, 2002; Kelleher, Bleakley, & Wells, 1995; Pomeroy et al., 2005). Broadly speaking, an MPA can fail for numerous reasons, including, but not limited to: poor planning and design, insufficient finances, low staff, lack of scientific knowledge, poor decision-making, or lack of political support (Agardy et al., 2003; Bennett & Dearden, 2014).

Stemming from this awareness on the ineffectiveness of MPAs, a considerable amount of research is being generated with a focus on understanding what constitutes MPA effectiveness, and how MPA managers should be establishing and managing MPAs to ensure that they are successful (Himes, 2007; Hockings et al., 2006). The vast array of existing literature on this topic has provided a multitude of arguments on MPA requirements for effectiveness. Overall, it suggests that MPA effectiveness is much more complex in reality than in theory and that each individual MPA will require a unique



approach for ensuring its effectiveness as there is no “one-size-fits-all” formula (Agardy et al., 2003; Bennett & Dearden, 2014; Rossiter & Levine, 2013). However, there is recognition within the literature that MPA effectiveness has three critical components: biological/ecological conservation, social and economic considerations, and legitimacy (Bennet & Dearden, 2014; Charles & Wilson, 2009; Hard et al., 2012; Hoelting et al., 2013). While the component of biological/ecological conservation is obvious as it is the primary purpose of MPAs, the remaining two components, which relate more closely to the focus of this study, are explained in the following sections of this chapter.

## **2.2 The Social Dimension of MPAs**

In the past, the creation of MPAs has focused solely on ecological and biological aspects of MPAs, and has given little attention to the human dimension, meaning the social and economic aspects that are associated with MPAs (Christie, 2003; Charles & Wilson, 2009). However, the recognition that marine protected areas are linked socio-ecological systems has become increasingly recognized today (Bennett & Dearden, 2014; Christie, 2003; Charles & Wilson, 2009; Hard et al., 2012; Hoelting et al., 2013; Jentoft et al., 2012). Arising from this was also the realization that establishing and managing effective MPAs therefore requires equal consideration of both the ecological and human dimensions of marine protected areas (Bennett & Dearden, 2014; Charles & Wilson, 2009; Hard et al., 2012; Hoelting et al., 2013; Jentoft et al., 2012). MPAs are considered linked socio-economic systems because any region that is to be managed using an MPA likely contains an array of people, or stakeholders, who are highly involved, interested, or more importantly, affected by an MPA’s development in some way (Carcamo, Garay-Fluhmann, & Gaymer, 2014). Specifically, because MPAs prioritize conservation and the

safeguarding of marine habitats against anthropogenic activities, their creation often results in restrictions and/or reallocations of human activities, potentially resulting in immediate and possibly severe negative consequences to the livelihoods of certain stakeholders (Bennet & Dearden, 2014; Charles & Wilson, 2009). Overall, depending on the goals of the MPA and how they are designed, MPAs can impact stakeholders' livelihoods, cultures, and way of life, varying in both the direction of the impact – positive or negative, as well as in its intensity (Bennet & Dearden, 2014; Jentoft et al., 2012).

Further, as the relationship between humans and their natural environment is quite complex, consideration of the social dimension at a proposed MPA is critical to understand how the MPA will likely be perceived by relevant stakeholders (Abecasis et al., 2013; Voyer, Gladstone, & Goodall, 2012). Specifically, MPAs are known to be associated with a diversity of stakeholders that differ widely in their backgrounds, views, values, and perceptions towards the marine environment and conservation (Abescasis et al., 2013; Chuenpagdee et al., 2013; Voyer, Gladstone, & Goodall, 2012). As a result, it is common to have a single MPA mean vastly different things to different types of stakeholders, regardless of what the actual goals of the MPA are (Ehler, 2003; Jentoft et al., 2012). Because of this, it is argued that to implement effective MPAs, social assessments must be conducted alongside ecological assessments at proposed sites, such that there is a comprehensive understanding of how the relevant stakeholders use, view, and value the marine environment (Abescasis et al., 2013; Agardy et al., 2011). This information is critical for managers to be able to create appropriate approaches to establishing MPAs that properly incorporate local needs and desires (Abescasis et al., 2013; Agardy et al., 2011). Therefore, understanding the social, cultural, historical, and

political landscape of different stakeholders is critical to predicting how and why certain stakeholders will perceive an MPA (Christie, 2003; Jentoft et al., 2012; Voyer, Gladstone, & Goodall, 2015).

Unfortunately, the perceptions stakeholders have towards MPAs are generally negative (Jentoft et al., 2012; Voyer, Gladstone, & Goodall, 2015). Particularly, those stakeholders who have the potential to be the most negatively affected by the MPA, such as fishers, often have the most resistance because they view MPAs as threats to their livelihoods and do not want them established in their “backyards” (Jentoft et al., 2012). However, MPAs tend to be negatively perceived in general because their benefits are difficult to physically observe and quantify, and often take years to be realized (Agardy, 1994). This is not advantageous for most stakeholders who typically have high expectations and demand to see immediate benefits in order to accept the MPA (Agardy, 1994).

Ultimately, when establishing MPAs, it is critical to understand the desires and perspectives of stakeholders because much research demonstrates that it is these beliefs, desires, and perceptions, as opposed to the biological factors, that are the primary determinants of the MPAs success or failure (Abecasis et al., 2013; Carcamo, Garay-Fluhmann, & Gaymer, 2014; Gall & Rodwell, 2016; Hard et al., 2012; Mascia, 2003; Voyer, Gladstone, & Goodall, 2012). This is because the perceptions that stakeholders have regarding conservation will influence the degree to which they will accept and support the MPA, which ultimately can affect its ability to successfully achieve its management objectives, particularly if the stakeholders are not complying with its regulations (Bennett & Dearden, 2014; Jentoft et al., 2012; Lankhorst, Bailey, & Bush, *pers. comm.*; Rantala, 2012). The level of acceptance and support stakeholders afford to

an MPA is a relatively new concept referred to as an MPAs “legitimacy”, which is discussed in the following section.

### **2.3 The Concept of MPA Legitimacy**

The concept of legitimacy refers to the ability of a political initiative or action, in this case an MPA, to be perceived as rightful and justified by those who the initiative wishes to govern, in this case, the relevant stakeholders of the MPA (Rantala, 2012). More specifically, an MPA’s level of legitimacy is the level in which the involved stakeholders accept the MPA, support it, comply with its regulations, and overall perceive it as being an effective initiative (Jentoft et al., 2012; Lankhorst, Bailey, & Bush, *pers. comm.*, Rantala, 2012). In other words, an MPA is said to be legitimate if it is accepted and supported by its stakeholder community, if the stakeholders are satisfied with it, and if the imposed regulations and management decisions being made by the authorities are perceived as proper and fair by the involved stakeholders (Rantala, 2012).

This emerging idea of MPA legitimacy has led academics to formulate a conceptual link between legitimacy and the effectiveness of MPAs, which indicates that in order for MPAs to be effective, they need to be legitimate. As well, if an MPA does not obtain legitimacy from its stakeholders, then it will likely not be effective at achieving its management objectives. This is because the MPA will lack compliance, buy-in, and acceptance from stakeholders (Hard et al., 2012; Hoelting et al., 2013; Lankhorst, Bailey, & Bush, *pers. comm.*). Overall, it is argued within literature that legitimacy is an important factor contributing to the development of an effective MPA (Rantala, 2012).

As a result, in order to establish legitimacy for MPAs, many researchers have identified numerous factors, or “indicators”, relating to the governance and process of

establishing and managing an MPA. It is argued that these indicators are necessary for obtaining legitimacy from stakeholders towards an MPA, and are referred to as the “process-related indicators for legitimacy” (Hard et al., 2012; Lankhorst, Bailey, & Bush, *pers. comm.*). Further, three different forms of legitimacy have been proposed with which these process-related indicators are categorized into: input legitimacy, throughput legitimacy, and output legitimacy (Lankhorst, Bailey, & Bush, *pers. comm.*). A brief explanation of each form of legitimacy is provided below. In addition, the full suite of indicators identified within the literature for obtaining legitimacy is provided in Appendix One, Table A, along with a brief description of each indicator. Finally, it is argued that in order to ensure a legitimate MPA, managers must give substantial attention to all three forms of legitimacy when establishing and managing MPAs (Bennett & Dearden, 2014; Lankhorst, Bailey, & Bush, *pers. comm.*).

### ***2.3.1 Input Legitimacy***

Input legitimacy refers to the extent in which stakeholders are included in the decision-making process at the planning and design phase of the MPA (Rantala, 2012). Specifically, input legitimacy indicators refer to the scale and the methods in which stakeholders are engaged prior to the official designation of the MPA. Examples of some input indicators identified within the literature as being necessary for legitimacy include *Inclusiveness of Stakeholders*, *Stakeholder Exposure to Science of the MPA*, *Capacity of Management Body*, and *Attention to Displacement* (Appendix One, Table 1A).

### ***2.3.2 Throughput Legitimacy***

Throughput legitimacy refers to the quality of the decision-making throughout the lifetime of the MPA, specifically relating to the practices that occur to continually manage an MPA once it has been officially designated (Lankhorst, Bailey, & Bush, *pers. comm.*; Rantala, 2012). Examples of throughput indicators identified within the literature as being critical for MPA legitimacy include *Accountability of Managers*, *Existence of Planned Activities*, *Level of Enforcement*, and *Cooperation Among Government* (Appendix One, Table 1B).

### ***2.3.3 Output Legitimacy***

Output legitimacy relates to the various outcomes generated by an MPA, and the extent to which they are observable to those involved (Rantala, 2012). This category includes indicators such as *Biological/Ecological Benefits*, *Environmental Awareness*, *Economic Benefits* and *Information Availability and Accessibility* (Appendix One, Table 1C).

## CHAPTER 3. METHODOLOGY

### 3.0 MPA Case Study Site Selection

To address the proposed research question, two marine protected areas were selected to act as case studies for this research. In order to select the sites, the researcher first limited the selection to only MPAs in Atlantic Canada that were designated by DFO under the *Oceans Act* [S.C., 1996]. This is because of a limited time-frame and travel capacity for this study, and because DFO is the primary department in Canada responsible for the development of Canada's future MPA networks towards the CBD targets. From this, given the nature of this research, the most ideal case study sites were MPAs that have been designated for around 10 years, and had clearly defined goals at the onset of designation, such that an assessment of their effectiveness could be made. In addition, MPAs that are coastal in design were preferred as these MPAs are more likely to be associated with a community and have a wide range of involved stakeholders that can be consulted, compared to offshore MPAs.

Given these criteria, the *Oceans Act* MPAs in Atlantic Canada were reviewed, and it was determined that the two best sites for this research were Musquash Estuary MPA in New Brunswick (NB), and Basin Head MPA in Prince Edward Island (PEI). Detailed descriptions of each MPA are given in the following chapters.

### 3.1 Data Collection

In order to collect data for this research, semi-structured interviews were conducted with various stakeholders from each case study MPA during site visits to New Brunswick and Prince Edward Island in July and August of 2016. Due to the qualitative

nature of this study, 13 participants were interviewed at Musquash MPA, and 13 participants were interviewed at Basin Head MPA, for a total of 26 participants. Participants were selected from as many of the key stakeholder groups as possible at each MPA in order to have fair and equal representation of all important groups and to gain a wide range of perspectives.

Specifically, the key groups interviewed for Musquash MPA included: local community members, past fisherman, Friends of Musquash members, Musquash Advisory Committee members, scientists, four local non-governmental organization (NGOs) including the Conservation Council of New Brunswick (CCNB), Fundy Baykeeper, the Nature Conservancy of Canada (NCC), and the Canadian Parks and Wilderness Society (CPAWS), as well as the New Brunswick Department of Environment and Local Government, and DFO managers. For Basin Head MPA, the key groups interviewed in this study included: farmers, commercial fisherman, scientists, land-owners, local community organizations including the Basin Head Fisheries Museum, an environmental group called the Souris & Area Branch of the PEI Wildlife Federation, and the Mi'kmaq Confederacy of PEI, provincial governmental representatives from the PEI Department of Forests, Fish & Wildlife, the PEI Department of Tourism & Culture, and the PEI Department of Agriculture & Fisheries, as well as members of the Basin Head MPA Advisory Committee, and DFO managers. For both sites, at least one representative from each of the stated groups was interviewed. However, it should be noted that some participants fit into multiple categories due to changes in occupation throughout their lives. A breakdown of the number of participants interviewed from each stakeholder group at each site is summarized in Table 1.



The researcher identified and recruited most participants with the help of the MPA managers at each site, and then identified additional recruits through snow-ball sampling, in which the current participants were asked to provide suggestions of other people who may be interested in participating in this study (Atkinson & Flint, 2011). Overall, participants ranged in age, from mid-20's to retired, as well as in the level of involvement they had with the MPA, from being only recently involved with the MPA to having been involved with the area even prior to MPA designation.

**Table 1.** The number of participants interviewed from key stakeholder groups at Musquash MPA and Basin Head MPA case study sites.

<b>Musquash MPA Participants</b>		<b>Basin Head MPA Participants</b>	
<b>Groups:</b>	<b># of Participants:</b>	<b>Groups:</b>	<b># of Participants:</b>
<i>NGOs</i>	4	<i>Local Organizations</i>	2
<i>Community Members</i>	2	<i>Community Members</i>	4
▪ Land-owners, Fisherman.		▪ Farmers, Fishers, Land-owners, First Nations.	
<i>Scientific Community</i>	3	<i>Scientific Community</i>	2
<i>Federal/Provincial Government</i>	2	<i>Provincial Government Representatives</i>	3
<i>MPA Managers</i>	2	<i>MPA Managers</i>	2
<i>Total # of Participants = 13</i>		<i>Total # of Participants = 13</i>	

### 3.1.1 Interviews

Prior to beginning data collection, the researcher obtained Dalhousie University Research Ethics Board approval for research involving human participants and thereafter followed all ethical requirements while conducting this work. Interviews were in-person or over-the-phone, approximately 60 minutes in length on average, and were conducted privately with each participant at a time and location of their choosing, typically at their place of work or a local café. Prior to beginning an interview, a consent form was reviewed and signed by both the researcher and the participant, and written consent was also given by the participant to audio-record the full interview. Participants were

informed that their participation was voluntary and that they had the right to withdraw themselves or any of their responses at any time. To ensure confidentiality and anonymity, participants were identified with a code, and no names were shared or are used throughout this report. All data and materials were handled by the researcher only and stored in a secure manner.

Interviews were semi-structured and discussion-based in style and consisted of three phases. First, participants were asked a series of basic demographic questions, including age, sex, occupation, years of experience, and timing and level of involvement with the MPA. Second, an indicator questionnaire was conducted in which participants were guided through a suite of indicators found in literature for affording an MPA legitimacy, categorized into input, throughput, and output indicators, and participants were asked to provide their opinions on the importance of each indicator (see Appendix One, Table 1 for list of indicators). Participants were also encouraged to highlight any new indicators not in the existing suite that they felt were important to them for affording an MPA legitimacy. The final phase of the interview consisted of asking open-ended discussion questions to the participant, centered around two themes. First, questions were asked about their perceptions towards MPAs overall as well as the MPA in question, in terms of their perceived level of effectiveness, the need for them, and how they feel towards them. Second, participants were introduced to the concept of legitimacy and asked questions relating to it, such as if they think the MPA in question has legitimacy, how satisfied they are with this MPA and its management by DFO, and what they feel needs improvement for their MPA. They were also asked to provide advice regarding the general establishment and management of MPAs in the future such that they can better obtain legitimacy. Questions are provided in Appendix Two.

### **3.2 Data Analysis**

Due to the qualitative nature of this study, data was analyzed by the lead researcher using qualitative content analysis techniques that involved identifying key words, patterns and trends present in the data. Although qualitative assessment software exists, due to the low number of participants in this research it was not deemed necessary to employ the use of such programs. The researcher therefore employed the use of a matrix in Excel spreadsheets to conduct this analysis.

### **3.3 Methodological Limitations**

One significant limitation with this study design was the narrow time-frame for data collection. More time to conduct interviews would have allowed the researcher to stay at the field sites longer, learn about the stakeholder communities at each site more thoroughly, and ultimately identify and form relationships with more of the key stakeholders. Following this, it was challenging to connect with some stakeholder groups because of their limited availability during the weeks the researcher was at the field sites. For example, farmers around Basin Head MPA were in the middle of harvest season and were difficult to contact. Also, fisherman around Musquash MPA are very few in number and as a result it was hard to identify who they were and how to contact them in such a short time-frame. These challenges may have resulted in some stakeholder groups being under-represented in this study compared to others. Additional time to conduct the field work would have allowed the researcher to dig-deeper to seek out certain stakeholder groups, and to coordinate interviews at a later date when participants were more available. However, the researcher was able to gather an adequate number of participants

at each site and ensured that at least one participant from all of the most relevant stakeholder groups at each site was represented, therefore these limitations are not considered to be major weaknesses of this study.

## CHAPTER 4. MUSQUASH MPA CASE STUDY

This chapter is focused on the case study at Musquash MPA, and will begin with a detailed description of Musquash MPA, followed by the results found at this case study as well as a discussion of these results. This chapter will then close with a series of recommendations directed towards improving the legitimacy of Musquash MPA, according to the perceptions of the stakeholders at this site.

### 4.0 Overview of Musquash MPA

Musquash Estuary MPA is a small, coastal MPA located in New Brunswick in the Bay of Fundy, approximately 20 km southwest of the city of Saint John (Figure 1; Fisheries and Oceans, 2008). It was formally designated by the DFO Maritime Division in 2006, becoming one of the first few MPAs in Canada designated under the *Oceans Act* [S.C., 1996].



**Figure 1.** Location of Musquash Estuary MPA, indicated by red dot, within Eastern Canada (adapted from *Google Maps*).

The Musquash Estuary MPA is approximately 11.4 km<sup>2</sup> in size, encompassing an intertidal salt marsh component of 4.0 km<sup>2</sup>, shown in Figure 2, and a 7.0km<sup>2</sup> shallow tidal estuary component (Fisheries and Oceans, 2008). The estuary, being one of the most productive types of ecosystems on Earth, supports a plethora of fish, invertebrates, marine plants, and rare birds. In addition, the intertidal salt marsh performs a variety of ecological functions such as sediment filtration, shoreline protection, and buffering from storms and floods (Fisheries & Oceans, 2008; Singh et al., 2000). An ecological overview of Musquash estuary identified commercial and non-commercial fishes, unique habitat, and areas of high biological diversity and productivity in the estuary (Singh et al., 2000).



**Figure 2.** View of the Salt Marsh Component of Musquash Estuary MPA (Photo taken by researcher).

Musquash estuary is considered unique from other estuaries in the Bay of Fundy due to its relatively large size and extensive salt marsh, diversity of habitats, and primarily, its undisturbed natural condition (Fisheries and Oceans, 2008; Singh et al., 2000). In fact, studies indicate that Musquash estuary is one of the last remaining large ecologically-intact estuaries in the Bay of Fundy, as over 85% of them have been altered or degraded from human activities over the past 300 years (Fisheries and Oceans, 2008).

Without protection, the Musquash estuary and salt marsh were being threatened with the same fate.

The Musquash estuary and marsh is surrounded by small rural communities that possess strong appreciations and cultural values towards the estuary (Fisheries and Oceans, 2008). Historically, the area has been predominately quiet and undisturbed, with only a small amount of low-scale commercial and recreational fishing occurring in the estuary from a small wharf, with less than 10 vessels, primarily for lobster and scallop fishing (Singh & Buzeta, 2007; Fisheries and Oceans, 2008). Scallops are not abundant within the estuary and therefore dragging occurs rarely and only at the mouth of the estuary (Singh & Buzeta, 2007; Fisheries and Oceans, 2008). Harvesting of intertidal species such as periwinkles, clams, and dulse also occurred in the area, but only on an irregular basis. While there is evidence of historical First Nations use in the estuary, their use today is virtually absent other than the occasional collection of sweet grass (Fisheries and Oceans, 2008).

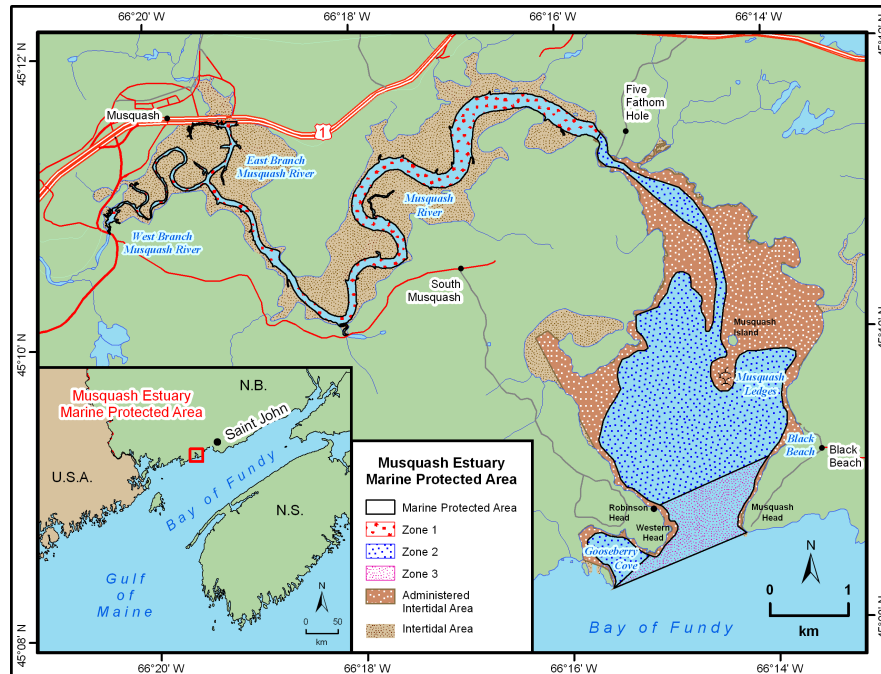
In 1998, immediately following the coming into force of the *Oceans Act* legislation, a local NGO group, the Conservation Council of New Brunswick, along with the support they garnered from the Fundy North Fishermen's Association and local community members, nominated the estuary and intertidal salt marsh to DFO for consideration as a candidate MPA (Fisheries and Oceans, 2008). Under the *Oceans Act*, *Section 35*, DFO has authority to designate MPAs in the marine environment up to the low water mark at low tide, therefore, in order to designate Musquash MPA, the provincial government of New Brunswick transferred authority of the intertidal salt marsh component, which was provincial Crown land, to the federal Government of Canada (*Oceans Act*, S.C. 1996, c.31, s. 4; Musquash Estuary MPA Regulations S.O.R., 2006;

Fisheries and Oceans, 2008). Approximately 8 years after nomination, the Musquash estuary and associated salt marsh, referred to as the Administered Intertidal Area (AIA), became a legal marine protected area. In addition to the MPA, a local NGO in the area, The Nature Conservancy of Canada NB Chapter, has worked diligently over time to protect more than 80% of the lands surrounding the estuary, further safeguarding the MPA (Fisheries and Oceans, 2008).

The vision for the Musquash MPA designation is the conservation and protection of the marine ecosystem. The specific conservation objectives for Musquash MPA are to ensure no reduction or human-caused modification in A) productivity, by maintaining the abundance and health of harvested species, B) biodiversity, by maintaining the diversity of species, communities, and populations, and C) habitat, by maintaining water and sediment quality (Fisheries and Oceans, 2008; Musquash Estuary MPA Regulations, S.O.R., 2006). In order to do this, the management regulations divide the estuary into 3 distinct zones (Figure 3). Zone 1 consists of the upper most region of the Musquash River and has the strictest degree of protection due to species richness and the sensitive salt marsh (Fisheries and Oceans, 2008; Musquash Estuary MPA Regulations, S.O.R., 2006). Specifically, no motorized craft are allowed in this zone, no commercial fishing of scallops, lobster, or herring, and no recreational dulse harvesting. However, basic no-take recreational activities such swimming and kayaking are allowed (Fisheries and Oceans, 2008; Musquash Estuary MPA Regulations, S.O.R., 2006). Zone 2 is the largest zone of the MPA, and allows for a broader range of activities including the fishing of lobster, clams, and herring, dulse harvesting, and the use of marine vessels up to a max speed of 5 knots (Fisheries and Oceans, 2008; Musquash Estuary MPA Regulations, S.O.R., 2006). Finally, Zone 3 forms the mouth of the estuary, and allows for the largest range of



activities, including scallop dragging and the use of marine vessels up to 8 knots (Fisheries and Oceans, 2008; Musquash MPA Regulations, S.O.R., 2006).



**Figure 3.** Three distinct management zones within Musquash Estuary MPA (Fisheries and Oceans, 2008).

Ultimately, Musquash MPA is an ideal case study for this research as it is a 10-year-old coastal MPA with a broad range of involved stakeholders, including NGOs, community members, fishers, provincial government representatives, and scientists.

#### 4.1 Musquash MPA Results

The purpose of this section is to state the results found from the case study at Musquash MPA, beginning with the perceptions Musquash stakeholders and managers had on MPA effectiveness in general, and with respect to Musquash MPA. This section will then state the results on the perceptions different stakeholders and manager provided on the legitimacy of Musquash MPA, followed by the results found on the importance

different stakeholder groups at Musquash MPA had on the various indicators for affording an MPA legitimacy, categorized as input, throughput, and output. This section will close with an outline of the results found on the overall perceived level of importance of process-related indicators for MPA effectiveness, and will state the additional indicators suggested by stakeholders as being important for MPA legitimacy.

#### ***4.1.0 Stakeholder Perceptions on MPA Effectiveness***

All 13 participants interviewed indicated that MPAs are valuable and necessary management tools for the conservation of our oceans. However, almost all participants acknowledged that whether an MPA actually becomes an effective tool or not depends on if they are designed and implemented correctly. Most notably, approximately half of the participants stated that an MPA's size was a primary factor influencing whether or not they perceive it as effective. In addition, most participants from the local NGO community suggested that the stringency of the regulations is also a key determinant of how they perceived an MPA's effectiveness. Contrastingly, the scientific community perceived an MPA's effectiveness as being primarily dependent upon how realistic and measurable the conservation objectives are for an MPA. As well, participants from the management community conveyed that MPAs are not the only management tools available and depending on the case, other measures may be more useful.

Overall, the results show that all participants were in support of MPAs. However, they questioned the level of effectiveness for various reasons. While a broad range of participants perceived an MPA's size as a primary factor influencing effectiveness, results demonstrate that scientists tended to associate effectiveness with the tangibility of the objectives put in place, while NGOs were more concerned with the strictness of the

existing conservation regulations. The management community expressed the importance of MPAs, but admitted that they may not be the best tools in all cases.

#### ***4.1.1 Perceived Effectiveness of Musquash MPA***

There was unanimity among participants that the fundamental reason Musquash MPA was designated by DFO was because of strong community pressure. When asked if they personally felt that an MPA was needed or not needed at Musquash, almost all participants concluded that this area deserved protection. However, participants from the scientific community indicated that the marine component of Musquash estuary is not actually unique or diverse in a way such that it required explicit MPA protection.

Results also showed contrasting opinions on the perceived effectiveness of Musquash MPA. While most groups, including community members, government representatives and MPA managers, indicated Musquash MPA was an effective MPA, participants in the field of science conveyed that certain aspects of the MPA negatively influence their opinions on its effectiveness, including its size. In addition, participants from three of the four NGO groups interviewed also noted specific aspects of Musquash that negatively influenced their assessment of its effectiveness, including its ecological significance and the strictness of its regulations. Despite this, all participants still came to the final conclusion that Musquash MPA was a valuable and worthwhile designation, and that it is effective overall.

#### ***4.1.2 Stakeholder Perceptions on the Legitimacy of Musquash MPA***

Participants were asked to share their overall perception towards Musquash MPA, specifically if they afford it legitimacy and think it has broad stakeholder support. Results

showed a consensus among stakeholders interviewed indicating that they all do indeed support Musquash MPA and afford it legitimacy. In addition, all participants, including managers, indicated Musquash MPA had broad stakeholder acceptance and support. Further, when asked if they thought DFO worked diligently to establish legitimacy for Musquash MPA, most participants who were involved at the initial planning phase of the MPA expressed that DFO actually did little to establish stakeholder acceptance and support, but rather, it was key community leaders who were central to making legitimacy happen. Similarly, the MPA managers interviewed also largely credit the MPA's success and legitimacy to the efforts of the community. Overall, it was considered by many participants that the designation of Musquash was "low-hanging fruit", as it was quite easy for DFO to designate because of its broad support.

Despite this, most participants acknowledged that DFO did do various things that have significantly helped the MPA maintain its legitimacy over time. Specifically, 10 out of the 13 participants suggested that the creation of the advisory committee was a vital action by DFO which allowed for continued engagement, knowledge sharing, and a platform to address any needs/concerns. Further, DFO's recent investments into ecological monitoring of the MPA was brought up by a broad range of stakeholder groups interviewed, including scientists, managers, and NGOs, as contributing to its legitimacy. Further, DFO's ability to consider trade-offs, such as allowing a small scallop-drag zone in the MPA, the use of public-policing as a primary means of enforcement, and their efforts to publicize the MPA were also brought up by various stakeholders as significant actions by DFO that have contributed positively to their assessment of its legitimacy.

In contrast, results reveal that seven out of the 13 participants indicated certain aspects of DFO's management that have somewhat influenced their opinions on

Musquash's legitimacy. The most common theme brought up by all seven of these participants was the extremely slow timelines and procrastination on DFO's end in designating Musquash. In addition, certain stakeholders suggested that DFO lacked full investment and commitment towards designating Musquash, dampening their opinions on its legitimacy. Third, participants from the community felt that instability within DFO, particularly the shifting in management positions, programs, and/or political priorities, as well as changes in government, significantly affected their opinions on Musquash's legitimacy. In addition, some community members questioned why they were not allowed to use a small boat in the river, when a much more destructive activity, scallop dragging, is allowed in the MPA. Finally, other comments brought up as negatively affecting stakeholders' opinions on Musquash's legitimacy were the positioning of the management staff in Halifax, Nova Scotia, hours away from the MPA, and not fulfilling all of the opportunities for Musquash, such as the lack of ecotourism development.

Interestingly, results also show that all three participants who are, or were, members of the management community indicated there was nothing DFO did to negatively affect people's opinions about the MPAs legitimacy, but brought up the lengthy timeline it took to designate the site as a potential factor. Moreover, Musquash managers who were interviewed commented that over the past 10 years, they have learnt how to better manage and govern the site.

#### ***4.1.3 Stakeholder Perceptions on Indicators for Legitimacy***

Participants at Musquash MPA shared their opinions on the importance of various factors, or indicators, for affording an MPA legitimacy. Results indicate that out of the 41 indicators in total, 32 of them, or 78% of the indicators, had general consensus among all

participants as being highly important for contributing to the legitimacy of an MPA, as shown in Table 2. There were no noticeable differences in opinion between different stakeholder groups, within stakeholder groups, or between stakeholders and managers on the level of importance of these 32 indicators; all groups equally suggested these were highly important indicators. However, from these, results show that the top 10 overall most meaningful indicators to stakeholders for affording an MPA legitimacy are those shown in bold in Table 2. They are as follows, from each legitimacy category, Input: *Inclusiveness of Stakeholders, Information Dissemination to Stakeholders, Stakeholder Exposure to Science, Conservation Ethic of Managers, Compatibility of MPA with Local Culture*, Throughput: *Transparency of Management Decisions, Cooperation of Government, Continued Engagement with Stakeholders*, Output: *Biological/Ecological Benefits, and Education*. This was deduced from further discussions with participants, in which these 10 topics were brought up repeatedly throughout conversations with the majority of participants. Furthermore, there was one output indicator, *Equal Distribution of Benefits*, which had general agreement among approximately 80% of participants as being not particularly important for contributing to an MPA's legitimacy. In addition, results showed quite contrasting opinions between different stakeholder groups on the importance of eight out of the 41 indicators, as illustrated in Figure 4, and shown in Table 3. These differences are explained below within the appropriate input, throughput and output categories.

**Table 2.** List of legitimacy indicators, categorized as input, throughput, and output, in which there was a general consensus among all stakeholders and stakeholder groups interviewed at Musquash MPA as being highly important indicators for affording an MPA legitimacy.

<b>Input Indicators</b>	<b>Throughput Indicators</b>	<b>Output Indicators</b>
<ul style="list-style-type: none"> <li>• <b>Inclusiveness of Stakeholders</b></li> <li>• Diversity of Stakeholders</li> <li>• Representation of Stakeholders</li> <li>• Style of Stakeholder Engagement</li> <li>• Extent of Stakeholder Engagement</li> <li>• <b>Information Dissemination to Stakeholders</b></li> <li>• Stakeholder Exposure to Reasoning of MPA</li> <li>• <b>Stakeholder Exposure to Science of MPA</b></li> <li>• Stakeholder Exposure to Expected Benefits of MPA</li> <li>• Equality of Stakeholders</li> <li>• <b>Conservation Ethic of Managers</b></li> <li>• Capacity of Management Body</li> <li>• Information Informing MPA Design</li> <li>• <b>Compatibility of MPA with Local Culture</b></li> <li>• Existence of Defined Goals/Objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Management Competence</li> <li>• Accountability of Managers</li> <li>• <b>Transparency of Management Decisions</b></li> <li>• Quality of Decision Making</li> <li>• Organization</li> <li>• Existence of Planned Activities</li> <li>• Quality of Deliberation</li> <li>• Existence of a Management Plan</li> <li>• <b>Cooperation Among Government</b></li> <li>• <b>Continued Engagement with Stakeholders</b></li> <li>• Level of Enforcement</li> <li>• Information Informing Management Decisions</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Biological/Ecological Benefits</b></li> <li>• <b>Education</b></li> <li>• Information Availability/Accessibility</li> <li>• Support</li> <li>• Environmental Awareness</li> </ul>

**Note:** Indicators shown in bold are the top 10 most important indicators to stakeholders at Musquash MPA for affording an MPA legitimacy.

#### 4.1.3.1 Assessment of Input Indicators

There were noticeable differences between stakeholder groups on the importance of four input indicators: *Power and Influence of Stakeholders*, *Environmental Knowledge of Managers*, *Attention to Displacement*, and *Stakeholder-Manager Agreement on Goals* (Figure 4; Table 3). Specifically, for the input indicator *Power and Influence of Stakeholders*, local NGOs, community members, and managers viewed it as a highly important factor contributing to an MPA's legitimacy, while scientists suggested it was only slightly important (Figure 4A). Further, while results show mixed opinions on the importance of this indicator within the federal/provincial government stakeholder group, most participants within this group stated it was only slightly important (Table 3).

For the input indicator *Environmental Knowledge of Managers*, there were different perceptions on its importance between all stakeholder groups and even within some stakeholder groups. Specifically, NGOs viewed this indicator as extremely important whereas scientists only viewed it as neutral in importance (Figure 4B). However, opinions remained divided within both the community members and federal/provincial government groups on the importance of this indicator (Figure 4B).

Further, for the input indicator *Attention to Displacement*, perceptions were also divided both between and within stakeholder groups (Figure 4C; Table 3). Specifically, MPA managers viewed this indicator as only slightly important, while representatives from the federal/provincial government viewed it as highly important (Figure 4C). For the remaining three groups, NGOs, community members, and scientists, the perceptions on the importance of this indicator were mixed, ranging from neutral to extremely important within each group (Figure 4C). However, the majority of opinions within these groups were that this indicator was extremely important (Table 3).



Finally, for the input indicator *Stakeholder and Manager Agreement on Goals*, all participants from the local NGOs and MPA management groups suggested that this indicator was highly important (Figure 4D). However, much discrepancy occurred within the remaining stakeholder groups on the importance of this indicator, with opinions being divided between slightly important to highly important (Figure 4D; Table 3).

#### *4.1.3.2 Assessment of Throughput Indicators*

There were differences in opinion between stakeholder groups on the importance of two throughput indicators: *Use of Incentives*, and *Conflict Resolution Measures*. Particularly, the local NGOs and community members placed *Use of Incentives* as higher in importance for affording an MPA legitimacy than government representatives, MPA managers, and scientists (Figure 4E; Table 3). Interestingly, for the indicator *Conflict Resolution Measures*, MPA managers, NGO groups, and scientists placed this indicator higher in importance than community members, who only suggested it was neutral (Figure 4F). However, opinions on the importance of this indicator were mixed between slightly to extremely important by participants belonging to the federal/provincial government group (Table 3).

#### *4.1.3.3 Assessment of Output Indicators*

There were contrasting opinions between stakeholder groups on the importance of two output indicators for affording an MPA legitimacy: *Provision of Common Good* and *Economic Benefits*. Specifically, community members and MPA managers all conveyed that the indicator *Provision of Common Good* was extremely important, while the remaining stakeholder groups viewed it as less important, particularly those from the

scientific community (Figure 4G). For the indicator *Economic Benefits*, only participants from the community viewed it as very important, while the remaining stakeholder groups all viewed this indicator as being only slightly to neutral in importance (Figure 4H). In addition, one NGO group indicated that the indicator *Economic Benefits* was not at all important (Figure 4H).

#### *4.1.3.4 Assessment of Process Indicators*

Participants were asked to assess the importance of process-related factors affecting legitimacy compared with ecological or socio-economic factors, as key determinants of MPA effectiveness. Interestingly, the majority of participants, particularly from the management community, NGOs, and government representatives, expressed that these process-related factors for legitimacy are important to a point, but not as important as ecological factors. In contrast, less than half of the participants, particularly community members, scientists, and a local NGO group, expressed that process-related factors were without a doubt important. However, one participant from an NGO group noted that these indicators from all three categories were not at all important and largely beside the point of MPAs.

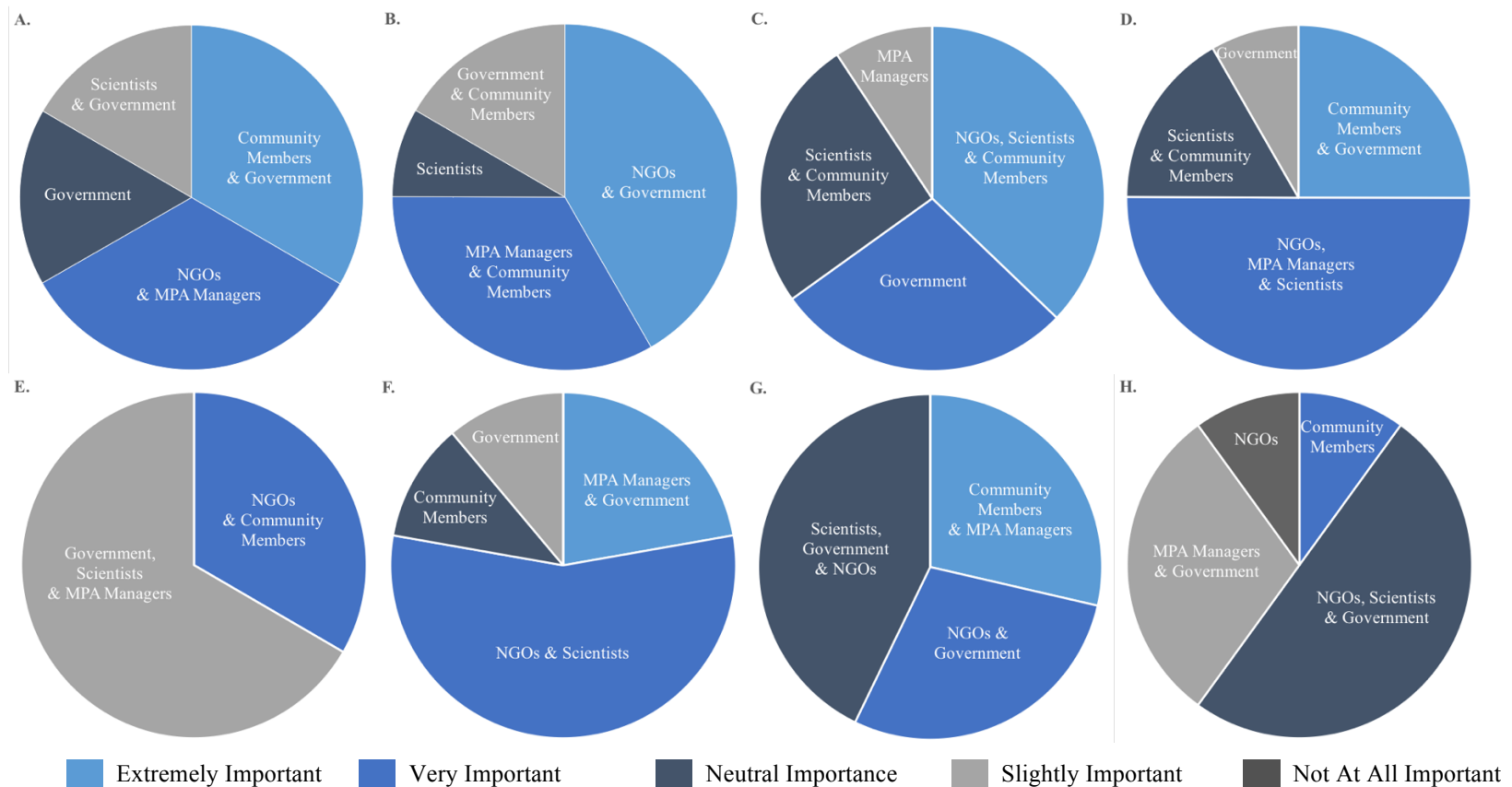
Finally, when asked if there were any other factors, or indicators, that stood out to them as important for assessing an MPA's legitimacy, approximately half of the participants noted that *Trust* was a critical factor. Two participants suggested that *Trust* is even more important than all the existing indicators mentioned. In addition, two participants suggested that *Equal Distribution of Costs* as an input indicator, rather than the existing output indicator of *Equal Distribution of Benefits*, was more important for an

MPA's legitimacy. Moreover, an indicator about the expected future costs of not designating the MPA was said to be important by approximately three participants.

**Table 3.** The contrasting opinions on the level of importance of eight legitimacy indicators, categorized as input, throughput, and output, according to various stakeholder groups at Musquash MPA.

<b>Legitimacy Indicators</b>	<b>Stakeholder Groups</b>				
	<i>NGOs</i>	<i>Community Members</i>	<i>Scientists</i>	<i>Federal/Provincial Government</i>	<i>MPA Managers</i>
<b>Input</b>					
<i>A. Power and Influence of Stakeholders</i>	very important	very – extremely important	slightly important	mixed opinions. slightly* – extremely important	very important
<i>B. Environmental Knowledge of Managers</i>	extremely important	mixed opinions. slightly – very important	very important	mixed opinions. slightly – extremely* important	very important
<i>C. Attention to Displacement</i>	mixed opinions. neutral – extremely* important	mixed opinions. neutral – extremely important*	mixed opinions. neutral – extremely important	very important	slightly important
<i>D. Stakeholder – Manager Agreement on Goals</i>	very important	mixed opinions. neutral – extremely important	mixed opinions. neutral – very important	mixed opinions. slightly important – extremely important*	very important
<b>Throughput</b>					
<i>E. Use of Incentives</i>	very important	very important	slightly important	slightly important	slightly important
<i>F. Conflict Resolution Measures</i>	very important	neutral importance	very important	mixed opinions. slightly – extremely important	extremely important
<b>Output</b>					
<i>G. Provision of Common Good</i>	neutral – very important	extremely important	neutral importance	neutral – very important	extremely important
<i>H. Economic Benefits</i>	mixed opinions. not at all – neutral* importance	very important	neutral importance	slightly* – neutral importance	slightly important

**Note:** An “\*” indicates the majority opinion within that stakeholder group when opinions were mixed, where applicable.



**Figure 4.** Differing opinions between stakeholder groups at Musquash MPA on the level of importance of eight indicators for legitimacy, indicated by Charts A – H (**Input Indicator Charts:** **A.** *Power and Influence of Stakeholders*, **B.** *Environmental Knowledge of Managers*, **C.** *Attention to Displacement*, and **D.** *Stakeholder & Manager Agreement on Goals*; **Throughput Indicator Charts:** **E.** *Use of Incentives* and **F.** *Conflict Resolution Measures*; **Output Indicator Charts:** **G.** *Provision of Common Good* and **H.** *Economic Benefits*).

Note: Different colors indicate the level of importance that an indicator is rated (see legend above), while the size of each section indicates the percentage of participants who expressed that opinion. Written within each pie section are the specific stakeholder groups associated with that opinion. Stakeholder groups written in more than one section within a pie chart indicate where there were mixed opinions within that stakeholder group on the importance of that indicator.

## **4.2 Discussion of Musquash MPA**

This section first discusses factors affecting MPA effectiveness according to stakeholders at Musquash MPA. Second, factors affecting an MPA's legitimacy from a Musquash MPA stakeholder perspective are discussed. This section then closes with an explanation of the findings on the level of importance of the suite of indicators for legitimacy by Musquash stakeholders.

### ***4.2.0 Factors Affecting MPA Effectiveness***

Results from this case study showed that while most participants indicated Musquash was an effective MPA overall, there were notable differences between stakeholders on how MPA effectiveness was perceived, particularly between those who were local community members and those who were not. Results showed that participants in government, science, and NGOs mentioned numerous factors influencing whether an MPA was effective, and specifically provided more critical opinions about the effectiveness of Musquash MPA. These participants supported their assessment of Musquash MPA not being highly effective by noting its small size, its marine component lacking ecological diversity and uniqueness, the fact that the MPA allows for destructive activities such as scallop dragging, and the level of scientific uncertainty surrounding the actual contribution of Musquash MPA to the health of the broader Bay of Fundy. In contrast, participants who were local community members around the estuary perceived the effectiveness of Musquash MPA much more positively, simply for the reasons that it has kept industry out of the area and maintained their way of life, regardless of whether it had contributed to the health of the broader ecosystem or checked off all of the

“requirements” for MPAs, as demonstrated in the literature (Edgar et al., 2014). This finding suggests that different stakeholder groups perceive MPA effectiveness in vastly different ways, depending on their background, experiences, current values and desires. Specifically, results from this case study demonstrate that stakeholders with direct cultural or emotional ties to the MPA tend to view effectiveness on a more local scale and in relation to their own interests and way of life, while broader stakeholders such as scientists, NGOs, and government, tend to perceive the effectiveness of an MPA more objectively, and at a larger scale in relation to the overall purpose of MPAs. This is in line with much literature, which states that differences in demographics, local history, and social profiles can significantly impact stakeholder responses and perceptions towards MPAs, or in other words, the same MPA can mean different things to different people (Charles & Wilson, 2009; Christie, 2003; Jentoft, Chuenpagdee, & Pascual-Fernandez, 2011; Masud & Kari, 2014; Voyer, Gladstone, & Goodall, 2015). Therefore, understanding the social, cultural, historical and political landscape of different stakeholders is critical to predicting how and why certain stakeholders will perceive an MPA, as it is these perceptions that ultimately have the ability to make or break the effectiveness of the MPA (Christie, 2003; Voyer, Gladstone, & Goodall, 2015).

#### *4.2.1 Factors Affecting MPA Legitimacy*

Results demonstrated an overwhelming degree of support towards the designation of Musquash MPA and towards MPAs in general, suggesting that the local stakeholders around Musquash possess a strong conservation ethic and environmental awareness. In fact, numerous community members also talked about their desire to expand the boundaries of the MPA in the near future to offer it more protection, further signifying the

high level of legitimacy this MPA has. Interestingly, this result was not expected, as it is at odds with the majority of literature that highlights the opposition and negative perceptions stakeholders typically have towards MPAs (Jentoft et al., 2012; Voyer, Gladstone, & Goodall, 2015). However, this discrepancy is likely because of the nature of the stakeholders around Musquash, who are primarily local environmental NGOs that prioritize conservation, and community members that are culturally tied to the “naturalness” of the estuary, rather than an abundance of fishers or industry who, due to loss of access, may be opponents of MPAs. Further, participants conveyed that Musquash MPA has such a high level of acceptance and support because its establishment was actually the community’s idea that was taken to DFO through a process called nomination; and because it was community leaders who worked diligently, independently of DFO, to consult the key stakeholders and garner the legitimacy for it. This result reaffirms a theoretical assumption that MPAs that are led by a well-known, local community group or individual from the onset tend to have a much greater level of legitimacy than MPAs that are led by “outsiders”, or government managers (Bennet & Dearden, 2014; Voyer, Gladstone, & Goodall, 2012). However, in some literature, opinions remain divided as to whether a top-down, science-based approach versus a community-based bottom up approach is more effective for MPAs, and suggest that finding the middle ground is the best option (Voyer, Gladstone, & Goodall, 2012). However, it is important to note that community-initiated MPAs such as Musquash are not the norm in Canada, and the potential to seize upon this success factor is not likely anymore since the nomination of sites by communities is no longer something that DFO promotes, and instead, they have taken on the responsibility in identifying sites for MPAs. Therefore, DFO will likely have to work much more diligently in the future than they did



for Musquash to obtain stakeholder legitimacy of proposed MPAs, especially when sited in areas with the potential for more conflict and contention such as in the broader Bay of Fundy. Nonetheless, this result demonstrates that stakeholders perceive the legitimacy of an MPA as being heavily associated with the person or group that is leading it, and whether they are respected, well-known, and trustworthy to have the community's best interests at heart.

The results of this research further suggests that DFO's ability to consider trade-offs by allowing a scallop-drag zone within Musquash was an additional factor contributing to the high level of legitimacy afforded to the MPA by community stakeholders. This finding supports the call in the literature for management bodies to increase stakeholder buy-in by considering trade-offs when designating MPAs (Bennett & Dearden; Lester et al., 2013). However, it should be noted that while participants from the NGO and scientific community at Musquash were not in support of the scallop-drag zone for fear of the MPA becoming a "paper park" (Jameson, Tupper, & Ridley, 2002), they understood the need for some level of trade-offs to address the concerns of fishing organizations in the area. Nonetheless, it is worth noting that actions that serve to increase the legitimacy afforded by one stakeholder group, may actually end up decreasing the amount of legitimacy afforded by other stakeholders.

Another key finding of increasing legitimacy obtained from this study is DFO's addressing of the community stakeholder desires to contribute meaningfully to management decisions. This was achieved through DFO's holding of regular advisory meetings, sharing knowledge, and allowing the community to give input into management decisions. In fact, some community members expressed that they actually want the community to have more responsibility than they currently do over the MPA and

management decisions. This result speaks to the type of community that exists at Musquash; one which has a huge sense of ownership towards the MPA and as a result, they desire hands-on involvement that goes much beyond simple consultation. This result is in accordance with a variety of literature which demonstrates that in order to have legitimacy with small coastal communities, public involvement needs to be meaningful, and that general public participation is typically not enough (Dalton, 2005; Hard et al., 2012; Hattam et al., 2014; Voyer, Gladstone, & Goodall, 2012). However, it is important to note that even though communities may want a more prominent role in managing the MPA, there are likely limits on how much responsibility and control DFO can delegate, as they are the legally mandated governing body for the establishment and management of MPAs in Eastern Canada.

While many of the factors identified in this research accounted for an increase in legitimacy towards Musquash MPA by its stakeholders, a key factor found negatively affecting its legitimacy was the lengthy time-frame between nomination and designation. The community members at Musquash expressed that the extensive time it took for DFO to designate the MPA, even when there was no opposition towards it, suggested a lack of priority by DFO to the community's concerns. This perception was further supported by an apparent lack of committed long-term staff and the necessary funding to move the initiative forward by DFO, which made stakeholders feel un-prioritized and that they were not being taken seriously. In fact, stakeholders stated that staff members should not be constantly changing positions throughout an MPAs designation as it completely erodes both the efficiency of the process, as well as the trust from the communities who are depending on them.

While these perceptions by the stakeholders at Musquash appeared to be warranted, this research suggests that increased efforts by DFO at raising awareness and communication could have mitigated some of these concerns and tempered some of the expectations of the community stakeholders. Specifically, DFO could have identified and communicated a number of factors internal and external to the DFO designation process which likely accounted for the increased timeline. Internally, these included the newness of the *Oceans Act* and the time needed for DFO to work out the details of implementing an MPA under this new legislation. Externally, factors such as the changing of the Liberal federal government to a Conservative-led government, and the September 11<sup>th</sup> terrorist attack on the United States severely limited DFO's ability to focus attention towards all MPAs in Canada, not just Musquash. A key lesson from this finding is a recognition that stakeholders may not always be aware that the realization of their expectations may be affected by factors outside the control of the responsible department. Nonetheless, this should not prevent the department from implementing good management practices of keeping its stakeholders informed throughout the process, particularly on why delays may be occurring.

#### ***4.2.2 Indicators for Legitimacy***

Results showed there to be general consensus among stakeholder groups and managers on the importance of all but eight of the 41 indicators. This finding of consensus on the majority of the indicators supports the importance of these indicators as being critical for MPA legitimacy and being widely recognized as importance by various stakeholders, MPA managers, and researchers as being necessary for a successful MPA (Lankhorst, Bailey, & Bush, *pers. comm.*). However, it is important to note that the

identification of the ranking of the top 10 most important indicators to stakeholders at Musquash MPA were site-specific, and were derived according to the themes that were most commonly brought up in discussions by the majority of participants. These results suggested that stakeholders at Musquash are more willing to afford an MPA legitimacy if they are highly involved with the initiative and educated on the scientific knowledge from the start, continuously engaged in the management of the MPA through cooperative partnerships with managers who are caring and transparent, and if the MPA is protecting nature in some way and educating the broader public on conservation.

For the eight indicators in which there were contrasting opinions between different stakeholder groups and managers on their importance for assessing legitimacy, this result is not unusual, as oftentimes different stakeholders will have different attitudes and perceptions towards MPAs (Chuenpagdee et al., 2013).

Specifically for Musquash stakeholders, the indicators *Power and Influence of Stakeholders*, *Stakeholder-Manager Agreement on Goals*, and *Use of Incentives* all demonstrated the same trend, in which the differences in perceptions on their importance were divided between the more direct/primary stakeholders who have an immediate connection with the MPA and the secondary stakeholders, such as the government representatives, scientists, or larger NGOs who are interested in the MPA because of their positions of affiliations, verifying the literature which indicates that different disciplines or backgrounds of stakeholders lead to many different “realities” of an MPA (Le Tissier et al., 2004). Direct stakeholders such as local NGO groups and community members ranked these three indicators high in importance as they reaffirmed that stakeholder viewpoints are very important, comprised of local knowledge, and often underestimated. Regarding the indicator *Use of Incentives*, community members supported this as

important because they wanted to be treated with dignity and offered simple appreciations such as a meal or compensation for giving up their time to government, as it is part of their culture. In contrast, stakeholders from scientific and government groups assessed these indicators as less important to them because even while acknowledging the importance of primary stakeholder involvement in enhancing legitimacy, they considered that too much stakeholder input and attention could lead to the inclusion of trivial and biased opinions that are not science-based, such as what has occurred in cases of past MPAs (Jentoft, Chuenpagdee, & Pascual-Fernandez, 2011). However, while this was clearly not the case for the stakeholders at Musquash who were knowledgeable and prioritized conservation, it is the case for MPAs more generally, where stakeholder groups are much more diverse and have broad interests. This finding highlights a significant difference in the scale at which local versus governmental stakeholders assess factors of legitimacy, with the former being informed by the site-specific case, while the latter drawing on more generalized knowledge.

This may also provide an explanation for why community members placed a low level of importance on the throughput indicator *Conflict Resolution Measures* compared to other stakeholders and managers, because there was never a need for these measures at Musquash MPA, as there has been minimal to no conflict occurring. In contrast, those working in government, science, NGOs, and managers realize that measures to resolve conflict are critical for a typical MPA. It may also explain why community members assessed the output indicators *Provision of Common Good* and *Economic Benefits* as highly important, since the MPA is part of their home and they want to see their area benefit both ecologically and economically. Since the non-local stakeholders do not have

this connection to the MPA, they may be inclined to think more generally, focusing mainly on the conservation objectives of MPAs.

Interestingly, the perceptions MPA managers had on most of indicators were actually in agreement with that of the community versus the government representatives or scientists, likely because they are trained to understand the public values when designating an MPA, and therefore are highly aware that communities need to be tended to and that these indicators are important. However, managers still acknowledged that economic benefits are rare in Canada and not the purpose of MPAs, contrasting with the perceptions of the community.

Results related to the importance of legitimacy indicators also showed discrepancy between stakeholders' perceptions on the input indicator *Environmental Knowledge of Managers*, particularly because members from the scientific community placed it lower in importance than other stakeholder groups. This result reflects the notion that scientists consider themselves to be the experts in science and that the MPA managers only need to be informed of it. Despite this, participants from other stakeholder groups were more inclined to afford an MPA legitimacy when the managers have an understanding of the environmental science of the area. However, even within stakeholder groups, there were widely different perceptions on the importance of this indicator. This may be because the participants within each category are still quite diverse in their background, experiences, and level of involvement with MPAs, as well as the sample size, which made it challenging to uncover an overall opinion within each stakeholder group.

Finally, with regard to the indicator *Attention to Displacement*, there were differing opinions expressed both across and within stakeholder groups. As expected, some community members ranked it high because even though they care about

conservation, they are the ones with the potential to be negatively impacted. However, unlike the trend shown for most of the other indicators, MPA managers differed in opinion from the community stakeholders in this instance by acknowledging the primary importance of achieving the ecological benefits of protecting an area.

#### **4.3 Recommendations for the Future of Musquash MPA**

This section will outline a series of site-specific recommendations to improve the legitimacy and ultimately the effectiveness of Musquash MPA, based on the perspectives provided from the stakeholders at this site. Note that the non-site specific recommendations concerning the legitimacy of MPAs in general are not discussed here, but will be provided in the comparative discussion chapter of both Musquash MPA and Basin Head MPA at the end of this report. Therefore, to improve the legitimacy of Musquash MPA, the following recommendations are provided:

##### ***(1) More meaningful involvement and responsibility towards the community***

It is recommended that MPA managers at Musquash MPA continue to strive for deeper, more meaningful involvement with stakeholders, particularly the local community members and local NGO groups at Musquash MPA. The community at Musquash MPA placed a large emphasis on being more involved in management decisions, and having more responsibilities delegated to them, such as participation scientific work and public enforcement, for example. It is suggested that DFO continues to advance the discussion with stakeholders for Musquash MPA, particularly regarding the current proposal to expand the MPA to provide more protection.

## ***(2) Improve communication and stakeholder understanding of DFO processes***

While it is not particularly feasible to suggest MPA managers work to improve the slow timelines or the instability in staff, funding, and political priorities within DFO, it is recommended that improvements in communication on DFO's end are taken to ensure stakeholders understand that not all their expectations can always be met due to factors internal and external to the DFO designation process. It is suggested that ensuring stakeholders have a clearer understanding and realizations of these factors will help to reduce some of their feelings of confusion or un-prioritization when their expectations are not fully being met to their satisfaction.

## ***(3) Pursue opportunities for more public promotion and education of Musquash MPA***

It is recommended that to improve the legitimacy of Musquash MPA, efforts are taken to increase the level of public and tourist awareness in the area. It is suggested that partnerships be formed between local organizations and the provincial/federal government to implement opportunities such as educational field trips, or kayak tours with the many cruise ship visitors entering Saint John, to not only support the area economically but bring public awareness to MPAs and an appreciation towards conservation. It is suggested that an increase in planned activities such as these would fill in the missing piece that would make Musquash MPA the "model MPA" for promoting to Canadians what MPAs are all about.



## CHAPTER 5. BASIN HEAD MPA CASE STUDY

### 5.0 Overview of Basin Head MPA

Basin Head is a small, coastal MPA in Prince Edward Island designated in 2005 by DFO's Gulf Region under the *Oceans Act* (Fisheries and Oceans, 2009). It is specifically located on the eastern tip of the province along the Northumberland Strait, between the towns of Souris and East Point, approximately 100 km east of Charlottetown (Fisheries and Oceans, 2009; Figure 5).



**Figure 5.** Location of Basin Head MPA, indicated by the red dot, in Eastern Canada (adapted from Google Maps).

Basin Head MPA is comprised of a 60-hectare shallow estuarine lagoon surrounded by agriculture lands and an extensive dune system, and an larger outer coastal area, totalling to 2,277 hectares in size (Fisheries and Oceans, 2009; Figure 6). The Basin Head ecosystem supports a rich diversity of marine organisms including plants, invertebrates, fish, mammals, and birds. Most notably however, the inner channels of the Basin Head lagoon contain a unique strain of Irish moss (*Chondrus crispus*), a marine

plant, that has not been found to exist in this form anywhere else in the world (Fisheries and Oceans, 2009). Furthermore, Basin Head lagoon is a very sensitive estuary due to the narrow channels and openings that make it quite vulnerable to sedimentation (Fisheries and Oceans, 2009).



**Figure 6.** Shallow lagoon component of Basin Head MPA (Fisheries and Oceans, 2009).

The lands surrounding the Basin Head lagoon are exceptionally rural with little to no residential and commercial development, primarily consisting instead of agricultural farms and forested lands (Fisheries and Oceans, 2009). The Basin Head watershed has long had cultural and ecological importance to farmers, fishers, land-owners, and community members in the region, as well as Mi’kmaq First Nations (Fisheries and Oceans, 2009). Historically, the Basin Head harbour and wharf were primarily used for fishing, peaking to about 25-30 fishing boats for numerous species including cod, hake, haddock, herring and mackerel, as well as lobster fishing in areas surrounding the Basin (Garrett, n.d.). Today, Basin Head has changed drastically, becoming a popular local and tourist site comprising the top-rated “Singing Sands” beach, and the Basin Head Fisheries Museum, displaying the rich cultural history of the coastal communities (Fisheries and Oceans, 2009; Garrett, n.d.).

Upon the discovery of the unique Irish moss in the 1960s, various options were explored at a provincial level to conserve the area, including the protection of 96 hectares of sensitive sand dunes surrounding the basin under PEI's *Natural Areas Protection Act* by 1997 (*Natural Areas Protection Act*, R.S.P.E.I. 1988; Fisheries and Oceans, 2009). In 1999, following the emergence of the federal *Oceans Act*, a Basin Head Lagoon Ecosystem Conservation Committee (BHLECC) was formed and they promptly nominated the Basin Head lagoon to DFO for consideration as a federal MPA. After 5 years of consultation and planning by the BHLECC and DFO, the Basin Head lagoon and outer coastal area was legally designated as a marine protected area for the protection of the unique Irish moss strain and its habitat (Fisheries and Oceans, 2009). Since then, efforts have continued to safeguard the watershed, including the protection of 57.5 hectares of adjacent beach land in 2007 by a local ENGO, The Nature Conservancy of Canada (Fisheries and Oceans, 2009).

Four specific conservation objectives are laid out for the protection of Basin Head MPA. Broadly, they encompass the maintenance of 1) environmental quality, 2) the physical structures of the ecosystem, 3) the health (biomass and coverage) of *Chondrus crispus*, and 4) the overall ecological integrity of the lagoon and inner channel. To manage the area, the Basin Head MPA is divided into 3 management zones: The Inner Channel (Zone 1), the Lagoon (Zone 2), and the Outer Coast (Zone 3). The Inner Channel is afforded the highest level of protection due to the presence of the Irish moss, and is restricted to most activities including swimming, diving, vessel use, and fishing. The Lagoon is intended to act as a buffer zone for the more sensitive Zone 1, and as a result only allows certain disturbances including swimming, diving, and non-vessel based fishing. Finally, the Outer Coast is the largest zone of the MPA and is intended to protect

the integrity of the dune structures by prohibiting all activities that may alter the coastline. However, it allows activities such as swimming, fishing, and motorized vessel use (Basin Head MPA Regulations, S.O.R., 2005; Fisheries and Oceans, 2009).

Despite these measures to control human behaviour, the health of *Chondrus crispus* within the Basin Head lagoon is currently being threatened by natural influences, particularly eutrophication and the invasion of the green crab (Fisheries and Oceans, 2009). However, for the purposes of this research, Basin Head MPA is an ideal site because of its longevity of designation and its strong connection with its surrounding community.



**Figure 7.** Three distinct management zones within Basin Head MPA (Fisheries and Oceans, 2009).

## **5.1 Basin Head MPA Results**

The purpose of this section is to outline the results found from the Basin Head MPA case study, beginning with a description of the perceptions various stakeholders and managers had on MPA effectiveness in general, and with respect to Basin Head MPA. This section then reports on the perceptions different stakeholders and managers provided on the legitimacy of Basin Head MPA, followed by a description on the level of importance different stakeholder groups at Basin Head MPA gave towards the various indicators for legitimacy, categorized as input, output, and throughput indicators. The remainder of this section outlines the results found on the overall perceived level of importance of process-related indicators for MPA effectiveness, and any additional indicators suggested by stakeholders as being important for MPA legitimacy.

### ***5.1.0 Stakeholder Perceptions on MPA Effectiveness***

All 13 participants interviewed at Basin Head possessed strong environmental awareness and stewardship, and almost all participants expressed an overwhelming positive perception towards the use of MPAs as tools for conserving our oceans. Further, only three participants, who were all either MPA managers or provincial government representatives, questioned whether MPAs were effective conservation tools. These participants conveyed that an MPAs size, as well as their ability to enhance the environmental integrity of the larger marine ecosystem, were two primary factors influencing their opinions on an MPA's potential effectiveness. Further, two of these participants indicated that MPAs are unable to safeguard the marine environment from external factors such as climate change, thus negatively influencing their opinion of MPA effectiveness. In contrast, the remaining 10 participants, who were mostly local

community members and organizations, indicated that MPAs are valuable and effective tools, without expressing any doubts or concerns about them.

### ***5.1.1 Perceived Effectiveness of Basin Head MPA***

There was general consensus among all 13 participants that the main reason Basin Head MPA was established was for the protection of the unique Irish moss species that is not known to exist anywhere else in the world. When asked if this reason aligned with their own opinions about the need for an MPA here, all 13 participants concluded that this area is special and most definitely deserved protection because of the moss. However, one participant from the PEI provincial government indicated that federal MPA designation may not have been the best type of protection for the lagoon.

Further, results showed conflicting opinions among participants as to whether Basin Head was an effective MPA overall. In particular, approximately half of the participants expressed concern over Basin Head's level of effectiveness ecologically, as the moss that the MPA was designed to protect has declined. Specifically, those interviewed from the management community stated that the MPA has not been successful at reaching its management objectives of enhancing the moss bed, and as a result, the MPA has technically not been effective. Scientists also noted this but indicated that the MPA has been somewhat effective in the sense that it has prevented and decelerated the extinction of the moss. In contrast, while most local community members acknowledged that the MPA has not enhanced the moss population, they still viewed the MPA as highly effective in terms of the many benefits it has generated for their community, such as research, environmental education, and national attention. In contrast, two locals and a member of the management community questioned if the MPA

regulations should continue in the future if they are no longer contributing to the protection or enhancement of the moss. Despite these opinions, all 13 participants declared that Basin Head MPA was a worthwhile designation overall.

### ***5.1.2 Stakeholder Perceptions on the Legitimacy of Basin Head MPA***

Participants were asked about their overall perception towards Basin Head MPA, specifically if they afford it legitimacy and view it as having broad stakeholder support. Results found that all stakeholders interviewed view Basin Head MPA as legitimate, have a positive perception towards it, and definitely support it. In fact, some participants from the community and local organizations indicated that not only do they support the MPA, but they also take pride in it as part of their culture and possess a sense of ownership towards it. In accordance with this, participants from the management community also viewed it as a very effective example of a legitimate, community-driven coastal MPA. When asked what they initially thought about an MPA being established here, most stakeholders interviewed indicated that they were excited for an MPA to be established, and that they had no concerns about it when it was first presented to them by DFO. However, a participant from PEI's government department conveyed that they were slightly concerned at first about how the community would respond to the MPA. Despite this, all stakeholders interviewed, including managers, indicated that the MPA has had broad support right from the beginning, and that the opposition towards it was minimal, with only a few concerns relating to restrictions on eel fishing, motorized craft use, and shoreline real-estate construction.

Further, when asked if they thought DFO worked diligently to establish legitimacy for Basin Head MPA, all participants involved with the MPA at its early stages indicated

that it was the efforts of the local community group that successfully garnered the support, awareness, and legitimacy from the local people towards this MPA, not DFO. Despite this, various stakeholders acknowledged that DFO has done many things to significantly help the MPA maintain its legitimacy over time, while a few participants expressed that they are not involved deeply enough with the MPA to give opinions on this topic. Specifically, all the stakeholders interviewed who did address this question stated that DFO's efforts to form a strong partnership with a credible group in the community, and to engage all relevant parties through continued advisory meetings contributed significantly to the MPA's legitimacy. Further, various participants, particularly the local community members and leaders, also stated that DFO's efforts to distribute responsibilities to the local community group, provide funding, continue scientific work in the area, and remain trustworthy, approachable and caring also contributed positively to their assessment on the MPA's legitimacy. In agreement with stakeholders' opinions, those interviewed from the management community also indicated that when establishing and managing Basin Head MPA, DFO recognized the importance of garnering community support and involvement, as well as fostering close relationships. It should also be noted that approximately three participants expressed that while they could not speak confidently about DFO's specific efforts in managing Basin Head, DFO has continually informed and updated them, helping to contribute to the legitimacy they give to the MPA. Finally, most participants from all stakeholder groups acknowledged that the immense level of environmental education and knowledge sharing efforts recently being done in the area is significantly enhancing their opinions on the MPA's legitimacy.

When asked if there was anything DFO did to negatively impact the level of legitimacy they afford to Basin Head MPA, seven out of 13 participants concluded that



based on their experiences, there was absolutely nothing DFO has done to diminish the level of legitimacy they afford towards Basin Head MPA. Again, almost half of these participants indicated that it is hard for them to give remarks on this topic because they are not deeply involved with the MPA. In contrast, two participants, a DFO manager and scientist, pointed out that kinks in the process of Basin Head's establishment and limitations on resources were likely factors that affected stakeholders' opinions on the legitimacy of the process. In agreement, two community leaders explained that they were not particularly satisfied with DFO's management in the past. However, they also noted that recently the management has improved tremendously and now they are more than satisfied. In addition, a member of the PEI provincial government expressed that DFO does not always acknowledge the conservation efforts of the entire Basin Head watershed and sand dune system surrounding the lagoon, slightly affecting his opinions on its legitimacy.

Overall, most of the stakeholders interviewed expressed that based on their experiences they are either very much satisfied, or more than satisfied with DFO's management and governance at Basin Head MPA. This was attributed to a high level of trust between DFO and the various stakeholders from the start. In line with this perspective, participants from the management community also conveyed that there is a shared perception of trust, support, and satisfaction between themselves as the governing body, and the various stakeholders around the MPA.

### ***5.1.3 Stakeholder Perceptions on Indicators for Legitimacy***

It should first be noted that there were a limited number of responses among the 13 participants regarding the discussions on the legitimacy indicators, due to the nature and/or requests of the participants at Basin Head MPA.

Results indicated that out of the 41 indicators, there was general consensus among all respondents from stakeholder groups interviewed that 29 of the indicators, or 70% of them, were highly important for affording an MPA legitimacy, as shown in Table 4.

There were no noticeable differences in opinions on the importance of these indicators between or within the different stakeholder groups at Basin Head MPA. However, the top 10 most meaningful indicators to stakeholders were deduced from this list according to discussions with participants, and are indicated in bold in Table 4. They include, by legitimacy category, Input: *Inclusiveness of Stakeholders*, *Stakeholder Exposure to Science*, *Conservation Ethic of Managers*, Throughput: *Cooperation Among Government*, *Transparency of Management Decisions*, *Continued Engagement with Stakeholders*, *Accountability of Managers*, Output: *Provision of Common Good*, *Education*, and *Information Availability/Accessibility*.

In addition, there was general consensus from respondents that two indicators, *Equal Distribution of Benefits*, and *Use of Incentives*, were not particularly important for affording an MPA legitimacy, while one indicator, *Economic Benefits*, was only slightly important. However, the number of participants who shared their opinions on these three indicators was limited. In addition, two indicators did not have enough responses from participants to conclude their importance: *Existence of a Management Plan*, and *Equality of Stakeholders*. Further, results show there to be notable differences in opinions between stakeholder groups on the importance of six out of 41 legitimacy indicators for affording

an MPA legitimacy: *Power and Influence of Stakeholders, Attention to Displacement, Stakeholder-Manager Agreement on Goals, Compatibility of MPA with Local Culture, Existence of Planned Activities, and Level of Enforcement*. These differences are explained below according to input, throughput, and output indicators. Further, these trends are illustrated in Figure 8 and provided in Table 5.

**Table 4.** List of legitimacy indicators, categorized as input, throughput, and output, in which there was a general consensus among all stakeholders and stakeholder groups interviewed at Basin Head MPA as being highly important indicators for affording an MPA legitimacy.

<b>Input Indicators</b>	<b>Throughput Indicators</b>	<b>Output Indicators</b>
<ul style="list-style-type: none"> <li>• <b>Inclusiveness of Stakeholders</b></li> <li>• Extent of Stakeholder Involvement</li> <li>• Information Dissemination</li> <li>• <b>Stakeholder Exposure to Science of MPA</b></li> <li>• <b>Conservation Ethic of Managers</b></li> <li>• Diversity of Stakeholders</li> <li>• Stakeholder Exposure to Expected Benefits of MPA</li> <li>• Stakeholder Exposure to Reasoning of MPA</li> <li>• Capacity of Management Body</li> <li>• Representation of Stakeholders</li> <li>• Environmental Knowledge of Managers</li> <li>• Style of Stakeholder Engagement</li> <li>• Information Informing MPA Design</li> <li>• Existence of Defined Goals/Objectives</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Cooperation Among Government</b></li> <li>• <b>Transparency of Management Decisions</b></li> <li>• <b>Continued Engagement with Stakeholders</b></li> <li>• Management Competence</li> <li>• <b>Accountability of Managers</b></li> <li>• Quality of Decision Making</li> <li>• Organization</li> <li>• Information Informing Management Decisions</li> <li>• Quality of Deliberation</li> <li>• Conflict Resolution Measures</li> </ul>	<ul style="list-style-type: none"> <li>• Biological/Ecological Benefits</li> <li>• <b>Provision of Common Good</b></li> <li>• Environmental Awareness</li> <li>• <b>Education</b></li> <li>• <b>Information Availability/Accessibility</b></li> <li>• Support</li> </ul>

**Note:** Indicators shown in bold are the top 10 most important indicators to stakeholders at Basin Head MPA for affording an MPA legitimacy.

### 5.1.3.1 Assessment of Input Indicators

Results show notable differences in opinion between stakeholder groups at Basin Head MPA on the importance of four input indicators: *Power and Influence of Stakeholders*, *Attention to Displacement*, *Stakeholder-Manager Agreement on Goals*, and *Compatibility of MPA with Local Culture*. Particularly, the input indicator *Power and Influence of Stakeholders* was suggested by local organizations, community members, and provincial government representatives as being a highly important indicator for affording an MPA legitimacy, while MPA managers and scientists placed this indicator as lower in importance (Figure 8A, Table 5). For the input indicator *Attention to Displacement*, participants from the local and MPA management community suggested that this indicator was highly important, compared to other stakeholder groups such as scientists and provincial government representatives (Figure 8B). However, data was not sufficient on the importance of this indicator from the local organization stakeholder group.

Trends between stakeholder groups on the importance of both the input indicators *Stakeholder-Manager Agreement on Goals* and *Compatibility of MPA with Local Culture* were similar, in which almost all stakeholder groups indicated that these indicators were extremely or very important, while those from the scientific community suggested they were lower in importance (Figure 8C and 8D). However, opinions were mixed within the scientific community on the importance of the indicator *Compatibility of MPA with Local Culture* (Table 5).

### *5.1.3.2 Assessment of Throughput Indicators*

There were notable differences in opinion between stakeholder groups on the importance of two throughput indicators: *Existence of Planned Activities*, and *Level of Enforcement*. Specifically, for the indicator *Existence of Planned Activities*, local organizations and provincial government representatives viewed this indicator as extremely important, while scientists and MPA managers viewed it as much lower in importance (Figure 8E). Interestingly, opinions on the importance of this indicator was mixed among community members, in which some participants viewed this indicator as extremely important while others only viewed it as neutral in importance for affording an MPA legitimacy (Figure 8E). Further, the indicator *Level of Enforcement* was found to be only moderate in importance to community members, but extremely important to provincial government representatives and MPA managers (Figure 8F). Also, participants from the scientific community had mixed opinions on the importance of this indicator (Table 5). However, it should be noted that responses for this indicator were limited among all stakeholder groups, and could not be determined for the local organization stakeholder group.

### *5.1.3.3 Assessment of Output Indicators*

There were no notable differences in opinion between stakeholder groups, within stakeholder groups, or among stakeholders and MPA managers on the level of importance of any of the output indicators for affording an MPA legitimacy, as therefore all are presented in Table 4.

#### 5.1.3.4 Assessment of Process Indicators

Participants at Basin Head MPA were asked to assess the importance of process-related factors affecting legitimacy compared with ecological or socio-economic factors, as key determinants of MPA effectiveness. While four participants from the local community and provincial government indicated they were not involved enough with the MPA to address this question, the majority of other participants acknowledged that good MPA governance, and legitimacy from stakeholders are very important for MPA effectiveness. However, one participant from an NGO suggested that overall, the suite of legitimacy indicators presented is not very applicable or important for MPA effectiveness.

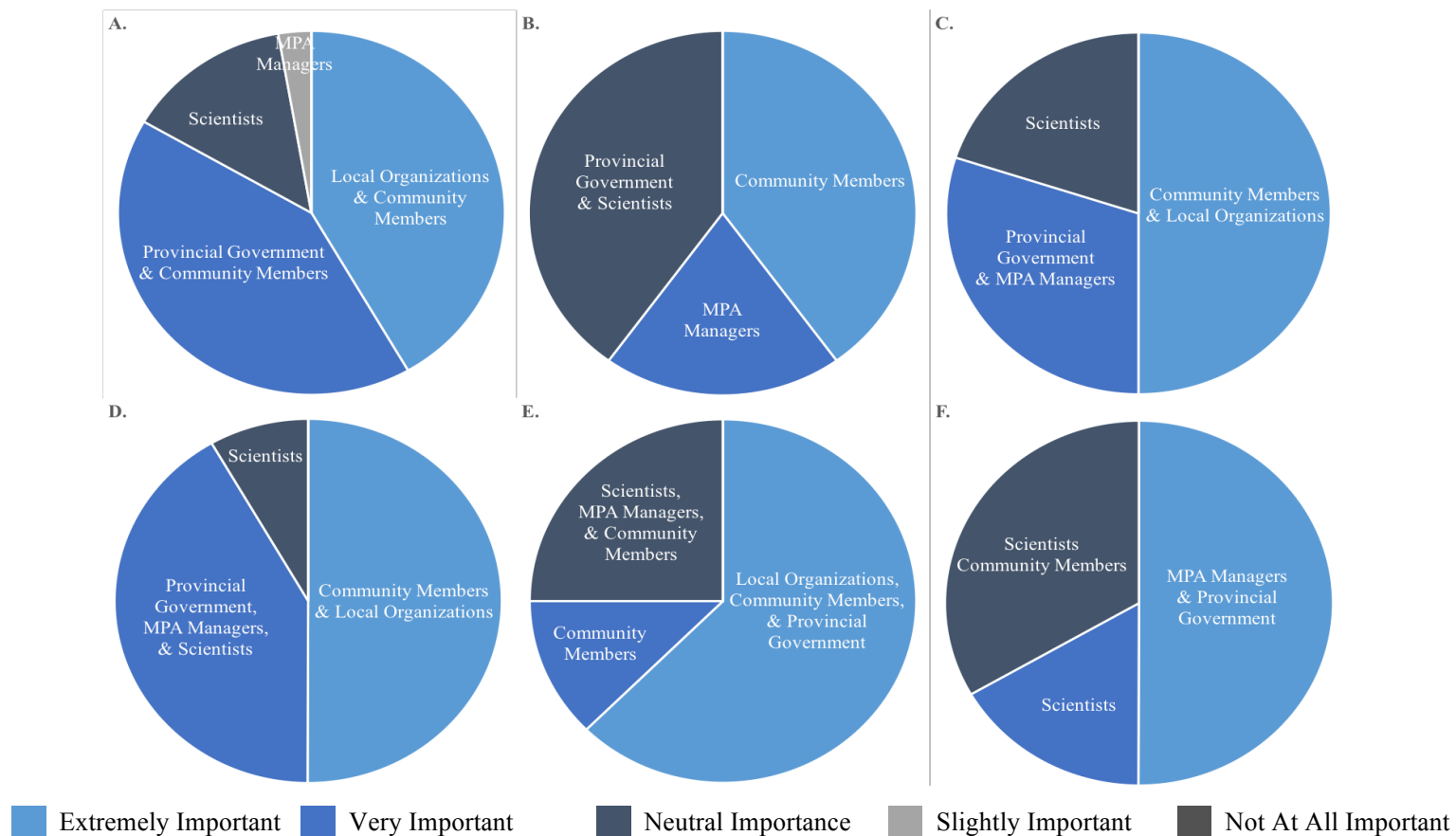
Finally, when asked if there were any other factors, or indicators, that stood out to them as important for assessing an MPA's legitimacy, over half of the participants suggested that *Trust, Partnerships between Government and Community* and the *Level of Scientific Work Conducted* were three very important factors contributing to an MPA's legitimacy. Further, a participant from the management community indicated that the existing indicator *Conflict Resolution Measures* should be an input indicator rather than a throughput indicator. Finally, an input indicator *Equal Distribution of Costs* was also suggested by one participant from the management community as being more relevant than the current output indicator *Equal Distribution of Benefits*.

**Table 5.** The contrasting opinions on the level of importance of six legitimacy indicators, categorized as input, throughput, and output, according to various stakeholder groups at Basin Head MPA.

<b>Legitimacy Indicators</b>	<b>Stakeholder Groups</b>				
	<i>Local Organizations</i>	<i>Community Members</i>	<i>Scientific Community</i>	<i>Provincial Government Dept.'s</i>	<i>MPA Managers</i>
<b>Input</b>					
<i>A. Power and Influence of Stakeholders</i>	extremely important	very* – extremely important	slightly – neutral importance	very important	slightly important
<i>B. Attention to Displacement</i>	n/a	extremely important	neutral importance	neutral importance	very important
<i>C. Stakeholder-Manager Agreement on Goals</i>	extremely important	very – extremely* important	neutral importance	very important	very important
<i>D. Compatibility of MPA with Local Culture</i>	extremely important	extremely important	mixed opinions. neutral – very important	very important	very important
<b>Throughput</b>					
<i>E. Existence of Planned Activities</i>	extremely important	mixed opinions. neutral– extremely* important	neutral importance	extremely important	neutral importance
<i>F. Level of Enforcement</i>	n/a	neutral importance	mixed opinions. neutral – very important	extremely important	extremely important

**Note:** An “\*” indicates the majority opinion within that stakeholder group when there were mixed opinions, where applicable. An “n/a” indicates that data was not sufficient to deduce a result.





**Figure 8.** Differing opinions between stakeholder groups at Basin Head MPA on the level of importance of six indicators for legitimacy, indicated by Charts A – F (**Input Indicator Charts:** **A.** *Power and Influence of Stakeholders*, **B.** *Attention to Displacement*, **C.** *Stakeholder-Manager Agreement on Goals*, and **D.** *Compatibility of MPA with Local Culture*; **Throughput Indicator Charts:** **E.** *Existence of Planned Activities* and **F.** *Level of Enforcement*).

Note: Different colors indicate the level of importance (see legend above), while the size of each section indicates the percentage of participants who expressed that opinion. Written within each section are the specific stakeholder groups associated with that opinion. Stakeholder groups written in more than one section within a pie chart indicate where there were mixed opinions within that stakeholder group on the importance of that indicators.

## **5.2 Discussion of Basin Head MPA**

This section critically discusses the findings from the Basin Head MPA case study, beginning with a discussion of factors affecting MPA effectiveness, followed by a discussion of factors affecting an MPA's legitimacy from a Basin Head MPA stakeholder perspective. Following this, an examination of the varying perceptions Basin Head MPA stakeholders and managers had on the level of importance on legitimacy indicators for is provided.

### ***5.2.0 Factors Affecting MPA Effectiveness***

Results from this case study showed one notable difference in how MPA effectiveness was perceived, primarily between the stakeholders and managers at Basin Head MPA. Specifically, almost all the stakeholders perceived MPAs in general, and Basin Head MPA in particular as highly effective, while MPA managers conveyed more critical opinions on MPA effectiveness. MPA managers supported their assessment of Basin Head not being a highly effective MPA due to factors such as its small size and its inability to solve external, non-human induced problems such as the invasive green crab that is causing a rapid decline of the moss. In contrast, most of the stakeholders at Basin Head, including community members, provincial government members, and local organization leaders, supported their assessment of Basin Head MPA as being an effective MPA despite the decline of the moss because of its ability to protect unique parts of the environment from human exploitation, raise conservation awareness, generate scientific knowledge, and preserve community culture. These findings reveal that the expectations and desires stakeholders have regarding an MPA can be much different than

those of the government managers leading the initiative (Ehler, 2003). Specifically, these results imply that MPA managers perceive MPA effectiveness more objectively, likely due to their expertise and knowledge with MPAs, while local stakeholders perceive MPA effectiveness as not being exclusive to conservation, but based also on the various benefits the MPA has generated for their community. However, one plausible explanation as to why Basin Head stakeholders did not express very critical opinions on MPA effectiveness is because many of them, including both the primary stakeholders as well as the broader government representatives, did not have in-depth knowledge, experience or expertise in the field of marine conservation or MPAs such that they would be able to reflect critically on MPA effectiveness in general in the way MPA managers could.

### *5.2.1 Factors Affecting MPA Legitimacy*

Results showed that all stakeholders interviewed were largely in support of the designation of Basin Head MPA, and expressed positive opinions towards MPAs in general. This result, while distinct from much literature that associates MPAs with conflict and contestation (Voyer, Gladstone, & Goodall, 2015), is likely because at the time of nomination of Basin Head MPA, there was no longer a fishing presence or any conflicting uses in the lagoon that may have caused major contention towards the MPA. Instead, the main stakeholders at Basin Head are a small, rural community with cultural ties to the lagoon and a strong recognition and appreciation of its global uniqueness. The nature of the stakeholders at Basin Head also provides an explanation as to why the MPA has such a high level of legitimacy.

Results also demonstrated that Basin Head MPA has a high level of legitimacy largely because the efforts to garner stakeholder buy-in and support at the initial stage of

the MPA were led by a highly respected local community group that partnered with DFO. Certain stakeholders supported their reasoning on this by expressing that government-led efforts to obtain legitimacy will not work because government is not viewed by local communities as being reputable. This finding further validates the theory that MPAs that are led by a trusted, credible, and local organization or individuals tend to have a greater level of support and acceptance than MPAs led solely by external government managers (Bennett & Dearden, 2014; Voyer, Gladstone, & Goodall, 2012). However, while this partnership was relatively easy for DFO to form in the case of Basin Head MPA, it will likely be much more challenging for DFO to do this in the future, as the more typical coastal communities, such as in the Bay of Fundy for example, are fishing-based communities that are fearful of MPAs and skeptical of government.

In addition, participants indicated that DFO's ability to maintain this strong partnership with the local leaders throughout the entire course of the MPA was a critical factor contributing to the level of legitimacy they afforded to Basin Head. DFO achieved this by allowing the community group to have significant influence over management decisions, providing funding for them to conduct public education and awareness efforts, and distributing responsibilities to them such as having them assist with scientific monitoring of the moss. This finding supports the call within the literature for MPA managers to engage in "collaborative management" practices to promote relationship-building and trust (Hattam et al., 2014).

Interestingly, some stakeholders also conveyed that the meaningful partnership between the local community group and DFO in managing Basin Head has made them fully confident and trustworthy in DFO, such that they do not wish for intensive hands-on involvement with the MPA and instead leave the decision making up to DFO and the

local leaders. More specifically, certain stakeholders at Basin Head did not desire extensive involvement with the management decisions being made for the MPA and were fully satisfied with simply receiving updates, giving input when help is needed, and listening in on meetings for informative purposes. This finding is likely an explanation as to why many stakeholders were unable to answer a lot of the topics of this research, because the high level of trust that the stakeholders have in DFO and the community group has allowed them to take a more “hands-off” level of involvement with the MPA. However, this finding is somewhat contrary to the literature, which stresses the need for meaningful public involvement reaching beyond basic invitations to meetings, sharing of knowledge and public participation in order to obtain legitimacy (Dalton, 2005). Regardless, this result demonstrates that while some stakeholders for an MPA may strongly want meaningful involvement, influence and responsibility in the MPA, others may be fully satisfied with basic-level consultation and knowledge-sharing. This is suggesting that MPA managers should not always assume that all stakeholders will desire meaningful involvement in management decisions, particularly in cases where there already is a high level of trust and a well-respected leader representing the community, such as at Basin Head MPA. However, this is not to diminish the need for MPA managers to implement best practices when consulting and collaborating with stakeholders, but instead to highlight that MPA managers should aim to understand the requirements and needs of specific stakeholders prior to developing methods for engagement.

Another key finding of increased legitimacy obtained from this case study is the extensive level of environmental education occurring at Basin Head MPA, such that the local people, broader public, and tourists knew basic scientific knowledge about the MPA. This was achieved through DFO’s partnership with the local community group to

hold many public meetings and presentations, conduct eco-tours, and maintain a popular webpage and quarterly newsletter with scientific updates. However, it is important to note that Basin Head is a widely popular beach on PEI with approximately 80,000 thousand visitors to the site each year, providing a likely explanation as to why the stakeholders here placed such a high emphasis on education and public awareness relating to conservation. Nonetheless, this finding also supports the arguments made in literature that high levels of education can have significantly positive impacts on people's attitudes towards conservation (Masud and Kari, 2015).

Interestingly, results showed that most participants were fully satisfied with DFO's management and governance at Basin Head MPA, and that there was absolutely nothing that negatively affected the level of legitimacy they afford towards the MPA. However, the lack of critical opinions expressed on this topic could again be attributed to the low level of involvement and expertise many of the stakeholders had in the management of the MPA, such that they were not deeply involved or knowledgeable enough to discuss this topic more critically. Despite this, a few stakeholders who did have extensive involvement in managing Basin Head indicated that in the past, DFO's apparent lack of conservation ethic, organization, and management capability at Basin Head negatively affected their opinions on its legitimacy. To put this in perspective however, the MPA managers expressed that the downfalls in management in the past were likely attributed to factors out of their control, such as shifting in political priorities and the September 11<sup>th</sup> terrorist attack. However, these stakeholders also noted that there have been vast improvements in management over the past few years in terms of conservation ethic, management competence and organization, increasing their opinions on legitimacy, reaffirming the call made in literature for MPA managers to follow good governance

practices such as communication, accountability, and leadership to ensure MPA social success (Rossiter and Levine, 2013). This finding also demonstrates that while opinions on legitimacy are known to differ between stakeholder groups, the opinions a single stakeholder has on an MPA's legitimacy can also change drastically throughout the course of the MPA (Jentoft, Chuenpagdee, & Pascual-Fernandez, 2011).

### *5.2.2 Indicators for Legitimacy*

Firstly, results showed that there were a limited number of responses from Basin Head MPA stakeholders on the assessment of the indicators for legitimacy. This result can be attributed to the nature of the stakeholders at Basin Head, in which they were not highly involved with the management of the MPA and therefore did not feel knowledgeable or comfortable enough to provide any opinion on how important they viewed these indicators. Because of this, there were two indicators where data was too scarce to provide any conclusions on their importance: *Existence of a Management Plan* and *Equality of Stakeholders*.

Nonetheless, there were enough responses from different stakeholders to conclude that out of the 41 indicators, 70% of them has general consensus among all stakeholder groups and managers as being important. This finding of consensus for most the indicators confirms them as being critical for obtaining MPA legitimacy, as well as their wide recognition across the literature, stakeholders, and managers as being essential components of a successful MPA (Bennett & Dearden, 2014; Lankhorst, Bailey, & Bush, *pers. comm.*). Further, results also demonstrated the top 10 indicators that stood out as being the most important to stakeholders at Basin Head, demonstrating that they care most heavily about factors of inclusiveness, knowledge sharing – particularly on the

science of the MPA, partnerships, conservation ethic, accountability of government, the realization of the MPAs benefits, and public education for affording an MPA legitimacy. However, these are site-specific to Basin Head MPA as they were deduced from the themes most commonly brought up through the discussions with these stakeholders.

Results showed there to be six indicators in which there were contrasting opinions on their level of importance for MPA legitimacy, which was expected as stakeholders are known to have many different views towards the same MPA (Chuenpagdee et al., 2013). Specifically for Basin Head Stakeholders, the four Input indicators *Power and Influence of Stakeholders*, *Attention to Displacement*, *Stakeholder-Manager Agreement on Goals*, and *Compatibility of the MPA with Local Culture* demonstrated the similar trend, in which the more direct stakeholders, such as the local organizations and community members, placed them higher in importance for MPA legitimacy than the secondary stakeholders, such as the provincial government, management, and science community. This result provides support to the literature which argues that different stakeholders associated with an MPA can all have a different reality of the MPA, due to their own disciplines and backgrounds with which they are from (Le Tissier et al., 2004). This is evidence as to why the local community members placed these indicators as higher in importance, because they have a direct cultural connection to the area and therefore want to ensure the decisions being made are in line with their local knowledge and culture, whereas those stakeholders coming from a position in science or government viewed them as less important because the focus on their job is to conserve the ecological integrity of the area. To prove this, the secondary stakeholders and managers at Basin Head MPA acknowledged that these indicators are lower in importance by noting that decisions will need to be made that not all stakeholders will be happy with for the greater



good of conserving the environment. Regardless, it is argued that there is a need for managers and stakeholders to improve communication on the intended purpose of the MPA, and to strive towards coming to an agreement on its goals and expectations that equally balance out both conservation and societal needs (Abecasis et al., 2013; Himes, 2007).

Interestingly, results for the throughput indicator *Level of Enforcement* showed the opposite trend than the previous indicators, in which the local organizations and community members viewed it as lower in importance than the secondary stakeholders and managers. This result speaks to the type of knowledge stakeholders versus managers base their perceptions on, in which community members are likely speaking based on their experiences with Basin Head MPA specifically, in which there has never been any problems with enforcement. In contrast, stakeholders working in government as well as the MPA managers are likely speaking generally about their broader knowledge with MPAs, in which enforcement is a critical tool.

Finally, for the throughput indicator *Existence of Planned Activities*, there were mixed opinions between the community members on the importance of this indicator. While most community members were appreciative of the fact that the MPA is a widely popular beach, some community members wanted the area to remain natural and pristine and were concerned about it becoming more commercialized and busy than they would like. As well, a participant viewed this indicator as important, however, wanted the type of activities to be for the local people rather than the tourists, such as an eel fishing tournament to benefit the local fishers. In addition, those from the management community viewed this indicator as lower in importance because the purpose of the MPA

is to protect the marine area, therefore the number of activities that have the potential to disturb it should be kept to a minimum.

### **5.3 Recommendations for the Future of Basin Head MPA**

This section outlines a series of site-specific recommendations to improve the legitimacy of Basin Head MPA, based on the perspectives provided from the stakeholders at this site. Note that the non-site specific recommendations concerning the legitimacy of MPAs generally are not discussed here, but are provided in the comparative chapter at the end of this report. Therefore, the following recommendations to improve the legitimacy of Basin Head MPA are as follows:

#### ***(1) Make prompt management decisions to save the moss***

It is recommended that scientific work on the moss be continued and shared among stakeholders and that decisions are made as soon as possible to implement initiatives to reduce the invasive green crab populations.

#### ***(2) Continue public engagement***

While Basin Head beach attracts a tremendous number of tourists each year, only an extremely small percentage of these tourists are aware that they are visiting an MPA. Therefore, it is recommended that improvements be made to make tourists more aware that Basin Head is an MPA, and also more aware of conservation, and the purpose of MPAs. It is recommended this be done through efforts such as improving online promotion, signage, and having information more visual and readily available at Basin Head MPA.

***(3) Develop more opportunities for local engagement***

Much of the engagement at Basin Head MPA is directed towards the broader public versus the local people, such as the fishers and farmers. It is recommended that to maintain the level of support towards the MPA from the local people, more activities or opportunities in the MPA that are tailored towards the local people's culture are needed.

***(4) Capture a more collaborative and holistic view of the Basin Head Watershed***

Because Basin Head MPA is surrounded by a series of provincially protected natural lands, it is recommended that DFO takes on a more holistic view of the entire Basin Head watershed, and to avoid focusing solely on the lagoon, as the two components are a connected ecological system. This is suggesting that there is room for more collaboration between the provincial and federal governments to make the area more holistic, as opposed to having these individual parties working independently of each other on the same area. This recommendation is likely difficult to achieve due to differences in mandates, processes, and jurisdictions between parties. However, the transfer of the surrounding lands around Basin Head MPA from provincial to federal jurisdiction, such as at Musquash MPA, is a potential solution to this difficulty.

## CHAPTER 6. COMPARATIVE DISCUSSION AND RECOMMENDATIONS

The purpose of this chapter is two-fold. First, a comparative discussion of the results found from both Musquash MPA and Basin Head MPA case studies is provided. This includes a discussion on how, regardless of the specific MPA context, stakeholders perceive MPA effectiveness and legitimacy. Following this, a discussion will be given on the factors that all stakeholders, regardless of context, view as important for affording an MPA legitimacy from the existing suite of indicators, as well as the new indicators stakeholders presented. Finally, overarching recommendations for improving the legitimacy and ultimately the effectiveness of future MPAs in Canada are put forward based upon the results found from both case studies.

### 6.0 Comparative Discussion

#### 6.0.0 *Factors Affecting MPA Effectiveness*

Findings from this study suggest that regardless of the context, perceptions on MPA effectiveness vary among different stakeholder groups, and between stakeholders and MPA managers at an MPA. Specifically, MPA managers perceived MPA effectiveness more critically and objectively, and in relation to the overall purpose of MPAs at conserving nature, such as being dependent on factors such as an MPA's size, its ecological diversity or uniqueness, and whether it contributes to the ecological integrity of the larger ecosystem. In contrast, the primary stakeholders of an MPA viewed effectiveness at a much more local scale and in relation to the broader realm of benefits that an MPA has brought to their community, such as whether it has raised awareness, generated science, or preserved their culture and way of life, regardless if it has met all

the “requirements” for MPAs. In contrast, secondary stakeholders such as NGOs, government representatives, and scientists perceived MPA effectiveness more similarly to MPA managers. Overall, this finding, as shown in the literature, demonstrates how various groups involved with an MPA can have different “realities” or perceptions of that MPA due to their differing disciplines, titles, and backgrounds, emphasizing the importance of understanding the social, cultural, historical and political landscape of the stakeholders at an MPA to predict how and why they will likely perceive it (Le Tissier et al. 2004; Christie, 2003; Voyer, Gladstone, & Goodall, 2015).

### ***6.0.1 Factors Affecting MPA Legitimacy***

There was an overwhelming level of support and acceptance towards MPAs by the stakeholders interviewed in this research, and a high level of legitimacy found at both Musquash and Basin Head MPA. This result is suggesting that all stakeholder groups interviewed were environmentally-conscious, prioritized marine conservation, and have positivity, respect, support, and compliance towards their MPA. However, while these are interesting and uplifting results when reflecting on the ability of future MPAs to obtain legitimacy, it is important to consider that communities such as the ones assessed in this study are likely not the type of coastal communities that MPAs will face today, and thus, DFO will need to put in a serious amount of effort in obtaining legitimacy for future MPAs.

Results from the case-studies at Musquash and Basin Head also show similarities between stakeholders on factors that influence the level of legitimacy they afford to an MPA. Most notably, the findings from this research validate the theory that community-

led MPAs have a greater level of stakeholder support, acceptance, and ultimately legitimacy compared to MPAs that are primarily government-led (Bennet & Dearden; Voyer, Gladstone, & Goodall, 2012). Both Musquash and Basin Head MPA had a high degree of community leadership beginning at the nomination stage and continuing in their management, either because the community initiated the idea of MPA designation such as at Musquash, or through the formation of a strong partnership between DFO and local community leaders such as at Basin Head. Specifically, MPAs with some form of community leadership generates feelings of trust and credibility of the MPA process from the stakeholders, allowing them to afford more legitimacy to the initiative. However, this finding is also likely a result of the fact that both MPAs assessed in this study are small, coastal MPAs with tight-knit communities associated with them, as opposed to offshore MPAs where community leadership is less likely to be relevant or important for legitimacy.

Further, results showed differences in the level and type of involvement stakeholders desired at each MPA for affording it legitimacy. Specifically, results from the case studies differed in that the community members at Musquash placed notable emphasis on being able to contribute meaningfully in management decisions as an important factor for them to afford an MPA legitimacy. In contrast, while the stakeholders at Basin Head also viewed the partnership between their local organization and DFO as a critical factor for affording the MPA legitimacy, the majority of them (excluding this partnering local organization) desired a more hands-off approach in their involvement with the MPA, and were instead fully satisfied with simply receiving updates and allowing DFO to make the management decisions. This result highlights that despite the similarities of these two communities in that they are small, tight-knit,

environmentally-driven communities, their expectations and desires for an MPA can still be vastly different. While the literature stresses the need to reach beyond general public participation when managing coastal MPAs (Dalton, 2005), this finding suggests that the expectations and desires stakeholders have towards MPAs are context-specific, and MPA managers cannot broadly assume that all stakeholders in coastal MPA communities will desire, or even have the knowledge and capacity to be deeply involved.

In addition, while a large percentage of stakeholders at Basin Head MPA indicated that they were fully satisfied with DFO's management and governance of the MPA, most of the stakeholders at Musquash indicated that there were things about DFO's management and governance of Musquash that negatively affected their opinions on its legitimacy. Overall, the stakeholders at Musquash MPA had much more critical opinions on factors that have negatively affected the level of legitimacy they afford to Musquash MPA compared to that of the stakeholders at Basin Head MPA, many of which did not feel knowledgeable or involved enough to address this topic. However, for those stakeholders from Basin Head MPA who did provide an opinion, there were commonalities between their opinions and those of the stakeholders at Musquash MPA for negatively impacting an MPA's legitimacy. These include the lengthy timelines in designation, lack of resource capacity, and periods of poor management capability, conservation ethic, and organization throughout the course of the MPA. However, these factors are somewhat unjustifiable because they are likely not in the control of the local MPA managers, but instead a result of external aspects, such as shifting national priorities. Therefore, while an appropriate level of capacity and management ethic is important, this finding more so highlights the importance of clear communication and transparency between managers and stakeholders, to minimize feelings of confusion,

distrust and unreliability from stakeholders towards DFO which can hinder the relationships, and further diminish legitimacy.

One noteworthy explanation for the differences in responses between stakeholders at Musquash and Basin Head MPA as described above is the differing epistemic nature of the stakeholder communities at each MPA. Although these communities appeared to be very similar at face-value, the stakeholder community at Musquash is more epistemic in nature, meaning they were mostly all highly knowledgeable about marine conservation and science, and more influential and authoritative in management decisions (Caveen et al., 2013), compared to the stakeholder community at Basin Head MPA. Specifically, the stakeholder community interviewed at Musquash was largely made up of NGO groups, scientists, and community members most of whom had strong marine conservation backgrounds. In contrast, with the exceptions of a few, the stakeholders at Basin Head were largely local farmers, fishers, and land-owners, as well as representatives from provincial government, many of whom did not have conservation knowledge or MPA experience. Interestingly, these epistemic differences were evident when this research was being conducted, in which the discussions with stakeholders at Musquash MPA tended to be more thorough and critical than discussions with stakeholders at Basin Head MPA, which were less opinionated and more easy-going in attitude. Overall, the findings from this research indicate that the epistemic nature of the stakeholder community at an MPA influences the ways in which the MPA will be perceived, supported, and how the stakeholders will desire to be involved with it.



### ***6.0.2 Indicators for Legitimacy***

Findings from this study indicate that stakeholders and managers, regardless of MPA context, viewed legitimacy as an important component of MPA effectiveness, and had consensus on the importance of most of the indicators as being important for an MPA's legitimacy. This is giving proof that there is widespread recognition among stakeholders, managers, and researchers on the importance of the majority of these indicators for contributing to a legitimate and effective MPA (Bennet & Dearden, 2014; Lankhorst, Bailey, & Bush, *pers. comm.*). In addition, these results also defend the theoretical assumption that all three forms of legitimacy – input, throughput, and output – are critical for an MPA's legitimacy, and ultimately its success (Bennet & Dearden, 2014; Lankhorst, Bailey, & Bush, *pers. comm.*). Overall, these findings increase our understanding of legitimacy by generating a more refined list of indicators that have been vetted by stakeholders themselves as being important for MPA legitimacy. This is further justifying their use by managers as a guide for obtaining or assessing the legitimacy of Canada's existing and future MPAs. However, it is critical to note that this suite of indicators should not be viewed as a “cookie-cutter” template for obtaining legitimacy within coastal MPAs, as all MPAs will be contextually different and therefore need to be assessed on an individual basis to specify which indicators may or may not be applicable.

Further, there was a great deal of overlap between the top 10 most important indicators for legitimacy between stakeholders at both Musquash and Basin Head MPA. Specifically, these similarities suggest that regardless of MPA context, stakeholders place the most emphasis on input factors of inclusiveness, scientific knowledge sharing, and conservation ethic of managers when they reflect on the level of legitimacy they afford to an MPA. At the throughput stage of an MPA, stakeholders perceive transparency,

cooperation among government, and continued engagement to be the most important factors, while at the output stage, stakeholders view education as the most meaningful factor influencing their perceptions on an MPA's legitimacy.

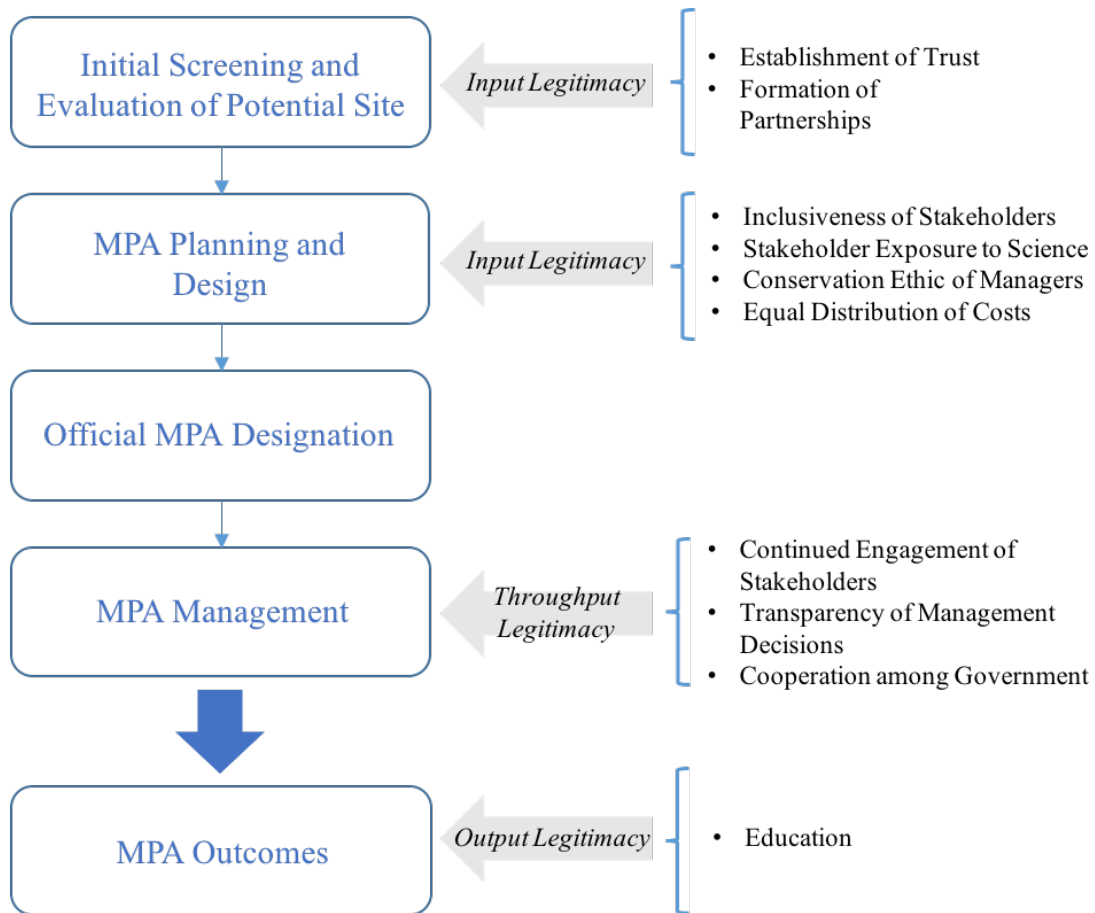
As well, there was also overlap between Musquash and Basin Head MPA among the indicators that had differences in opinions between different stakeholder groups. Particularly, for the input indicators *Power and Influence of Stakeholders*, *Attention to Displacement*, and *Stakeholder-Manager Agreement on Goals*, the primary stakeholders viewed these indicators as higher in importance than the indirect stakeholders at each MPA. This similarity across both MPAs further solidifies the explanation discussed previously, in which primary stakeholders care considerably more about displacement issues and ensuring their voices are heard because they are culturally connected to the area and have the potential to be directly impacted, while others lack this cultural connection or are involved with the MPA solely for ecological conservation as per their occupation or background. This is highlighting that contrasting perceptions arise among stakeholders at an MPA due to differences in discipline, background, or the type of association with the MPA that stakeholders have.

In addition, stakeholders at Musquash and Basin Head MPA proposed new indicators that they believed were important for MPA legitimacy. Similarly, stakeholders at both sites brought up *Trust* as a paramount factor for legitimacy, and expressed that it must be established even prior to any of the existing input, throughput, output indicators if an MPA is to be legitimate, becoming a "pre-input indicator". This also provides explanation as why stakeholders at both Musquash and Basin Head MPA viewed community leadership within an MPA as a critical factor for legitimacy, because it helps to generate this necessary trust, and close the gap between government authorities and

local people. Further, participants at Musquash MPA brought up *Equal Distribution of Costs* as a more relevant input indicator than the existing *Equal Distribution of Benefits*, as it is much more important for MPA managers to ensure certain stakeholder groups are not bearing a significantly greater burden from the MPA compared to others, and because it is not likely possible due to the complexity of stakeholder communities to ensure that the benefits of an MPA are equally distributed. In addition, stakeholders at Basin Head MPA suggested *Formation of Partnerships between Government and Community* and the *Level of Scientific Work Conducted* as two additional indicators contributing to an MPA's legitimacy, likely because as shown previously, the partnership the local leaders have with DFO, and the investments in scientific monitoring being done at Basin Head MPA were regarded by stakeholders as two factors enhancing its legitimacy. As well, managers at Basin Head concluded that the throughput indicator *Conflict Resolution Measures* was more appropriate at the input stage of an MPA for reasons that the planning and design phase is typically when the most conflict occurs.

As illustrated in Figure 9, the similarities in the findings from both cases studies in this research allow for an understanding of which factors, regardless of MPA context, stakeholders are the most concerned about, and at what stage throughout the MPA process stakeholders place emphasis on them for affording an MPA legitimacy, as per the input, throughput, and output indicators they viewed as important. While these findings are based on the perceptions from only the limited number of stakeholders assessed in this study, they are valid in that these perceptions were communal between two separate stakeholder communities from two different coastal MPAs in Canada. Therefore, these findings provide improved clarity into the desires and expectations stakeholders from small coastal MPAs have towards marine protected areas, and the level of support they

afford to them. As a result, the framework illustrated in Figure 9 can serve as a useful guide to help managers decipher which indicators are the most important to consider and when each indicator should be considered throughout the lifetime of an MPA to ensure the legitimacy of future coastal MPAs in Canada. However, it should be noted that this framework is a guide, and is not intended to devalue the need for managers to conduct efforts to understand stakeholder communities' desires and expectations on a case-by-case basis, as the applicability of this framework to all MPAs is not guaranteed.



**Figure 9.** A framework highlighting critical areas of opportunity to obtain legitimacy, and the key indicators to consider at each area during the process of establishing and managing an MPA in Canada, as per the opinions of stakeholders from two small coastal MPAs in Atlantic Canada.

## **6.1 Cross-Cutting Recommendations for the Future of MPAs in Canada**

Based on the overall results presented in this study, the following recommendations are prescribed to ensure the legitimacy and ultimately the effectiveness of both existing and future coastal MPAs in Canada:

### ***(1) Incorporation of all three forms of legitimacy***

It is recommended that MPA managers recognize the concept of legitimacy as a crucial component of MPA effectiveness, particularly for small coastal MPAs, and that they devote attention towards all three forms of legitimacy: input legitimacy – when planning and designing an MPA, throughput legitimacy – when managing an existing MPA, and output legitimacy – when prioritizing the potential outcomes of an MPA, when assessing the legitimacy of existing MPAs, or establishing new MPAs for the future in Canada.

### ***(2) Use of framework presented in this paper a guide for obtaining legitimacy***

It is recommended that MPA managers make use of the framework of critical areas of opportunities for obtaining legitimacy as presented in this report, to act as a guide for legitimacy in the development of future MPAs in Canada. Proper understanding of stakeholders' perceptions on the importance of indicators for legitimacy, as summarized within this tool, will give MPA managers a better impression of where to focus their efforts, time, and resources to garner the highest level of legitimacy possible for future coastal MPAs.

With this, it is also recommended that MPA managers incorporate the new indicators suggested by stakeholders for obtaining legitimacy into their existing methods for assessing MPA legitimacy.

***(3) Efforts to ensure community leadership of MPAs to generate trust***

It is recommended than explicit emphasis be given to the newly suggested indicator of *Trust* prior to the consideration of all of the other indicators when establishing future MPAs. To establish trust, it is recommended that MPA managers secure some type of community leadership right from the start at proposed MPAs, to minimize the level of skepticism and bridge the gap in differences in perceptions between the high-level government managers and the on-the-ground local community. Two sub-recommendations are provided as options to foster community leadership in future MPAs:

***(A) Private consultation prior to public announcement***

It is suggested that prior to initially publically announcing a proposed MPA site, MPA managers thoroughly assess the stakeholder community of a proposed area, identify the influential community groups or leaders, and consult privately with them to discuss the idea of an MPA, and to garner their support and partnership. Following this, the proposed MPA can then be announced to the broader community and this trusted organization or leader can guide the efforts towards garnering the legitimacy of the MPA from the broader community. This option will likely minimize any immediate adverse reactions from stakeholders towards MPA as there will be a credible community individual or group leading the discussion.

*(B) Reintroduction of formal public nomination process*

Another option that is highly recommended is to reintroduce the community-nomination processes for the selection of MPA sites. It is suggested that DFO shifts back to how areas for MPAs were selected for the first few *Oceans Act* MPAs by promoting again the formal processes of public nomination of sites for MPAs and better encouraging coastal communities to come forward with special areas. Not only could this shed light on important marine areas along Canada's coasts that DFO may have over-looked for protection, but it will likely generate MPAs with an extremely high level of legitimacy since they will be community-led processes.

*(4) Understanding each MPA on a case-by-case basis*

While the results and tools identified in this report provide an enhanced understanding on stakeholder perceptions towards legitimacy and guidance on how to best assess and obtain legitimacy of coastal MPAs, it is recommended that MPA managers acknowledge that every MPA community will be different. Specifically, MPA managers must realize that there is no "one-size-fits-all" approach to obtaining and/or assessing legitimacy of MPAs. Therefore, it is recommended that the results and tools provided in this study be used as a guide, and that the unique context of each MPA site must still be understood to determine the applicability of these tools to that MPA.

Further, as shown in this study, the desires and expectations of stakeholder communities will be vastly different depending on their epistemic nature, composition, and social/cultural/historical backgrounds. Therefore, it is recommended that prior to proposing a new MPA, efforts are conducted to gain a clear understanding of the unique nature of the stakeholders in that area. This includes their historical backgrounds,



disciplines, values, and beliefs, such that MPA managers can better gauge how these stakeholders will respond to an MPA proposal, and what their desires will be from it. Knowing this information will ensure that the most appropriate next steps for designation will be taken that are tailored to the unique stakeholder community at that MPA.

#### ***(5) Future research***

Finally, it is recommended that two distinct areas of research are explored:

##### *(A) Assessments of different types of MPAs in Canada*

It is recommended that additional assessments on MPA legitimacy be conducted on other types of MPAs in Canada, particularly MPAs in areas other than Atlantic Canada, and also on different types of MPA, such as an offshore MPA rather than a small coastal one. This research is recommended to gain a more comprehensive insight into the perceptions of MPA effectiveness and legitimacy that exist in different geographic areas in Canada, and also among different stakeholder groups that were not represented in this study, such as industry, aquaculture, and large-scale commercial fishing interests, for example.

##### *(B) Designing a scalable approach for MPAs*

It is recommended that a more scalable approach be designed for the process of establishing and managing MPAs for the future in Canada. Specifically, as more and more MPAs get established, there is a real risk that DFO will eventually lose their ability to devote enough resources into establishing and maintaining the legitimacy of all of the existing MPAs, in addition to all of the new MPAs in Canada. This is simply because DFO is already at limited resource capacity, and there are just not enough resources to go

around as we increase our number of MPAs. As such, further research should be done to develop a proactive strategy for MPAs. This would help DFO sustain a sufficient and stable resource capacity to continue implementing more MPAs. It would also ensure that enough attention is given to all of these new MPAs, as well as the existing ones, regarding their level of legitimacy and overall effectiveness.

## CHAPTER 7. CONCLUSION

The effectiveness of MPAs is highly dependent on their ability to obtain an appropriate level of legitimacy, or acceptance and support, from the involved stakeholders. By assessing the perceptions of different stakeholders and managers on legitimacy, this research has led to an increased level of understanding on various factors important to stakeholders from coastal MPAs for affording an MPA legitimacy. The new knowledge will greatly improve the information currently being used by those involved in the establishment and management of Canada's current and future MPAs, thereby contributing to an increased level of legitimacy, and ultimately effectiveness of marine protected areas in Canada.

While the results presented here cannot be extrapolated to all MPAs, they can most definitely be used as a guide to help MPA managers obtain and/or assess the legitimacy of existing or future coastal MPAs in Canada. It is suggested that the recommendations provided in this study be considered for implementation to further enhance the legitimacy of Musquash MPA, Basin Head MPA, and more broadly for ensuring the legitimacy of future coastal MPAs in Canada. The current rush for Canada to implement MPAs over the next four years makes it more crucial now than ever before to ensure managers utilize the existing knowledge, such as presented in this study, to establish MPAs that are legitimate, effective, and will ultimately yield genuine conservation outcomes to protect Canada's precious marine ecosystems for generations to come.

## REFERENCES

- Abescasis, C.R., Schmidt, L., Longnecker, N. & Clifton, J. (2013). Implications of community and stakeholder perceptions of the marine environment and its conservation for MPA management in a small Azorean island. *Ocean and Coastal Management*, 84, 208-219.
- Agardy, T. (1994). Advances in marine conservation: the role of marine protected areas. *Elsevier Science*, 9(7), 267-270.
- Agardy, T., Bridgewater, P., Crosby, M. P., Day, J., Dayton, P. K., Kenchington, R., . . . Peau, L. (2003). Dangerous targets? unresolved issues and ideological clashes around marine protected areas. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 13(4), 353-367. doi:10.1002/aqc.583
- Agardy, T., Notarbartolo di Sciara, G., & Christie, P. (2011) Mind the gap: Addressing the shortcomings of marine protected areas through large scale marine spatial planning. *Marine Policy*, 35, 226 – 232.
- Anglo-Valdes, A. J. & Hatcher, B.G. (2010). A new typology of benefits derived from marine protected areas. *Marine Policy*, 34, 635-644.
- Atkinson, R. & Flint, J. (2011). Accessing hidden and hard to reach populations: snowball research strategies. *Social Research Update*.
- Basin Head Marine Protected Area Regulations. (2005). S.O.R. Retrieved From: <http://laws.justice.gc.ca/eng/regulations/SOR-2005-293/>
- Bennett, N. J., & Dearden, P. (2014). From measuring outcomes to providing inputs: Governance, management, and local development for more effective marine protected areas. *Marine Policy*, 50, Part A, 96 – 110.
- Beukers-Stewart, B.D., Vause, B.J., Mosley, M.W. J., Rossetti, H. L., & Brand, A. R. (2005). Benefits of closed area protected for a population of scallops. *Marine Ecology Progress Series*, 298, 189-204.
- Carcamo, P.F., Garay-Fluhmann, R., & Gaymer, C.F. (2014). Collaboration and knowledge networks in coastal resources management: How critical stakeholders interact for multiple-use marine protected area implementation. *Ocean & Coastal Management*, 91, 5 – 16.
- Caveen, A.J., Gray, T.S., Stead, S.M., Polunin, N.V.C. (2013). MPA Policy: What lies behind the science? *Marine Policy*, 37, 3-10.
- Charles, A. & Wilson, L. (2009). Human dimensions of marine protected areas. *Journal of Marine Science*, 66, 6-15.
- Chuenpagdee, R., Pascual-Fernandez, J.J., Szelienszky, E., Alegret, J.L., Fraga, J., & Jentoft, S. (2013). Marine protected areas: re-thinking their inception. *Marine Policy*, 39, 234-240.
- Costello, M.J., & Ballantine, B. (2015). Biodiversity conservation should focus on no-take marine reserves: 94% of marine protected areas allow fishing. *Trends in Ecology and Evolution*, 30(9), 507-509.

- Christie, P. (2003). Marine protected areas as biological successes and social failures in southeast Asia. *American Fisheries Society Symposium*, 42, 155-164.
- Dalton, T.M. (2005). Beyond Biogeography: a framework for involving the public in planning U.S. marine protected areas. *Conservation Biology*, 19(5), 1392-1401.
- Dudley, N., Parrish, J.D., Redford, K.H. & Stolton, S. (2010). The revised IUCN protected area management categories: the debate and ways forward. *Cambridge*, 44(4), 485 – 490.
- Edgar, G. J., Stuard-Smith, R.D., Willis, T.J., Kininmonth, S., Baker, S.C., Barrett, N.S., ...Thomson, R.J. (2014). Global conservation outcomes depend on marine protected areas with five key features. *Nature*, 506, 216-220.
- Ehler, C.N. (2003). Indicators to measure governance performance in integrated coastal management. *Ocean and Coastal Management*, 46, 335-345.
- Fisheries and Oceans Canada. (2009). Basin Head Marine Protected Area Management Plan. Report. Retrieved from: [http://publications.gc.ca/collections/collection\\_2011/mpo-dfo/Fs119-1-2009-eng.pdf](http://publications.gc.ca/collections/collection_2011/mpo-dfo/Fs119-1-2009-eng.pdf).
- Fisheries and Oceans Canada. (2016). Endeavour Hydrothermal Vents MPA. Retrieved from: <http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/endeavour-eng.html>.
- Fisheries and Oceans Canada. (2016). Marine Protected Areas and Proposed Future Sites. Retrieved from: <http://www.dfo-mpo.gc.ca/oceans/mpa/proposed-future-sites-eng.html>.
- Fisheries and Oceans Canada. (2008). Musquash Estuary: A management plan for the marine protected area and administered intertidal area. Report. Retrieved from: <http://www.dfo-mpo.gc.ca/Library/344113.pdf>.
- Garrett, A. (n.d.). History of Basin Head MPA. *Basin Head PEI Webpage*. Retrieved from: <http://www.basinhead.com/history.html>
- Gall, S. C., & Rodwell, L. D. (2016). Evaluating the social acceptability of marine protected areas. *Marine Policy*, 65, 30-38.
- Gell, F.R., & Roberts, C.M. (2003). Benefits beyond boundaries: the fishery effects of marine reserves. *Trends in Ecology and Evolution*, 9(18), 448-455.
- Gardner, J. Bicego, S., & Jessen, S. (2008). Challenges and Opportunities in Progress towards Canada's Commitment to a National Network of MPA by 2012. *CPAWS: Canadian Parks and Wilderness Society*.
- Hard, C. H., Hoelting, K. R., Christie, P., & Pollnac, R. B. (2012). Collaboration, legitimacy, and awareness in puget sound MPAs. *Coastal Management*, 40(3), 312-326. doi:10.1080/08920753.2012.677640
- Hattam, C.E., Mangi, S.C., Gall, S.C., & Rodwell, L.D. (2014). Social impacts of a temperate fisheries closure: understanding stakeholders' views. *Marine Policy*, 45, 269-278.

- Himes, A.H. (2007). Performance indicators in MPA management: using questionnaires to analyze stakeholder preferences. *Ocean & Coastal Management*, 50, 329 – 351.
- Hockings, M., Stolton, S., Leverington, F., Dudley, N., & Courrau, J. (2006). Evaluating effectiveness: a framework for assessing management effectiveness of protected areas. *ICUN Report, Gland, Switzerland, and Cambridge, UK.*
- Hoelting, K. R., Hard, C. H., Christie, P., & Pollnac, R. B. (2013). Factors affecting support for Puget sound marine protected areas. *Fisheries Research*, 144, 48-59.
- Jameson, S.C., Tupper, M.H., & Ridley, J.M. (2002). The three screen doors: can marine “protected” areas be effective? *Marine Pollution Bulletin*, 44, 1117 – 1183.
- Jentoft, S., Pascual-Fernandez, J. J., De la Cruz Modino, R., Gonzalez-Ramallal, M., & Chuenpagdee, R. (2012). What stakeholders think about marine protected areas: Case studies from Spain. *Human Ecology*, 40(2), 185 – 197.
- Jentoft, S., Chuenpagdee, R., & Pascual-Fernandez, J.J. (2011). What are MPAs for: On goal formation and displacement. *Ocean and Coastal Management*, 54, 75-83.
- Kelleher, G., Bleakley, C. & Wells, S. (1995). A global representative system of marine protected areas. Report from *The Great Barrier Reef Marine Park Authority, The World Bank, & The World Conservation Union (IUCN)*.
- Lester, S.E., Costello, C., Halpern, B.S., Gaines, S.D., White, C. & Barth, J.A. Evaluating trade-offs among ecosystem services to inform marine spatial planning. *Marine Polict*, 38, 80-89.
- Le Tissier, M., J.M. Hills, J.A. McGregor, and M. Ireland. (2004). A training framework for understanding conflict in the coastal zone. *Coastal Management*, 32, 77-88.
- Mascia, M.B. (2003). The human dimension of coral reef marine protected areas: Recent social science research and its policy implications. *Conservation Biology*, 17(2), 630–632.
- Masud, M.M. & Kari, F.B. (2015). Community attitudes towards environmental conservation behavior: empirical investigation within MPAs, Malaysia. *Marine Policy*, 52, 138-144.
- Musquash Estuary Marine Protected Area Regulations. (2006). S.O.R. Retrieved from: <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2006-354/page-1.html>
- O’Brien, K. & Whitehead, H. (2013). Population analysis of endangered northern bottlenose whales on the scotian shelf seven years after the establishment of a marine protected area. *Endangered Species Res*, 21, 273-284.
- Oceans Act*, S.C. 1996, c. 31. Online: Department of Justice Canada <<http://laws-lois.justice.gc.ca/eng/acts/O%2D2.4/page-1.html>>
- Pomeroy, R.S., Watson, L.M., Parks, J.E., & Cid, G.A. (2005). How is your MPA doing? A methodology for evaluating the management effectiveness of marine protected areas. *Ocean & Coastal Management*, 48, 485 – 502.

- Rantala, T. (2012). Legitimacy of forest and nature conservation policy: A conceptual framework with illustrations. *Scandinavian Journal of Forest Research*, 27(2), 164-176.  
doi:10.1080/02827581.2012.657008
- Rossiter, J. S. & Levine, A. (2014). What makes a “successful” marine protected area? The unique context of Hawaii’s fish replenishment areas. *Marine Policy*, 44, 196-203.
- Singh, R., Buzeta, M.I., Dowd, M., Martin, J.L. & LeGresley, M. (2000). Ecological overview of Musquash Estuary: a proposed marine protected area. Report. Can. Manusc. Rep. Fish. Aquat. Sci. 2538: 39.
- Singh, R., & Buzeta, M.I., 2007. An Ecosystem Framework for the Management of Musquash Estuary Marine Protected Area. Report. Can. Tech. Rep. Fish. Aquat. Sci. 2702.
- Selig, E.R., & Bruno, J.F. (2010). A global analysis of the effectiveness of marine protected areas in preventing coral loss. *PLOS One*.
- United Nations Environmental Programme. (2010). Strategic plan for biodiversity 2011-2020. In Conference of the Parties to the Convention on Biological Diversity (CBD) at its tenth meeting, Nagoya, Japan, 18–29 October 2010. Nairobi, Kenya.
- United Nations Environmental Programme. (2014). UNEP Annual Report: Protected Planet Report 2014: Tracking progress towards global targets for protected areas. Report. Retrieved from: [http://wdpa.s3.amazonaws.com/WPC2014/protected\\_planet\\_report.pdf](http://wdpa.s3.amazonaws.com/WPC2014/protected_planet_report.pdf)
- United Nations Environmental Programme World Conservation Monitoring Centre (UNEP-WCMC). (2015). The World Database on Protected Areas (WDPA). Cambridge (UK): UNEP World Conservation Monitoring Centre. Retrieved from: <http://data.unep-wcmc.org/pdfs/12/WCMC-016-WDPA-Metadata.pdf?1437132301>
- Voyer, M., Gladstone W., & Goodall, H. (2012). Methods of social assessment in Marine Protected Area planning: Is public participation enough? *Marine Policy*, 36, 432-439.
- Voyer, M., Gladstone, W., & Goodall, H. (2015). Obtaining a social licence for MPAs – influences on social acceptability. *Marine Policy*, 51, 260-266.
- Worm, B., Barbier, E.B., Beaumont, N., Duffy, E.J., Folke, C., Halpern, B.S., ... Watson, R. (2006). Impacts of biodiversity loss on ocean ecosystem services. *Science*, 314, 778-790.

## APPENDIX ONE

**Table 1A.** Suite of input indicators for legitimacy, and a brief description of each indicator.

<b>LEGITIMACY INDICATORS</b>	<b>BRIEF DESCRIPTION</b>
<i>INPUT INDICATORS</i>	
<b>1. Inclusiveness of Stakeholders</b>	The involvement and engagement of stakeholders in planning and designing the MPA.
<b>2. Diversity of Stakeholders Involved</b>	The involved stakeholders come from an assortment of different groups/organizations.
<b>3. Representation of Stakeholders Involved</b>	The involved stakeholders are representative of the affected population.
<b>4. Style of Stakeholder Engagement</b>	The methods chosen to involve stakeholders (i.e. consultative, informative, instructive).
<b>5. Extent of Stakeholder Involvement</b>	The timing and frequency of stakeholder involvement in the MPA planning and design process.
<b>6. Information Dissemination to Stakeholders</b>	The degree to which information/knowledge was provided to the involved stakeholders.
<b>7. Stakeholder Exposure to Reasoning of MPA</b>	The sharing with stakeholders of the purpose and need for the MPA.
<b>8. Stakeholder Exposure to Science of MPA</b>	The sharing with stakeholders of the scientific knowledge underlying the MPA.
<b>9. Stakeholder Exposure to Expected Benefits of MPA</b>	The sharing with stakeholders of the expected benefits of the MPA.
<b>10. Power and Influence of Stakeholders</b>	The extent to which stakeholders' involvement influenced and controlled the decision-making process.
<b>11. Equality of Stakeholders</b>	The fair and equal treatment of all stakeholders in MPA planning and design.
<b>12. Environmental Knowledge of Managers</b>	The level of environmental expertise that managers have relating to the MPA.
<b>13. Conservation Ethic of Managers</b>	The level of effort and care given by managers towards conservation.
<b>14. Capacity of Management Body</b>	The management body's ability to manage effectively (i.e. funding, resources, staff, training).
<b>15. Information Informing MPA Design</b>	The type and level of information used to design the MPA (i.e. expert opinion vs local knowledge vs scientific info).
<b>16. Compatibility of MPA Design with Local Culture</b>	The level of compatibility of the MPA with stakeholders' characteristics, local cultures, and beliefs.
<b>17. Attention to Displacement Issues</b>	Level of attention given to, and availability of, alternative income/livelihood sources.
<b>18. Existence of Defined Goals/Objectives</b>	The MPA has clearly defined and set out specific goals and objectives.
<b>19. Stakeholder–Manager Agreement on Goals</b>	The level of consensus between stakeholders and managers on the MPAs goals.



**Table 1B.** Suite of throughput indicators for legitimacy, and a brief description of each indicator.

<i>THROUGHPUT INDICATORS</i>	
<b>1. Management Competence</b>	The level of professional expertise in management and leadership skills.
<b>2. Accountability of Managers</b>	The level to which managers are responsible for and answerable to stakeholders about management decisions.
<b>3. Transparency of Management Decisions</b>	The level to which management actions are made public and are clear to the involved public.
<b>4. Quality of Decision Making</b>	The merit and suitability of the management decisions.
<b>5. Organization</b>	The efficiency and coordination of management.
<b>6. Use of Incentives</b>	The use of incentives (economic, participative etc.) for management policies.
<b>7. Existence of Planned Activities</b>	The level of activities being held within the MPA or relating to the MPA.
<b>8. Quality of Deliberation</b>	The extent to which discussions relating to management decisions are meaningful and constructive.
<b>9. Existence of a Management Plan</b>	A management plan exists and the extent to which it is followed when making decisions.
<b>10. Cooperation Among Government</b>	The level to which various sectors and levels of government collaborate and coordinate towards management efforts.
<b>11. Continued Engagement with Stakeholders</b>	The extent and ways in which stakeholders are still participating after the MPA has been established.
<b>12. Level of Enforcement</b>	The extent to which the MPA rules and regulations are being enforced through surveillance, monitoring etc.
<b>13. Information Informing Management Decision</b>	The type of information being used to inform management decisions (i.e. expert, science, social, or local knowledge).
<b>14. Conflict Resolution Measures</b>	Measures to reduce and resolve conflict are in place.

**Table 1C.** Suite of output indicators for legitimacy, and a brief description of each indicator.

<i>OUTPUT INDICATORS</i>	
<b>1. Provision of Common Good</b>	The extent to which the benefits of the MPA are realized by stakeholders.
<b>2. Biological/Ecological Benefits</b>	The extent to which conservation outcomes have been achieved and the environment has been improved.
<b>3. Economic Benefits</b>	The extent to which economic conditions, employment and livelihood opportunities have improved.
<b>4. Equal Distribution of Benefits</b>	The benefits from the MPA are equally distributed among stakeholder groups.
<b>5. Support</b>	The MPA receives recognition at some level and/or collaborates with other existing public/private actors.
<b>6. Environmental Awareness</b>	The level of local, public, and tourist awareness of the MPA.
<b>7. Education</b>	The local community has gained a considerable amount of knowledge regarding conservation and the MPA.
<b>8. Information Availability/Accessibility</b>	The level to which information relating to the MPA is available and accessible to many.

## APPENDIX TWO

### Interview Guide for Semi-Structured Discussion Questions:

1. What is your general perception towards MPAs? Do you think they are an effective management tool for conserving our oceans?
2. In your opinion, what do you feel is the main reason DFO had for establishing this MPA?
  - a. Does this align with your opinion about the need for an MPA here?
  - b. If not, for what reasons do you think an MPA was needed/not needed here?
3. Reflecting back to when the establishment of this MPA was first being discussed, how did you feel about it initially? Did you feel you were involved enough and given enough information to generate your own knowledgeable opinion about it?
  - a. What about other stakeholders? How do you feel they perceived it initially?
4. Do you feel that DFO worked diligently to establish legitimacy for this MPA from stakeholders?
  - a. At the initial planning and design stage of the MPA?
  - b. After the establishment of the MPA?
5. What are some of the things DFO did to gain stakeholder support for this MPA? Are there specific things that stood out to you as being very effective, or not effective? If you could improve them, what would you suggest?
6. Overall, do you think this MPA has the support of a broad range of stakeholders?
7. In the initial design phase of the MPA, do you feel that enough attention was given to: Ecological factors? Socio-economic factors? Process-related factors?
8. Specifically relating to the process indicators discussed above, what important factors do you think were lacking in this MPA that more attention should have been given to?
  - a. Are there any other factors you think are important that were not discussed?
9. Based on the suite of legitimacy indicators, you felt *<insert indicator>* was *<not at all important/extremely important>*. What is your reasoning for this selection?  
(Do this for a few different indicators that they felt were important/unimportant).
10. Generally speaking, what is your current perception towards *<insert name>* MPA? Overall, do you accept it/perceive it as legitimate?
11. Do you have any stories that you wish to share to illustrate any of your above thoughts?
12. Lastly, do you know of any other people (friends/colleagues etc.) who you think would be interested in participating in this study?