

Influential or Ignored?  
The Role of Fishermen in Management of the Nova Scotia Lobster Industry

By

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

Dalhousie University  
Halifax, Nova Scotia

November 2015

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## **Abstract**

The Atlantic Canadian lobster industry is the highest valued fishery in Canada, with Nova Scotia landings representing more than half of the total industry value. As catches have steadily risen over the past decade, the lobster fishery represents one of the most successful fisheries, past or present, within Atlantic Canada. The industry supports numerous coastal communities and plays an important role in the livelihoods of many families who participate in the harvesting, processing, transporting, or selling of lobster. While Fisheries and Oceans Canada (DFO) uses advisory committees as well as other forms of consultation with industry, there is no framework in place to advance participation, so that fishermen can become more engaged in making final management decisions. This results in inconsistencies in terms of the levels to which fishermen's concerns are addressed in management of the fishery. Using the study area of Eastern Nova Scotia, semi-structured interviews were conducted with fishermen from four lobster-fishing areas (LFAs) to provide insights into current participatory and decision-making practices. Barriers to fishermen participation in management were also identified by those interviewed. A literature review was completed to identify aspects of participatory management regimes that could be used within management and decision-making for the Atlantic lobster fishery. Observations were made regarding the success of the industry thus far stemming from participatory practices, as well as ways to enhance these practices to ensure the future viability of the fishery.

*Keywords:* lobster industry; participation; DFO; fishermen; fishermen's organization; decision-making; management; Atlantic; Nova Scotia.

## **Abbreviations**

DFO: Department of Fisheries and Oceans Canada

LFA: Lobster Fishing Area

FAO: Food and Agriculture Organization of the United Nations

MSC: Marine Stewardship Council

MFU: Maritime Fishermen's Union

EEZ: Exclusive Economic Zone

IFMP: Integrated Fisheries Management Plan

NGO: Non-Governmental Organization

TAC: Total Allowable Catch

FRCC: Fisheries Resource Conservation Council

MPA: Marine Protected Area

ITQ: Individual Transferable Quota

## **Acknowledgments**

I would first like to thank my academic supervisors, Dr. Claudio Aporta and Chris Milley, for their continuous support and guidance throughout the development of this study. Their insights were invaluable to these topics, and I truly appreciate the time, patience, and perspectives they graciously provided.

I would also like to thank Dina Desveaux, Shannon Scott-Tibbetts, and Tricia Pearo-Drew for the opportunity to be an intern with the Fishermen and Scientists Research Society for the summer of 2015 in addition to past years, when my passion for fisheries was sparked. Without those opportunities I would not have had the chance to interact with fishermen on many occasions, experiences that have led me to find a path that I am excited to continue on.

In addition, I would like to thank the many fishermen who invited me onto their boats and taught me countless lessons about fisheries; never making me feel like an outsider and always providing the best hands-on classroom I could have hoped for. An important thank-you to those fishermen who were participants in this study, providing valuable insights into this research.

I would like to thank the Marine Affairs staff for their incredible teaching and sharing of knowledge. A huge thank you goes to my classmates, who truly made this experience a family affair, supporting one another through the hard times and the great times. For without their listening ears, encouragement, and snack days, the past sixteen months would have been a lot tougher (and hungrier).

Finally, I would like to thank my family. My Dad for the countless discussions and extensive knowledge about fisheries, and my Mom for listening as those discussions took over at the dinner table. Thank you to my brothers for always being there in a time of need. Lastly, to my closest friends, who always knew when to drag me from the library for a walk in the woods or a Tim's tea.

## **1. Introduction**

Fisheries have long been an integral part of the lives of Canadians on the Western, Northern, and Atlantic coasts. Indigenous peoples who initially inhabited the land resided on the coast through the spring, summer, and fall seasons to take advantage of marine resources for food, fertilizers, and spiritual uses (Hanlon, 2012). Initial observations made by European settlers showed records of large abundances of fish such as cod and halibut on the Atlantic coast, prompting exploitation of the resources and the emergence of cod as a staple food in Europe (Pearson, 1972 p. 1). From the development of the cod fishery came further exploration of the coast, and later settlement by France and other nations in Europe. Fishing was then used as a method of subsistence, feeding and supporting settlers before developing into the significant commercialized industry that it is in Canada today.

The participation of fishermen in fisheries management has been a widely analyzed topic over the past several decades. While fishermen participation has been viewed as an important method to enhance the success of management and the compliance rate with regulations, there remains a lack of involvement of fishermen in management and decision-making across the globe. This paper will analyze the level of participatory management within the Nova Scotia lobster industry, using Eastern Nova Scotia as a study area. Emphasis will be placed on how the participation of fishermen has, and can benefit the industry, and where improvements should be made to enhance this participation.

The importance of Canadian fisheries is demonstrated through the historical, social, and cultural role they play in the lives of Canadians. Throughout Canada, and in the Atlantic provinces in particular, fisheries represent a significant part of the economy and the livelihoods of those who hold a stake in the industry. Rural communities throughout Atlantic Canada were largely developed and continue to thrive due to the fisheries that take place along their coasts. Today, commercial fisheries remain one of the sole supporters of many communities that would otherwise disappear without them.

Fisheries management can be defined in various ways, with the Food and Agriculture Organization of the United Nations (FAO) describing it as:

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

This definition describes sustainability of the resource as the main goal, in addition to accomplishing other fisheries objectives. These objectives often include optimizing benefits gained from available resources while diminishing conflict (Cochrane, 2002), and range in scope between regions and fisheries globally. The goals of fisheries management fall under four categories: biological, ecological, economic, and social (Cochrane, 2002). True fisheries management considers all of these factors to ensure success and sustainability of the fishery being managed.

According to FAO's definition of fisheries management, a 'well-managed' fishery may then be one that exploits a resource sustainably with minimal conflicts. Other organizations, the Marine Stewardship Council (MSC) for example, have a more detailed standard for well-managed fisheries. This includes three key principles, 1) maintaining sustainable fish stocks, 2) minimizing environmental impact, and 3) using an effective management system in compliance with relevant laws and responsive to a changing environment (MSC, 2014). What this demonstrates is the variation between the standards held for a 'well-managed' fishery, but also, the presence of various critical factors to consider. A well-managed fishery is not solely based on economic gains or biological sustainability, but on both of those factors in addition to social and ecological considerations.

### *1.1 Commercial fisheries in Atlantic Canada*

Commercial fisheries in Atlantic Canada have transformed over time, creating a different



present-day fishing industry from that of 25 years ago. In the late 1980s, groundfish species including cod, haddock and halibut were the primary resources exploited off the Atlantic coast (R. Baker, *personal communication*, October 22<sup>nd</sup>, 2015). Other species such as lobster and snow crab had minimal to no presence in the commercial fishery. The modern day industry shows a significant contrast, with lobster as the primary fishery resource for the majority of fishermen<sup>1</sup>, infrequently supplemented with snow crab and groundfish licenses.

This considerable change in the Atlantic commercial fishery can be attributed to the decline of groundfish stocks and significant growth in alternate stocks in the early 1990s. In 1992 the cod stocks had collapsed on the Grand Banks of Newfoundland, resulting in a moratorium<sup>2</sup> on the cod fishery that was later expanded to include all of Atlantic Canada in 1993 (Bavington, 2010; Myers et al., 1997). Following this collapse, both lobster and snow crab populations began to rise, resulting in the transition from a primarily groundfish-based fishery to the primarily lobster-based fishery that remains today.

This transition in the commercial fishery has resulted in a limited ability to diversify within the industry. When the groundfish stocks were healthy, commercial fishermen had the ability to vary their fishing activities by targeting various species throughout the year. Not only would this help distribute fishing pressure on the stocks, but also acted as a safeguard for their livelihood by having various resources to support them. When lobster became the primary resource for the majority of fishermen, this ability to diversify was lost. As a result, a decline in the lobster stocks could have significant repercussions for the industry. The lack of alternative fishery resources creates an enhanced risk for fishermen and their communities, and an increased importance in maintaining the fishery's viability.

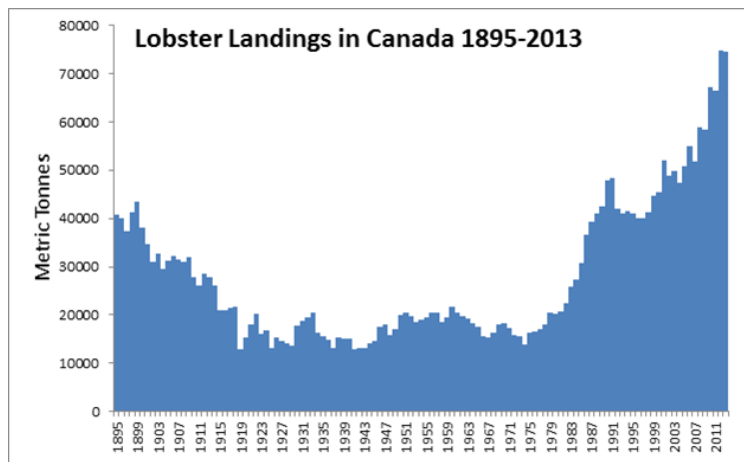
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<sup>1</sup> While the term 'fishers' has been increasingly used in the academic literature, many fishermen have stated that they prefer to be called 'fishermen', and for that reason this will be the term used in this paper.

<sup>2</sup> A moratorium is when all harvesting of a particular resource is restricted.

The cod collapse, which was a main contributor to the transformation of the commercial fishery in Atlantic Canada, was attributed to an overestimation of fish abundance and a simultaneous underestimation of fishing mortality (Myers et al., 1997). Leading up to the moratorium, the offshore fleet subsidized by the Canadian government were experiencing positive catches and observing high cod abundance in their surveys, while inshore fishermen were observing declines in stocks (Bavington, 2010). However, these concerns expressed by the inshore fishermen were ignored by government regulators (Kurlansky, 1997; Bavington, 2010). Overall, a failure in fisheries management prevented the cod fishery from thriving.

The failure of the cod fishery serves as a stark contrast to the ongoing success of the Atlantic lobster fishery. Over the past decade, lobster landings have been steadily on the rise (Figure 1), comprising 34% of the total landed value of all Atlantic Canadian commercial fisheries. Nova Scotia alone accounts for more than 60% of the \$400 million total industry value, with 30 000 metric tonnes of lobster



**Figure 1. Lobster landings in Canada from 1895-2013 (DFO, 2015b).**

landed in 2013 (DFO, 2014b). The industry continues to support many rural communities where residents are employed in the harvesting, processing, transporting, and selling of lobster.

A notable characteristic of the Atlantic lobster fishery is the participation of fishermen in the management and decision making processes implemented by the Department of Fisheries and Oceans (DFO). This participation, largely dependent on the level of fishermen organization, has been present within the industry since early on in its commercialization. This paper will analyze the participatory methods used within management of the Atlantic lobster fishery, and their potential role as one of the drivers for success within the industry.

## 1.2 Objectives

The objectives of this research are to analyze the role of fishermen within management of the Atlantic lobster industry and to assess how this has contributed to the success of the industry, using Eastern Nova Scotia as a study area. This paper is particularly concerned with the perceptions held by fishermen of their level of participation in the fishery, and how their participation may be further enhanced to ensure the continued viability of the lobster fishery in Atlantic Canada. These objectives will be reached by answering the following research questions:

1. What is the current state of fishermen participation in management of the Nova Scotia lobster fishery?
2. How do fishermen perceive the participatory practices used within the Nova Scotia lobster industry?
3. Is the level of fishermen participation within the Nova Scotia lobster industry sufficient?

## 2. Approach

In order to answer the research questions, a qualitative research approach of data collection was followed. A literature review was conducted using both primary and secondary sources, as well as semi-structured interviews with license holders (fishermen) in the Nova Scotia lobster industry. These two phases of research are explained further below. These methods were chosen to evaluate the effectiveness of fishermen participation as perceived by fishermen themselves, in addition to how regulations and policy outline participation. It should be noted that the researcher originates from a family of fishermen, and has lived in a fishing community in Eastern Nova Scotia for 23 years. This has allowed the researcher to conduct her research with a range of knowledge from within the fishing industry, while intending to maintain a balanced perspective through the analysis of relevant literature and policy documents.

## *2.1 Literature Review*

Literature reviewed for this study included government documents and web pages, legislative hearings, peer-reviewed articles, as well as grey literature relating to fishermen's organizations and other fisheries associations. A wide range of literature on co-operative management, participatory management, and fisheries management was also reviewed in order to gain a knowledge base on different systems that have been explored in the past and which are being developed currently to better manage natural resources. Additionally, the history of the Nova Scotia lobster industry was reviewed in order to understand how it has evolved over time.

Case studies involving participatory approaches in fisheries were explored in order to compare the Nova Scotia case with others in which participatory approaches have been applied. These cases were chosen based on varying similarities with the Nova Scotia lobster industry including the type of resource being managed, organizational structure and regulatory measures, as well as the potential to consider their participatory methods in the Atlantic Canadian industry. A description of each case is provided (Appendix 1) with comparisons used to supplement the discussion of this paper.

## *2.2 Interviews*

Nineteen semi-structured interviews were completed with lobster fishermen from Nova Scotia, residing in Lobster Fishing Areas (LFAs) 27(2), 31B(6), 32(10), and 33(1). Fishermen from four separate LFAs were interviewed in order to gain various perspectives, while maintaining a condensed scope by limiting the chosen LFAs to the Eastern portion of the province. It was important to limit the geographic scope of the interviews, as experiences in the Southern area of the province vary from those in the Northern or Eastern portions. Participants ranged in age and experience level, as well as length of time they have spent working in the lobster fishery. Ages ranged from 25 to 70 years old, with some fishermen who were new

entrants to the fishery holding a license for only 1 year, and others being near retirement, holding a license for nearly 52 years. The majority of fishermen interviewed were over forty years old. All fishermen interviewed were members of one of the following fishermen's organizations: the Guysborough County Inshore Fishermen's Association (6), the Eastern Shore Fishermen's Protective Association (9), the LFA 27 Management Board (1), the Maritime Fishermen's Union (2), and the Halifax West Commercial Fishermen's Association (1).

Interviews were completed either over the telephone or face-to face, depending on the preference of the participant. Interviews were typically 25-40 minutes in duration; however, several extended past that time frame. Interviews were completed using open-ended questions, allowing fishermen to expand their insights into additional matters than those contained in the interview questions (Appendix 2). This resulted in a variety of interview responses, with questions and answers that varied in content and scope.

Participants were chosen based on contacts obtained by the researcher throughout previous work completed with the Fishermen and Scientists Research Society, an NGO based in Dartmouth, Nova Scotia. Through this experience the researcher was able to form relationships with various fishermen from the study areas, which helped in drawing fishermen's interest for the study. Additional participants were contacted based on suggestions from fishermen and other industry stakeholders.

All participants were given an oral description of the study and were asked for verbal consent prior to completing the interview. Additional consent was obtained for audio recording some of the interviews as part of the consent process. If desired, participants were also provided with additional information regarding the research study in the form of an emailed PDF document following the completion of the interview (Appendix 3). Following Dalhousie University's ethics practices, participants had the right to withdraw from the study at any time, along with any responses that they had given. Face-to-face interviews were audio recorded and subsequently transcribed, while written notes were taken for all phone interviews. Each

participant was given an alpha-numeric code to be identified by, ensuring the confidentiality of their responses. All notes and recordings obtained are held in a secure place with the researcher. Participants remain anonymous, with no names being used throughout this paper.

### *2.3 Data Analysis*

A limited number of interviews were completed in order to gain detailed responses, rather than a larger quantity of interviews with minimal detail. Obtaining interviews from fishermen in various LFAs ensured a broad range of perspectives rather than many similar perspectives from one area. Fishermen were not chosen based on their level of involvement or participation in the management of the lobster industry; therefore, viewpoints were obtained from a variety of actors, including those heavily involved in management issues (for example, a president of a fishermen's organization), and those with no specific role outside of being an active fisherman. This allowed the researcher to gain insights into barriers preventing participation in management and decision-making from a range of participants with different degrees of involvement.

Due to the qualitative nature of the data collected, statistical analysis was not performed. Interview responses were analyzed for consistency, and thematic trends that were present were noted and analyzed.

### *2.4 Limitations in methodology*

Ideally, the data obtained from interviews would have been validated with a quantitative approach, considering a wider range of opinions. Several factors prevented this method, including the limited time frame under which the study was completed, the inability to travel to all study areas to recruit participants, and the difficulty in finding fishermen that were willing to participate. For this reason it was only feasible for the researcher to aim for several interviews in the desired study areas. Undertaking a survey to obtain responses from additional fishermen

could have supplemented the qualitative data obtained for the study, and may be a valuable tool in future research.

An additional limitation was the access to published literature on both participatory management and Atlantic fisheries, particularly archived articles that have not been transferred to online databases and only exist in print. For example, various reports from DFO, and technical papers from the FAO that have been published more than 10 years ago were not always accessible to the researcher. These would have been a positive addition to the development of the historical context of both fisheries management and the lobster industry described in this paper.

### **3. The Atlantic Canadian lobster industry**

#### *3.1 Historical overview*

In the mid 1840s, American lobster was viewed in the Maritimes as a meal eaten out of necessity, rather than a desired dish. Lobsters were an abundant resource throughout coastal waters and when sold, could generate a penny per lobster at most (Hanlon, 2012). They were often used as fertilizer on farmers' fields, and were known to be the diet of families who could not afford more desirable foods (Tye, 2004). During these early years, traps were not yet used for harvesting, as lobsters were so bountiful they could be collected from shallow waters by hand or using rakes.

The mid-1800s marked the development of the canner industry, an important turning point for the lobster fishery. This allowed caught lobster meat to be preserved and sold in cans, permitting shipment around the globe (Tye, 2004). This development led to a surge in harvesting, causing stocks to decline inshore and prompting the development of hoop nets for use in fishing further off the coast (Hanlon, 2012). It was not until the 1950s, when lobster

became a valued product in both Canadian and American markets, that the baited trap method of fishing currently used today was introduced<sup>3</sup>.

In fear of over-fishing of the resource, the Canadian federal government implemented the first regulations on the fishery in the 1870s, controlling when the resource was fished and restricting the landing of berried and soft-shelled lobsters (Hanlon, 2012). The fishery was open access until 1918, at which time license requirements were introduced. However, these initial requirements had no qualification criteria, area restrictions, or fishing limits, making implementation difficult (Bodiguel, 2002). From this time until the 1990s, a lobster license could be acquired for as little as 25 cents, and the lack of qualification criteria remained. Lobster was solely fished as a supplement to other fisheries during these years due to the low landings fishermen were able to acquire.

With the collapse of the cod fishery in the early 1990s, lobster landings began to rise. More than 700 canneries were established in the Maritimes, 244 of which were in Nova Scotia, generating an increased demand and resulting fishing pressure from a rising number of fishermen (McMullan et al., 1993; Hanlon, 2012). In 1945 licenses were restricted to certain harvesting areas, but the quantity of licenses remained unregulated. It was not until late 1960 when the development of a limited entry licensing system began (Bodiguel, 2002). The 'Moonlighter Policy' followed this in 1974, serving to eliminate fishermen from the industry who had alternative employment in order to reserve it for those who were dependent on the resource for their livelihood (Hanlon, 2012). Using this policy, fishermen were categorized as holding Class A, B, or C licenses. B and C licenses were phased out once the license holder had completed fishing, or within two years of the initial designation, respectively (Hanlon, 2012). In 1978 a government-issued buy-back program removed an additional 1600 licenses from the

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<sup>3</sup> Modern day lobster traps are 44-48 inches in length and are built out of wood or wire with cement weights in the bottom. They contain two funnels to allow entry by lobsters and a rectangular escape vent to encourage juvenile lobsters that cannot be legally harvested to leave the trap. Bait (typically mackerel, in Nova Scotia) is placed on a spike inside the trap before being placed overboard. A rope with a small buoy on the end is tied to each trap so they can be easily found the next hauling day.



province of Nova Scotia alone, improving the economic returns for those choosing to remain in the industry (Hanlon, 2012).

The initial licensing policy was inconsistently applied and confusing, and fishermen were required to fish the licenses they held even if the fisheries were at risk of collapse, in order to retain that license for the following year (Hanlon, 2012). As a result, the Fisheries Minister proposed the creation of “full-time” and “part-time” fishermen designations. This proposal was not well accepted by industry, causing several fishermen to develop their own alternative policy. By traveling to various ports throughout the Maritimes to gain backing from industry, the individuals who initiated the new policy were successful in demonstrating to DFO the overwhelming support of fishermen. DFO then worked further with fishermen, as well as policy developers to finalize the ‘*Bonafide Licensing Policy*’, and ultimately implement it (Hanlon, 2012).

The *Bonafide Licensing Policy* allowed fishermen to sell and trade licenses as desired, as long as they always held one major license (typically lobster), and never held two of the same species licenses. This maintained the license cap within the industry, but allowed fishermen to diversify or divest when necessary, preventing unnecessary pressure being placed on stocks that were not healthy or profitable (Hanlon, 2012). This policy formed the basis for the *Core-Licensing Policy*<sup>4</sup> used today, and represents one of the most meaningful contributions from fishermen to management of the industry (Hanlon, 2012).

### 3.2 *The modern lobster fishery*

Currently, the lobster fishery is an owner-operated industry that involves the use of cape-islander style fishing vessels up to 45 feet in length to trap lobster during designated seasons annually. The coastal region is divided into LFAs designated to create boundaries for fishermen

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<sup>4</sup> The *Core Licensing Policy* (CLP) was officially established in 1996. The main concept of the CLP is that a core group of license holders is established based on regional criteria, and entering into the core group can only be accomplished by replacing an existing core member. A number of concepts are made within the CLP, namely the Fleet Separation Policy and Owner Operator Policy.

of where and how they can harvest. According to the LFA, a limited number of traps are set by each fisherman, and lobsters are harvested before being sold on the wharf at the end of each day to a plant or other lobster buyer<sup>5</sup>. Season lengths also range depending on the LFA, as well as additional regulatory measures including trap limits, minimum size requirements, and conservation methods.

There are approximately 3000 lobster licenses held within Nova Scotia, and this number remains unaltered as new licenses are not provided to the industry by DFO or otherwise. In order for a new fisherman to enter the fishery, a license must be acquired from a previous core license holder. The cost of entering the fishery as a new license holder has been steadily increasing over the past decade, with licenses being sold at a cost of between \$200 000 on the Eastern Shore and over \$1 million in South West Nova Scotia<sup>6</sup>.

Fishermen typically haul their traps every day of the season, only taking the odd day off due to poor weather or other unusual circumstances. On average, two deck hands are used on each vessel to help empty and bait the trap before putting them back over the side to soak for the next haul. Seasons range from two to six months in length, with some areas having two seasons in each year (spring and fall). Trap limits range from 250 to 400, as do minimum size requirements, which range from 81mm to 84mm in carapace length<sup>7</sup> (Table 1). Landings vary greatly throughout the province, with fishermen in South West Nova Scotia landing the highest catches relative to other regions.

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<sup>5</sup> A lobster buyer may be from a processing plant, exporting company, or individual truck driver who sells to various outlets. Each fisherman typically has an agreement with a particular buyer who meets them at the wharf each day to purchase their catch. Fishermen may also sell small quantities of their catch to individuals who come to the wharf seeking fresh seafood for their personal use.

<sup>6</sup> The cost of entering the fishery ranges greatly due to the variation in the volume of landings in different areas of Nova Scotia. Areas in South West Nova Scotia experience significantly higher landings than Eastern Nova Scotia, giving licenses in the area a higher demand and cost.

<sup>7</sup> Carapace length is the distance from the back of the lobster's eye socket to the beginning of its tail.

Table 1. Regulation variations between LFAs (adapted from DFO, 2011).

LFA	Season (months)	Trap Limit	Legal Size (mm)	Additional Measures
27	2 (spring)	275	81	-
28	2 (spring)	250	84	Max entrance hoop 153mm
29	2 (spring)	250	84	Max entrance hoop 153mm
30	2 (spring)	250	82.5	Max female CL <sup>8</sup> 135mm
31a	2 (spring)	250	82.5	Closed female window 114-124mm <sup>9</sup>
31b	2 (spring)	250	82.5	V-notching <sup>10</sup>
32	2 (spring)	250	82.5	V-notching
33	6 (winter)	250	82.5	-
34	6 (winter)	375/400	82.5	-
35	2.5 (fall) 5 (spring)	300	82.5	-

While regulations are typically set by DFO, an increasing number of responsibilities have been recently handed down to industry through fishermen's organizations, including data collection, conservation efforts, and tag distribution. Fishermen's organizations act as a forum for fishermen to express their concerns and have them communicated to DFO. Advisory meetings are often conducted by DFO through these organizations as well, making them an important intermediary between government regulators and fishermen. Fishermen's organizations play an important role in the Atlantic lobster industry, and their role is explored further in the following section.

### 3.3 Fishermen's organizations

The organization of fishermen is an important aspect in fisheries management, as it brings the stakeholder group together to speak with a collective voice. The level of fishermen organization within the Nova Scotia lobster industry sets it apart from other fisheries, providing a

<sup>8</sup> Carapace length.

<sup>9</sup> Female lobsters that have a carapace length of between 114 and 124mm cannot be harvested, and therefore must be thrown back when caught.

<sup>10</sup> A conservation measure used where each fishermen must put a pre-determined amount (weight) of sexually mature females back into the water after placing a V-notch in a specified tail flipper. These lobsters can then not be harvested or sold by anyone, and must be thrown back if they are caught in a trap.

valuable structure to facilitate participatory management. The initiation of the evolution of this organizational development dates back to the early fishery, culminating in the fishermen's organizations that exist today.

The organization of fishermen in Nova Scotia began with the co-operative movement in the 1920s. Jimmy Tompkins and Moses Coady of Cape Breton began initiatives to educate and organize fishermen, ultimately leading to the development of co-operatives in several areas of the province, some of which remain active today (Hanlon, 2012). This development of leadership among fishermen was the first step toward the development of fishermen's organizations that evolved later in the industry (Hanlon, 2012).

### 3.3.1 Organization development

It was Roméo Leblanc, Minister of Fisheries and Oceans in the early 1970s who first encouraged fishermen to organize in order to have their voices heard by government regulators (Hanlon, 2012). He reminded fishermen that consultation could not be accomplished with each and every fisherman individually, requiring fishermen to organize themselves to ensure their ability to contribute to the management decisions being made by government. This resulted in the development of fishermen's organizations throughout the Maritimes, the first being the Maritime Fishermen's Union.

The Maritime Fishermen's Union (MFU) was founded in 1977 in Baie-Ste-Anne, New Brunswick, becoming one of the first fishermen's organizations established. The MFU quickly became known for their assertiveness, leading to their recognition from the fisheries minister and DFO. This eventually resulted in DFO decision-making reflecting the influence of the Union (Hanlon, 2012). Members of the MFU were those responsible for the initial development of the *Bonafide Licensing Policy*, and ultimate implementation of the policy by DFO (Hanlon, 2012).

The current overarching goal of the MFU is the "unification, solidarity and welfare of fishermen and other workers in the fishing industry" (MFU, 2015). Today, the Union is the

official organization of New Brunswick fishermen under the *Inshore Fisheries Representation Act*<sup>11</sup>, and voluntary membership of Nova Scotian fishermen is accepted as well; resulting in a current representation of over 1300 harvesters from the two provinces. The MFU actively participates in efforts to ensure sustainability of the resource, maintain the viability of the inshore fishery, marketing, and other strategic priorities (MFU, 2015).

Following the development of the MFU, an increasing number of fishermen's organizations became established throughout the Maritimes. As encouraged by Minister Leblanc, they began to play a vital role in connecting fishermen with DFO regulators, by creating an interface for communication and collaboration. They were often relied upon to transfer information between the two groups, address issues and conflicts, and maintain positive interactions between the key stakeholders in their areas. Fishermen's organizations did not have a set structure or legislated requirements until the *Fish Harvester Organizations Support Act* was established in 1996.

The *Fish Harvester Organizations Support Act*, formerly known as the *Fisheries Organization Support Act*, was introduced by the government of Nova Scotia to encourage fishermen to further organize in their respective regions. Through a vote in each region, fishermen determined whether or not to implement the provisions of the Act. When implemented, the Act requires fishermen to pay dues to an accredited organization<sup>12</sup> in their region, making them a member of that organization and allowing them to gain from the services it provides. Thus far, this Act has resulted in the development of approximately eleven accredited organizations throughout the province, encompassing the regions from the Nova

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<sup>11</sup> The *Inshore Fisheries Representation Act* is New Brunswick's legislation equivalent to Nova Scotia's *Fish Harvester Organizations Support Act*.

<sup>12</sup> An organization becomes accredited through application to the provincial Minister of Fisheries and Aquaculture, and must meet the following criteria: 1) have the primary purpose of representing its members, 2) have minimum annual dues of \$100 paid by members, 3) maintain an elected executive including a board of directors, 4) establish and maintain a regular reporting system to actively communicate with members, 5) register with the Registry of Joint Stock Companies under the *Societies or Companies Act*, and 6) maintain a membership of at least 100 license holders or 15% of the license holders in the region (whichever is less).

Scotia-New Brunswick border on the Northumberland Strait to the Sackville River in Halifax Harbour.

Implementation of this new legislation was beneficial for fishermen's organizations in several aspects. The mandatory membership regulations allowed organizations to grow in membership while developing dependable financial resources from member dues (Boudreau et al., 2002). The increase in membership also gave organizations a stronger voice when dealing in provincial fishery matters (Boudreau et al., 2002). Finally, the Act made organizations more accountable in terms of their structure and operations, due to the terms of accreditation they were committed to.

These fishermen's organizations have been formed with the objective of representing fishermen's interests in fishery science, management, regulatory, and safety issues (*Fish Harvester Organizations Support Act*, 2011). In recent years, the organizations have evolved to carry several responsibilities in managing the fisheries, including tag distribution, implementing conservation measures, and representing fishermen in consultations with government regulators. The organizations are run in various ways, and may be coordinated by volunteers, paid employees, or a combination of the two.

### 3.3.2 The Lobster Council of Canada

The Lobster Council of Canada is an additional form of industry organization playing a vital role in the Atlantic<sup>13</sup> Canadian lobster fishery today. As a mechanism to address important issues within the lobster industry, the Council was developed in 2007 after the need for such a body was identified at the Lobster Summit<sup>14</sup> (Lobster Council of Canada, 2015). The Council is comprised of a board of directors composed of representatives from fishermen's organizations,

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<sup>13</sup> The Lobster Council works solely in Atlantic Canada because there are no lobster fisheries on the Northern or Western coasts of the country.

<sup>14</sup> The Lobster Summit is a conference that brings together various stakeholders of the lobster industry within the Maritime provinces (Nova Scotia, New Brunswick, and Prince Edward Island) to discuss important aspects or current issues within the industry.

processing sectors, and aboriginal groups. The broader membership of the Council encompasses members from each of the Atlantic Provinces, including processors, organization representatives and other industry stakeholders, including fishermen.

The Lobster Council works toward enhancing the value of the lobster sector in Canada by addressing key issues such as marketing position, market access and market initiatives, industry and government relations, trust and awareness within the industry, branding, and improving returns (Lobster Council of Canada, 2015). Most recently, the Council has attained MSC certification for the New Brunswick, Prince Edward Island, and Nova Scotia inshore lobster fisheries, which identifies them as well-managed and sustainable resource industries. The Lobster Council is an important level of organization within the Canadian lobster fishery, as it brings together key stakeholders in efforts to improve the success and sustainability of the fishery. Involving all stakeholders ensures that all aspects of the industry are addressed, from management, to marketing, to sustainability.

#### **4. Canadian fisheries management**

##### *4.1 Historical overview*

Fisheries management in Canada has evolved significantly as fishing technologies have advanced and global markets have grown (Caddy and Cochrane, 2001). When fishing was primarily subsistence based, management was performed within fishing communities according to family traditions and acceptable practices according to community standards (Barnett and Anderies, 2014; Davis et al., 2006; McMullan et al., 1993). With a lack of outside markets for the harvested resource, the lure of overfishing was not present. This allowed the community-based method of management to be largely successful, as the incentive to harvest was closely linked with local demand. This balance contributed to a sustainable fishery regardless of the lack of top-down government regulation (Caddy and Cochrane, 2001).

The first federally enforced regulations came after Canada's Confederation in 1867, mainly dealing with inshore fisheries; however, regulatory controls were used sparingly until the 1960s (Crowley and Palsson, 1992). With the development of improved technologies, including better storage, processing, and harvesting capabilities, came wider markets and subsequently higher harvest rates. This led to a greater need of government regulation to ensure the continued sustainability of the fisheries. The establishment of the 200 nautical mile Exclusive Economic Zone (EEZ) in the late 1970s provided the framework for coastal nations to implement laws and regulations to control fisheries within their respective EEZs (Johnsen et al., 2009). This enhanced the ability of Canada to regulate its fisheries further, making it an important milestone in Canadian fisheries management (Johnsen et al., 2009).

#### *4.2 Modern fisheries management*

Currently, the Fisheries Act regulates all Canadian fisheries. The Act was developed in 1985 and places complete power over fisheries matters in the hands of the Fisheries Minister. Many regulations have been developed under this Act, as well as fisheries management policies and frameworks to help achieve its objectives. Some notable policies include the *Commercial Fisheries Licensing Policy*, the *Sustainable Fisheries Framework*, and the *Fishery Decision-Making Framework* incorporating the precautionary approach (DFO, 2013b). Sustainability and the precautionary approach are two relatively new concepts in fisheries management, and are therefore still a work in progress within Canadian fisheries management regimes. Creating a framework for the development and implementation of the precautionary approach for each individual fishery is still underway (DFO, 2013a). These policies provide the basis for management of all Canadian fisheries, supplemented by specific Integrated Fisheries Management Plans developed for each individual fishery.

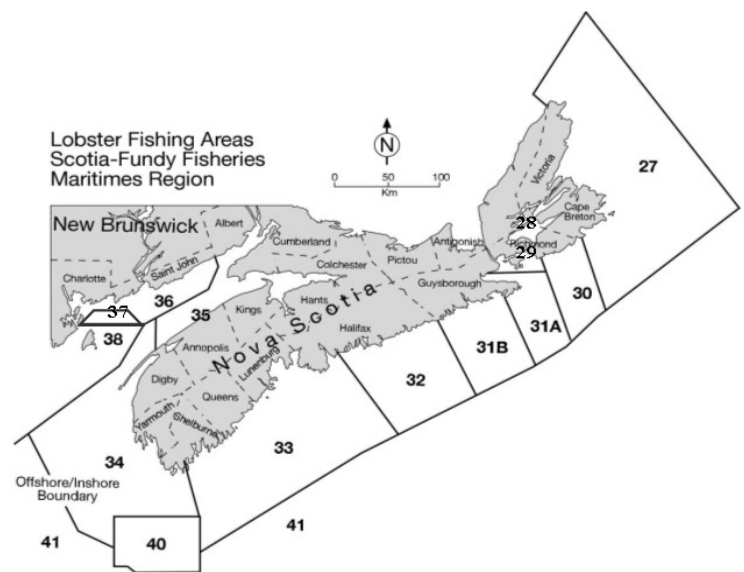
Integrated Fisheries Management Plans (IFMPs) are developed for each species in a particular region of Canada to guide their sustainable use and conservation. DFO uses the best



available science along with industry data in order to create each individual plan (DFO, 2015c). IFMPs are not legally binding, and the Fisheries Minister has the right to alter a plan at any time (DFO, 2013b). The IFMPs are developed jointly by several sectors of DFO, including Resource Management, Science, Economics, and Conservation & Protection. Consultations with outside stakeholders are also an important tool used when developing the IFMP for each fishery; however, these consultations are done after the initial draft has been developed. Lastly, each IFMP is reviewed annually to ensure its effectiveness and identify any improvement needs (DFO, 2013b).

The IFMP for inshore lobster provides the specific framework used for managing the lobster fishery in the Maritimes region, LFAs 27-41 (Figure 2). The twelve LFAs encompassing the Scotia-Fundy region divide the marine space along the coast in order to manage the fishery more effectively depending on the specifics of each area. Management measures differ from LFA to LFA depending on factors such as number of licenses held in the area, abundance of lobster, seasonal changes, and other biological parameters. The IFMP

describes content such as stock assessment and status, management issues, objectives for the fishery, strategies for achieving those objectives, tactical management measures, access and allocation, compliance, performance review, and plan enhancement (DFO, 2011). In addition, methods for facilitating shared stewardship are described within the IFMP, with advisory committees being the main forum for consultation with industry stakeholders.



**Figure 2. Lobster Fishing Areas (LFAs) in Nova Scotia (DFO, 2011).**

assessment and status, management issues, objectives for the fishery, strategies for achieving those objectives, tactical management measures, access and allocation, compliance, performance review, and plan enhancement (DFO, 2011). In addition, methods for facilitating shared stewardship are described within the IFMP, with advisory committees being the main forum for consultation with industry stakeholders.

Advisory committees act as the primary forum for consultation for various Canadian fisheries. They consist of industry stakeholders including fishermen, non-governmental organizations (NGOs), aboriginal communities, provincial governments, and DFO (DFO, 2011). The structure of these advisory committees and their representatives varies between fisheries. For example, advisory committees for the Atlantic groundfish fishery have industry representatives for each sector (ie. each harvesting method). However, advisory committees in the Atlantic lobster industry are present for each individual LFA, with elected fishermen representatives from each port or community (C. Milley, *personal communications*, November 6<sup>th</sup>, 2015). This makes the advisory committee process much more localized to the community level within the lobster industry relative to others, enhancing the involvement of fishermen in this consultation process.

#### 4.3 Quota vs. effort-based management

Two differing systems characterize how fisheries are managed in Canada: quota-based and effort-based management. Various fisheries in the Maritimes region, including groundfish and snow crab, are managed using a quota-based management system. Alternately, an effort-based system is used in managing the lobster fishery. This is an important differentiation to identify, as the system used determines how fishermen interact with one another, how the resources are harvested, and how fishermen contribute to many other aspects of management that can have an impact on the industries overall.

##### 4.3.1 Quota-based management

Quota-based management relies heavily on stock estimates that are used to determine a Total Allowable Catch (TAC) for a particular resource, which is then divided by sector and in some cases individual fishermen (Charles, 1997). Similar to other management systems including effort-based, quota-based management also incorporates limited entry, gear restrictions, closed areas, and closed seasons in order to ensure the sustainability of the fishery

(Charles, 1997). Government regulators were using quota-based management to manage the cod fishery when it collapsed, revealing some important weaknesses in this type of system.

Stock assessments completed using the catch rates provided by fishermen are not always accurate in portraying the abundance of a resource. While stocks may be in decline, fishermen often remain successful in finding and catching what fish remain (Charles, 1997). This gives a false indicator of the health of the stocks, preventing accurate TACs from being recommended. This issue in quota-based management was an important contributor to the sudden collapse of the cod fishery, which is well known globally as one of the most significant fishery collapses in history.

Prior to the implementation of quota-based management, there was no set goal for fishermen to reach during a fishing trip. However, once quotas were implemented, this provided a target for fishermen to aim for, encouraging them to reach that volume regardless of what they needed to harvest. This issue is amplified in areas where quotas are allocated to a particular area or group of fishermen rather than individuals, giving them the incentive to harvest as much as they can as fast as they can, before the quota has been completely fished (McCay, 1995). This encourages competitive behavior among fishermen, diminishing their ability and in some cases desire to work together for the benefit of the industry. Efforts have been made to prevent this issue by allocating a certain portion of the quota to individual fishermen or boats (McCay, 1995); however, this has not been implemented in all regions of Canada.

Discarding lesser-valued fish at sea became a common practice with the introduction of quota-based management, as fishermen would often do so in order to catch more fish of higher value within their allocated quota (Charles, 1997). Catches are also often underreported, with fishermen catching more fish than permitted within their quotas (Charles, 1997; McCay, 1995). These practices contribute to inaccurate data recording as well as higher fishing mortality, damaging the health of the fishery (Charles, 1997; McCay, 1995). Finally, the allocation of set quotas creates an inability to alter TACs within a season, as fishermen perceive themselves as

having the right to harvest those quotas (Charles, 1997). This prevents the adaptability that is necessary in fisheries management due to the often-changing environment that it considers.

In addition to the inherent issues of quota-based management discussed, there are also difficulties in working collaboratively within such a management system. Quota-based management relies on external, science-based decision making from government regulators, allowing minimal room for collaboration with fishermen (McCay, 1995). Furthermore, quota-based management is an approach based on individual sectors, dividing fisheries into competing groups (Charles, 1997). While participation from fishermen can be incorporated, quota-based management makes this process difficult due to its implicit management structure.

#### 4.3.2 Effort-based management

The effort-based management system used to manage the Atlantic Canadian lobster fishery is a significantly different system than quota-based management. Rather than harvesting based on allocated quotas, lobster fishermen are permitted to harvest based on input controls, including limited entry licensing, number and size of traps, and season lengths (Charles, 1997). The lack of quotas prevents the perceived need to reach a particular target volume, and management measures can be adapted more easily between seasons (Charles, 1997). Additional regulatory measures such as minimum size requirements, trap escape vents, and the release of ovigerous females<sup>15</sup> strengthen the management regime of the fishery further.

Along with an avoidance of the issues present in quota-based management systems, the effort-based system used to manage the lobster fishery has also allowed valuable participation from fishermen in the industry. The system of LFAs developed has allowed fishermen in each area to work together with DFO scientists and managers to create regulations appropriate for their own particular areas. A notable example of this is the individual conservation tools

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<sup>15</sup> An ovigerous female, also known as a berried female, is a female lobster that is carrying eggs.

implemented in each LFA beginning in 1997. These tools included measures such as increasing minimum carapace length, limiting fishing to six days a week, window sizes<sup>16</sup>, and V-notching. These measures were developed jointly by government regulators, fishermen, and scientists after the Minister of Fisheries and Oceans requested that each LFA implement a plan to double the eggs per recruited lobster over a period of several years. This resulted in eight LFAs, namely those with strong fishermen's organizations, making significant changes in their approach to conservation (Miller and Breen, 2010). By jointly determining which tool to use, better support of the decision was obtained, resulting in less resistance to these and other measures implemented by DFO.

Like quota based management systems, efforts-based management does not come without its weaknesses. Because LFAs consist of relatively small marine areas, they are too small geographically to be effective in ensuring adequate conservation (Charles, 1997). For this reason, it has been suggested that synchronized conservation measures be created in various LFAs throughout the Maritimes (Charles, 1997). This has been implemented to some extent in various LFAs; however, there remain conflicts between fishermen in several LFAs who disagree with the conservation being implemented, or lack thereof.

## **5. Fisheries cooperative and participatory management**

As demonstrated in the collapse of the cod fishery and the wide range of decline in global fish stocks, it has been recognized that top-down management of fisheries resources are not effective in ensuring the sustainability of commercial fisheries (Thompson, 2008). Furthermore, centralized government regulators have been questioned in their ability to manage fisheries without other stakeholders playing a role (Thompson, 2008). As a result, recent

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<sup>16</sup> A window size is a range of measurement that fishermen must use to determine whether they can harvest a female lobster, or throw it back.

decades have seen governments around the globe moving towards participatory and co-management interactions within natural resource industries.

Cooperative management, or co-management emerged as a management approach that can facilitate stakeholders' engagement. It has been defined as a sharing of responsibility and authority between government, local resource users, and the community regarding the management of natural resources (Pomeroy, 1995). In order to work toward a co-management regime, stakeholder groups must be effectively involved in decision-making processes. This management regime works to decentralize management by empowering and building management capacity in other stakeholder groups (Thompson, 2008).

Participation is a process by which individuals, groups, and organizations play an active role in making choices that affect them (Reed, 2008). The different levels of public participation have been widely analyzed and documented (see Arnstein, 1969). Stakeholder participation refers to the involvement of specific groups who hold a stake, whether directly or indirectly, in the situation at hand (Reed, 2008). This study will focus on the most important stakeholder group in fisheries: the fishermen themselves.

It has been widely noted in the literature that by sharing management with fishermen, more effective and equitable solutions can be developed. This can be achieved both in terms of managing the fishery and strengthening the communities that rely on the resource. Participation can facilitate improved data collection, and more effective relationships between government regulators, scientists and resource users. Bringing together various levels of organization can facilitate the exchange of both resources and knowledge (Carlsson and Berkes, 2005).

Fishermen hold valuable knowledge of the resource they harvest, which can be integrated with the scientific knowledge provided to, and obtained by regulators in order to create a better understanding of the resource being managed (Reed, 2008). Participation of fishermen can also enhance the success of management, as engaged stakeholders are more likely to comply with regulations (Jentoft et al., 1998; Blyth et al., 2002). Lastly, by allowing

fishermen to participate in management, the costs and risks present within the industry are more equally distributed between management parties, diminishing the vulnerability of the management system to failure (Carlsson and Berkes, 2005).

Participatory management is an adaptive process, changing to meet the needs of both the particular industry, and the environment in which the industry is operating (Léopold et al., 2013). Due to the ever-changing nature of the natural environment, an adaptive management regime is required in order to account for the uncertainties that are present within the social and ecological system (Williams, 2011). Most natural resource systems, fisheries included, change throughout time both in response to environmental conditions and management practices (Williams, 2011). For this reason, they require a management regime with the capacity to adapt to changing circumstances and emerging conflicts when needed.

Participatory management has been identified as a valuable tool for fisheries management globally. Fishermen representation in the regulatory decision-making process is wide spread throughout fisheries in many countries (Jentoft and McCay, 1995); however, the scale in which this representation truly has an influence on management decisions is broad. While fishermen participation in management has increased over the past several decades, the level of involvement remains variable from complete government power, to complete fishermen power over management and decision-making (Jentoft and McCay, 1995).

As previously noted, fishermen have had the opportunity to play a role in several decisions regarding the management of the Atlantic Canadian lobster industry. However, the consistency in the level of power they hold within decision-making is variable, creating tension between the fishermen and government regulators. Arnstein's (1969) Ladder of Citizen Participation will be used as a framework to analyze the level of participation held by fishermen in Nova Scotia, and the implications this has on their role in management.

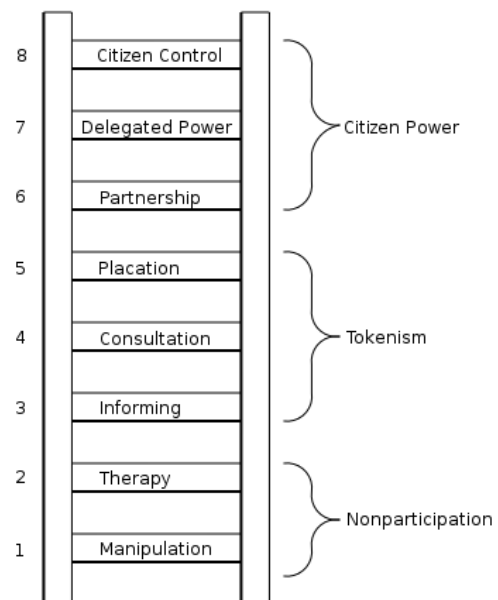
### 5.1 Scales of stakeholder participation

An important concept relating to participatory management is the level of participation achieved by those in the management system. Arnstein's classic model of assessing and describing public participation is useful in evaluating fishermen participation in fisheries management systems. Arnstein proposed that citizen participation is a categorical term for citizen power, and that without redistribution of power, participation can be an empty process that does not allow citizens to become fully engaged (Arnstein, 1969).

In her categorization, the lower levels of participation are described as power strategies that allow power-holders to claim that all sides have been considered, when in reality management remains a top-down approach. She defines eight different levels of participation to which citizens can be involved in: *manipulation, therapy, informing, consultation, placation, partnership, delegated power, and citizen control*, which she arranges in a ladder formation to demonstrate the increasing level of power as rungs further up the ladder are reached (Figure 3).

The first two levels of the ladder, *manipulation* and *therapy*, are described as levels of non-participation, in which power holders wish to educate or cure participants rather than allowing citizens to participate in the planning or development of programs. These levels typically take the form of advisory committees or other groups made up of citizens where the intention is to educate or create support from them, rather than cultivating true participation from those individuals (Arnstein, 1969).

The next three levels, *informing*, *consultation*, and *placation*, represent forms of tokenism, allowing citizens to have a voice;



**Figure 3. Arnstein's Ladder of Citizen Participation (Arnstein, 1969).**



however, preventing them from having any power to create change. Because of this, power-holders have the ability to ignore the concerns of the citizens and maintain the right to decide what is best. *Informing* maintains a one-way channel of communication from the power-holders to the citizens, with no opportunity for feedback or negotiation. *Consultation* is often achieved through surveys, meetings or public hearings; however, little is achieved from these methods other than giving the power-holders the right to say that consultation has been completed. *Placation* allows an increase in participation as chosen citizens are placed on boards or public bodies with the ability to advise and create plans; however, because power remains out of their hands there is no assurance that those plans will be utilized (Arnstein, 1969).

It is only on the top three levels of the ladder, (*partnership, delegated power, and citizen control*) where citizens legitimately become empowered. A *partnership* enables negotiation with power-holders, creating a shared power dynamic in planning and decision-making. *Delegated power* and *citizen control* further elevate the level of citizen power achieved, placing the majority of power in the hands of the citizens (Arnstein, 1969). Within this framework, true participation is only achieved with these top three levels of participation and the accompanying power that comes with them.

Davidson (1998) describes the appropriateness of different levels of engagement in different contexts, and rearranges the levels of participation developed by Arnstein into a “wheel of participation”. This emphasizes the legitimacy of different participatory approaches depending on the objectives of the work and the capacity that stakeholders possess to influence outcomes (Davidson, 1998). Other authors have narrowed the levels of the ladder into more condensed versions. Biggs (1989) describes four levels of participation: *contractual, consultative, collaborative, and collegiate*. This was further simplified by Farrington (1998) to *consultative, functional, and empowering*. Lawrence (2006), in turn, added a level (*transformative*), to the top end of the scale.

Lawrence's scale pinpoints the flow of information between regulators and stakeholders within each level. This aspect, in the natural resource and fisheries context, is valuable as the effective flow of information is an important factor in making environmental decisions (Lawrence, 2006). The *consultative* and *functional* levels have a one-way flow of information, from the stakeholders to the regulators. The third and fourth levels, *collaborative* and *transformative*, are defined by a two-way flow of information between the stakeholders and regulators, providing expert knowledge to supplement the local ecological knowledge held by the stakeholders (Lawrence, 2006). A two-way flow of information can facilitate a better participatory regime in fisheries management, as fishermen can contribute their knowledge to decisions while remaining informed of the scientific knowledge held by regulators.

The various scales of participation described in the literature provide valuable frameworks to evaluate the level of participation held by fishermen in the Nova Scotia lobster industry, and how this reflects in their relationship with government regulators. While these models were not developed to evaluate participatory management of fisheries specifically, they provide insights into what various levels of participation encompass and what can be achieved between different stakeholder groups when those levels are reached.

### *5.2 Best practices for stakeholder participation*

Regardless of the conceptual model and terminology used, it is clear that effective participation is critical in the success of organization arrangements where multiple stakeholders are involved. Reed (2008) reviewed literature in environmental management, compiling best practices for stakeholder participation. Those identified include: the empowerment of stakeholders, ensuring trust and learning between included parties, ensuring participants have the capacity required to facilitate meaningful engagement, identifying and breaking down barriers, setting clear objectives, integrating knowledge bases, maintaining a specific process, and institutionalizing that process. By incorporating these practices into a participatory

management regime, successful stakeholder participation is more likely, leading to a more sustainable resource industry.

By demonstrating the best practices used within the Nova Scotia lobster industry through fishermen's experiences, the degree of participatory management within the fishery can be shown. Furthermore, by isolating best practices that are currently lacking within the participatory processes of the industry, considerations can be made of how to enhance the level of fishermen participation in management of the industry.

## **6. Fishermen participation as outlined in policy**

### *6.1 DFO consultation*

As discussed above, the IFMP for lobster outlines advisory committees as the primary forum used by DFO regulators to gain input from fisheries stakeholders. Advisory committees for the lobster industry have a high presence of local fishermen, promoting the involvement of fishing communities in this consultation process. As the main method used for the engagement of industry members, these committees provide the interface for discussion on conservation, protection, science, and management.

The IFMP also states, "in addition to advisory committees, other committees are in place to discuss specific matters including science and enforcement, and DFO engages in issue specific consultation, formally and informally, on an on-going basis" (DFO, 2011). These "other" committees further the attempts of government regulators to include stakeholders in the decision making process; however, these methods of consultation are not described in detail within the management plan.

Fishermen participation in management as outlined in DFO policy is vaguely described with minimal detail. This makes it difficult to identify specific processes that are, or are meant to be followed to allow participation of fishermen in management of the industry. Furthermore, it

prevents fishermen themselves from having access to a specific process outlining the steps required to participate in decisions being made by government regulators. This lack of concrete participatory process has been previously outlined as an issue in management of the Canadian lobster industry; most recently, in the Lobster Panel Report developed for the provincial governments of Nova Scotia, New Brunswick, and Prince Edward Island (Thériault et al., 2013).

## *6.2 Policy reviews*

Over the years, DFO policies have been scrutinized by reviewers both internal to the federal government, and by external parties. These reviews demonstrate aspects of Canadian fisheries policy that are in need of improvement in various subject areas, including the inclusion of fishermen in management and decision-making. In examining these reviews, the level of fishermen participation present within management of the Atlantic Canadian lobster industry, and the inadequacy of this participation is exposed. The sequence of reviews and the recommendations made within each of them demonstrates whether the weaknesses in the area of fishermen participation have been addressed in DFO policies, or if they remain. Academic reviews of Canadian fisheries policy have also been conducted; however, were not considered within this study.

### *6.2.1 Internal reviews*

Various internal reviews of DFO policies have exposed weaknesses and challenges in the area of involving fishermen in management of the Atlantic lobster industry.

Recommendations have been made to review these policies to better incorporate co-management processes into the management regimes of Atlantic fisheries. These reviews provide evidence that the issues have been identified in the past, and that recommendations have been made to address them. Nonetheless, there remains a lack of policy or framework addressing these issues within the Atlantic Canadian lobster industry.

The Report of the Auditor General of Canada released in 1999 contained a chapter addressing the management of Atlantic shellfish in a sustainable manner. This chapter highlighted several weaknesses in how the Atlantic lobster fishery was being managed. Of particular interest were the points made on methods of consulting with fishermen, and involving them in the management process. A review of the process used to develop the IFMP exposed the lack of consideration perceived by stakeholders of their interests, as well as problems created by stakeholders going directly to the Fisheries Minister with their concerns, rather than using the IFMP process for consultation.

The Report also noted additional issues within the consultation processes used by DFO regulators. The formalized process used for consultation with stakeholders was acknowledged; however, a lack of sharing in real decision-making was identified, along with a minimal breadth of stakeholder involvement (Young et al., 1999). The co-management arrangements were found to be largely cost-sharing rather than allowing a sharing of decision-making, a significant weakness of DFO processes. It was recommended that an open and transparent process be developed and applied to guide decision-making, ensuring all stakeholders that their interests would be considered, promoting co-management within the industry (Young et al., 1999). It was also noted in the Report, however, that DFO agreed to take action on each of the recommendations made, with the exception of this recommendation addressing co-management (Young et al., 1999).

In 2004, DFO conducted an internal Atlantic Fisheries Policy Review, aimed at creating a modern policy framework for the management of fisheries. Within this review, the ineffectiveness of top-down management was recognized along with the need for resource users to become more involved in decision-making. The final chapter was dedicated to 'Shared Stewardship', and identified the need for new approaches to effectively involve fishermen in decision-making (DFO, 2004). Specific objectives were developed to achieve this, including determining the scope of policy forums and how they will work, developing policies to allow

greater participation in decision-making, working with user groups to implement this strategy, and helping build the capacity of resource users to participate in decision-making (DFO, 2004). The accomplishment of these specific objectives has not been demonstrated through recent DFO interactions with fishermen, as detailed by the participants in this study.

### 6.2.2 External reviews

Over the years, consultants and other outside parties have been contracted by federal and provincial governments to identify and address specific issues within the Atlantic Canadian lobster industry. These issues have encompassed marketing, product value, product quality, and other various topics. The following presents a summary of these reports in order to understand the full extent to which fishermen are consulted on various management issues. This contributes to a broader understanding of the full array of consultations that are completed with fishermen outside of DFO's direct advisory committee methods, and the issues those consultations have identified.

The Fisheries Resource Conservation Council (FRCC) developed a Sustainability Framework for Atlantic Lobster in 2007 as a follow-up document to the previous Conservation Framework for Atlantic Lobster they had completed in 1995. Their framework was developed using 18 public consultations with approximately 800 stakeholders in attendance, a focus group workshop, and over 80 written briefs submitted by various industry participants. The Framework was aimed at allowing harvesters to have a stronger influence on fisheries (FRCC, 2007). They identified collaboration and leadership as key elements to the success of fisheries management generally, but of particular importance for the lobster industry.

Concerns heard by the FRCC from fishermen included issues with the decision-making processes used by DFO, and the limited role of fishermen in those processes. This resulted in a recommendation from the FRCC for DFO to work with fishermen to review and redesign processes to allow more opportunity for discussion between the two parties. Recommendations

were also made to review legislation to ensure it facilitated assisting harvesters to organize appropriately into well funded associations, creating the capacity to successfully participate in management (FRCC, 2007). This confirms the lack of development in DFO policies in terms of fishermen participation in decision-making, as these issues persisted since both the 1999 Auditor General's report, and the Atlantic Fisheries Policy Review conducted by DFO in 2004.

Most recently, the provincial Ministers of Fisheries called for a review of the state of the Maritime lobster industry following a significant drop in lobster prices in the spring of 2013, resulting in fishermen protests across Nova Scotia, New Brunswick, and Prince Edward Island (Thériault et al., 2013). The provincial Ministers appointed three individuals to a panel to engage stakeholders, review reports and studies, and make recommendations for the industry (Thériault et al., 2013). In conducting this review, the panel held more than 50 meetings with more than 200 various industry stakeholders across the three provinces. Written submissions were also accepted from those who were unable to attend consultative meetings (Thériault et al., 2013).

While the panel focused on several different areas within management of the industry, of particular interest was their focus on relationships. They recognized the importance of fishermen's organizations, and the need to establish them in areas where they are not already in place throughout the three provinces. They also recommended that DFO establish a new method from the current approach used to make changes within the industry. They addressed the limitations in requiring a consensus from industry to create a change, and the need for an alternate approach to be taken. It was suggested that "change guidelines" be developed to inform fishermen and their organizations of the steps they must take to suggest, and have a change implemented within the industry, facilitating their engagement in decision-making. Finally, among the recommendations was the suggestion to develop a provincial organization in Nova Scotia to act as an overarching body for individual fishermen's organizations throughout

the province, along with implementing a training course for executive members of fishermen's organizations (Thériault et al., 2007).

The above mentioned reports and reviews identify common trends in the issues present within the Atlantic Canadian lobster industry regarding fishermen participation in management and decision-making. While there is some presence of consultation with fishermen, these reviews clearly show the desire of fishermen to be more involved than they currently are. However, from the persistent limitations described in these reports, it is apparent that little progress has been made in enhancing the role of fishermen in the management process further than what has been established in the past.

Involving fishermen in the development of these publications allows their voices to be heard in terms of concerns they have about the industry. However, these consultations limit the role of fishermen to discussing the issues, rather than facilitating legitimate contributions to decisions being made. The use of a regulated and concrete process by DFO to allow fishermen involvement in management prior to the development of such issues would encourage more effective participation of fishermen in management and decision-making. Such a process may also help diminish these issues before they reach a point of conflict.

## **7. Fishermen's perceptions of participatory management in the NS lobster industry**

While records demonstrate a level of fishermen participation throughout management of the lobster fishery, these are described from the perspective of either government regulators, or consultants who are looking at the industry from an outside perspective. Fishermen were interviewed to gain insight into how they have experienced participation within management of the industry, in addition to the benefits and challenges that this participation has created. This section aims to give a summary of the common trends found within these interviews, and a discussion surrounding the level of participation those trends are indicative of; in particular, as described by Arnstein's conceptual framework for citizen participation. Methods of enhancing



participatory practices currently taking place within the Nova Scotia lobster industry will also be explored using examples from case studies, and best practices identified in the literature.

Throughout the interviewing process, seven key themes emerged from the discussions with the majority of the fishermen who participated. These themes were identified as having significant importance within the management system among participants, and showed common trends throughout the responses gathered. These themes include: 1) *communication*, 2) *willingness of fishermen to participate*, 3) *power sharing*, 4) *knowledge integration*, 5) *individualistic thinking*, 6) *trust*, and 7) *participatory process* (Table 2).

Table 2. Brief descriptions of the seven common themes identified by fishermen as having significant importance to their role in management of the lobster fishery.

<b>Identified Theme</b>	<b>Brief Description</b>
<i>Communication</i>	<ul style="list-style-type: none"> <li>▪ Some methods of written communication used by government regulators, such as mail-outs and emails can be difficult for fishermen to understand.</li> <li>▪ There is limited opportunity for verbal discussion between government regulators and fishermen.</li> </ul>
<i>Willingness of fishermen to participate</i>	<ul style="list-style-type: none"> <li>▪ There exists a lack of participation by fishermen in organization and advisory meetings.</li> <li>▪ Many fishermen fail to see the benefit in participation due to the history of their limited role in management.</li> </ul>
<i>Power sharing</i>	<ul style="list-style-type: none"> <li>▪ There is limited power sharing between government regulators and fishermen.</li> <li>▪ Many fishermen are of the belief that they should hold increased decision-making power in the industry.</li> </ul>
<i>Knowledge integration</i>	<ul style="list-style-type: none"> <li>▪ There is a lack of knowledge sharing between government regulators and fishermen.</li> <li>▪ Knowledge is not successfully disseminated to all fishermen prior to, or when decisions are being made, resulting in uninformed contributions from fishermen.</li> </ul>
<i>Individualistic thinking</i>	<ul style="list-style-type: none"> <li>▪ Some fishermen currently think individualistically rather than as a collective group.</li> <li>▪ Competition between individual fishermen affects input into decisions being made.</li> </ul>
<i>Trust</i>	<ul style="list-style-type: none"> <li>▪ Limited trust between fishermen and government regulators, fishermen and buyers, and among fishermen themselves creates tension in the industry.</li> <li>▪ This limited trust inhibits collaboration in management.</li> </ul>
<i>Participatory process</i>	<ul style="list-style-type: none"> <li>▪ No clear framework or process is defined for how fishermen can participate in the decisions being made for the industry.</li> <li>▪ There are different experiences held within different areas of the province, and by different fishermen within those areas.</li> </ul>

## 7.1. Discussion

Fishermen-driven initiatives such as the *Bonafide Licensing Policy*, in addition to the close connections between LFA advisory committees and local fishing communities, demonstrates some presence of fishermen participation within management of the Nova Scotia lobster industry, and the benefits it serves. However, the limits to this participation are apparent from recommendations continuously made from both internal and external review, as well as insights from participants in this study. While methods for shared stewardship and fishermen participation have been initiated within the policies and practices of DFO, the presented findings demonstrate the room for improvement available within these regimes. The following will explore the implications of the results of this study, and how participatory management can be enhanced within the Nova Scotia lobster industry, ultimately having application to the Atlantic Canadian lobster industry as a whole.

### 7.1.1 The value in organization

The evolution of organization within the Nova Scotia lobster industry has been an important contributor in facilitating the participation that has been present. The majority of fishermen interviewed expressed a great level of positivity when discussing their respective fishermen's organizations. All participants deemed their organization as extremely valuable in facilitating communication between regulators and themselves, many of them identifying organizations as the sole forum that allows them to be effectively consulted on industry issues.

Fishermen's organizations in Nova Scotia adopt an advocacy approach for their members, acting as a middle-man to advocate the needs of their members to government regulators (Kennedy, 1982). This allows members of an organization to make decisions collectively, prior to communicating to DFO what those needs are. While this specific approach does not facilitate direct interaction between fishermen and DFO employees, participants noted

that their organizations often invite regulators to scheduled meetings if clarification on a particular issue is needed, or to discuss industry concerns.

The collectivity created by fishermen's organizations enhances the strength of fishermen's voice when an issue is raised. This was clearly demonstrated in the development of the *Bonafide Licensing Policy*, where fishermen within the MFU were able to gain enough support from fellow fishermen to encourage DFO to accept their proposed policy. This Policy helped to lift fishing pressure from stocks that were in decline, while ensuring the ability of fishermen to maintain a livelihood within the fishery. The compliance with implementation of conservation measures that were requested by the Fisheries Minister in 1997 was also led by active fishermen's organizations. These examples of fishermen participation were made possible through the high level of organization present within the lobster industry, a factor that has been able to enhance the success of the fishery overall.

The organizational structure present within Nova Scotia is comparable to that held within the New Zealand rock lobster industry. What differentiates Nova Scotia's structure from New Zealand's, is the lack of cohesiveness throughout the province. While each region of New Zealand possesses its own regional stakeholder group, Nova Scotia maintains regions where fishermen are not organized via an accredited organization. This fragmentation of the industry prevents fishermen throughout the province from possessing the ability to advocate for desired objectives collectively, or work together to better understand the fishery. This limits Nova Scotia fishermen from having the capacity to meaningfully contribute to management concerns in the substantial way that New Zealand fishermen have been, due to their consistent organizational structure throughout the region.

Fishermen in areas without accredited organizations, namely from the South shore, were described by several participants as being opposed to various management and research endeavors headed by government regulators and the Canadian Lobster Council. Those interviewed described this as a major frustration, as those fishermen who are members of an

organization are often better informed on current issues; therefore, having the ability to make fully informed decisions when given the opportunity to contribute to decision-making. Often, those who are unorganized oppose those decisions, resulting in maintenance of the status quo. This diminishes the incentive for fishermen to remain active within their organizations, as this issue demonstrates the ineffectiveness of making an effort to participate and stay informed. It also minimizes the value of having the Canadian Lobster Council as an additional level of organization, for without support its ability to make changes for the benefit of the industry is hindered.

The strength of an organization often comes from the leadership within it (Pomeroy, 1995). It was evident throughout the interviews that fishermen who spoke highly of the leader of their organization also had greater confidence in the participatory management process, and a higher willingness to participate in those processes. Several participants had withdrawn their membership from one organization to move to another due to their lack of confidence in their original organization's leader. Having proper leadership is one of the first steps in building the capacity of an organization. It promotes the ability to gain support and participation from the organization's members, allowing it to effectively contribute to management objectives (Pomeroy and Berkes, 1997).

In addition to leadership, further resources are important in building the capacity within fishermen's organizations to take on their role in management successfully. Adequate finances, trained individuals to run the organization, as well as the full range of information required to meet the needs of the membership are all necessary in order to share the responsibility of management with government (Pomeroy and Berkes, 1997). While organizations have been allocated increased responsibilities by DFO, studies have shown that they are seldom allocated the corresponding resources to complete these tasks (Wiber et al., 2009; FRCC, 2007). This creates significant difficulties for fishermen's organizations that are attempting to accomplish

more and more as time progresses, while working with the same number of resources as they have always had access to.

#### 7.1.2 From placation to partnership

Through the advocating efforts of fishermen's organizations, fishermen are able to contribute to management and decision-making to a limited extent. Currently, a number of fishermen can also participate in advisory committees, allowing them to advise on fisheries issues and make suggestions for changes within the industry. Regardless of these two endeavors, the final power over fisheries management remains solely in the hands of the Minister of Fisheries and Oceans. This method of engagement without the sharing of power corresponds to Arnstein's description of *placation*, and does not achieve true participation.

Interviewed participants described several examples where fishermen had been engaged ineffectively by DFO. One such occurrence was when the members of a fishermen's organization were asked to vote on which conservation measure to implement in their LFA, V-notching or a window size. The majority vote from the membership was to implement V-notching in the area; however, when the final decision was made by DFO, the opposite measure was implemented. Additional instances were recalled of when decisions were made without any consultation with fishermen, or with consultation being performed after the decision was finalized. An added problem identified by fishermen in the consultation process included not being consulted when options for making a management alteration were being formed. They perceive DFO as developing the options that fishermen can advise on, without gaining input from fishermen on potential options that may work for the industry.

These examples of engagement without the sharing of power have resulted in frustration among fishermen in the consultation process. Many fishermen have decreased their participation in advisory and organizational meetings due to their ineffective role in decision-making, and subsequent limited gain from the process. This has been described as

'consultation fatigue' in the literature, where stakeholders perceive their capacity to influence decisions as minimal, and; therefore, surrender their role in the process (Burton et al., 2004).

A lack of trust has also developed among fishermen towards government regulators and the participatory process, resulting in challenges for collaborative efforts between the two groups. One fisherman felt the advisory committee structure held within the industry was a "quick and dirty" method, developed by DFO without much consideration. This describes the attitudes that have developed among many fishermen toward DFO, due to the lengthy history of meaningless consultation over time, causing fishermen to feel ignored. One fisherman described the attitude of many with one simple statement, "why bother trying if nothing ever changes."

While the New Zealand rock lobster industry is structured to allow fishermen to play an advisory role similar to those in Nova Scotia, the results are much different. It has been found that through negotiations with government, New Zealand fishermen have a significant share of power with government regulators within the industry (Jentoft and McCay, 1995). Similarly, the management structure held in Maine's lobster industry employs representative boards and fishermen voting to ensure the views of fishermen are influential to management decisions being made (Barnett and Anderies, 2014).

The empowerment of fishermen in Chile demonstrates the benefits that accompany effective fishermen participation in management. Some of these include the cultivation of a collective mentality among fishermen, collaboration and the enhancement of trust, as well as a better overall understanding of the fishery (Schumann, 2007). Such empowerment allows fishermen to gain a better perspective on what management entails, as well as the overall nature of the industry they work in. Empowering fishermen gives them the incentive to participate, as they can play a meaningful role in the sustainability and future of the industry (Schumann, 2007).

While the varying political and regulatory frameworks of these cases gives them significant differences from the Canadian regulatory structure, effective participation has been developed in Canada as well. The Eastport Peninsula Lobster Protection Committee in Newfoundland provides a positive example of how empowering fishermen in management can result in meaningful results. By signing a memorandum of understanding with DFO allowing coordination of research activities and enforcement around the closed areas on their fishing grounds, the Committee gained significant influence over management of the lobster industry in their area (Davis et al., 2006). Furthermore, the majority of voting members on the Marine Protected Area (MPA) steering committee for the area are now fishermen within the community. This example of shared power has created valuable benefits for the fishery, including healthier stocks, less illegal activity, and increased educational initiatives for harvesters (Davis et al., 2006).

These favorable examples of fishermen participation in decision-making more closely resemble a *partnership* scenario. As described by Arnstein, this allows negotiation between government regulators and fishermen, facilitating a shared power and decision-making dynamic. A *partnership* in management prevents occurrences of meaningless consultation, and empowers fishermen to participate in management of the industry. The collaborative efforts present within a *partnership* work in an open and transparent way, facilitating legitimacy in the process (Pita et al., 2010). Ultimately, the effectiveness of management of the industry is dependent on the fishermen and how they abide by the regulations. A *partnership* allows fishermen to have a significant role in the processes used to create those regulations, raising the likelihood of compliance, which ultimately results in their success (Blyth et al., 2002, Jentoft and McCay, 1995; Jentoft et al., 1998).

Davidson (1998) describes the need for different levels of participation depending on the context, a notable argument when applied to the lobster industry. Many fishermen interviewed were confident in their opinion that fishermen should hold more power within management of

the industry. Nonetheless, points were raised on the risks of placing more power in the hands of fishermen. Several fishermen expressed the individualistic mentality held by some fishermen within the fishery, and how those fishermen are solely concerned with their own well-being and success. These participants addressed the importance of acting as a collective group of fishermen for the success of the entire industry for both current and future generations, rather than individual gains. An additional point raised was the need for information in order to have the ability to make informed decisions within management. Several participants acknowledged the importance of expertise provided by government regulators and scientists on aspects of the industry they are less familiar with, including marketing, economics, and other various topics.

The fishermen's opinions, therefore, align with Arnstein's concept of *partnership*, but does not involve what Arnstein would describe as *delegated power* or *citizen control*. These levels place the majority of the decision-making power within the hands of fishermen, which is not realistic for the industry, or regulatory regime present in Canada. In addition to the large number of fishermen involved, making it difficult for consensus to be reached among the stakeholders, fishermen require the technical expertise of scientists and regulators to appropriately manage the fishery. The knowledge held by fishermen supplemented by other industry stakeholders creates the opportunity for a successful *partnership* within management, the most appropriate level of participation from Arnstein's model for this particular industry.

### 7.1.3 The use of participation to facilitate knowledge integration

The capacity of national regulators to effectively regulate fishing activities is often restricted due to the limited staff allocated to the task, lack of available funding, and physical distance from the fishing activities (Pomeroy, 1995). Therefore, sharing management responsibilities with stakeholders on the local level can enhance the effective management of fisheries resources (Pomeroy, 1995). Fishermen possess valuable first-hand knowledge of the fishery that is only obtained by working with the resource on a daily basis. Integrating this



knowledge base with that of government regulators can create a better understanding of the complex system being managed (Reed, 2008). Facilitating a two-way transfer of knowledge enhances the participation of fishermen (Lawrence, 2006), while creating a common understanding between the two parties (Pita et al., 2010).

The incorporation of various knowledge bases provided valuable benefits to the lobster fishery near the Eastport Peninsula in Newfoundland. Through collaboration with scientists from both DFO and Memorial University, fishermen were able to enhance their own knowledge of the lobster stocks in the area, in order to determine appropriate areas of the fishing grounds to protect (Davis et al., 2006). The development of MPAs in the area, with subsequent enhancements to the fishery, resulted from the integration of knowledge held by multiple parties who were involved in management of the industry.

The importance of knowledge-sharing within the lobster industry is further highlighted with shared decision-making. As it stands, fishermen are occasionally given the opportunity to vote on management issues in order to express their opinions. However, interview participants expressed that fishermen are seldom fully informed on an issue prior to completing a vote. Particularly in recent years, with organization meeting attendance declining in most areas, fishermen do not have the opportunity to discuss issues as they arise. As one participant described, five fishermen may have all of the information and vote one way, while the majority of fishermen know only one aspect of the issue, and vote in the opposite manner. This can result in poor decision-making for the industry.

Low participation in organization-held meetings was a topic brought up by the majority of fishermen interviewed. Meetings held by fishermen's organizations are the settings where DFO often addresses issues concerning the industry, and obtains feedback from the fishermen in attendance. Almost half of those interviewed admitted to not regularly attending these meetings due to various reasons. Prior commitments, inconvenient timing and location, as well as being at sea when meetings are held were all common factors diminishing meeting attendance. Other

participants attributed the lack of attendance to the current success of the industry and lack of pressing issues to address. Additional causes of low meeting attendance were mentioned, including the often drawn-out nature of meetings, conflicts that arise between fishermen or others in attendance, and the lack of consideration for fishermen's views by government regulators.

The recent decline in meeting attendance has prompted some fishermen's organizations to implement mail-in voting practices to facilitate participation from their full membership. Several fishermen who were interviewed were opposed to this method due to the lack of awareness fishermen may have on issues that are discussed in meetings. As described earlier, this results in members casting an uninformed vote. Discussions held within organization meetings are valuable in gaining as much information on an issue as possible. Without participation in these meetings, this information cannot be disseminated as successfully.

All except for one fisherman interviewed felt that given the opportunity, fishermen would participate in management on an increased level if provided with increased decision-making power. The individual in disagreement felt that in the industry's current success, increased participation was not warranted; however, he noted that if a crisis arose, increased participation would occur. Without meaningful participatory methods in place, fishermen fail to see the value in attending meetings that act to well inform them on issues in the industry, and subsequently their own participation in these meetings diminishes. This limits the benefits of the meetings, disconnecting fishermen from the range of knowledge and discussion that takes place during them.

Enhancing fishermen participation in management of the lobster fishery facilitates knowledge sharing. By connecting fishermen to other sources of knowledge, and government regulators to the knowledge base held by fishermen, a wide range of information can be discovered, and used for successful management and decision-making. However, meaningful

processes for allowing fishermen to participate in management are required in order to keep fishermen willing to play their role in the process.

#### 7.1.4 Participatory management processes

Many institutional structures responsible for implementing management do not allow participatory processes to be easily incorporated into their policies (Reed, 2008). DFO's current management regime, with the *Fisheries Act* placing the ultimate power over all fisheries in the hands of the Fisheries Minister, has a limited capacity to allow power sharing to be incorporated. This has resulted in efforts to incorporate participatory management without altering the framework, preventing the proper facilitation of participation as often occurs in management systems (Jentoft et al., 1998). This has hindered the participation of fishermen in decision-making for the Atlantic lobster industry from being at a level of *partnership* as opposed to *placation*.

According to interview participants, management decisions have been made using varying levels of input from fishermen throughout the province. An example of this was described in the alteration of a season opening date in two separate LFAs during the same year. In one LFA, DFO allowed a fishermen's organization to conduct a member vote, allowing the final decision to be made by the fishermen. In the other LFA, DFO made the decision without consulting with fishermen. This lack of consistency is present due to a lack of defined process for considering concerns raised by industry stakeholders, an issue identified by several participants of this study.

The appropriateness of decisions made within a management system can often be overshadowed by the process that was used to make them. Aspects such as who participated, how deliberations took place, what knowledge was shared, how conflicts were resolved, and how the final decisions were made are critical to a management system (Jentoft et al., 1998). As one interviewed fisherman described, if an individual disagrees with a final decision, the first

thing he would question is how the decision was made. For this reason, in order to improve stakeholder engagement, a formalized process for decision-making, including how fishermen are able to participate, should be developed for the industry. As recommended by Thériault et al. (2013), a policy or document outlining how fishermen can contribute to management decisions would be highly beneficial to improving fishermen participation in management, and ensuring a consistent process was followed throughout the industry.

Methods defined in a participatory management process should be tailored to the participants involved, the objectives of the process, and the decision-making context (Reed, 2008). Several fishermen who were interviewed expressed concerns over the tools used by DFO and fishermen's organizations in communicating with the industry. Mail-outs and emails used as direct communication tools from DFO were depicted as difficult and sometimes impossible to understand by fishermen; as one participant described: "You gotta be a lawyer to read that stuff!" The lower levels of formal education held by some fishermen, particularly those over the age of forty, make these forms of written communication ineffective for them. The majority of oral communications between fishermen and DFO take place at organizational meetings; however, as noted above, these meetings often suffer from low attendance levels.

The problems experienced with effectively communicating between fishermen, DFO, and organizations is one example of how current methods used to encourage fishermen participation can be improved. Increased efforts should be made to simplify the language used in written documents and communications in order to promote reading them, and to make them more comprehensible to fishermen. This would help keep fishermen informed while simultaneously promoting their involvement in management of the industry. A simple measure like accommodating the communication needs of fishermen could help to enhance the participatory process, resulting in enhanced willingness of fishermen to participate.

### 7.1.5 Trust and relationships

The effectiveness of fishermen in participatory management depends largely on their ability to speak with a collective voice (Jentoft and McCay, 1995). When fishermen lobby government regulators for different changes pertaining to the same issue, they inadvertently work against one another. One large voice is much more effective in creating change than fishermen working individually. As many of the interviewed participants expressed, fishermen are all concerned with the success of the fishery, in order to maintain their livelihood in the industry. However, in order to ensure that success they must accept that working together is the most efficient way to effect change within management, and maintain the resource at a level that can maintain the fishery.

A factor that often deters fishermen from working together is their competitive mentality. Whether there is a history of family rivalry, or a desire to catch more of the resource than the other fishermen, competitive attitudes not only increase pressure on the resource, but also hinder fishermen from participating with one another for the betterment of the industry. Due to this competition, self-restraint, caution, and solidarity among fishing communities have been breaking down (Jentoft, 2000). When social integrity breaks down within communities, the capacity for members of the community to work together becomes jeopardized (Jentoft, 2000). Without this cooperation, the base of support needed to facilitate participation with government regulators is lost, weakening the potential for a strong participatory management system (Jentoft, 2000).

Competition between individuals can also lead to distrust between them, encouraging secrecy and further inhibiting collective participation. Trust within the lobster industry is not only absent between fishermen themselves, but also between fishermen and lobster buyers. This clearly emerged when participants were asked whether buyers should be more involved in management. All except one participant responded with “no”, as they believed that buyers would make decisions based on their own financial gains, rather than the best decision for the

fishery as a whole. Many participants said specifically that they had no trust in buyers, believing that they work together throughout the province to earn more money for themselves, while paying fishermen as poorly as they can for their catches.

This level of mistrust, combined with the aforementioned distrust in DFO regulators inhibits relationships from being built among stakeholder groups. The mistrust between and within groups prevents industry stakeholders from seeing the value in each other's viewpoints, preventing them from effectively collaborating in management (Stringer et al., 2006). This lack of collaborative capability prevents the various groups from fully understanding the needs or impacts of management changes on one another. This creates a significant barrier to working together for the betterment of the industry, and can be the cause of serious misunderstandings and conflict between stakeholders.

A participant described disconnect between fishermen and government regulators in terms of the relationships they hold. He described the difficulties in creating relationships with DFO regulators as they change roles and responsibilities so frequently. This prevents them from gaining a true sense of the industry and getting to know the fishermen who depend on it. The participant perceived this as an issue that has allowed a lack of understanding to develop among regulators of the magnitude of affect some management decisions have on fishermen, using the shortening of a fishing season as an example. He also noted the lack of recognition gained by DFO employees from fishermen, in terms of what management consists of and the constraints those employees face within making decisions. This disconnect is another factor inhibiting trust between the two parties, and subsequently hindering effective collaboration.

The lack of trust present between stakeholder groups in the Nova Scotia lobster industry stems from both history within the industry and competitive mentalities. Steps are required to build the trust and relationships between fishermen and other stakeholder groups, particularly DFO regulators, in order to augment the understanding they have of one another. This will lead

to improved collaboration and a subsequent enhancement of participatory management within the industry.

## 8. Conclusion

The high level of dependence within Atlantic Canada on the lobster fishery, and the limited ability of fishermen to diversify make the continued viability of the industry critical. Through the efforts of effective fishermen's organizations, participation in management of the Nova Scotia lobster fishery has allowed valuable contributions to be made by fishermen, adding to the success of the industry. Through positive leadership and advocacy, these organizations have made significant strides in giving fishermen a collective voice for management in their respective LFAs, despite their limited resources. Nonetheless, there remains a fragmentation within the industry in Nova Scotia due to the lack of accredited organizations in all areas of the province. The formalized organization of those remaining areas would be a beneficial step to furthering the ability of fishermen to drive change within the management processes used by DFO.

Following Arnstein's ladder of citizen participation, the current level of fishermen participation within the Nova Scotia lobster industry could be labeled as *placation*, where fishermen are able to advise on issues, but share no power in making final management decisions. While this has allowed some ability to influence management decisions, it has also resulted in frustration among fishermen, as they perceive their contributions are not fully considered. This has contributed to the formation of mistrust between fishermen and government regulators, resulting in a lack of desire for fishermen to participate.

Various examples of participatory management have demonstrated how sharing power with fishermen can enhance their participation in management. Under the right circumstances, true participation can create a *partnership* between fishermen and regulators, allowing the two groups to collaborate and enhance the effectiveness of management. This level of participation

is appropriate for the Nova Scotia lobster industry, as it would allow power to remain in the hands of DFO, while facilitating meaningful participation from fishermen. This approach would ensure that the lobster fishery remained sustainable, the stocks healthy, and that fishing communities play an active role in management and decision-making for the industry.

The participation of fishermen in management is important, as they possess valuable first-hand knowledge from working in the industry, and interacting with the ocean and its resources on a daily basis. Combining local knowledge with that held by government regulators and scientists through fishermen participation can contribute to a better understanding of the fishery, resulting in better decision-making. Being fully informed on issues prior to making decisions is essential to ensure proper management strategies are implemented.

The low participation of fishermen in fishermen's organizations currently, in the form of declining attendance in their meetings can be partially attributed to the lack of value they perceive in participating. Meaningless participation over the years has lead fishermen to lose interest and confidence in their role in management, resulting in their disengagement from consultation processes. Meaningful processes are required in order to reconnect fishermen with the knowledge and discussion that accompanies meetings with their respective organizations and DFO regulators.

The process used to make decisions often holds more value than the decision itself, as it engages stakeholders in the management problem. The decision-making process must be structured and comprehensive, ensuring consistency over time and among various areas. A process should be developed for the Atlantic Canadian lobster fishery as a whole, outlining specific steps used in management and decision-making, incorporating fishermen participation. Such a process should be developed while considering the needs and capabilities of fishermen, in order to ensure their capacity to effectively participate in the decisions being made. Simple aspects such as the communication tools used can have an important impact on the level to which fishermen maintain their participation.



The ability of fishermen to work together and speak with a collective voice is essential to enhancing their role in management of the industry. The competitive mentality held by many fishermen hinders this collectivity, weakening their ability to contribute to management and resulting in mistrust among them. This mistrust extends between fishermen and other stakeholders groups as well, including buyers and government regulators. This inhibits the development of relationships, culminating in disconnect between parties that prevents effective collaboration in management.

The multiple factors identified in this paper are each conducive to the level of fishermen participation currently present within the industry, and it's effectiveness in influencing management and decision-making. There remains room for improvement in terms of the power fishermen hold in decision-making, the process used for their participation, and the relationships they hold between themselves and other stakeholder groups. As mentioned, there have been repeated recommendations to DFO to improve the processes used to incorporate fishermen participation into management and decision-making. This paper proposes that this enhancement of participatory management in Nova Scotia, and ultimately Atlantic Canada, can help fishermen to play an influential role in creating effective and equitable management decisions to ensure the sustainability of the fishery for generations to come.

Future research on this topic should be conducted in the remaining regions of Nova Scotia, to evaluate where perceptions differ between groups of fishermen. This may identify further inconsistencies with the processes DFO uses for consultations, and ways to mitigate them. Further studies should also be conducted to determine variations between the Maritime Provinces, and whether there are aspects present that would influence the success of fishermen participation in their management of fisheries, as compared to Nova Scotia. This will provide further insights into the value of incorporating participatory management practices into the lobster industry throughout Atlantic Canada, providing a broader basis for its implementation.

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## Appendix 1 – Case studies

### The Maine lobster industry

The Maine lobster industry is a valuable industry to examine, as it shows many similarities to the lobster industry in Nova Scotia. Not only are fishing practices the same, but markets are also similar and the fishery acts as the sole livelihood for many of the fishermen who participate. In 1993, lobster fishermen as well as leaders in the Department of Marine Resources (DMR) sought to have decentralized management authority for the industry. This resulted in the state of Maine developing the Atlantic Coastal Fisheries Management Act and subsequent bill defining co-management zones two years later (Barnett and Anderies, 2014). This transferred the majority of authority from the federal agency to members of the lobster industry themselves. Through this Act, the federal government gave recognition to elected industry representatives, allowing them to organize and develop regulations for the lobster fishery. As such, the federal government has also recognized customary rules and property relations. This system of management has allowed fishermen to implement measures, such as altered trap limits for example, in order to accommodate issues they perceive in the fishery (Barnett and Anderies, 2014).

### The New Zealand rock lobster industry

The New Zealand rock lobster industry varies from the Nova Scotia industry in that it is not a common-pool resource, but instead enforces individual transferable quotas (ITQs) as its primary form of regulation. Even still, the structure used to influence management decisions demonstrates a level of participatory management useful for review in comparison to the Nova Scotia industry. Each of the nine regional fishing areas in the country is represented by a group of stakeholders known as ‘CRAMACs<sup>17</sup>’ that act as management advisory committees. Stakeholders involved in these groups include quota holders, fishermen, processors, and exporters (Yandle, 2006). Each of these nine organizations nominate a representative to sit on the board of the overarching national umbrella organization for the industry, the New Zealand Rock Lobster Industry Council (NZ RLIC).

The CRAMACs focus on research and management at the regional level, while the larger umbrella organization works to advocate and represent CRAMACs on national-level issues, provides analysis, advice, technical and administrative services, as well as assisting with stock assessment research and the development of regional management plans (Yandle, 2006). This research is often a part of contracts obtained from the Ministry of Fisheries to complete scientific research and stock assessments (Miller and Breen, 2010). This organizational structure facilitates a two-way relationship between the regional and national levels in which information, expertise and responsibilities can be shared in both directions (Yandle, 2006).

The NZ RLIC acts as an advisor to the Minister of Fisheries along with a National Rock Lobster Management Group comprised of representatives from the ministry, fishing industry, environmental groups, and scientists (Miller and Breen, 2010). CRAMACs have the opportunity to present the NZ RLIC with proposals for research, and the Management Group with proposals for management changes as they see fit. These have included data collection, voluntary closures, and changes to quota allocations (Miller and Breen, 2010). This demonstrates the

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<sup>17</sup> Regional rock lobster management groups. CRAMAC is a combination of two acronyms; CRA represents “crayfish” (the informal term for rock lobster) and MAC represents “management advisory committee”.

power that fishermen hold in the management system; they are not simply consulted, but are empowered in that they can contribute meaningfully to decisions or changes being made.

#### The Eastport Peninsula Lobster Protection Committee

The lobster industry in Newfoundland experienced a similar history to Nova Scotia. With a moratorium implemented on the cod fishery in 1992, lobster stocks became heavily exploited as fishermen attempted to retain their livelihood in the fishing industry by increasing fishing pressure on lobster (Davis et al., 2006). As a result, fishermen residing on the Eastport Peninsula in Bonavista Bay, Newfoundland established the Eastport Peninsula Lobster Protection Committee in 1995 to ensure protection of their lobster stocks (Davis et al., 2006).

The Committee was initially formed by seven individuals, one representing each community within the area, and dealt with issues such as outside fishermen encroachment on traditional fishing grounds, and illegal harvesting. Later on, educational initiatives as well as monitoring and enforcement were incorporated into the Committee's functions, as well as encouraging more egg production. In 1997 the Committee was able to create an exclusive fishing zone surrounding the Peninsula for local harvesters that was accepted by DFO, as well as no-take fishing reserves in the region. Eventually, the Committee signed a memorandum of understanding with DFO that allowed coordination of research activities and enforcement in and around the closed areas (Davis et al., 2006). In 2005 the no-take areas were designated as marine protected areas (MPAs) by DFO through the efforts of the Committee, and currently all voting members of the MPA Steering Committee are residents (most of them harvesters) of the Eastport Peninsula.

#### Chile's Areas for the Management and Exploitation of Benthic Resources

Chile demonstrates a different form of participatory management through its use of Areas for the Management and Exploitation of Benthic Resources. This system gives fishermen the access rights to shellfish grounds with the condition that they take principal responsibility for management of the species in which they choose to exploit, under government supervision (Schumann, 2007). In doing so, the fishermen must hire biological consultants to produce stock assessments annually, which are subsequently reviewed by the Undersecretary of Fisheries. While the final authority rests with the State, valuable outcomes have resulted from this management structure. With increasing awareness of the fishery and the ecology surrounding it, fishermen have become more conscious of what they catch and what the implications are for the future of the fishery. Educational courses directed by hired consultants helped those who were in attendance to better understand the resource, how it grows, and what that means for management. This method of management has also contributed to a unification of fishermen within each area, allowing them to work together toward a common goal (Schumann, 2007). While this may bring with it additional conflict between fishermen in different regions, it facilitates a bond and trust within each area that creates the ability to work together and treat the fishery as a collective resource, rather than something meant for only individual gain.

## **Appendix 2 - Interview questions**

### Background

1. How many years have you owned a lobster license? Do you hold any additional commercial licenses?
2. What port do you fish out of?
3. Do you belong to a fishermen's organization? If so, have you always been a member of the same one? Why did you join this organization?
4. Would you consider yourself a 'full-time' fisherman?

### Consultation

5. Have you ever been consulted on a management decision for the lobster industry? Was this consultation done through a fisherman's organization?
6. Do you feel that regulators do adequate consultation with license holders? Do you feel that this consultation is meaningful, and consistent among different areas?
7. Have you ever participated in a vote for a management change? Do you feel that this was/is a good way to gain industry participation in management?
8. Have you, or anyone you know of, ever requested a management change? Was the request successful in getting the change made?
9. Do you feel being a member of a fisherman's organization has increased your capability to participate in management decisions being made? How so?

### Decision-making

10. Have you ever been in disagreement with a management change within the industry? Has your organization ever been in disagreement with a management change within the industry?
11. Do you feel the lobster industry is currently well managed?
12. Do you think increased involvement of license holders in management of the industry would improve it overall? How so?
13. Do you believe that a management change should only be made if there is full support from industry? Why or why not?
14. Thank you for your time. Are there any additional comments you would like to make?



### **Appendix 3 - Study information provided to participants**

#### **Project Title:**

Considerations for participatory management of the Nova Scotia lobster industry

#### **Lead researcher:**

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#### **Introduction:**

We invite you to take part in a research study being conducted by Elizabeth Baker who is a student in the Master of Marine Management program at Dalhousie University. Taking part in the research is up to you; it is entirely your choice. Even if you do take part, you may leave the study at any time for any reason. The information below tells you about what is involved in the research, what you will be asked to do and about any benefit, risk, inconvenience or discomfort that you might experience.

Please ask as many questions as you like. If you have any questions later, please contact the lead researcher.

#### **Purpose and outline of the research study:**

This research looks at the consultation and decision-making processes within management of the Nova Scotia lobster industry. In particular, the study aims to find the strengths and weaknesses in the consultation methods used by the Department of Fisheries and Oceans (DFO) to engage license-holders in management decisions being made, such as season openings and closures, conservation practices, and other alterations. Through interviews with Nova Scotia license-holders (ie. fishermen), methods currently used will be studied to determine their consistency and success in engaging industry stakeholders and making appropriate management decisions. The purpose of this study will be to identify considerations to be used by government regulators in creating a more effective participatory management system, where industry participants play a significant role in the decisions being made regarding industry management.

#### **Who can take part in the research study?**

You can participate in this study if you hold a Class A lobster fishing license in the province of Nova Scotia. The participant must be actively fishing his/her license in the year that the study is being completed (2015), and must have been a license-holder for a minimum of 1 year.

### **How many people are taking part in the study?**

Approximately 20 license-holders will be taking part in this study.

### **What you will be asked to do:**

To help us understand how license-holders can be more involved in the management of the Nova Scotia lobster industry, we will ask you to participate in a telephone interview with the lead researcher sharing your experience with the current consultation processes used by DFO. The interview will ask for your opinion on these processes and how successful they have been in managing the industry. You will also have the opportunity to provide any additional insights on the current state of the management of the industry, and how you feel this may be improved. The interview will be completed at a time of your convenience and will take no longer than forty minutes. In some cases, the interview may be audio-recorded in order to analyze the responses more fully after the interview has been completed. In this case, your consent will be asked for beforehand. Additionally, a follow-up phone call may be requested if clarification is needed.

### **Possible benefits, risks and discomforts:**

Your participation in this study will contribute to the development of recommendations to DFO of how successful their current consultation methods are, and how they could be improved. These recommendations will also include how industry stakeholders should play a role in management decisions regarding the lobster industry. Your participation will also make a contribution to knowledge surrounding participatory management and how it can be beneficial for a fisheries management system.

The risks associated with this study are minimal, and there are no known risks for participating in this research beyond being fatigued or uninterested. If at any time you wish to end the interview, you may do so.

### **How your information will be protected:**

Information that you provide to us will be kept private. In most cases, only the research team will have access to this information. In some cases, other authorized officials at the University such as the Research Ethics Board or the Scholarly Integrity Officer may have access as well. We will describe and share our findings in a thesis and class presentations. We will be very careful to only talk about group results so that no one will be identified. This means that ***you will not be identified in any way in our reports***. The people who work with your information have an obligation to keep all research information private. Also, we will use a participant number (not your name) in our written and computerized records so that the information we have about you contains no names. All your identifying information will be kept in a separate file, in a secure place. All electronic records will be kept secure in a password-protected, encrypted file on the researcher's personal computer. If the interview is audio-recorded, the recording will be destroyed immediately after analysis.

### **If you decide to stop participating:**

You are free to leave the study at any time. If you decide to stop participating at any point during the study, you can also decide whether you want any of the information that you have contributed up to that point to be removed or if you will allow us to use that information. You

can also decide for up to 3 months afterwards if you want us to remove your data. After that time, it will become impossible for us to remove it because it will already be analyzed and published.

### **How to obtain results:**

We will provide you with a short description of group results when the study is finished. You can obtain these results by including your contact information during the consent process so that the results can be shared with you upon completion of analysis. This information will be completed and sent to you no later than December 31<sup>st</sup>, 2015. No individual results will be provided in order to maintain participant confidentiality. A finalized report will be available and may be sent on request of the lead researcher, contact details listed above.

### **Questions**

We are happy to talk with you about any questions or concerns you may have about your participation in this research study. Please contact Elizabeth Baker at 902 818 9260 or [elizabeth.baker@dal.ca](mailto:elizabeth.baker@dal.ca), or Claudio Aporta at 902 494 7123 or [claudio.aporta@dal.ca](mailto:claudio.aporta@dal.ca) at any time with questions, comments, or concerns about the research study (if you are calling long distance, please call collect). We will also tell you if any new information comes up that could affect your decision to participate.

If you have any ethical concerns about your participation in this research, you may also contact the Director, Research Ethics, Dalhousie University at (902) 494-1462, or email: [ethics@dal.ca](mailto:ethics@dal.ca)