Burgeo residents' values, attitudes, and beliefs regarding a South Coast National Marine Conservation Area

by

A major project submitted to the Faculty of Science
in partial fulfillment of the requirements for the degree of
Master of Environmental Science

Faculty of Science
Memorial University of Newfoundland
May 2016

St. John's Newfoundland and Labrador

ABSTRACT

There are a variety of conservation and socioeconomic impacts associated with Marine Protected Areas (MPAs). However there is a widespread lack of successful or effective MPAs globally for various regulatory, physical, sociocultural and economic reasons. One of the most common reasons is that successful MPAs require positive local perceptions of ecological and socio-economic outcomes, a condition that is often lacking (Bennett and Dearden, 2014b). The South Coast region of Newfoundland and Labrador has been identified as a potential National Marine Conservation Area (NMCA) by Parks Canada. Parks Canada's mandate of achieving partnership with local stakeholders supports some of the key factors in determining MPA success or effectiveness. This study focused specifically on the values, attitudes and beliefs of Burgeo residents (i.e. human dimensions) toward a potential South Coast NMCA. In this study 180 residents were surveyed. Respondents mostly opposed (42.8%) the designation of a South Coast NMCA based mainly on negative perceptions of restrictions on their livelihoods and the current way of life. Those that did support the NMCA (32.8%) recognized the potential for economic development based on tourism and conservation of marine biodiversity. If a South Coast NMCA is to be considered feasible it will require greater support levels and a shift in attitudes toward MPAs based on effective stakeholder engagement and increased educational and information campaigns.

Key Words: attitudes, beliefs, Marine Protected Area (MPA), South Coast National Marine Conservation Area (NMCA), values

ACKNOWLEDGEMENTS

I would like to thank Dr. Evan Edinger and CPAWS NL Chapter for providing me with the funding required to complete this project. Without their financial support this project would not have been possible. Thank you to Mayor Barbara Barter and the Burgeo Town Council and staff for their in-kind support, which was pivotal to the completion of my field work and data collection. Many thanks to Rick and Wanda Blagdon for their wonderful lodging and facilities.

Immense gratitude and appreciation is extended to the following people whose contribution in one way or another made this project possible:

Special thanks to my parents, family and my girlfriend Valerie for their unwavering support and encouragement. Valerie, thank you for your support in the field and from the beginning of my graduate studies.

To my peers especially Ethan and Bonnie for your excellent advice and suggestions.

I would like to especially thank my supervisors, Dr. Alistair Bath and Dr. Kelly Vodden who were crucial to the completion of this project. Thank you for your guidance, advice, motivation and feedback. It has been an excellent learning experience under your supervision.

Lastly I would like to extend immeasurable gratitude to the residents of Burgeo, Ramea, Grey River and Francois, especially Dave McDonald and Ivan

Lushman for their transportation to Grey River and Francois. You provided me with an unforgettable experience through the sharing of your knowledge of the South Coast.

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1.0 Introduction

The South Coast region of the province of Newfoundland and Labrador (NL) has received interest from several groups (e.g. residents of Burgeo and the South Coast, Parks Canada and the Newfoundland and Labrador (NL) chapter of the Canadian Parks and Wilderness Society (CPAWS)) as a potential National Marine Conservation Area (NMCA). NMCAs, a form of Marine Protected Area (MPA) implemented and defined by Parks Canada (2015) are "marine areas managed for sustainable use containing smaller zones of high protection" that "include the seabed, the water above it and any species which occur there" (para. 2). This research paper will examine the potential for a sample of residents of the South Coast Region of Newfoundland to support and accept a South Coast NMCA, by seeking to better understand the perceived ecological and socioeconomic benefits and costs of such, and by considering if and how these benefits and costs might materialize in the future should designation occur.

Understanding those perceived benefits and costs will be partly achieved by a literature review of MPAs and their impacts. This will be combined with a study of Burgeo residents' values, attitudes and beliefs toward a potential South Coast NMCA, conducted using a resident survey. This baseline research will allow for discussion of the potential for a feasibility study (considered the next step in the NMCA process) and will help to inform future decision making regarding a South Coast NMCA.

1.1 Marine Protected Areas

The IUCN definition for a marine protected area (MPA) is: "Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part, or all, of the enclosed environment" (Kelleher & Kenchington, 1992 p.98). From this definition, one can easily see the purpose of marine protected areas (MPAs) and recognize the need for them in a world reliant upon the ocean and its coasts, for natural resources (e.g. food, transportation, oil, etc.). MPAs are increasingly recognized as potentially effective ecosystem based management tools for protecting marine environments from exploitation in Canada (e.g. *Oceans Act 1997)* and globally (e.g. Australia, Scotland) (Guenette & Alder, 2007). A key advantage of ecosystem based management over traditional methods of handling environmental issues in isolation, is its integrated approach (Guenette & Alder, 2007).

MPAs come in many shapes and forms (Heck & Dearden, 2012), with a variety of governing bodies and management strategies (e.g. in Canada: Parks Canada Agency- NMCAs, Fisheries and Oceans Canada- referred to as MPAs). Ecological, cultural and socioeconomic management objectives of MPAs vary for each sociocultural and environmental setting (Agardy et al., 2003; Dahl-Tacconi, 2005; Heck & Dearden, 2012). Rarely does "one size fit all".

MPAs are generally classified by their level of restriction and their objectives, as is the

case with terrestrial protected areas. Therefore it is useful to consult the IUCN categories for protected areas (Table 1) to cover the spectrum of potential MPAs.

Table 1: IUCN categories of protected areas.

Category I	Protected area managed mainly for science or wilderness protection (Strict Nature Reserve/Wilderness Area)
Category II	Protected area managed mainly for ecosystem protection and recreation (National Park)
Category III	Protected area managed mainly for conservation of specific natural features (Natural Monument)
Category IV	Protected area managed mainly for conservation through management intervention (Habitat/Species Management Area);
Category V	Protected area managed mainly for landscape/seascape conservation and recreation (Protected Landscape/Seascape)
Category VI	Protected area managed mainly for the sustainable use of natural ecosystems (Managed Resource Protected Area). (IUCN, 1994)

(Adapted from Kelleher, G. (1999). Guidelines for Marine Protected Areas. IUCN, Gland, Switzerland and Cambridge, UK. xxiv +107pp)

There are a range of examples of how MPAs can fit within this categorization (Kelleher, 1999) which will not be detailed here. However for context, the most strict marine reserves (e.g. U.S. Pacific Remote Islands Marine National Monument) (Marine Conservation Institute, n.d.) or no-take zones would fall within protected area category I, whereas NMCAs such as the Lake Superior NMCA and the potential South Coast NMCA would likely fit into Category VI (Table 1). To avoid confusion, the term MPA will be used from here on as an "umbrella term" to capture all categories of MPAs mentioned above. This will allow for a broader understanding of MPAs as the literature rarely focuses on one specific type when considering the array of

impacts, especially from a sociocultural and economic perspective.

1.2 Marine Protected Areas in Canada

There are an estimated 797 MPAs in Canada covering 56, 000 km² of the country's oceans and Great Lakes[1] (Government of Canada, 2010). Primary reasons for protecting marine areas in Canada include: (1) ecological (23, 106 km²), (2) ecological and socio-cultural (13, 336 km²), and (3) ecological, socio-cultural and sustainable harvesting (12, 338 km²) (Government of Canada, 2010).

The three agencies with federal statutory powers for protecting marine areas in Canada are: (1) Fisheries and Oceans Canada (DFO), (2) Environment Canada and (3) Parks Canada. As mentioned above Parks Canada is responsible for NMCAs, which "encourage public understanding, appreciation and enjoyment" while "DFO and Environment Canada are concerned particularly with conservation purposes" in establishing MPAs (Dearden & Rollins, 2009, p. 407). However both conservation and public understanding, appreciation and enjoyment can serve to complement each other.

1.2.1 National Marine Conservation Areas (NMCAs)

Implementing NMCAs is Parks Canada's way of representing the full range of marine ecosystems – in Canada's Atlantic, Pacific and Arctic oceans along with its Great Lakes –

[1] Parks Canada includes the Great Lakes in its 29 marine regions identified for NMCA designation (e.g. Lake Superior NMCA).

within its protected areas system. NMCAs recognize the benefit, education and enjoyment of people when protecting and conserving marine areas, a key differentiation factor from the strict no-take MPAs. Prohibited activities include: ocean dumping, undersea mining and oil and gas exploration and development. Traditional fishing activities are permitted along with marine research and ecological monitoring and marine interpretation and recreation. The latter activities have associated NMCAs with increased tourism opportunities (e.g. Lemelin and Dawson, 2013).

In consultation with scientists Parks Canada has developed a framework of 29 physically and biologically distinct marine regions across the country for protection via Canada's National Marine Conservation Areas System Plan. Parks Canada is falling short of its goal to protect the 29 identified marine regions through NMCAs, with their four currently designated sites: Fathom Five National Marine Park in Georgian Bay Ontario, Saguenay-St. Lawrence Marine Park in Quebec, Gwaii Haanas NMCA and Heritage Site, and Lake Superior NMCA (Parks Canada, 2014). In February, 2012 the provincial government of NL turned down Parks Canada's request to complete a South Coast NMCA feasibility study to advance a potential fifth NMCA location (Ballam, 2013). Apparent reasons for this decision include the potential for aquaculture development and subsea oil and mineral exploration (Ballam 2013; McLeod, 2013). A South Coast NMCA would allow Parks Canada to represent the identified Laurentian Channel Region, one of the 10 marine regions in the Atlantic Ocean that are currently unrepresented by this agency[2].

[2] The Laurentian Channel was declared an Area of Interest (AOI) for potential designation as a MPA under the *Oceans Act* in June 2010 (DFO, 2014).

Despite ongoing efforts in Canada to expand its NMCA system and the increasing use of MPAs worldwide, it appears there is a widespread lack of successful MPAs (Christie et al. 2003; White et al. 2002) for a variety of reasons. The following section will briefly explore some of the conservation and socioeconomic impacts of MPAs and their shortcomings to develop the context of this research project.

1.3 Impacts of Marine Protected Areas

1.3.1 Improvements to Density, Biomass, Size and Diversity

Up until the early 2000's much of proclaimed success or benefits of marine reserves or MPAs was anecdotal in nature (Halpern, 2003), or in other words, not based on rigorous scientific analysis. Since then, several studies have assessed globally, whether MPAs are having positive impacts on marine life (e.g. Cote, Mosqueira & Reynolds, 2001; Gell & Roberts, 2003; Halpern & Warner, 2002; Halpern, 2003; Lester et al. 2009) and the effects that these impacts have on adjacent fisheries (Halpern, Lester & Kellner, 2009; Roberts, Bohnsack, Gell, Hawkins & Goodridge, 2001; Russ & Alcala, 2011).

Halpern (2003) specifically evaluated whether four biological factors (density, biomass, size and diversity of organisms) were affected by marine reserves and whether effects were influenced by reserve size (in no-take zones). This revealed an overwhelming association of reserves with higher values of density, biomass, organism size and diversity of species for four separate functional groups of organisms: herbivores, planktivores/invertebrate eaters, carnivores and invertebrates (Halpern, 2003) (Figure 1). Interestingly, the relative magnitude of the above effects were found to be independent of

reserve size. However, Halpern (2003) highlights the important distinction between relative and absolute measurements by clarifying that a doubling in small reserves, from 10 to 20 fish may not be quite as beneficial as a doubling from 5,000 to 10,000 fish in a large reserve.

In addition Edgar et al. (2014) found: "species richness of large fishes was 36% greater inside MPAs compared to fished areas, biomass of large fishes was 35% greater and sharks 101% greater" (p. 217). The importance of reduced fishing towards conserving and rebuilding fish species is therefore quite evident. Not only targeted species, but those that often fall victim as by-catch to particular fishing methods (e.g. sharks to long-line fisheries) may benefit tremendously from reduced or eliminated fishing effort (Edgar et al., 2014; Gallagher, Orbesen, Hammerschlag & Serafy, 2014).

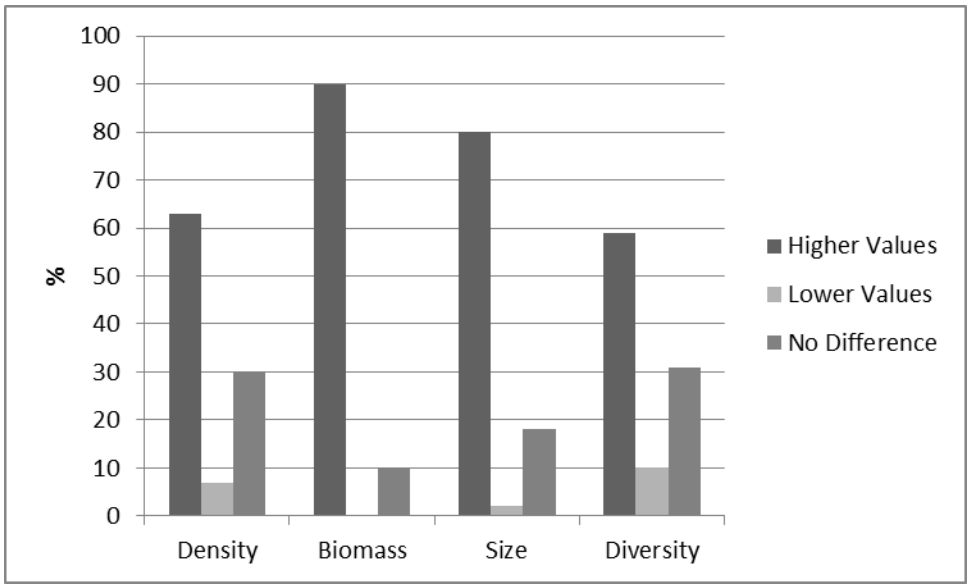

Figure 1: Differences in biological measures between: inside a marine reserve and outside a marine reserve for all organisms grouped together (overall). Dark grey bars represent higher values reported inside a reserve, light grey - lower values reported inside reserve and medium gray - no difference between reserve and non-reserve areas (Halpern, 2003, p. s122).

It is also important to acknowledge the effects MPAs may have on pivotal, sedentary species such as corals. Corals form the very basis of the food web in many tropical areas – providing habitat requirements (e.g. food, shelter) for a diversity of fish species (Grassle, 1973; Sale, 1977). MPAs have proven beneficial in preventing coral loss when compared to unprotected reefs (Selig & Bruno, 2010). This trend was observed in both the Caribbean and Indo-Pacific oceans, emphasizing MPAs role in not only protecting reefs from coral loss, but suggesting that with time, coral cover may in fact increase (Selig & Bruno, 2010). It is worth noting however that MPA designation alone may not defend coral reefs from all external threats and one need only look to the detrimental coral bleaching occurring in the Great Barrier Reef Marine Park (GBRMP Authority, 2014). Therefore it is of crucial importance to mitigate or eliminate harmful practices which damage corals (i.e. precautionary approach) through the use of MPAs and/or related measures, as processes such as ocean acidification (Caldeira & Wickett, 2003; Orr et al., 2005) may be much more difficult to defend against (i.e. transcend the boundaries of MPAs) in the future.

1.3.2 Temporal Effects of MPAs

A review by Halpern (2002), revealed a variety of studies examining the effects of time on species within marine reserves that indicated biological measures either increased, changed very little, and/or decreased with time. However studies tend to focus on specific species or species groups and therefore warrant a more "general understanding of temporal impacts of reserve protection" (Halpern, 2002 p. 362).

Through a literature review Halpern and Warner (2002) evaluated invertebrates and fish from all trophic groups, analyzing the grand mean change (relative change) in any of all four biological measures (alluded to above). All measures reached near mean values within the first 1-2 years of protection, therefore the intended functions of marine reserves should be attained relatively quickly and persist through time. The benefit of older reserves (>10 years) was made clear by Edgar et al. (2014) which seems to support the findings of Halpern and Warner (2002), that ecological benefits of reserves can be long lasting. This may hold particularly true for slower growing or larger species as it would intuitively take time for effects of protection to materialize. However, the limitations of these findings include their lack of generalizability for all marine species. For example, species which display relatively slow growth and late maturation (e.g. Atlantic cod *Gadus morhua*) may not respond as quickly as species with faster growth and shorter lives (e.g. scallops *Pectinoidea*) (Halpern and Warner, 2002).

Other limitations of the above findings must be considered, such as the complexity of exploitative fishing practices. Overfished species may see a rapid increase in density, biomass etc. when fishing practices are limited (Halpern and Warner, 2002). Whereas those species that are not commercially harvested may exhibit no change or even declines due to increase in competition or predation from species that are suddenly rebounding. Therefore it is important to understand ecosystem dynamics before management and decision makers implement no-take MPAs. Overall there may be no way of predicting all outcomes of MPA designation, especially if ecosystem interactions, keystone species and potential trophic cascades are not well understood.

1.3.3 Impacts to Fisheries and Resource Management

There is clearly a body of evidence that points towards MPAs with no-take zones being especially beneficial to a variety of species (see above). However no-take zones may be interpreted by fisheries managers and harvesters alike as being too restrictive. Fishers are specifically concerned with decreased catches and the associated costs of increased travel time to reach fishing grounds (Gell & Roberts, 2003). Like the management of any natural resource, trade-offs must be considered. The above results suggest that if fisheries are going to be sustained into the future important habitat must be set aside for protection. No-take zones, upon further examination by fisheries managers and fishers, may not be quite as restrictive on fishing activities as they appear. No-take zones may prove beneficial to the fishery.

No-Take Zones

The ecological benefit of no-take MPAs is that fish stocks will be protected indefinitely and decisions to re-open a temporary fishing closure prematurely are less likely to occur, if not prevented outright (due to strict legislation) (Day et al. 2012). In addition to increases in abundance, diversity and biomass of many species within their boundaries (Halpern 2003; Lester et al. 2009; Micheli, Halpern, Botsford & Warner, 2004), no-take MPAs have the potential to create spillover effects (Bennett and Dearden, 2014; Bohnsack, 1998; Salm, Clark & Sirilla, 2000). Spillover effects are the increased abundance and biodiversity of fish occurring outside the boundaries of reserves, which can help to achieve both conservation and utilization of fish species (Halpern et al., 2009; Roberts et al., 2001; Russ & Alcala, 2011). This has the potential to eliminate conflict between fishery and conservation goals and contribute to overall

sustainability of fish populations or stocks (Halpern et al., 2009; Russ & Alcala, 2011).

Studies on increased Catch Per Unit Effort (CPUE) of various species, within and adjacent to reserves when compared to outside or in exploited areas, are quite abundant (e.g. Bennett and Atwood, 1993; Cowley et al. 2002; Davidson, 2001; Goni et al. 2001; Roberts et al. 2001; Tawake et al. 2001). CPUE is used in fisheries management to indirectly measure the abundance of a target species. Increased CPUE bodes well for potential socioeconomic spin-offs of re-established commercial fish species and increased catches associated with MPAs.

Despite perceived benefits of spillover effects, if fishing effort is not monitored and managed effectively, the problem of over exploiting the spillover can take place, partly reversing the positive impacts (Agardy et al., 2011). In that regard, the presence of buffer zones with decreased fishing effort around no-take areas can prove beneficial, particularly for species that have low rates of movement (e.g. rockfish) (Salomon, Waller, McIlhagga, Yung & Walters, 2002). Also, a need for connectivity of multiple MPAs forming MPA networks (Christie & White, 2007) cannot be overlooked. It has been suggested that connectivity may be even more important to the efficiency of MPA networks than habitat quality in promoting recruitment of open populations of dispersed larvae back into the more localized adult population (Berglund, Jacobi & Jonsson, 2012).

A crucial factor to allow spillover effects to occur is again rooted in the design of MPAs and depends on the target marine species. If no biological linkage exists between open and closed areas, then MPAs can fail in promoting spillover effects and will only enhance local ecological impacts (Sanchirico, 2000). In other words spillover effects in non-protected areas cannot be guaranteed due to increased fishing effort. Again, highly

migratory pelagic species may or may not benefit from spillover as it spends much of its time outside of the MPA (Sanchirico, 2000). This stresses the importance of the interconnectivity and the potential movability of MPAs when attempting to conserve pelagics. However identifying and targeting so called nursery habitats of species which have mobile larvae may prove potentially beneficial (Janes, 2009).

1.3.4 Socioeconomic Impacts

As mentioned above if spillover effects do occur, which appears to be dependent on reduction of fishing in certain areas, then enhancement of fisheries and hence economic benefits may accrue. It is challenging to pin down the total socioeconomic benefits resulting from MPA designation due to the difficulty associated with applying a cost-benefit analysis to MPAs (Claudet, 2012). Such an analysis is outside the scope of this study. As an example however, in a study of 12 Mediterranean MPAs, average yearly incomes generated by the ecosystem services of MPAs were revealed to be: €710, 000 per MPA in the case of fishing, €510, 000 in the case of scuba diving and €88, 000 in the case of recreational fishing (keeping in mind the yearly average MPA management costs was €588, 000 per year) (Alban et al., 2011 as cited in Claudet, 2012).

It is important to recognize the potential for economic opportunity, but it varies with the increasing complexity and variety of MPAs and management regimes worldwide. In the case of a South Coast NMCA, with Parks Canada's reputation for visitor attraction and tourism development, tourism arises as the most obvious and straightforward example of potential economic development.

The designation of MPAs can be promoted as a job and money generator for locals who wish to avail of tourism potential. Such a process has been defined as the "designation effect" or the ability of a particular designation such as an IUCN MPA or UNESCO World Heritage Site (WHS) to attract visitors and hence visitor dollars (Lemelin and Dawson, 2013). Specifically, if MPAs are successful in attracting visitors it may lead to job creation, tax revenues and income for locals (Sanchirico et al., 2002; Claudet, 2012). The extent of the outcome is of course dependent on many factors such as location (e.g. inshore vs. offshore) (Sanchirico et al., 2002) or accessibility, or the extent of attractions within the protected area.

Tourism Expectations

The Burgeo Diversification Development Board submitted an application to Parks Canada in 2003 to consider the South Coast region as a potential NMCA. This effort on part of local communities illustrates the recognition of the benefits that may come with NMCA designation. Ecological benefits aside, the application prepared by Burgeo Diversification Development Board (BDDB) clearly highlights the naturally and culturally unique attractions of the area (BDDB, 2003). This speaks to a primary goal of protecting the resources of the South Coast and attracting visitors and visitor dollars as well as government funding to help with economic development of the region. The limitations of tourism in a similarly remote region of Northwestern Ontario have been documented, but with large government investment in the adjacent Lake Superior National Marine Conservation Area (LSNMCA), expectations are high (Rosehart, 2008).

A focus on capturing and retaining visitors with well-planned tourism (e.g. abundant

and diverse visitor experiences) can potentially benefit local communities and regional economies (Agardy, 1993; Lemelin, Koster, Wozniczka, Metasinine & Pelletier, 2010; Lemelin and Dawson, 2013). Economic diversification associated with well supported, non-consumptive and ecotourism-based opportunities can occur as a result of conservation initiatives and protected areas designation (Rosehart, 2008; Bennett, Lemelin, Koster & Budke, 2012). As in the case of the LSNMCA or the Saguenay- St. Lawrence Marine Park (one of Canada's most visited Canadian tourist attractions in 2008), increased visitation to the South Coast of Newfoundland is attainable (Lemelin et al., 2010).

In order for benefits of tourism to be realized or attained in the South Coast Region however, it will likely depend on the attitudes of local residents. Wozniczka et al. (2010) describe attitudes toward tourism development as being possibly linked to the current state of the economy. Positive attitudes towards tourism in particular tend to follow the destabilization of traditional, resource economies (Wozniczka et al., 2010). This is a possible explanation for BDDB's interest in a South Coast NMCA (following the Northwest Atlantic cod moratorium) as was the case with forestry communities (e.g. Red Rock, Nipigon and Lake Helen First Nation) adjacent to the LSNMCA (Lemelin et al., 2010).

1.4 What Makes MPAs Effective or Ineffective

As alluded to above MPAs can indeed be beneficial to marine biodiversity, but many are ineffective due to a variety of shortcomings. This begs the question as to what factors or criteria make for a more successful or effective MPA.

1.4.1 Regulatory and Physical Characteristics

Edgar et al. (2014) in an extensive review of 87 MPAs worldwide found that conservation benefits increased at an exponential rate with the accumulation of five key features: no take, well enforced, old (> 10 years), large (> 100 km²) and isolated by deep water or sand (Abbreviation: NEOLI). It may appear obvious that these factors are essential to achieving conservation through MPAs, but it is a rare occasion when the multitude of MPAs worldwide possess all, or even four of these features (i.e. only four sites in total contained all five features: Cocos, Costa Rica; Malpelo, Columbia; Kermadec Islands, New Zealand; and Middleton Reef, Australia) (Edgar et al., 2014).

No-take zones are limited by the amount of enforcement and hence compliance of local and foreign fishers (Agardy et al., 2011; Guidetti et al, 2008). Monitoring the activities of MPAs may be made difficult by many underlying factors such as proximity to land, communication with local fishers, and the financial resources of the management or governing body responsible for the MPA. In the case of Wakatobi National Park in Sulawesi Indonesia, it became evident that the MPA was designated and established without effective consultation with locals on their traditional subsistence activities in the region. Upon further examination it was discovered that many illegal fishing activities were occurring inside the MPA unbeknownst to management. Illegal activities that damaged the important coral reefs in the area ranged from dynamite and potassium cyanide fishing to coral mining. Compliance on these issues was minimal due to locals not viewing these subsistence activities as illegal (e.g. coral mining) or connected to overfishing and regulators simply being unaware of the extent of the problem (Elliott et al., 2001).

There are obvious limitations to small reserves, especially regarding the protection of large species with extensive migration routes, such as cetaceans (e.g. whales, dolphins, porpoises etc.). Therefore designation of MPAs to the improper scale (i.e. improper matching of protected area size and design to the home range of particular species) can cause them to fall short of their intended goal (Agardy et al., 2011). Such improper designs have materialized in the form of: a Biosphere Reserve in the Gulf of California failing to protect a crucial 40% of the vaquita's (*Phocoena sinus)* core habitat and The Gully MPA (off eastern Canada) insufficiently protecting the northern bottlenose whale (*Hyperoodon ampullatus)* from boating traffic, due to reserve size restrictions (Hooker et al., 1999; Rojas-Bracho, Reeves & Jaramillo-Legoretta, 2006 as cited in Agardy et al., 2011).

Large size intuitively means greater area protected and therefore greater impact. That being said aiming for large, isolated areas seems to be increasingly more common in certain nations (e.g. Pacific Remote Islands Marine National Monument) and this may not be entirely positive for marine conservation. As seen with land-based protected areas (e.g. Northeast Greenland's "Rock and Ice" National Park), politically motivated decision makers are biasing MPAs to areas of little interest to resource extraction to minimize conflict (Devillers et al., 2014).The term used to describe these protected areas is 'residual' and the problem with this method is clear. Fisheries will be purposely concentrated in areas where there is greater production, which is often associated with biodiversity. Continuing to allow fishing in certain areas, that due to depletion of fish stocks warrant protection, can effectively defeat the purpose of MPAs (i.e. conservation).

Australia with its large MPAs protecting the Great Barrier Reef is possibly the

country most often associated with MPA emergence as an ecosystem based management approach. Overall, through a national analysis of Australia, it was discovered that developing systems of MPAs/no take zones "do not give precedence to more threatened biodiversity features, they do not adequately represent all biodiversity features of interest, nor do they represent more threatened examples of features that are different from less threatened examples" (Devillers et al., 2014, p. 17). Reasons for this lack of adequate conservation appear to be linked to bias towards commercial activities and lack of quantitative objectives for representivity, among others (Devillers et al., 2014).

With an estimated number of 11, 333 MPAs globally (Marine Conservation Institute, 2014) it appears there are widespread problems with the process of identification of marine areas for MPA designation. This may be linked to the use of our oceans for a multitude of operations such as transportation, industrial development, fishing, and tourism, to name a few. When policy and decision makers strive to achieve a balance between conservation and the above extractive processes, the result may or may not be entirely beneficial from a 'conservation of marine biodiversity' standpoint. Achieving such a balance may not be easily attainable and some tradeoffs must be made to ensure that MPAs are not simply "paper parks" (Kelleher, 1999). This can be difficult due to many countries' and coastal nations' long history of fishing, which may be the most direct identifiable threat to marine life.

1.4.2 Sociocultural Considerations

Although MPAs can prove successful by leading to increases in density and biomass of protected species (Halpern 2003), some discrepancies are bound to exist.

Lundquist and Granek (2005) state that regarding successful marine conservation in general "the inclusion of available science (both scientific and local knowledge), marine protected area design considerations, and long term monitoring strategies that assess success at all levels – scientific, social, economic – are important tools in the process" (p.1777). A narrow focus on the outcomes of MPAs, accompanied by inattention to the importance of inputs (e.g. governance, management and local development), may be a key driver in the wide-spread lack of successful or effective MPAs (Bennett & Dearden, 2014a; Chuenpagdee et al., 2013; Christie et al., 2003;White et al., 2002).

There are many sociocultural shortcomings of current MPAs around the world. If we are not careful in the designation, planning and management of MPAs, they can fail to achieve their purpose and even have negative consequences for marine conservation (Agardy et al., 2011). If managers and planners focus too heavily on tourism and economic benefits of MPA designation, it may lead to one or more of the five main types of shortcomings that Agardy et al. (2011) illustrate, particularly: "failure due to unprotected surrounding ecosystems and/or dangerous illusion of protection when in fact no protection is occurring" (p. 226).

However if MPAs are going to be accepted and supported by local stakeholders, allowance for economic benefits (e.g. tourism, recreation, commercial fishing) and alternatives to extractive use may be beneficial to that end (Heck & Dearden, 2013). If those benefits are in turn perceived by local stakeholders, it may increase support for MPAs and NMCAs (Heck & Dearden, 2013; Sesabo et al., 2006). This can be achieved through involvement of social structures and use patterns of locals in development

processes (e.g. Fiske, 1992). The importance of local involvement in determining support for MPA designation can be seen in an example from Newfoundland and Labrador. The successful establishment of a MPA on the Eastport Peninsula was made possible by a community driven co-managed process (Charles & Wilson, 2009; Davis, Whalen & Neis, 2006). A key factor in this success was the bottom-up approach of first establishing a lobster protection area, protected and monitored by local fisherman and community members. On the other hand a top-down approach to the attempted establishment of an MPA by DFO in Leading Tickles, NL failed due to an overwhelming lack of community support (CBC News, 2007).

Intentions in creating MPAs may include local involvement, but it is more important that those intentions are sustained. This did not occur in a Marine Park development in Mafia Island, Tanzania. Although intending to involve local residents, this project became exclusionary due to bureaucratic processes (Walley, 2010). Despite some scientists' wishes to utilize residents' local knowledge, in the end locals were deemed as lacking the proper education credentials (Walley, 2010). Removal of locals' ideas and knowledge of their surroundings, in this case, the ocean as a resource, will surely yield negative repercussions from a socio-cultural and economic aspect (e.g. displacement).

It appears there needs to be some control and benefit by local stakeholders in order to garner support from local community members for conservation efforts (Bennett & Dearden, 2014b). This benefit may solely be the perceived protection of local fish stocks as sustainable management of a resource or the tourism-generated economic spin-offs of a potential designation effect (Lemelin & Dawson, 2013). Benefits and costs of

marine reserves in general are wide ranging: the former (going beyond ecological and resource management) include strengthening of rights to a clean environment, improved tourism opportunities (e.g. boating, diving), management of cultural resources, enhanced oceanographic research opportunities and external effects such as buffer zones (Hoagland, Kaoru & Broadus, 1995). The costs however can materialize as: lost economic opportunities (e.g. mineral exploration and development), monitoring and enforcement on livelihoods, the expense of conducting research and education, risk of developing a paper park (ineffective ecologically or economically), and the risk that zoning the area is often difficult to reverse (Hoagland et al., 1995).

Arguments have been made that MPA designation should achieve not only protection of biodiversity, but ensure the rights and livelihoods of locals (Elliott et al., 2001; Lemelin & Dawson, 2013; Mascia & Claus, 2009; Samonte, Karrer & Orbach, 2010). That being said if an MPA is to be designated on the basis of protecting a highly endangered fish population, livelihoods may need to be put aside temporarily if not permanently, especially if we are approaching the elimination of said species. This presents only one example of the dilemma that faces MPA planners and decision makers in attempting to achieve a balanced approach to resource management. Effective stakeholder engagement and assessing local attitudes, beliefs and values at the pre-development stage may help with the resolution of this dilemma.

1.4.3 Stakeholder Engagement

Just as Parks Canada requires stakeholder engagement with coastal communities, it is recognized by many (e.g. Fiske, 1992; Kenchington & Kelleher 1995; Kelleher, 1999; Charles

& Wilson, 2009; Walley, 2010) to be of crucial importance if any benefits of MPAs are to be realized. Stakeholder engagement is presently seen as a necessary condition for success of MPAs (Dearden & Rollins, 2009). Protected areas of any kind are bound to be viewed by the general public (Burgeo residents included) as either positive, negative or both. While some may see economic diversification, others see only "intrusive management tools" (Cartwright, 2003; Lemelin et al., 2010). That is why it is key to garner an understanding of the perceptions of Burgeo Residents at a pre-implementation stage to mitigate against later stage conflicts (Cocklin, Craw & Mcauley, 1998; Kenchington & Kelleher 1995; Smith, 1982). Also the mere occurrence of listening and documenting values, attitudes, and beliefs is the first step in achieving engagement. Using that data to inform decision-making and management is the next step.

1.4.4 Local Values, Attitudes, and Beliefs

For successful implementation of MPAs, there is a need to understand local values, attitudes and beliefs in the early stages of the creation of MPAs. General definitions of the above terms as defined by Rokeach (1973) and summarized by Allen et al. (2009) are as follows: (1) *values* are relatively general, yet enduring conceptions of what is good or bad, right or wrong, desirable or undesirable (2) *attitudes* are tendencies to react favourably or unfavourably to a situation, individual, object or concept (3) *beliefs* are judgements about what is true or false – judgements about what attributes are linked to a given object (p. 23). These social factors fall within the realm of 'step-zero' of MPA establishment: ensuring the conditions, drivers and processes prior to MPA planning and establishment

(Chuenpagdee et al., 2013).

Understanding of local values, attitudes, and beliefs can be partially achieved through a human dimensions-like approach to natural resource management. The Human Dimensions Research Unit, Cornell University (2005) states: human dimensions of natural resources refers to "the social attitudes, processes, and behaviours related to how we maintain, protect, enhance, and use our natural resources." Understanding the public's level of knowledge along with their beliefs and attitudes toward a MPA can prove beneficial (Charles & Wilson 2009; Davis, 2002). The benefit of gauging the attitudes and perceptions of local stakeholders (e.g. fishers) and encouraging participation in the planning processes of MPAs, range from increasing support to decreasing alienation (Suman, 1999; Gleason et al., 2010).

Successful establishment and management of conservation regimes in general, rely on public consultation and participation. Benefits of early involvement include negotiation and mitigation of adverse effects, and avoiding consequence of late stage conflicts (Cocklin et al., 1998; Kenchington & Kelleher, 1995; Smith, 1982). Monitoring of attitudes, specifically towards social impacts of Marine Reserves in New Zealand, has proven beneficial and transferable to other marine conservation initiatives (Cocklin et al., 1998). Wolfenden, Cram & Kirkwood (1994) support the acknowledgement of anthropocentric and ecocentric values through social science methodologies and that gauging local beliefs, attitudes and knowledge may help resolve tensions between socioeconomic development and protection of marine environments.

Insight gathered from local stakeholders beliefs, attitudes and knowledge can be utilized to influence policy, management and decision- making processes and programs (Decker & Chase 1997; Majic & Bath, 2010; Wolfenden et al., 1994). There are many human dimensions to be considered when planning MPA establishment including, but not limited to: objectives and attitudes, effective governance, concerns about displacement, and costs and benefits (Charles & Wilson, 2009). The focus here being again on the attitudes toward general costs and benefits associated with MPAs.

There is a need for a baseline study to establish an indication of support for a South Coast NMCA designation focused on cost-benefit perceptions and attitudes of local residents. This support will in turn help shape the success of, and determine the potential benefits or costs that may stem from the South Coast NMCA. The range of both natural and sociocultural benefits mentioned above can aid in the protection and promotion of the South Coast region and help to achieve rural economic development. Finding the balance between such benefits and costs (e.g. industrial development limitations) is important. It is necessary to understand these potential benefits and costs as well as local perceptions of such, to determine support levels and hence potential 'success' of MPA designation. Before any perceived benefits can be realized, certain inputs or indicators must be in place to help ensure an ecologically and socially 'successful' MPA is attainable. In the context of MPAs, social and ecological success or effectiveness is interdependent.

The overarching purpose of this project is therefore to document and identify

Burgeo resident's values, attitudes, and beliefs regarding a potential South Coast NMCA and gauge levels of support or opposition. This will allow for continued discussion of the feasibility of a South Coast NMCA. Perceptions of socioeconomic and ecological outcomes may ultimately determine the potential support for and success of a South Coast NMCA (Agardy et al., 2003; Christie et al., 2003; Heck, Dearden & McDonald, 2012; Bennett & Dearden, 2014b). Engaging residents in a mixed intra-method (qualitative/quantitative) survey of residents' perceptions and analyzing indicators of readiness for and feasibility of a South Coast NMCA, will help to achieve the above purpose.

2.0 Problem and Purpose Statement

The purpose of MPAs is first and foremost to protect and conserve biodiversity therefore it must take precedence before socioeconomic benefits can be realized. The most recognizable economic benefits of MPAs (e.g. fishing and tourism) depend upon health of fish stocks, other species and the environment as a whole, further supporting this idea. Furthermore, inclusion of appropriate and available science and consideration of variables such as: target ecosystems, size, and no-take areas are major determinants of the success of MPAs (Agardy et al., 2011, Lundquist & Granek 2005).

From the planning stages to establishment and management of MPAs (and all of the in between processes), community involvement is essential (Lundquist & Granek 2005; Mascia, 2003). Inadequate involvement of stakeholders can fuel

opposition to MPAs, therefore warranting transparent, participatory, planning processes (Agardy et al., 2011). Use of a social science approach, specifically surveying local residents, can help to achieve 'step-zero' (Chuenpagdee et al., 2013) and set a precedent for future involvement of local stakeholders in planning processes (if such processes commence). This in turn supports social learning (Bandura, 1963) through engaging in decision making. The success of a community driven, co-managed process towards a MPA on the Eastport Peninsula of Newfoundland, for example, supports the above arguments (Charles & Wilson 2009, Davis et al., 2006). Analyzing and presenting indicators (e.g. attitudes and beliefs) for a South Coast NMCA may identify reasons for support and/or opposition and therefore it is important for MPA planning.

2.1 Research Goals

This research project will portray the potential for the South Coast Region of Newfoundland to support and accept a South Coast NMCA. To achieve this goal I identify and document local residents' values, attitudes and beliefs regarding the proposed South Coast NMCA. This in turn will help to display its potential to protect the marine biodiversity of the region and support rural economic development for local communities (e.g. Burgeo, Ramea, La Poile, Francois and Grey River). Since, "the success of MPAs is predicated on positive local perceptions of socio-economic and ecological outcomes in many locations" (Bennett & Dearden, 2014 p. 107), residents' values for the natural history (e.g. wildlife, landscapes) and socioeconomic development of the region (e.g. ecotourism potential) will help

determine the overall effectiveness of the proposed site in achieving conservation and development goals in the future. A mixed intra-method questionnaire (Katsirikou & Skiadas, 2010) will be used to assess the perceived benefits or costs by locals, of a potential NMCA designation.

The overall goal of this project is to: (1) better understand the perceived ecological and socioeconomic benefits and costs of an NMCA in the South Coast region so as to (2) gauge support (or lack thereof) for the NMCA to obtain information relating to its feasibility. This should inform a preliminary feasibility study to help direct future action, policy and decision making regarding potential NMCA establishment.

2.2 Objectives

The purpose of this applied conservation research project is to assess the readiness of the South Coast Fjords for NMCA designation, with particular attention to the level of resident support and resident perceptions regarding the designation. This will in turn help in determining its potential effectiveness towards conserving biodiversity and promoting rural economic development. More specifically my research objectives are:

1) Identify and document: (i) residents' perceived knowledge, beliefs and values related to a potential NMCA in the South Coast region and its cost and benefits and (ii) the degree of resident support or opposition (e.g. attitudes) to the establishment of a NMCA in the South Coast region and the reasons behind this support or opposition.

2) Discuss the implications of public perceptions, support and/or opposition toward the feasibility of a potential designation.

3.0 Study Area

3.1 The South Coast Region

"Located between Port-aux- Basques and the Burin Peninsula, the southwest fjords of Newfoundland offer a stunning coastal landscape from low sandy beaches in the west to immense granite cliffs and deep fjords in the east (CPAWS, 1997-2011, para. 4) (Figure 2)." The marine environment is considered to be ecologically rich, providing habitat for several species of whales: humpback, minke, orca and the globally rare and endangered blue whale. Endangered leatherback turtles and piping plover also frequent the area. The region boasts a diversity of migrant land and shorebirds and a productive spawning, nursery, rearing and feeding area for lobster (CPAWS, 1997-2011).

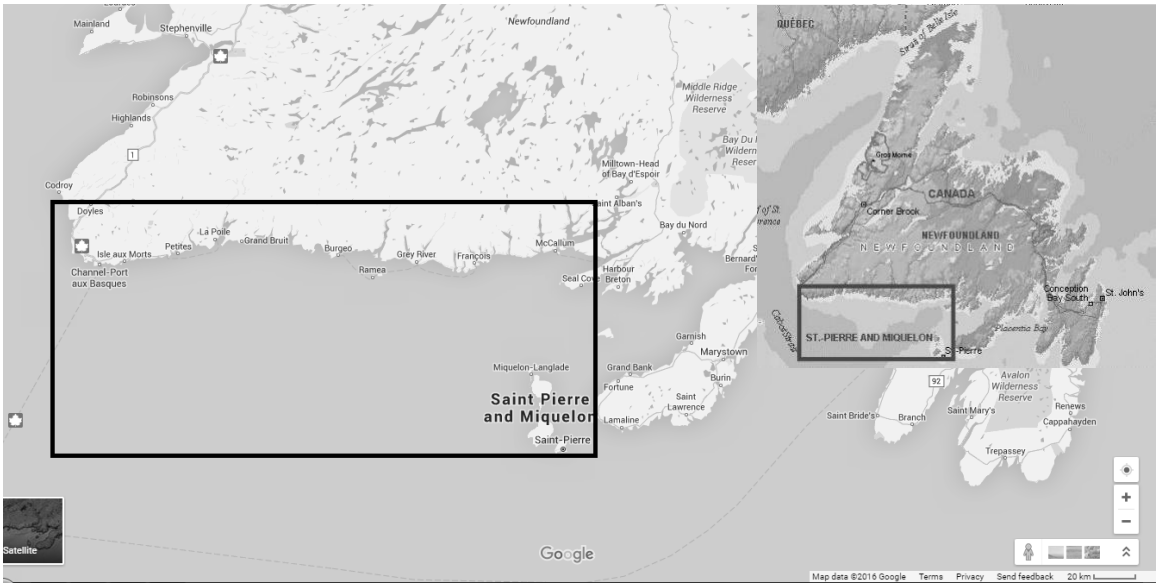

Figure 2: Approximate location of the South Coast region (Google Maps, 2014; Curran, 2010).

In 2003 when the Burgeo Diversification Development Board (BDDB) submitted an application to Parks Canada to perform a feasibility study for a South Coast NMCA, it was requested to include the coastal and marine geographic region from the Eastern Head of La Poile Bay – East to Francois and seaward to encompass the Island of Ramea and the Penguin Islands. This would therefore encompass the communities (from west to east) of Grand Bruit, Burgeo, Ramea, Gray River and Francois (BDDB, 2003). Grand Bruit has since been resettled with all remaining residents relocating as of July, 2010 (The Canadian Press, 2010). Collectively the remaining four communities and La Poile make up the political geography of "Local Area 31: Burgeo Area" in the Government of Newfoundland and Labrador's Community Accounts database (equivalent to Statistic's Canada CCS's 3E, 3F and 3I) (NL Stats Agency, 2014b).

The study area to be considered by Parks Canada has since been focused on a 15,000 km² area further east than that proposed by the BDDB (excluding Grand Bruit and including the community of McCallum) (Figure 3).

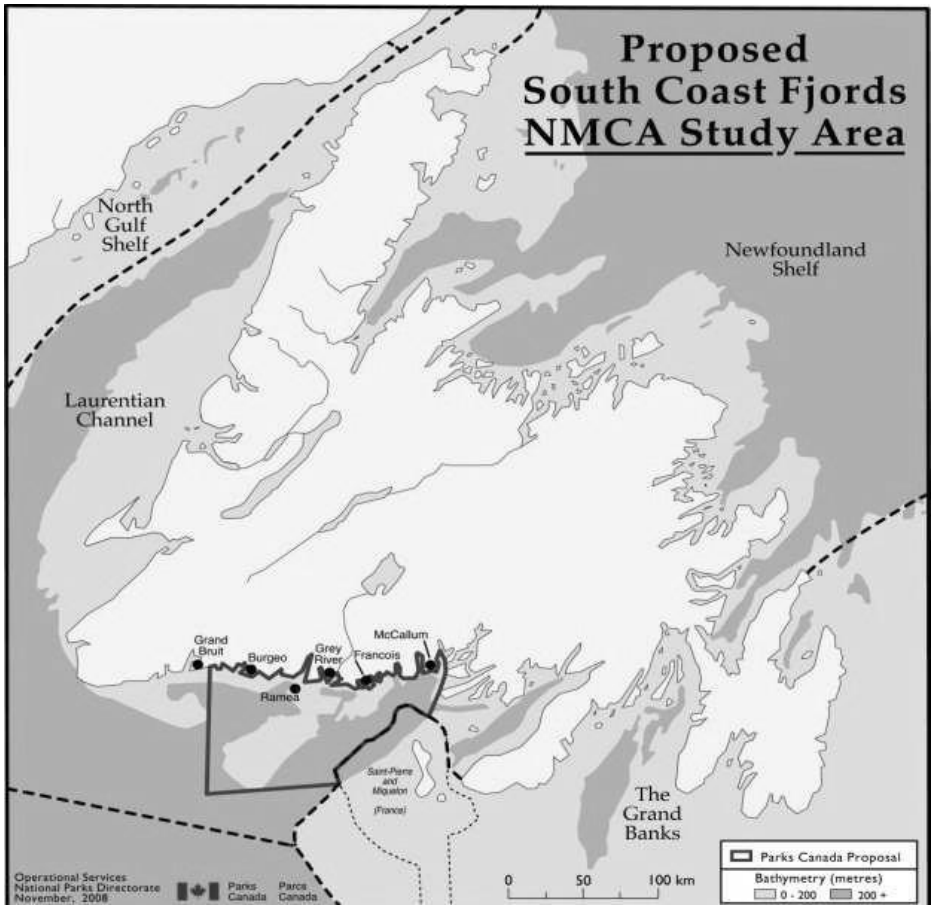

Figure 3: Parks Canada's proposed South Coast Fjords NMCA Study Area (Parks Canada, 2008).

For the purpose of this study I focused mainly on the Town of Burgeo in my sampling efforts and therefore give particular attention to it in this study area description. The following factors determined why I focused the majority of my research efforts (e.g. Burgeo Residents Survey) on this single community. Due to accessibility and the fact that it is the largest of the communities within the greater area, it acts as the service hub (i.e. hospital, supermarket) for the remainder of the four communities. Burgeo's 1465 residents represent 61% of the region's population, which was 2400 in 2011 (NL Stats Agency, 2014). Burgeo is also the town that has

displayed interest in the South Coast NMCA through its leadership in the initiative (CPAWS, 2012).

3.1.1 Codfish and Impacts of the Cod Moratorium

It would be an injustice to focus any research effort in the South Coast region of NL without paying homage to a key natural resource that has shaped the area both economically and culturally. That resource is the Atlantic cod (*Gadus morhua*): "the 1790's saw the first influx of permanent settlers who made a living fishing...for cod … in the 1940's a modern fish processing facility was built in the Short Reach and Burgeo heralded a new period of growth..." (Town of Burgeo, 2006). According to research by Strengthening Rural Canada (SRC) (2013) trawlers and the local fish plant served to employ between 400 and 500 people prior to the cod moratorium in 1992. The fish plant was first closed and sold to Barry Group (Seafreez) in the early 1990s which subsequently moved its redfish processing to Nova Scotia (Rose, 2007). From April, 1992 and on through the 1990s, Burgeo's population experienced a mass layoff with no signs of the main employer returning (Communications for Survival, 1997). However the early 21st century has seen conversion of the plant to a fish meal plant that employs 12 seasonal workers (SRC, 2013; Tract Consulting & BAE Newplan Group, 2010). Burgeo's current inshore fishing catches of crab, cod and lobster are sold locally or transported to Port aux Basques for processing (SRC, 2013).

In the South Coast region, as of 2005, harvesting of cod in the Northwest Atlantic Fisheries Organization (NAFO) 3Psa and 3Pn (Figure 4) divisions appeared to exceed snow crab harvests (Sydney Basin SEA, 2007). The total allowable catch (TAC) for

codfish in 3Ps (overlap with 3Pn) in 2015 was 11, 353 metric tons (M.T.) (91 % of the TAC for the entire NL Region); only 39% of which was actually caught. It is important to note that these totals represent fishers from the province as a whole highlighting the South Coast Region as a go to area for cod fish harvesters (DFO, 2016a). The TAC for snow/queen crab for the 3Ps and 3Pn divisions in 2015 was 4, 307 M.T., approximately 9% of the TAC for the entire NL Region (DFO, 2016b). Shellfish (e.g. snow crab) however compose approximately 80% of the province's total landed value ($463 out of $579 million) (Government of NL, 2014). Therefore one may assume that cod as a natural resource holds greater significance to the isolated communities of the Burgeo area, in comparison to other areas of the province where fisheries today have greater focus on shellfish.

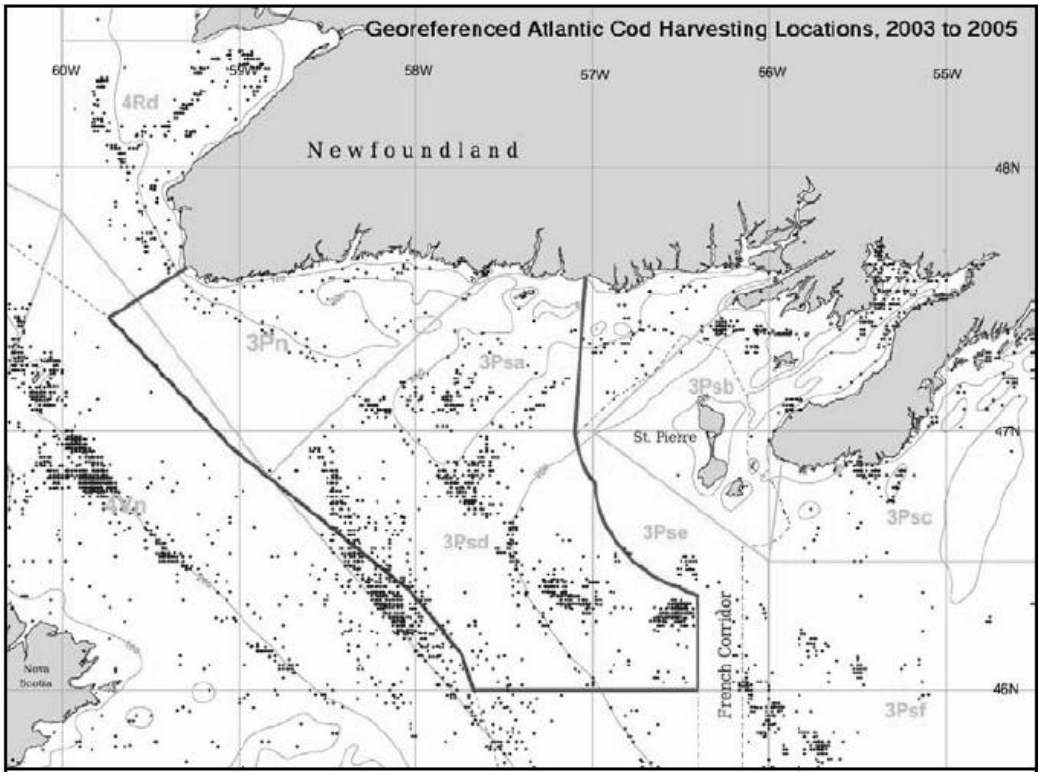

Figure 4: North Atlantic Fisheries Organization sub-divisions 3Pn and 3Ps in the South Coast region of Newfoundland. Dots represent Atlantic cod harvesting locations from 2003-2005 (Jacques Whitford Sydney Basin SEA, 2007).

From 1991-1996, at the time of the collapse of the Newfoundland cod stocks and the cod moratorium (1992), the South Coast of Newfoundland being composed of mainly isolated, outport fishing communities, was negatively impacted from an employment and economic standpoint. The percentage of people unemployed increased by 10.1 % while the Avalon Peninsula and Canadian unemployment rates decreased. Males on the South Coast were especially hard hit with 23.1% of the population losing employment, while female unemployment decreased (Hamilton & Butler, 2001). The former is not surprising due to fishers being predominantly male in NL and in the region: approximately 82 % of those employed in "natural resources, agriculture and production" in the Burgeo area (i.e. Burgeo, Francois, Grey River, La Poile, Ramea) in 2011 were male (NL Stats Agency, 2014b). Finally, the percentage of income from employment decreased by 18 % on the South Coast. This coincided with a 39.3 % increase in government transfers or subsidies (Hamilton & Butler, 2001).

Most recent figures (May 1-7, 2011) indicate an unemployment rate of 43.9 % in the Burgeo Area and an employment rate of 29% for individuals 15 years and older (NL Stats Agency, 2014b). The fact that approximately 95% of individuals worked in 2010 while only 4% did not, indicates seasonal or part time nature of employment.

From the above economic factors one can see the negative impacts associated with the loss of a major industry (resulting from the collapse of cod stocks) and presume that the northern cod were of great socio-economic and cultural importance to the South Coast region of Newfoundland. The species provided much of their livelihood for approximately 200 years and therefore has shaped the cultural geography of South Coast communities. Many of the communities still cannot be accessed by car (with the

exception of Burgeo) for example, but must use a boat or ferry for transportation. This illustrates the reliance that these people have had upon the ocean and this key natural resource (i.e. transportation was not an issue due to the coastal boat service and because the majority of families had access to boats due to the dominance of fishing as an occupation).

The very resource upon which these communities relied on for survival, once diminished, has been responsible for much of its population decline. The following statement emphasizes the importance of the cod stocks to the South Coast communities: "…from 1986 to 1998… as resource depletion set in…the South Coast of Newfoundland lost 18% of its population to migration" (Hamilton and Butler, 2001, p. 5). In the Burgeo area specifically in 1986 the population was 4655 which decreased to 3745 by 1996. This population continues to decline today with the latest figures indicating a 12.2% decrease from 2006 to 2011 (i.e. 2735 to 2400) (NL Stats Agency, 2014b).

Today we see less people pursuing a career in the fishing industry throughout the province (in 1880 90% of the male workforce of NL were engaged in fishery related work) (NL Heritage, 1998), possibly making the South Coast and other outport regions undesirable places to return to (if other employment opportunities are limited). Of the 645 (27% of population) respondents to the National Household Survey in 2011 (Stats Canada), the employment mix in the Burgeo Area was as follows: trades, transport and equipment (17%), natural resources, agriculture and related production occupations (17%), sales and services (16%), education, law and social, community and government services (14%), management occupations (11%), business, finance and administration (9%), health (9%), natural and applied sciences (5%), manufacturing and utilities (2%). It

is likely that the majority of 17% employed in natural resources and related production occupations are working in fishery related occupations.

The impact of the cod collapse and its importance to the socioeconomic fabric of the South Coast of NL is far-reaching. Evidence of an aging demographic and the loss of younger people seeking higher education can be seen throughout rural Newfoundland. The prime working age population in rural NL (e.g. age 20 to 44 years) declined by 27.0% from 2001 to 2011 (SRC, 2013). Combining this with the challenges that remote, rural regions face (e.g. twice as many individuals without a high school diploma than in urban regions), creates a significant obstacle to innovation and economic development (SRC, 2013). This poses great implications for the economy of the province as a whole, as communities become less self-sustaining and increasingly reliant upon government subsidies and transfer payments as their population ages.

The small communities mentioned above continue to persist along the South Coast of NL despite losing their economic mainstay with the northern codfish moratorium in 1992. An NMCA, with its associated attraction of visitors, could enhance prosperity from a tourism standpoint for those remaining communities. Preserving not only biodiversity, but also the outport culture and way of life are seen as potential benefits of an NMCA (BDDB, 2003) which may in turn offer new and sustainable economic opportunities. Gros Morne National Park on the west coast of the island portion of NL, is an example of a protected area where communities within the park have benefitted, more than those outside, from increased tourism opportunities and infrastructure (e.g. visitor centres, accommodations, better roads etc.).

3.2 Burgeo

The Town of Burgeo can be accessed via route 480 (known as The Caribou Trail) from the Trans-Canada Highway south of Corner Brook and east of Stephenville. This is the only road linkage to the main highway for all South Coast communities mentioned above. The settlement pattern of the town of Burgeo to this day echoes sentiments of a time when people relied heavily upon the sea for its resources. The older area of the town in particular is close to the ocean with a relatively dense residential area. The total area of Burgeo however is 31.4 km² indicating a density of approximately 22 dwellings/km² (Stats Can, 2013). There are many wharves and stages intact. As one moves landward the community dwellings begin to disperse (slightly) with more modern houses. The Town of Burgeo is situated on a landmass that was once an island (Grandy's Island), but has since been connected to the main island of Newfoundland by causeway.

Burgeo boasts almost 500 years of rich fishing history since its supposed European discovery by the Portuguese (Town of Burgeo, 2006). It also has a history of aboriginal occupation by groups such as the Dorset Eskimo, Beothuk and later Mi'kmaq (evidenced by local archaeological finds). Permanent settlement by Europeans did not occur until the 1790s and the community was officially incorporated as a town in 1950 (Town of Burgeo, 2006). Some significant economic developments within the town include, but are not limited to: the first fishing merchant setup operations in the early 1800's, the first hospital (Burgeo Cottage Hospital) was built in 1935, and the first modern fish processing plant began operating in the 1940's (Town of Burgeo, 2006). The fish processing plant later closed following the cod moratorium in 1992, resulting in a major loss of employment as seen throughout the large majority of rural Newfoundland

(Hamilton and Butler, 2001). As mentioned above a portion of the plant reopened due to the conversion to a fish meal plant in early 2000 (SRC, 2013).

Some notable attractions in Burgeo and the greater geographic region include the seascape and its archipelago of resettled islands, a long stretch of sandy beaches west of Burgeo (nesting site for critically endangered Piping Plover) designated as Sandbanks Provincial Park, and towering granite cliffs and large fjords to the east. Burgeo was also once the home of renowned writer and environmentalist Farley Mowat and provided the setting for the story for his novel *Whale for The Killing*. Farley's house is still standing today (Town of Burgeo, 2006).

3.2.1 Current Demographics and Economy

The population of the Local Area 31: Burgeo Area (Burgeo, Francois, Grey River, La Poile and Ramea) and the Town of Burgeo has been in steady decline since 1986, with a 12.2% and 10.1% decrease respectively since 2006 (NL Stats Agency, 2014; Stats Canada, 2013). As noted above the total population of Burgeo Area in 2011 was 2400 with Burgeo proper composing approximately 1400. Of this 1400, 1240 (~89%) were over the age of 18 with the median age being 51 (compared to a median age of 44 in NL). In 2011, approximately 42% of the population were aged 55 and over, up 8.1% from 2006 (NL Stats Agency, 2014b; Stats Canada, 2013). With only 8.9% of population below the age of 15, Burgeo will inevitably continue to face population decline. Of the 1240 adults, 625 identified as male while 620 as female, approximating a 50% split. The total number of dwellings in 2011 in the community was approximately 682.

The main sources of occupation for Burgeo residents include: trades, transport

and equipment operators and related (23%); sales and services (19%); natural resources, agriculture and related production occupations (17%); education, law and social community and government services (14%); health (9%) and management (6%) (Stats Can, 2013). With 23% of the population of Burgeo working in trades and related field it is likely much of this percentage is made up of migrant workers commuting to Alberta for 3-6 months of the year (Tract & BAE Newplan Group, 2010). Major businesses in the area that would account for sales and services include, but are not limited to: Ingram's Foodland, Burgeo Pro Hardware Store, Scotiabank, Burgeo Pharmacy, several convenience stores, restaurants and two garages (one with gas bar). Services such as these make Burgeo an important hub for the remainder of the region.

Most occupation within natural resources, agriculture and production occupations likely reside in the fishery as there is presently no mining, or oil and gas development and little to no forestry activities (outside domestic wood cutting) occurring (Tract & BAE Newplan Group, 2010). A recent attempt at a community greenhouse supporting hydroponically grown tomatoes has been discontinued. There are approximately 12 fishing enterprises in Burgeo, whereas 12 years ago there was 30 plus (pers. comm, key informant interview #2-002, 2015). Although limited, fishing has and continues to have an influence on the town's identity.

Burgeo Academy (grades K-12) evidently accounts for jobs in education while BCJ Tax Centre is a private sector employer. Canada Post and the Coast Guard station are examples of community government service employers. Some of the local economic assets identified in Burgeo include the regional ferry service, Sandbanks Provincial Park, outfitting operations, outdoor adventure operations, greenhouse infrastructure and the

hospital (Tract Consulting & BAE Newplan Group, 2010). Tourism and related activities may employ a small proportion of Burgeo's residents, but has been recognized by the community as a new and important economic driver (Tract Consulting & BAE Newplan Group, 2010). First class fishing, hunting and outdoor recreational activities are seen as key attractions in the area. Some priorities identified by Burgeo Town Council and members of the public in their Integrated Community Sustainability Plan (2010) include a National Marine Area/Park and tourism planning and development, again recognizing the potential benefits of tourism and an NMCA.

4.0 Methods

4.1 Design

To meet the above objectives of this project a study was undertaken using a two-part approach: (1) a literature review researching and examining (a) positive and negative impacts of MPAs in general (e.g. environmental and socioeconomic), (b) what makes a MPA effective or ineffective including the role of attitudes and opinions toward MPAs; and (2) a mixed intra-method (i.e. quantitative/qualitative) questionnaire (Katsirikou & Skiadas, 2010) to assess local residents' values, attitudes and beliefs toward a South Coast NMCA.

Possible outcomes of MPAs were derived from the review of MPA literature, providing guidance for the design of the questionnaire component of this research. Drawing from the literature on the conservation and biodiversity impacts of MPAs (e.g. Halpern 2002; Halpern and Warner) and in turn impacts to fish stocks (e.g.

Lester et al. 2009, Salm et al. 2000) and fisheries (e.g. Roberts et al. 2001; Russ and Alcala 2011) informed the possible ecological outcomes. Furthermore, various authors summarize the expected socioeconomic costs and benefits of MPA establishment such as restrictions to industry or enhanced tourism (e.g. Hoagland et al. 1995; Lemelin and Dawson 2013). Of course the importance of these apparent costs and benefits are subjective, which is why it was important to measure individuals' values, attitudes and beliefs toward possible outcomes through a questionnaire. Presenting residents with potential outcomes retrieved from the literature allows them to display their personal beliefs regarding an MPA 'in their backyard', assess their values for environment, economy and place, and ultimately identify any themes of particular concern or interest.

4.1.1 Questionnaire Design

To identify Burgeo residents' (general population) values, attitudes and beliefs related to the costs and benefits of a potential MPA in the South Coast region I designed and pre-tested a mixed, intra-method questionnaire composed of both quantitative and qualitative questions (Katsirikou and Skiadas, 2010). Quantitative questions were closed ended with answers displayed on a 5-point Likert scale (e.g. 1=Strongly Disagree, 5=Strongly Agree). The questionnaire was eight pages containing 49 questions in total divided into four sections (Appendix A). Estimated time to complete the questionnaire based on pre-testing was ten to fifteen minutes.

Questions were designed to assess perceived knowledge (Section A),

perceived outcomes (beliefs) and value placed on those perceived outcomes (Section B), support or opposition (attitudes) for an NMCA (Section C) and demographics (Section D). Open-ended qualitative questions accompanied each section of the questionnaire to allow for a less structured expression of what residents' opinions, beliefs and attitudes might be that were not covered by closed-ended questions. These questions were more general (e.g. When you think of a South Coast NMCA what comes to mind, what might be the positives/negatives, what is most important to you in the South Coast region? etc.).

Themes underlying the quantitative questions presented in Section B included: economic development, access to fishing, conservation of marine biodiversity, industrial development and sense of or attachment to place values. This was further assessed by follow up qualitative questions such as "what is most important to you in the South Coast region?" Overall the questionnaire aimed to evaluate perceptions of knowledge and outcomes (beliefs), values and in turn support or opposition. Open-ended questions were designed to allow for further theme development.

4.2 Data Collection

Field data collection took part over a 29 day period from April 9, 2015 to May 7, 2015. Due to a lack of response and the Town of Burgeo's settlement pattern (dense and sporadic), it quickly became evident after an initial attempt at calling residents from a telephone directory to gain verbal consent to distribute questionnaires, that this approach to recruitment was impractical. For example

locating households was quite difficult based on verbal description of the address of each household. This was further complicated by inadequate street signage. This method was abandoned for door-to-door visits requesting verbal consent at the door. Questionnaires were left at the household with willing individuals. Approximately two weeks were allowed for questionnaires to be completed upon which time I returned to pick them up (i.e. drop-off/pick-up method) (Glasow, 2005; Vaske, 2008). The drop-off/pick up method is considered advantageous particularly for small communities (Salant & Dillman, 1994 p.43). All households (~700) were visited twice during drop-off, resulting in 402 surveys in total being distributed. The goal was to achieve a representative sample of the Burgeo population (~1400), which according to Vaske (2008) was 400 individuals.

Due to the difficulties associated with retrieving the questionnaires via pick-up (e.g. no one at home, questionnaires not yet completed) several steps were taken in an effort to have all questionnaires returned. These included placing a message on the local TV station, Burgeo Broadcasting System (BBS) encouraging completion, setting up a drop-box at a central location in the Burgeo Town Hall, and placement of posters at service centres around town (e.g. post office, convenience stores etc.). In total 180 questionnaires were returned completed resulting in a 45% response rate. A lower response rate than intended could be due to several factors. During the initial door-to-door visits individuals often refused, stating they had little to no knowledge on the topic and/or simply a lack of interest. Such an outcome may have resulted in capturing the most knowledgeable of the population and/or those with the strongest opinions.

4.3 Data Analysis

Quantitative data were analyzed using IBM Statistical Package for the Social Sciences (SPSS 20). Basic frequency and descriptive statistics were taken from the data. General characteristics (e.g. demographics) of respondents were examined initially. The remainder of the data was organized into, and then analyzed within, four broad themes: (1) perceived knowledge; (2) respondents' beliefs regarding a potential NMCA and its costs and benefits; (3) respondents' values related to these costs and benefits; and (4) respondents' support levels. Frequency statistics were used to represent perceived knowledge, support for commercial fishing (i.e. values) and levels of support for an NMCA designation. Mean values for the residents' perceived impacts of a South Coast NMCA were analyzed along with mean values for resident's values (negative or positive) for each perceived impact.

Transcribed, qualitative data from open-ended questions was organized and analyzed using QSR International's NVIVO 11 (Plus) software, which was used to develop themes within the dataset. This data was first coded into individual "nodes" that correspond to each individual question. A word frequency query then allowed for coding each question into "child nodes" for the 5 most frequent words used by respondents. Those child nodes were then further analyzed to generate sub-themes within each of the broader themes mentioned above (e.g. knowledge, perceptions, values and support levels).

The overall coding process was therefore deductive (Burnard, Gill, Stewart, Treasure & Chadwick, 2008; Spencer, Ritchie & O'Connor, 2003) as key words and ideas were analyzed within the context of pre-determined themes. Limitations to

this method include its potential for bias and inflexibility regarding theme and theory development (Burnard et al., 2008). This was seen as necessary however for identifying knowledge and key perceptions, values and reasons for support or opposition, directly related to a South Coast NMCA. Further, the open-ended nature of the qualitative questions allowed respondents to go outside the bounds of previous quantitative questions to communicate important ideas that may be overlooked by the quantitative questions alone, or even by the predetermined themes.

Qualitative data are presented below with quantitative data to complement, support and/or contradict and expand upon any findings of the quantitative analysis. This allowed for a more robust examination of Burgeo residents' knowledge, beliefs, values and support levels regarding a South Coast NMCA. Qualitative data are presented with quantitative measures (e.g. % of respondents referencing a key word or idea) along with specific quotes to represent the sub-themes generated. Calculated percentages for sections 5.1 to 5.5 are the percentage out of the 180 respondents. It is worth noting that in some instances qualitative questions were unanswered by a number of individuals. Calculated percentages for reasons for support, opposition or neutrality (Section 5.1.1) are percentages of the number that stated support, opposition or neither for a South Coast NMCA, not the total 180 respondents.

4.4 Clearance

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research (ICEHR 20151956) and found to be in compliance with

Memorial University's ethics policy.

5.0 Results

The following results section will be presented based on characteristics of respondents (5.1) and then by the various themes that the questionnaire was designed to investigate: perceived knowledge about NMCAs (5.2), perceived outcomes (beliefs) and values (5.3), and support or opposition (5.4).

5.1 Characteristics of the Respondents

A total of 180 residents of Burgeo returned the questionnaire completed. One hundred and twenty three (68%) of the residents identified as male while 57 (32%) identified as female. Possible reasons for the skew towards males include that contacted females often stated they would have their husbands complete the survey. There appeared to be a perception by those females that they knew less than their male counterparts about marine related matters. This is possibly due to fishing and marine resource extraction being traditionally male dominated activities in rural Newfoundland.

The majority of questionnaire respondents – 115 (64%) – were over the age of 56, while the remaining 36% ranged in age from 18 to 55 (Table 2). With 42% of the total population of Burgeo over the age of 54, and 47% ranging in age from 17 to 54, older residents were overrepresented in the respondent mix (Table 3).

Table 2: Age characteristics of respondents to the questionnaire.

Years of Age	**18-25**	**26-35**	**36-45**	**46-55**	**56+**
% of Respondents	**1.0%**	**6.0%**	**9.0%**	**19.0%**	**64.0%**

Table 3: Age characteristics of the total population of Burgeo

Years of Age*	17-24	25-34	35-44	45-54	Over 54
% of Total Population	5.0%	7.0%	15.0%	20.0%	42.0%

* Stats Canada (2011) used different age categories than those used in the questionnaire (e.g. 17-24 vs. 18-25).

Ninety-four percent of the individuals have lived in Burgeo for more than 20 years (many likely life-long residents). Approximately half (46.7%) of respondents stated their primary occupation as other (many listing "retired"), while 24 (13%) chose fishing and 19 (10%) chose trades. The remaining 25.5 % worked in: education (7.2 %), health care (5%), sales and services (3.3 %), tourism (2.2%) or were unemployed (14%).

5.2 Respondents' Perceived Knowledge about NMCAs

When asked: "how knowledgeable are you with the concept of a National Marine Conservation Area" the most common response was "Somewhat Knowledgeable" (31.3%), but the majority (63.3%) fell within the range of "Very Unknowledgeable" to "Unsure" (Figure 5). The least common answer given was "Very Knowledgeable" (3.3 %).

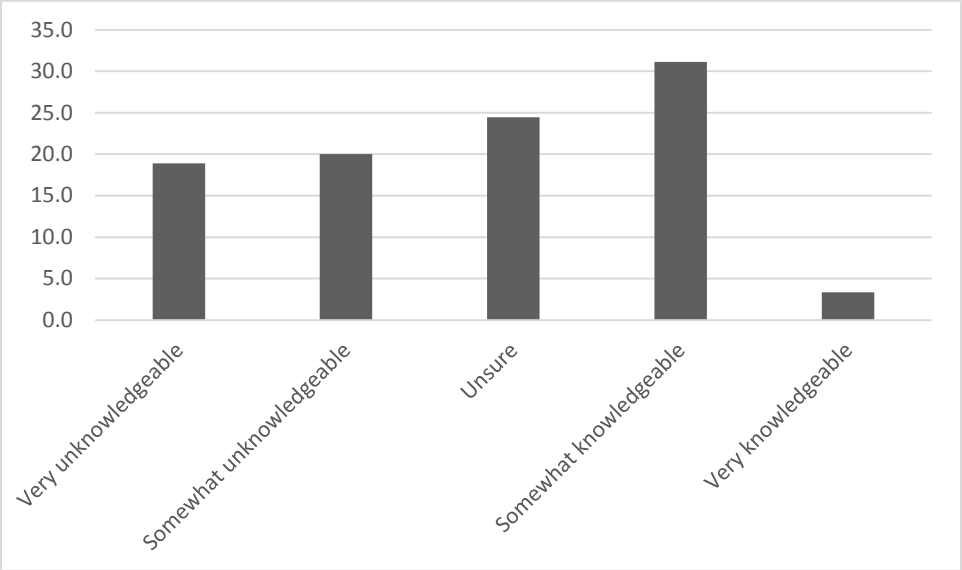

Figure 5: Burgeo residents' perceived knowledge of the concept of a National Marine Conservation Area.

When presented with the statement "The South Coast Region has been identified as a potential National Marine Conservation Area", most respondents were "unsure" (51%), 44.4 % were correct stating "generally true", while only 1.7% were incorrect in stating "generally false".

5.3 Respondents Beliefs

5.3.1 What Comes to Mind

When asked: "what comes to mind when you think of a South Coast National Marine Conservation Area", most frequently used key words (including synonyms) were fishing, protected, hunting, restrictions and conservation. Coding allowed for sub-themes of protection and conservation (30% or 54 responses) and fishing (28% or 50 responses). The protection and conservation subtheme was further divided by references of

protection and conservation of: wildlife and the environment in general (24% of respondents or 43 responses)[3], fish specifically (5%, 9 responses), the fishery (1%, 2 responses) and an area or zone (5%, 9 responses). The fishing subtheme was further divided into: restrictions/threats to fishing (23%, 41 responses), general references to the activity fishing (4%, 7 responses) and opportunities for fishing (1%, 2 responses). Also mentioned outside the above sub-themes was fish farming (1%, 2 responses).

Restrictions were referenced quite often in quotes from the open-ended question "what comes to mind…?" and almost always related to fishing and/or hunting: "Regulations and restrictions. No hunting, no fishing probably, not even in the area for anything" (ID #024). Some were less detailed and more direct: "We won't be allowed to fish and hunt" (ID #120). Others also related the restrictions to other industrial activities: "an area where activities such as hunting and fishing are restricted. Oil and gas exploration and exploiting may also be restricted…" (ID #118). Few (3-4 respondents.) questioned would it affect fishing (as opposed to having suggested it would), while even fewer (2) referenced opportunities for fishing: "an area…protected from any commercial development, but still be able to be used for traditional activities such as fishing, hunting, trapping…." (ID #268)

Protection and conservation was often referenced, mostly regarding wildlife and the environment in general: "protecting the species of wildlife in the area" (ID #025) or "an area that will be protected from future development; that will be kept in its natural state" (ID #071). Protection and conservation of fish was specifically referenced in some

[3] Responses and respondents are equivalent and percentages represent the number of individual responses or respondents.

instances (9 responses): “conserving our fish stocks” (ID #079) or “fish conservation” (ID #329) and in couple cases (2) the fishery itself was referred to: “protecting the wildlife and fishery” (ID #097).

In some instances references to an actual protected area type or related activities was given: “…something like a national park...” (ID #107), “…an area like the St. Mary’s Bird Sanctuary…” (ID #376), along with possible goals: “…marine areas managed for sustainability...” (ID #137), “…educational campaigns to inform public of the area’s designation/importance”(ID #355). These references were very few as were those to tourism (2).

As expected there was notable overlap between references to the sub-themes of protection and conservation, restrictions and fishing as evidenced by statements such as: “conserving local game/fish through restrictions on hunting/fishing” (ID #011).

5.3.2 Perceived Impacts

Given the statement: “there are more benefits than negative impacts associated with a South Coast National Marine Conservation Area”, 19.4 % strongly disagreed, 17.2% somewhat disagreed, 31.7 % were neutral, 19.4% somewhat agreed and 9.4% strongly agreed (Figure 6). In total there was 36.6 % disagreement, 31.7% neutral and 28.8% agreement. The mean response on a scale of 1 (strongly disagree) to 5 (strongly agree) was 2.82 (SD= 1.241).

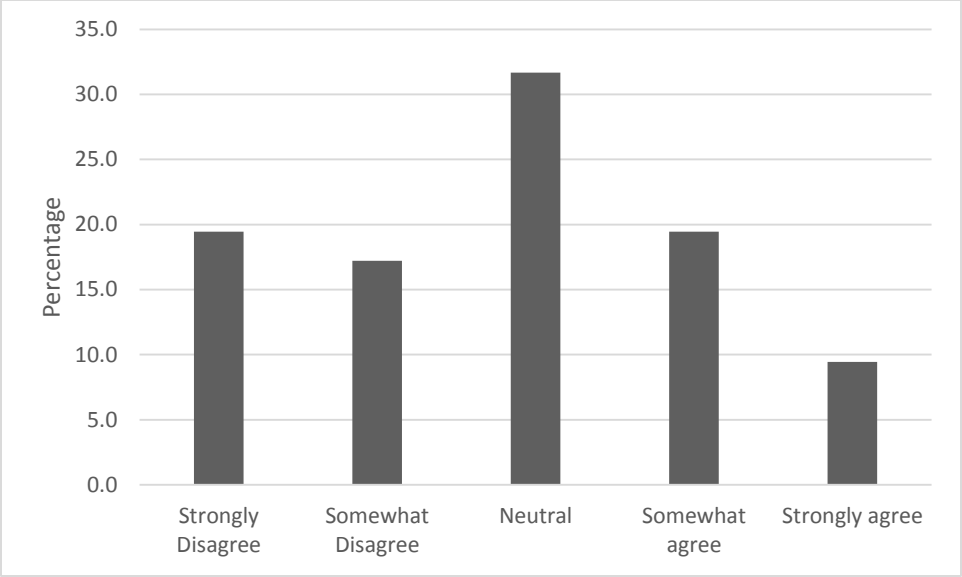

Figure 6: Burgeo residents' response to "there are more benefits than negative impacts associated with a South Coast National Marine Conservation Area."

When presented with select possible outcomes from a South Coast NMCA (Table 4), respondents' mean perception scores were generally highest (i.e. agreement) around restricted access to fishing ($\bar{x} = 3.7$) and restrictions to oil and gas development ($\bar{x} = 3.7$). There appears to be a tendency to agree that a South Coast NMCA will conserve marine life ($\bar{x} = 3.65$) and to disagree ($\bar{x} = 2.68$) that it will save South Coast communities from resettlement (Table 4).

Table 4: Mean perception scores for a South Coast NMCA.

	Mean	Std. Error	Std. Deviation
A South Coast NMCA will…			
...increase tourism in the south coast region (1=Strongly Disagree, 5= Strongly Agree)	3.35 (+)	0.093	1.237
...promote economic development... (1=Strongly Disagree, 5= Strongly Agree)	3.20 (+)	0.090	1.203
...diversify the economy... (1=Strongly Disagree, 5= Strongly Agree)	3.16 (+)	0.085	1.125
...restrict access to fishing... (1=Strongly Disagree, 5= Strongly Agree)	3.70 (+)	0.105	1.387
...close the current fishery... (1=Strongly Disagree, 5= Strongly Agree)	3.34 (+)	0.113	1.484
...conserve marine life... (1=Strongly Disagree, 5= Strongly Agree)	3.65 (+)	0.094	1.246
...benefit marine species... (1=Strongly Disagree, 5= Strongly Agree)	3.51 (+)	0.098	1.305
...rebuild fish stocks... (1=Strongly Disagree, 5= Strongly Agree)	3.41 (+)	0.100	1.324
...restrict industrial/economic development... (1=Strongly Disagree, 5= Strongly Agree)	3.37 (+)	0.096	1.267
...restrict aquaculture development... (1-Strongly Disagree, 5= Strongly Agree)	3.31 (+)	0.098	1.299
...restrict oil and gas development... (1=Strongly Disagree, 5= Strongly Agree)	3.70 (+)	0.097	1.290
...balance tourism and industrial development with marine conservation... (1=Strongly Disagree, 5= Strongly Agree)	3.17 (+)	0.092	1.217
...save South Coast communities from resettlement (1=Strongly Disagree, 5= Strongly Agree)	2.68 (-)	0.109	1.434
...preserve outport/rural culture... (1=Strongly Disagree, 5= Strongly Agree)	2.91 (-)	0.108	1.431
...preserve outport towns... (1=Strongly Disagree, 5= Strongly Agree)	2.89 (-)	0.112	1.476

(+) = agreement, (-) = disagreement

Standard deviation for each response item range from 1.125 to 1.484. This indicates a polarization around responses particularly for closure of the current fishery and preserving outport towns and saving South Coast communities from resettlement

(Table 4). All standard error values are relatively low indicating reliable mean values.

5.3.3 Negative Impacts

When asked "what might be the negative impacts of a South Coast NMCA?" a word frequency query in NVivo revealed the words fishing, hunting, restrictions, people, and fishermen as most often referenced. Further coding revealed negative impacts perceived by Burgeo residents revolved around: "restrictions, limitations and loss" (82%, 148 responses) with particular regard to "fishing & hunting" (43%, 78 responses), "people and livelihoods" (18 %, 33 responses) and to a lesser extent industrial development (5%, 9 responses).

References to restrictions on fishing and hunting were similar to those mentioned above: "…all fishing and hunting rights taken away from everyone. Closing the current fishery" (ID #018). However, particular reference to fisher people developed: "…what impact will this have on local fishermen..." (ID #139), "if fishermen are not permitted to fish, then that would definitely mean the end of a way of life for this town and possibly the end of this town"(ID #163) and the "possibility of losing fishing zones for the few inshore fishers we still have on this coast" (ID #284). This again has considerable overlap with the theme of "people and livelihoods", with a focus on loss of livelihoods and/or a way of life.

"Depending on the amount of protection planned a NMCA could totally disrupt the livelihood of the fishers in the area, the lifestyle of the small isolated communities and the recreation", states one respondent (ID #031). For some there was a concern for apparent day to day activities: "operation of watercrafts (examples: boats, sea doo)" (ID #109), "restriction on fishing, hunting, camping and boating" (ID #117), "affecting our

way of life like seasonal bird hunting" (ID #265), "water routes to cabins may be cut off or diverted" (ID #293), just to mention a few.

Future industrial development restrictions (5 %, 9 responses) were also negative impacts mentioned by some: "no oil exploration, no aquaculture" (ID #014), "…prevention of economic development…" (ID #224) and "Mining exploration in this area may be limited" (ID #311). On the other hand one individual associated an NMCA with development of aquaculture. When asked: "what are the negative impacts of an NMCA", they replied: "Government setting up farms for salmon and cod fish in our area; the poison they are feeding the fish is killing all life on the sea bed" (ID #018).

5.3.4 Positive Impacts

Residents' responses to the question: "what might be the positive impacts of a South Coast NMCA", contained conservation, protection, tourism, jobs and fish as key terms. Two main themes that developed from coding were economic opportunities (28%, 51 responses) and protection and conservation (20%, 36 responses). The economic opportunities theme was further subdivided into several sub-themes: jobs and employment (generally speaking), tourism, and infrastructure development.

General references to jobs and employment (17%, 30 responses) include: "create jobs" (ID #258) or "it might bring more jobs to the area" (ID #079). More specifically individuals mentioned "government investing money in the area with possible jobs" (ID #025), "more jobs for patrol officers" (ID #188) and "there will be money spent to develop the area for conservation purposes and jobs created to manage and maintain it" (ID #307).

The most common form of economic development stated was tourism (16%, 28

responses). Specifically individuals suggested "it could be a boost to nature tourism, sea kayaking and whale watching…" (ID #031), "…might encourage tourism if government allowed interaction of tourists and marine life, and that would lead to jobs" (ID #287). A few (~1%, 1-2 responses) seemed less enthusiastic about the benefits of tourism with statements like "…all that tourism is going to do for me is put the prices up in our town…no benefits for me" (ID #046).

Some individuals (4%, 8 responses) saw infrastructure development as potential positives: "…more research people, better road conditions, better cell phone coverage…" (ID #210), "…improved road conditions on the road accessing Burgeo and the area" (ID #237) and "Burgeo may benefit from improved wharves and harbour protection in the future" (ID #139).

As mentioned above protection and conservation together were referenced (20%, 36 responses) fairly often as a positive impact. As seen in the first qualitative question, it mostly referred to the environment or components of it (e.g. the ocean, wildlife or particular species). Specific references to fish include: "…bringing back fish stocks such as mackerel, squid, caplin and cod which have disappeared over recent years" (ID #043), "rebuilding of fish stocks" (ID #051) and "…area where fish and animals can reproduce and grow without risk of being caught or interfered with" (ID #118). Some saw it as protecting select species, "lobsters…whales" (ID #148) while others perceive a "protected area for every species in the area" (ID #362). Several individuals perceived both tourism and protection/conservation benefits, again indicative of overlap between the two sub-themes.

5.4 Respondents' Values

When respondents were asked how they feel about possible changes to the South Coast Region as a result of NMCA designation, generally they felt most positive about conserving marine life ($\bar{x} = 3.77$), benefiting marine species ($\bar{x} = 3.65$) and rebuilding fish stocks ($\bar{x} = 3.71$) (Table 5). Closure of the current fishery ($\bar{x} = 2.04$) appeared to elicit the most negative responses along with restricted access to fishing ($\bar{x} = 2.32$). Furthermore when asked: "how much, if any of the South Coast Region would you like to see closed to commercial fishing", 70 % of respondents stated 0% or none (Figure 7). Increased economic development ($\bar{x} = 3.60$) and increased tourism ($\bar{x} = 3.66$) were seen as generally positive while restrictions to: industrial development ($\bar{x} = 2.83$), oil and gas ($\bar{x} = 2.85$) and aquaculture ($\bar{x} = 2.98$) were seen as slightly more negative, but hovering very close to neutrality. Again all responses were polarized as indicated by relatively high standard deviations. How people felt about restricted access to fishing (SD=1.423) and saving South Coast communities from resettlement (SD=1.410) were notable examples of this.

Table 5: Mean value scores for potential South Coast NMCA impacts.

	Mean	Std. Error	Std. Deviation
How do you feel about ... in the South Coast Region			
Perceived Positive Impacts			
…increased tourism… (1=Very Negative, 5=Very Positive)	3.66 (+)	.084	1.110
...increased economic development… (1=Very Negative, 5=Very Positive)	3.60 (+)	.090	1.203
...diversification of the region's economy (1=Very Negative, 5=Very Positive)	3.35 (+)	.085	1.114
...conserve marine life… (1=Very Negative, 5=Very Positive)	3.77 (+)	.089	1.184
...benefit marine species… (1=Very Negative, 5=Very Positive)	3.65 (+)	.086	1.136
...rebuild fish stocks… (1=Very Negative, 5=Very Positive)	3.71 (+)	.091	1.191
...preservation of rural outport culture… (1=Very Negative, 5=Very Positive)	3.33 (+)	.103	1.362
...preservation of outport towns… (1=Very Negative, 5=Very Positive)	3.37 (+)	.105	1.383
...saving South Coast communities from resettlement (1=Very Negative, 5=Very Positive)	3.39 (+)	.106	1.410
…balancing tourism and industrial development with marine conservation… (1=Very Negative, 5=Very Positive)	3.39 (+)	.085	1.124
Perceived Negative Impacts			
...restricted access to fishing… (1=Very Negative, 5=Very Positive)	2.32 (-)	.107	1.423
...closure of the current fishery... (1=Very Negative, 5=Very Positive)	2.04 (-)	.101	1.327
...restrict industrial/economic development… (1=Very Negative, 5=Very Positive)	2.83 (-)	.096	1.266
...restrict oil and gas development… (1=Very Negative, 5=Very Positive)	2.85 (-)	.098	1.306
...restrict aquaculture development… (1=Very Negative, 5=Very Positive)	2.98 (-)	.097	1.273

(+) = perceived positive impact, (-) = perceived negative impact

5.4.1 Most Important to You

When asked: "what is most important to you in the South Coast Region?", the dominant themes arising from key words included people, livelihoods and way of life (40%, 72 responses) which were intertwined with hunting and fishing (35%, 63). In addition to simply stating our "way of life" which often was the case, individuals provided more details: "being able to live a quiet peaceful life and breath fresh salty air everyday" (ID #016), "a relatively quiet simplistic way of life that embraces many local customs and traditions" (ID #307). Inherent in many statements was the importance of freedom: "On the water is freedom, to boat as you please to go anywhere you want without answering to anyone else" (ID #295). The reliance on hunting and fishing to make a living was quite evident: "to continue the lifestyle as in the past hunting and fishing in the area" (ID #047). The concern over restrictions continued: "to be able to make a living in the fishery. I have so much money invested into the lobster fishery, it can't be closed down to protect some other species" (ID #074).

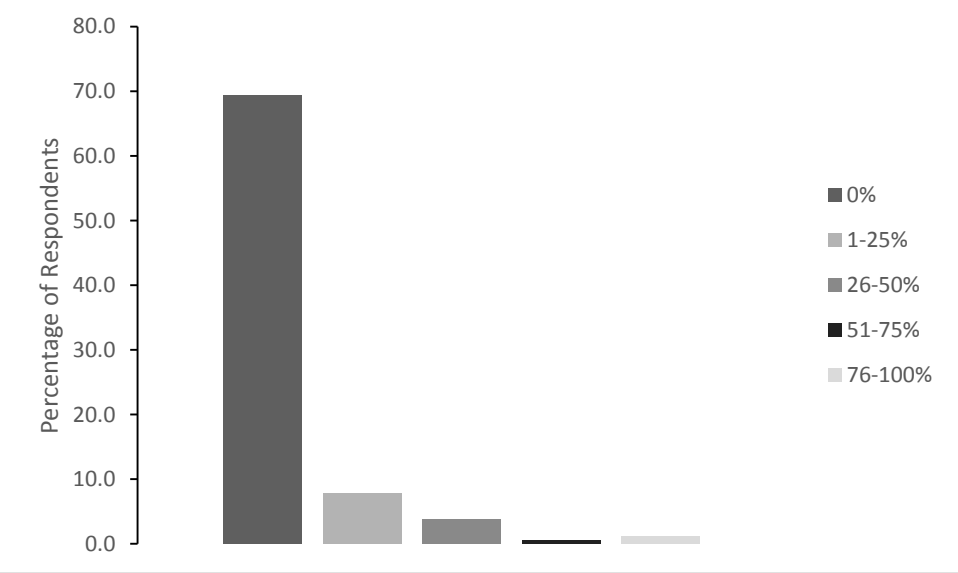

Figure 7: Percentage of the South Coast region that Burgeo residents would like to see closed to commercial fishing.

Direct references to economic development were less common (4%, 8 responses), but again intertwined with making a living: "…diversification of the economy" (ID #117), "maintaining a rural way of life, with hopefully rebuilding and promoting healthy tourism and fishery" (ID #265), "…carry out any development for the area such as mining and aquaculture" (ID #311). Raised multiple times (2%, 3 responses) was the importance of getting "some jobs" or "work" to "keep our people home" (ID #329) or reduce the amount of people leaving to find work.

Protection of the natural environment was also referenced (8%, 14 responses): "preservation and protection of our pristine coastline"(ID #059), but almost always in conjunction with sustaining livelihoods: "stopping the destruction of the marine life that exists on the coast and not taking away from the people who make a living there" (ID #092), "protect the environment and resources while maintaining fishing jobs and not preventing future industrial work and jobs" (ID #171), "preserving outport towns and giving nature a helping hand without compromising either" (ID #313).

5.4.2 Protected and Conserved

When asked: "what would you like to see protected/conserved in the South Coast Region", the natural environment and its resources (e.g. fish and wildlife) were most often mentioned (31%, 56 responses), people and livelihoods (e.g. way of life) (13%, 24 responses), fishing (14%, 25 responses) and other facets of the economy (8%, 15 responses). Most references (11 of 15) to the economy in general related to restricting industry to achieve protection and conservation (excluding inshore commercial fishing).

Residents referenced a large range of species that they would like to see

conserved and protected (e.g. mammals, birds and fish). Whales and other cetaceans were often (10%, 18 responses) mentioned, but fish (23%, 42 responses) including codfish, halibut, herring, mackerel, lobster, "all groundfish", salmon, scallops etc., made up more of individual responses. In addition to protecting such a range of species, respondents often mentioned doing so without closing the current fishery: "protect the fish yes, but not close it" (ID #198), "protecting marine life should not restrict against leisure fishing, residential fishing rights" (ID #173). Consultation with fisher people before protecting and conserving was put forward: protect/conserve "all fish/marine life that are perceived to be in danger with consultation with local residents, not just government personnel and scientists" (ID #373). Some expressed concern for maintaining inshore or small scale fishing, but not necessarily larger scale fishing gear practices: "Ban all seiners, they wiped out the mackerel here two years ago" (ID #047), "I would hope recreational fishing would be maintained…commercial seining for mackerel and herring would not be missed by locals" (ID #197), "would like to see zero seiners or other trawl methods" (ID #381).

In addition to industrial fishing, restrictions to industry in general were suggested with some attention given to aquaculture: "restrict oil and gas development. Maintain rural outport culture. Restrict fish farms" (ID #040), "would like to see the forest and ocean protected from irresponsible mining and fishing and forestry" (ID #223), "save our salmon (pesticides abolished to control sea lice. Clean up aquaculture)" (ID #346).

5.4.3 Economic Development

Evenly referenced in response to the question "what type of economic

development would you like to see in the South Coast Region?" were tourism (16%, 29 responses), fishing (14%, 25 responses), and industrial operations (14%, 26 responses), particularly aquaculture or fish farming (11%, 20 responses). General comments (12%, 21 responses) mainly referenced increased jobs, work or employment without any specification.

There was some overlap between the above such as: "aquaculture, tourism, fishing (traditional inshore)" (ID #171) and "fish plant reopen and boost in the tourism industry" (ID #313). Some referenced tourism in the context of a marine conservation area: "Tourism, visits to our beautiful marine park…" (ID #183). Fishing however was more often cited alone with sentiments like: "outside of fishing I can't see anything that would be feasible" (ID #223). "Aquaculture, mining or any other industry" (ID #146), supports the general desire for economic development. However, a few posed opposition to aquaculture (1%, 2 respondents versus 11% or 20 in support).

5.5 Respondents' Support Levels

When asked whether they supported or opposed the potential designation of a South Coast NMCA, 27.2 % were strongly opposed, 15.6 % were somewhat opposed, 24.4 % neither support nor opposed, 19.4% somewhat supported, while 10.6% strongly supported (Figure 8). In total 42.8% oppose, 24.4% neither support nor oppose while 32.8% support the designation of a South Coast NMCA. The mean value chosen from 1-5 is 2.70 (SD=1.354). This suggests the community is quite divisive on the issue which may result in higher potential for conflict.

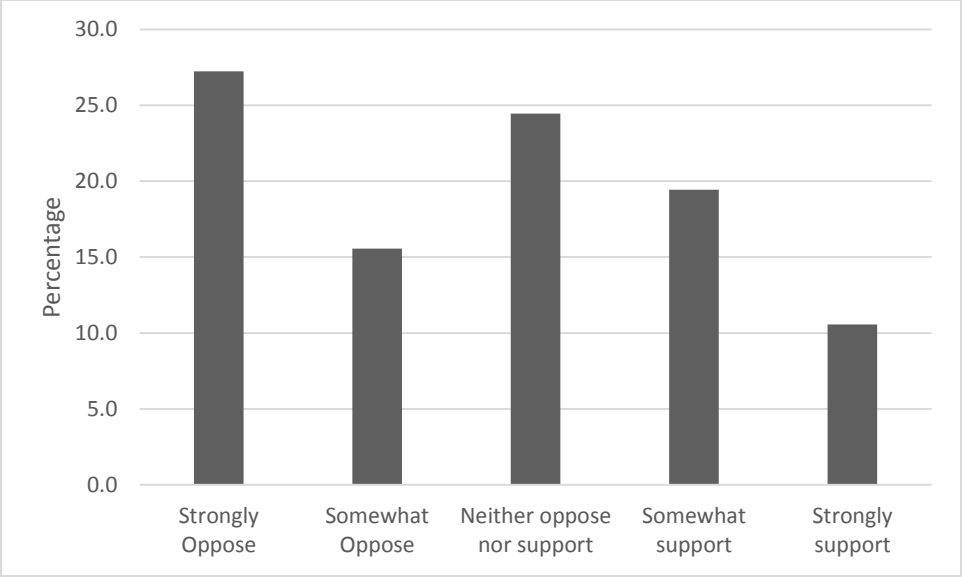

Figure 8: Burgeo residents' levels (%) of support and/or opposition for the potential designation of the South Coast as a National Marine Conservation Area.

5.5.1 Reasons for Support or Opposition

When asked why they chose their particular response to the question: "…do you support or oppose the potential designation of the South Coast as a National Marine Conservation Area?", responses varied for opposition, support and neutrality.

Opposition

In terms of reasons given for opposition, the most common response (28% of respondents opposed to the NMCA) raised was perceived restrictions and loss of livelihoods and the current way of life. This is consistent with sections above (e.g. negative impacts). These ranged from specifically: "restricts hunting/fishing which is our way of life" (ID #011) to more broadly "I feel that we would lose everything that we have access to all our lives: fishing, mussel picking, trouting etc." (ID #046). Some even

questioned the ability to continue living in rural Newfoundland with such a designation: "if you are…prohibited from fishing, hunting, walking, swimming, and boating then you have no other purpose on earth to live" (ID #016). Others added: "if you turn this into a reserve you be just as well to resettle us" (ID #220), "many depend on hunting and fishing for survival and support" (ID #387), "…what is the point of living in rural Newfoundland if we can't use our boats and fish without restrictions" (ID #373)

To a lesser extent, people simply suggested it is not needed (6 % of opposed) and that it may hinder other forms of economic development (6 % of opposed): "I feel this would jeopardize economic development with regards to aquaculture or any kind of industry (e.g. oil). People need industry not Marine Protected Zones" (ID #009).

Concerns

Respondents' concerns with regard to the South Coast becoming a National Marine Conservation Area mirror that of the perceived negative impacts. Most referenced ideas were restrictions and loss of fishing, hunting, and the fishery (30%, 54 responses) and overall their way of life (18%, 32 responses). This would be as some state "losing my rights to enjoy my province" (ID #280) and "the 'freedom' to hunt and fish" and even as much as the dependency on such activities to "survive". One individual highlighted the importance when s/he stated: "That our access to the ocean and its offerings will be restricted thereby changing a way of life. We choose to live here because of our connection to the sea. There is no circumstance in which we would tolerate having this taken away" (ID #197).

Support

Support was mostly backed by expectations of economic development (25% of those who support). Generally more jobs and employment were mentioned: "To promote tourism, create jobs, preserve/conserve species (e.g. codfish)" (ID #320). Statements like "anything that gets work in the area" (ID #205) and "anything to save the town. We need something, its slowly dying…" (ID #231) indicated an openness. As seen above there is some overlap with economic opportunities and conservation: "conservation of various species while at the same time allowing industries to grow" (ID #193). Expectations of protection, conservation and economic opportunities were summarized by one individual by proclaiming, "I strongly support the idea of a NMCA, because I value a healthy and protected environment as well as a traditional lifestyle based on clean oceans, sustainable fish harvesting and emphasis on culture and heritage" (ID #355).

What do you want a South Coast NMCA to achieve?

Those who support the idea of a South Coast NMCA – when asked what they would want such a designation to achieve – spoke of protection and conservation of fish, marine life and the local way of life (78%, 42 responses) and the economy (28%, 15 responses). Greater than 100% of responses indicates again overlap between the sub-themes. For example responses often contained an element of each (i.e. achieving conservation and economic development together). Suggesting a balance, although only stated by a few: "Balance of conservation and sensible environmentally sensitive development" (ID #171), "A balance to a way of life and conservation" (ID #210) and "a balance between conservation and protection and development of the total area" (ID

#226), summarizes the ideas of many of these respondents.

Neutrality

Reasons for neutrality appear to revolve around a perceived lack of knowledge or need for more information (34% of those neutral). Statements such as: "I really don't know enough about what impact an NMC area would do for this area" (ID #204), "Basically I have very little knowledge and would like to learn more" (ID #284), and "there are too many unknowns to give a beneficial answer, not enough information" (ID #278), support this idea.

6.0 Results Summary

Burgeo residents presented a variety of perceptions of a South Coast NMCA within their questionnaire responses. Most respondents (63%) were unsure to very unknowledgeable about the concept of an NMCA (Figure 5) and about half were unsure (51 %) that the South Coast had been identified as a potential NMCA. Initial perceptions reveal mostly concerns about restrictions to livelihood activities (especially hunting and fishing), ways of life and protection of conservation and wildlife. Overall most were opposed to potential designation (42.8%) and disagreed that more benefits than negative impacts could come from a South Coast NMCA (36.6%), but there was some definite disparity with 31.1 % neutral and 28.8 % in agreement (Figure 6). Identified negative impacts again focused on the potential restriction or loss of livelihoods, which developed as a key theme throughout the study. This was strongly supported by respondents' identification of their livelihood and way of life – based on traditional hunting and fishing

activities and access to and use of the natural environment – as the most important thing in the South Coast Region.

The most often referenced potential positive impacts of a South Coast NMCA were economic in nature, with the perception of potential for creating more employment, particularly tourism related jobs. Again, for some this related to a way of benefiting the livelihood or survival of the community and retaining young, working class individuals. Respondents would generally like to see increased economic opportunities in fishing and other industrial operations particularly aquaculture. It is worth noting however that some respondents were against aquaculture development. Overall potential restrictions on aquaculture appeared to be divisive (Mean Value Score: $\bar{x} = 2.98$, SD 1.273) (Table 5).

Protection and conservation of wildlife and the environment in general were perceived as positive impacts, with respondents giving particular reference to economically and culturally important fish species (e.g. codfish, lobsters and baitfish: caplin, mackerel, herring) and marine mammals. This sentiment was further supported by recognition of whales and other cetaceans as a species respondents would like to see protected and conserved. Conservation of marine wildlife received the highest mean value score ($\bar{x} = 3.77$) indicating most viewed it as positive (Table 5). Despite the value placed on conservation and protection of marine wildlife, respondents strongly value the continuation of their commercial fishery (i.e. 70% would like to see 0 % of the commercial fishery closed) (Figure 7). Some respondents mentioned a need to achieve balance between fishing and conservation and consultation with local fisher people, before any decisions are made regarding protection of fish species.

An overall perception that a South Coast NMCA will restrict access to fishing ($\bar{x} = 3.7$) as well as oil and gas ($\bar{x} = 3.7$) and aquaculture development ($\bar{x} = 3.31$) (Table 4) and the fact that these restrictions were generally viewed as negative ($\bar{x} = 2.32$, 2.83 and 2.98 respectively) (Table 5), seems to account for the overall tendency to oppose a South Coast NMCA (42.8%) (Figure 8). This is further supported by reasons given for opposition (see above). However significant support levels (32.8%) and neutrality (24.2%) reflect the polarity around some of these issues and the strong value for protection and conservation of marine life ($\bar{x} = 3.7$). Disagreement that a South Coast NMCA could save South Coast communities from resettlement ($\bar{x} = 2.68$) and preserve outport culture ($\bar{x} = 2.91$) and towns ($\bar{x} = 2.83$) may again go hand in hand with the perception of threats to livelihoods and the economy that appear to contribute to public opposition to an NMCA (Table 4).

7.0 Discussion

Assuming Burgeo residents are honest about their own knowledge levels, then the majority of residents (63 %) completed the questionnaire with little knowledge of what a NMCA entails. Still others in the community refused to complete the questionnaire because they had little knowledge of the subject. This may account for some of the perceptions around restrictions or loss of rights and access to livelihood activities, despite Parks Canada's promises to allow for such activities in an NMCA. Positive attitudes toward conservation in general have been found to be positively correlated with education and knowledge of the conservation issue at hand (Aipanjiguly, Jacobson &

Flamm, 2003; Decker, Bath, Simms, Lindner & Reisinger, 2010; Fiallo & Jacobsen, 1995). Some supportive respondents displayed such knowledge levels with references to balancing a traditional lifestyle (e.g. sustainable fish harvesting) with protection of the marine environment, resembling the management objectives of NMCAs (Parks Canada, 2010). During Lake Superior NMCA planning stages, Parks Canada claimed that support grew steadily over a four year period as information became available and a clear proposal emerged (Parks Canada, 2001). This may indicate the potential for changing support levels in the future through information and education if a South Coast NMCA feasibility study is pursued.

Unsupportive respondents may be thinking of conservation or protected areas in general and basing perceptions on prior experience with such activities in the area. Personal communication with some respondents following completion of the questionnaire revealed dissatisfaction with restrictions associated with the Sandbanks Provincial Park Area. Such dissatisfaction may be influencing local opposition to the NMCA concept. Sandbanks Park contains nesting ground for Piping Plover, which has resulted in restrictions on ATV use and dog-walking in the area.

Another plausible explanation for expected restrictions, despite Parks Canada's (2010) mandate for maintaining sustainable traditional activities (e.g. fishing and hunting), is a distrust for the federal management agency as seen in Northwestern Ontario near the proposed Lake Superior NMCA (Lemelin, 2008; Lemelin et al., 2010). Trust with managing agencies may not only shape ones perceptions of restrictions, but also may determine compliance to protected area regulations where a protected area is implemented (Stern, 2008a). Furthermore active opposition of locals towards

neighbouring parks can potentially arise as a result of distrust for institutions and managers (Stern 2008b).

Perhaps the present study can be viewed as a starting point to building procedural trust and fostering social learning (Bandura, 1963). Stern and Coleman (2015) define procedural trust as: "trust in procedures and other systems that decrease vulnerability of the potential trustor…" and are anteceded by "perceptions of legitimate, transparent and/or binding procedures…" (p. 122). If listening to and documenting the attitudes and perceptions of residents is viewed as a transparent procedure, then attention to the findings herein (as a basis for further discussion) may help initiate the building of procedural trust. If that is the case then a vital component to the collaborative process of planning (Stern & Coleman, 2015) for a South Coast NMCA (i.e. trust) may be now more readily attainable.

At the very least resident values, attitudes and beliefs have been identified to assist with a key challenge in developing trust during collaborative processes. Decision-makers can utilize such insight in the consideration of local values to facilitate collaborative efforts. Furthermore this may help improve decision making and conflict resolution along with the chances of implementing such natural resource management efforts as an NMCA (Innes, 1996; Wondolleck & Yaffee, 2000; Stern & Coleman, 2015). However if that trust is built then it must also be maintained and that is dependent upon the management agencies involved (e.g. federal and or provincial) and their willingness to collaborate with local governments, groups and residents.

Despite apparent support in the past for a South Coast NMCA, evidenced by an application to Parks Canada from community leaders in the South Coast and letters of

support from fisher committees (BDDB, 2003), the results of this study suggest that this support may not hold true for many Burgeo residents today (Figure 3). However, with the largest percentage of respondents (27.2%) being strongly opposed it may suggest a capturing of those residents with the strongest opinions.

Inherent throughout the responses to the questionnaire (e.g. what came to mind, negative impacts, and reasons for opposition) were perceived restrictions to local peoples' livelihoods, mainly involving hunting and fishing. While on the other hand perceived positive impacts and reasons for support of a South Coast NMCA pertained mainly to potential for economic development of the area in general with some mention of tourism specifically and wildlife conservation. Overlap with protection and conservation while continuing traditional livelihood activities to achieve a balance, displays a tendency toward sustainable development thinking. This resembles findings that protected areas in general can elicit positive perceptions of economic diversification in some while negative perceptions of intrusive management tools by others (Cartwright, 2003; Cormier, Pelletier, Lemelin, Koster & Metansanine, 2008; Lemelin, 2010; Lemelin et al., 2010). A declining economy accompanied by the fear of losing rights and distrust of management by provincial and federal agencies (all of which were present in this study) are thought to be contributing factors to the above concerns (Lemelin, 2008; Lemelin et al., 2010).

Concerns for livelihood strategies (e.g. hunting and fishing) being quite prominent in Burgeo residents' perceptions of an NMCA is consistent with that of residents of the Andaman Coast in Thailand and their perceptions of Marine National Parks (Bennett & Dearden, 2014). Participants in that survey were particularly concerned about the

"exclusion of fishers and subsistence harvesters from the area" (Bennett & Dearden, 2014, p. 110). Again this was a reoccurring theme for Burgeo residents. Perceived threats to livelihoods and negative impacts on local stakeholder should not be underestimated as they can ultimately thwart attempts at NMCA designation, as seen at Bonavista- Notre Dame Bays, NL (Dearden & Rollins, 2009).

It is clear there are a variety of negative as well as positive impacts that could occur as the result of the designation of a South Coast NMCA and MPAs in general. If Parks Canada (2010) follows its requirements and mandate for NMCAs: "of recognizing the benefit, education and enjoyment of the people" and allowing "multiple use" and "sustainable" practices such as "traditional fishing activities along with marine research and ecological monitoring and provisions for marine interpretation and recreation", then many of the negative impacts associated with no-take MPAs (e.g. restricted access, decreased catches, cost of travel) may be mitigated against.

In the event that higher zones of protection (e.g. no-take) were put forward by management (Parks Canada) and accepted by local stakeholders, previous experience with MPAs and the associated literature demonstrates that there is potential for increased fish productivity in those areas and associated spillover (Roberts et al. 2001; Halpern et al. 2009; Russ & Alcala, 2011) for fishers to take advantage of. NMCAs with higher zones of protection hold potential to increase sustainability of a resource by creating a balance between fishing and conservation and potentially eliminating conflict between management and fishers (Halpern et al. 2009; Russ & Alcala, 2011).

Furthermore if Parks Canada (2010) is successful in its stated management requirement of truly "partnering with regional stakeholders, coastal communities, aboriginal peoples and

provincial and territorial governments and other federal departments and agencies", this may help prevent or eliminate the negative sociocultural impacts associated with lack of consultation and engagement of the local residents in management and decision making. Arnstein (1969) defines partnership as a form of citizen participation "that allows the citizens some power to negotiate with powerholders, agreeing to share planning and decision making responsibilities through such structures as joint policy boards, planning committees and mechanism for resolving impasses" (p. 221). Commitment to this definition will more than achieve consultation and engagement; it will allow residents an active role in decision making and may help build support (Gleason et al., 2010).

As seen in previous attempts at MPA designation, local residents and their traditional subsistence activities need to be considered (Elliott et al., 2001). Inclusion of available science (including local knowledge) to assess scientific, social and economic success (Lundquist & Granek, 2005; Walley, 2010), attention to inputs such as local development indicators (Bennett & Dearden, 2014a), involvement of social structures and use patterns (Fiske, 1992), and achievement of the rights and livelihoods of locals (Elliott et al. 2001; Lemelin & Dawson, 2013; Mascia & Claus, 2009; Samonte et al., 2010), are all goals that must be achieved to establish effective partnership of the managing body with local (residents) and regional stakeholders.

The above considerations must be taken into account at step-zero (Chuenpagdee et al., 2013) or prior to planning and establishment of an MPA (or in this case an NMCA). Identifying and documenting attitudes, values and beliefs is a small, but necessary step towards establishing partnerships with Burgeo residents. This can potentially increase support and decrease alienation (Suman, 1999), allow for negotiation and mitigate against

adverse effects to avoid late stage conflicts (Cocklin et al., 1998; Kenchington & Kelleher, 1995; Smith, 1982). The identification of the attitudes, values (anthropocentric and ecocentric), local beliefs and knowledge can now inform and facilitate the discussion of feasibility of a South Coast NMCA and help to resolve current and future tensions between marine environmental protection and socioeconomic development (Wolfenden et al., 1994). Of course, genuinely taking local concerns into account may mean that an NMCA will ultimately not proceed.

8.0 Recommendations

- There is a need to explain the nature of a South Coast NMCA to local residents and stakeholders, particularly regarding potential restrictions and opportunities. Development of a communication and educational program or campaign (e.g. brochure/pamphlet) would be beneficial to this effect.
- A more comprehensive study of values, attitudes and beliefs of the greater South Coast region (e.g. other communities involved) is needed.
- There is a need for Human Dimensions research into the trust toward, and credibility of, organizations and stakeholders (e.g. Parks Canada, DFO, Provincial Parks, Provincial Fisheries, CPAWS, and Memorial University) among residents. This has implications for identifying the best messenger and in turn achieving successful communication and message delivery.

- There is a need to understand the views of key stakeholders (e.g. Parks Canada) particularly their position on, and willingness to, engage communities and key interest groups in an effective partnership process.
- If design and implementation processes were to occur in the future regarding a South Coast NMCA, further studies should utilize Bennett and Dearden's (2014a) framework for analyzing marine protected area inputs (e.g. local development, governance, and management indicators). As Bennett and Dearden (2014a) claim, "…it might provide governors and managers with a list of best practices or recommendations to lay the groundwork for creating more successful MPAs" (p. 106).

9.0 Conclusion

The goal of this research project was to portray the potential for the residents of the South Coast Region of NL to support and accept a South Coast NMCA. To achieve this goal I set out to identify and document local residents' values, attitudes, and beliefs toward the 'proposed' South Coast NMCA. This was meant to help display its potential to protect marine biodiversity of the region and support rural economic development for local communities (e.g. Burgeo, Ramea, La Poile, Grey River, Francois). The former was partly achieved for the Town of Burgeo, but it is suggested a more comprehensive study of the values, attitudes, and beliefs of the residents of the greater South Coast Region (e.g. other communities involved) is needed. Due to an apparent lack of support and concern for restrictions the former

will require greater attention, through information and education campaigns (i.e. through a feasibility study) that highlight the scope of those potential benefits and realities regarding restrictions within an NMCA.

The feasibility of a South Coast NMCA cannot be wholly determined by Burgeo residents' attitudes, values, and levels of support or opposition. It will require a much larger assessment of the South Coast residents' opinions in general, along with other types of assessment (e.g. management capacity, governance etc.). However if such a study were to demonstrate similar opinions throughout the South Coast (i.e. due to similarities in the socio-cultural, economic and livelihood characteristics of each community), then one would have a stronger foundation for assessing feasibility.

Based upon the findings of this study, the project may be potentially feasible with greater education and information. However feasibility is contingent upon Parks Canada achieving effective stakeholder engagement through partnering with local communities and stakeholders. Only then can a true understanding of residents' and stakeholders' attitudes, values, and support levels be taken into account. Although this study has revealed negative perceptions and some strong opposition to a South Coast NMCA, it appears that this may be due to limited knowledge of Parks Canada's approach to allowing traditional subsistence activities to continue. However the concerns raised by local residents about the restriction of future industrial development (e.g. oil and gas, mining and aquaculture) must be considered by managing agencies. With a mandate to limit such activities there will need to be balancing of Parks Canada's mandate for marine conservation and protection with

that of the community's desires for economic development. Positive from a feasibility perspective is the community's value for protection and conservation of marine life along with some recognition of the benefit that sustainable tourism can provide.

Again, educational and information campaigns may allow those who could neither support nor oppose a South Coast NMCA to make a more informed decision. Those who expressed support or opposition in this study may also be swayed by a more accurate understanding of what a South Coast NMCA will mean. As mentioned above, support for and success of MPAs is ultimately asserted by positive local perceptions of socio-economic and ecological outcomes (Agardy et al., 2003; Christie et al., 2003; Heck et al., 2012; Bennett & Dearden, 2014b). However support also requires positive perceptions of "the effectiveness and quality of management and governance policies, institutions, and processes" (Pomeroy et al., 2004; Lockwood, 2010; Hind, Hiponia & Gray, 2010; Webb, Maliao & Siar, 2004; Bennett & Dearden, 2014b p. 107). Therefore perceptions of the above factors will need to be continually addressed before and during the involvement of federal and provincial agencies in the process of assessing the feasibility of a South Coast NMCA.

Stakeholder engagement and a baseline study of Burgeo residents' values, attitudes, and beliefs has now been initiated. The next step in moving towards a feasibility study for an NMCA is to build upon this engagement to inform the public as to why the South Coast is/was under consideration for NMCA designation and based on both experiences elsewhere and knowledge of local conditions, what this could mean for local residents and stakeholders.

10.0 References

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Appendix A: Questionnaire

Burgeo Residents' Attitudes toward a Potential South Coast National Marine Conservation Area

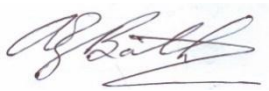
Thank you for agreeing to participate in this research project. I, Brandon Ward, a Master of Environmental Science student at Memorial University of Newfoundland am interested in learning more about residents' opinions toward a potential National Marine Conservation Area (NMCA) in the South Coast region. Canadian Parks and Wilderness Society (CPAWS), Newfoundland Chapter is partially sponsoring this study. I am distributing this questionnaire to a select number of individuals so your participation is greatly appreciated.

Whether you are against, in favour, or neutral about a South Coast NMCA, we would like to hear from you. Your opinions are valuable and we encourage you to answer all of the questions, but you are free to skip any question that you are not comfortable answering. You have the right to withdraw from the study at any time between the point of contact and the time of collection at your own discretion. Your answers will be grouped with those of other respondents, and your individual answers will be kept anonymous and strictly confidential. I, Brandon Ward, will arrange to pick up your completed questionnaire within a couple of days.

Thank you for your time and for expressing your views about this issue. If you have any questions about the project please feel free to contact me by phone at 709-765-6070 or by e-mail at bmw354@mun.ca.

Sincerely,

Brandon Ward
Principal Investigator



Dr. Alistair Bath
Principal Supervisor

Residents Attitudes toward a South Coast National Marine Conservation Area

Section A: *The first few questions ask about your knowledge and perceptions of a South Coast National Marine Conservation Area.*

1. How knowledgeable are you with the concept of a National Marine Conservation Area? (Circle the number that best represents your response)

Very unknowledgeable	***Somewhat unknowledgeable***	***Unsure***	***Somewhat knowledgeable***	***Very knowledgeable***
1	2	3	4	5

2. The South Coast region has been identified as a potential National Marine Conservation Area (NMCA).

Generally True Generally False Not Sure

3. When you think of a South Coast National Marine Conservation Area, what comes to mind?

_____

_____

_____

_____

_____

4. There are more benefits than negative impacts associated with a South Coast National Marine Conservation Area? (Circle the number that best represents your response)

Strongly disagree	***Somewhat disagree***	***Neutral***	***Somewhat agree***	***Strongly agree***
1	2	3	4	5

5. What might be the negative impacts of the South Coast region becoming a National Marine Conservation Area?

_____

_____

_____

_____

_____

_____

6. What might be the positive impacts of the South Coast becoming a National Marine Conservation Area?

_____

_____

_____

_____

_____

_____

Section B: *In the following section you will be asked two similar sets of questions. The first set (1.) will assess what you think a South Coast National Marine Conservation Area will do for your region. The second set (2.) will assess how you feel about those potential changes to your region.*

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1. To what extent do you agree or disagree with each of the following? (For each statement, circle the number that best represents your response.)

A South Coast NMCA will…	***Strongly Disagree***	***Somewhat Disagree***	***Neutral***	***Somewhat Agree***	***Strongly Agree***
…increase tourism in the south coast region	1	2	3	4	5
…promote economic development in the south coast region	1	2	3	4	5
…diversify the economy in the south coast region	1	2	3	4	5
…restrict access to fishing in the south coast region	1	2	3	4	5
…close the current fishery in the south coast region	1	2	3	4	5
…conserve marine life in the south coast region	1	2	3	4	5
…benefit marine species in the south coast region (e.g. whales, fish, lobster, etc	1	2	3	4	5
…rebuild fish stocks in the south coast region	1	2	3	4	5
...restrict industrial/economic development in the south coast region	1	2	3	4	5
…restrict aquaculture development in the south coast region	1	2	3	4	5

…restrict oil and gas development in the south coast region	1	2	3	4	5
…save South Coast communities from resettlement	1	2	3	4	5
…preserve outport/rural culture in the south coast region	1	2	3	4	5
…preserve outport towns in the south coast region	1	2	3	4	5
…balance tourism and industrial development with marine conservation in the south coast region	1	2	3	4	5

The following questions are asking about your general attitudes toward a variety of impacts which could potentially occur as a result of National Marine Conservation Area designation.

2. How do you feel about the following impacts in the South Coast region?

	Very negative	***Somewhat negative***	***Neutral***	***Somewhat positive***	***Very positive***
Increased tourism	1	2	3	4	5
Increased economic development	1	2	3	4	5
Diversification of the region's economy	1	2	3	4	5
Restricted access to fishing	1	2	3	4	5
Closure of the current fishery	1	2	3	4	5
Conserve marine life	1	2	3	4	5
Benefit marine species in the region (e.g. whales, fish, lobster, etc.)	1	2	3	4	5

Rebuild fish stocks	1	2	3	4	5
Restrict industrial/economic development	1	2	3	4	5
Restrict oil and gas development	1	2	3	4	5
Restrict aquaculture development	1	2	3	4	5
Preservation of rural outport culture	1	2	3	4	5
Preservation of outport towns	1	2	3	4	5
Saving the South Coast communities from resettlement	1	2	3	4	5
Balancing tourism and industrial development with marine conservation	1	2	3	4	5

4. What is most important to you in the South Coast region?

_____

_____

_____

_____

_____

5. What percentage (from 0 % to 100 %) of the South Coast marine region, if any, would you like to see closed to commercial fishing?

_____

6. What would you like to see protected/conserved in the South Coast region?

_____

_____

_____

7. What type of economic development would you like to see in the South Coast region?

Section C*: The next question asks you about your support or opposition of the South Coast becoming a National Marine Conservation Area.*

1. On a scale from 1 to 5 do you support or oppose the potential designation of the South Coast as a National Marine Conservation Area?

Strongly oppose	***Somewhat oppose***	***Neither oppose nor support***	***Somewhat support***	***Strongly support***
1	2	3	4	5

2. Why? (Please give a reason for your previous answer)

3. What, if any, concerns do you have of the South Coast becoming a National Marine

Conservation Area?

_____

_____

_____

_____

_____

4. If you answered “somewhat support” or “strongly support” to Question 1 Section C, what do you want a National Marine Conservation Area to achieve?

_____

_____

_____

_____

Section D: *To finish I would like to know some information about you solely for the purpose of statistical analysis.*

---

1. Gender: ☐ Male ☐ Female ☐ Identify as other

2. What is your age?

☐ 18-25 years ☐ 26-35 years ☐ 36-45 years ☐ 46-55 years ☐ 56-65 years ☐ Over 65 years

3. How long have you lived in Burgeo, NL?

☐ 0-5 years ☐ 6-10 years ☐ 11- 20 years ☐More than 20 years

4. What is your primary occupation? If other please explain (Check the box that most applies to you).

☐ Fishing	☐ Healthcare	☐ Education	☐ Trades
☐ Sales/Services	☐ Tourism	☐ Unemployed	Other:_____

5. Do you have any additional comments about the potential for the South Coast region to become a National Marine Conservation Area?

_____

_____

_____