

**The Slippery Road to Empowerment: The Musquash
Experience in Developing a Co-management Model for a
Marine Protected Area in the Bay of Fundy**

by

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Abstract

Marine resource management is an area that has come under much scrutiny in recent times due to resource mismanagement in top-down bureaucratic approaches.

Increasingly, the integrity of such management regimes has been called into question.

Emphasis is shifting toward finding alternative, more responsible management

approaches, including co-management. Co-management entails the sharing of regulatory and decision-making power between the state and resource users in order to create more

effective and legitimate management practices. This thesis investigates the

implementation of a co-management arrangement in a Marine Protected Area (MPA).

MPAs are a conservation strategy employed by the federal government to protect unique and endangered marine ecosystems. MPAs are intended to be jointly managed between

the state and those who utilize or reside adjacent to them. This research examines

community participation in the management of a proposed MPA through documentation

of the process and investigates the challenges and problems that arise.

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List of Abbreviations

MPA - Marine Protected Area

DFO - Department of Fisheries and Oceans

GEOIDE - Geomatics for Informed Decisions

CPR - Common Property Resource

Introduction

Marine resource management is an area which has come under considerable scrutiny and which lies in much turmoil in contemporary times. Marine resources face problems of overexploitation and degradation. Current management systems face issues of civil disobedience in regard to enforcement of resource regulation and find that they are unable or ill equipped to deal with resource sustainability challenges. Because of past marine resource mismanagement in top-down bureaucratic approaches, the integrity of such management regimes has been called into question. Increasingly, emphasis has shifted toward finding an alternative, more responsible management approach. One such approach, the co-management model, attempts to address the problems plaguing modern management regimes by integrating local communities and stakeholders into the management process.

One goal of co-management is greater involvement, even empowerment, by those who utilize resources or reside adjacent to them. Involvement in the management process implies that resource users meaningfully participate in regulatory decision making, implementation of policy and enforcement of regulations (Felt, Neis and McCay, 1997; Jentoft, McCay, and Wilson, 1998). The underlying ideology behind such an approach is that the integration of traditional knowledge possessed by local resource users into the management process will result in more effective and efficient management practices.

Participation in the management process enhances community compliance as users feel that they are part of the process. Involvement affords a sense of agency to users and lends legitimacy to regulation.

This thesis focuses upon a case study of a proposed Marine Protected Area (MPA) in the Bay of Fundy, New Brunswick, and examines the factors which contributed to the formation of the model of co-management that was employed in this situation. MPAs are a conservation strategy employed by the federal government to protect and preserve unique and endangered marine ecosystems. The federal government emphasizes the need for MPAs to be jointly managed between the state and those who are directly affected by the conservation effort. Therefore, co-management arrangements are extensively used in MPAs. The intent of this thesis is to investigate the implementation of a co-management arrangement for an MPA in the Bay of Fundy, New Brunswick and to examine the factors which helped to shape the eventual model of co-management that was assumed. This is accomplished by following the designation effort and subsequent search for a relevant management model of a proposed MPA site at Musquash. This research was made possible through a federally supported research project, in which I played a part, that utilized the proposed Musquash MPA as a case study. We are able to follow the community's effort to designate Musquash as an MPA through examination of such things as community planning groups and meetings. As the community's effort to find an appropriate management model is followed, factors influencing and shaping this process

become apparent. This thesis identifies such factors and examines their role in shaping the final model of management that was implemented in Musquash.

Canada's MPA Initiative

The MPA program is a relatively new federal government initiative aimed toward conservation and protection of endangered or unique habitats. The Department of Fisheries and Oceans (DFO) is responsible for implementing the program under the guidance of the Oceans Act. DFO emphasizes the need for MPAs to be cooperatively managed by both the state and those who are directly affected by MPA designation, the stakeholders. This is apparent in DFO's guiding policies which stress the principles of integrated management, partnering, and consultative arrangements in the management of all MPAs. Stakeholder involvement is deemed necessary as the MPA program is new and the process is somewhat unpracticed. DFO, in implementing the MPA program, avails itself of aid and knowledge offered from a variety of sources as this may expedite the process and turn in into one which is much more effective. The need for co-management also exists as potential MPA sites are quite diverse in nature. The purpose of designation varies greatly across situations and this implies that management practices must be flexible enough to accommodate such diversity. However, the degree of partnering and the extent of co-management arrangement are left somewhat ambiguous as it is to be determined on a case-to-case basis as the situation warrants. This implies that MPA management could incorporate anything from a co-management arrangement to

merely a consultative arrangement.

One current focus in marine resource management literature rests upon co-management arrangements as an alternative approach to other less adequate, dominant management regimes. This research is an addition to such literature as it examines the implementation of a co-management arrangement through a case study. The challenges inherent in implementing this specific co-management model and the factors which influenced its creation can make a valuable contribution to the literature. The understanding gained from this specific example can be applied to wider issues in co-management. Thus, the research has significant implications for MPA management as well. The MPA program is in its early stages and is relatively unpracticed. The MPA designation process is one that has not yet been implemented frequently, and as such management is not well developed. This thesis can therefore offer valuable case-specific knowledge of MPA management that can be applied to the development of future management models.

Introduction to the Proposed Musquash MPA

Musquash is an estuary located approximately 20 kilometres west of Saint John, New Brunswick in Canada (DFO, 2001). It is located within the Bay of Fundy, which is an internationally significant marine ecosystem in the Gulf of Maine. For a map of Musquash refer to Figure 1. The Bay of Fundy is notorious for its enormous tides which have been known to extend to a height of 16 metres, the highest in the world (Musquash

MPA Campaign Website, 2003). This ecosystem supports some of the healthiest and most productive marine fisheries in Canada. Musquash estuary is currently an Area of Interest in the MPA program.

An “estuary” is defined as “a semi-enclosed coastal body of water which has a free connection with the open sea and within which sea-water is measurably diluted with fresh water derived from land drainage” (Salm & Clark, 1991). Estuaries and salt marshes are highly productive areas which support a variety of life forms and play a crucial part in the health of marine ecosystems. In 1997 the Conservation Council of New Brunswick, in coordination with various other partners, engaged in the “Gulf of Maine Estuaries Restoration Project” which conducted habitat assessments of estuaries in the Gulf of Maine including the Bay of Fundy. As a result of such assessments it was determined that all of the Bay of Fundy’s estuaries had been degraded and their functioning impaired except Musquash Estuary which remains relatively healthy and intact (Musquash MPA Campaign Website, 2003). Presently (2003), Musquash continues to be productive and thriving as very little industry and development exists within the estuary which could potentially destroy or pollute it. In 1998 the Conservation Council with the support of the Fundy North Fishermen’s Association produced a joint proposal to nominate Musquash as an MPA so that the estuary would be permanently protected and conserved.

Musquash is a small estuary, measuring approximately 27 square kilometres (Musquash

MPA Planning Group, 1999). It is a macro-tidal estuary with tides ranging from 6 to 9 metres and featuring extensive tidal mudflats which provide a home for various life forms such as clams, seaworms and mud shrimp (Musquash MPA Planning Group, 1999). For a picture of the mudflats refer to Figure 2. Its harbour contains cobble and sand beaches, rocky headlands and islands which provide nesting areas for several species of birds. Also the estuary contains salt marshes in which sections have been drained by Ducks Unlimited and formed into extensive bird sanctuaries. Ducks Unlimited owns a considerable amount of land in Musquash, approximately 137 hectares, where impoundments have been constructed to facilitate several forms of life such as Canada Geese (Musquash MPA Planning Group, 1999). Refer to Figure 3 for a picture of the salt marshes. Freshwater flow is regulated in the estuary by turbines from an electrical generating plant which can be seen in Figure 4. The marsh land itself is very significant as most of the Bay of Fundy's original marsh land has been destroyed due to development of various sorts. The salt marshes in Musquash are the largest intact tract of salt marsh left on the New Brunswick side of the Bay of Fundy and incorporates approximately 773 hectares (Musquash MPA Planning Group, 1999).

Musquash is not a densely populated area with approximately only 5 people per square kilometre (Statistics Canada, 2001). See Figure 5 for more information concerning population density. The total population in 1996 was 1315 (Statistics Canada, 2001). Refer to Figure 6 for other population information. In touring the area it is clear that

residential neighbourhoods are not overly abundant. In fact, residential land accounts for a small percentage of the total existing land in Musquash. The vast majority of land is marsh land as evident from the property data collected from Service New Brunswick's deed records (refer to Figure 7 for property ownership percentages). While Musquash does not have a large residential section, areas that are utilized for recreation have the potential to be frequented by a substantial amount of people. Therefore, there exists a need to regulate use in these areas as people may possibly compromise the health of the estuary.

Through the use of various socioeconomic indicators it is apparent that the Musquash economy is 'modest'. In 1996, the unemployment rate was approximately 13%, and the mean income for males was \$28 000 with 50 residents working in primary industry (Statistics Canada, 2001). For greater detail concerning unemployment rates see Figure 8, mean income see Figure 9, and primary industry labour force see Figure 10. Musquash supports a small lobster fishery and a scallop fishery which runs six weeks a year.

Musquash is worth protecting as it is a valuable resource. The integrity of the estuaries in the Bay of Fundy have been compromised, all except that of Musquash. Estuaries are important ecological habitats to protect as they are unique and productive systems. Musquash estuary possesses many positive attributes such as its healthy salt water

marshes and mudflats and also provides a home for many marine life forms and other species such as Canada Geese. Musquash is an ecosystem that is worth saving and as such is a promising candidate for MPA status.

Thesis Structure

This thesis is organized as follows. Chapter one is devoted to a methodological discussion of the research process. Chapter two is an introductory chapter on MPAs that offers a definition of the term, presents reasons behind the program's inception and a formal overview of the MPA process. Chapter three consists of a relevant co-management literature review which discusses the need for such arrangements and what specifically it is that they constitute. The fourth chapter examines social theory behind co-management models and explores the inherent nature of change in any co-management arrangement. The fifth chapter offers a description of the case study (the proposed Musquash MPA), provides a review of the designation process to date, and addresses the factors which shaped the specific model of co-management that was employed in the case study. The concluding chapter reviews the research findings and offers a set of recommendations for future MPA co-management endeavours.

Chapter 1: Methodology

The Research Subject

The purpose of this thesis is to examine the challenges associated with the implementation of a co-management arrangement in a proposed MPA and to investigate the factors which shape the final management model. Originally, the focus of this research was somewhat different. Initially, the research was directed toward an investigation of socio-cultural aspects in boundary delineation of MPAs, focussing primarily upon territorial use rights by local residents of designated MPA areas and potential impacts of designation upon local residents. This research was to be funded through the GEOIDE (Geomatics for Informed Decisions) program's Good Governance of Canada's Oceans initiative.

GEOIDE is part of the Network Centres of Excellence program which is federally supported by the government to encourage interdisciplinary research and collaboration among universities, industry and government. The 'Good Governance of Canada's Oceans: The Use, Value and Significance of Marine Boundary Information' initiative was to investigate marine boundary issues in Canada. Musquash estuary, which was already independently seeking DFO MPA designation through its Planning Group was offered to the GEOIDE project as a case study by the Director of the Oceans Act Coordination

Office. The Planning Group consisted of community members, the Conservation Council of New Brunswick, and other stakeholders and represented the Musquash community in the MPA designation process. DFO was to be a full supporting partner in the GEOIDE initiative. DFO was interested in the GEOIDE work as it hoped to utilize the group's expertise in defining boundaries in the proposed Musquash MPA. The GEOIDE effort would further benefit DFO as it could apply the work concerning the Musquash MPA to further boundary and subsequent and legal issues in other MPAs. An important point to make is that the GEOIDE group's work was an independent project, the group's intentions were not to impede the Musquash Planning Group's efforts to get Musquash designated as an MPA, but to fulfill their own research mandate and to assist the Musquash project with issues concerning boundary delineation which had to be addressed at some point in the designation process. The GEOIDE team was working with a DFO official who was responsible for co-ordinating Musquash MPA designation.

One objective of the Good Governance of Canada's Oceans initiative was to investigate the socio-cultural aspects of boundary delineation for MPAs. This was the section of the project from which my original research was to stem. The leading researcher was Dr. Lawrence Felt who intended to carry out research through the use of already existing secondary data and the use of interviewing techniques. Again, the objective was not to study the MPA implementation process itself, or any group involved in this initiative. The objective was to address the boundary research and assist the community Planning

Group in their efforts to complete an acceptable management plan to submit to DFO as this is a necessary step in the designation process.

In introducing the GEOIDE socio-cultural boundary initiative, Dr. Felt attended a Musquash MPA Planning Group meeting in March of 2001 in Musquash. At this meeting Dr. Felt intended to convey his role in the GEOIDE project as one which would encompass research for the development of a social, economic and cultural impact statement as background material for MPA boundary designation. Dr. Felt also intended to convey the fact that the GEOIDE research team did not intend to redo any already existing social and cultural research that might have been completed by local community members. Instead GEOIDE research was to complement and build upon such work.

Dr. Felt assumed that the members of the Planning Group had prior knowledge of the socio-cultural aspect of the GEOIDE project and anticipated his presence at the meeting. However, it became clear at the beginning of the presentation that the Planning Group had no knowledge of the GEOIDE project and was in fact opposed to it as Dr. Felt's presentation was met with a great deal of hostility and resistance. Dr. Felt recounts several incidences of opposition including statements such as "Who in hell are you and what are you doing here?" (Dr. Felt, personal communication, January 2003). Upon further inquiry Dr. Felt came to the realization that the Planning Group did not know anything about the GEOIDE project. No one acknowledged any contact with the

GEOIDE group even though in earlier Planning Group meetings other GEOIDE members had made presentations concerning boundary issues and local ocean mapping. Obviously, no link was made between the ocean mapping presentation and GEOIDE on the part of the Planning Group. Dr. Felt was told that his presentation was not needed but he was allowed to stay as an observer at the meeting and was able to listen to some general discussion concerning MPA designation.

Clearly, a miscommunication or misunderstanding concerning GEOIDE's role in the project occurred. In retrospect it is obvious that DFO's Ocean's Act Coordination Office Director, who signed off as a partner in the GEOIDE program, had not informed the Planning Group directly or through the locally appointed DFO official responsible for carrying out the MPA mandate about the socio-cultural aspect of the GEOIDE initiative (Dr. Felt, personal communication, January 2003).

In response to Dr. Felt's presentation at the Planning Group meeting and to the proposed GEOIDE research concerning the socio-cultural aspects of boundary delineation in an MPA, the Musquash Planning Group sent a letter to the local DFO official responsible for handling the MPA, which is partially quoted below:

We have considered this (Dr. Felt's research) carefully and it is CCNB's [Conservation Council of New Brunswick] opinion...that we should ask Mr. Felt not to begin this research until after the MPA has been declared. We are keenly aware that new initiatives and strange faces introduced to an area in the midst of other developments can be easily misconstrued or misrepresented. Our primary

concern is that people will mistake his researchers and their survey questions as having something to do with the MPA process itself and/or its proponents (Planning Group, e-mail, March 27, 2001).

The Planning Group raises issues pertaining to the negative influence of outside involvement as it may hamper the MPA designation process. The circumstances in this situation are relevant examples of what can occur when the communication process in management arrangements break down. Co-management (discussed in detail in Chapter 3) is structured around the belief that stakeholders need to be involved in all stages of the management process for it to be truly effective, as each has the potential to contribute essential knowledge and skills which can strengthen management. Research institutions such as GEOIDE are thought to be of some help to the management process as they can offer beneficial resources, skills and experience that would otherwise not be available. However, effective and meaningful participation by those involved is not possible without open lines of communication. The contribution of users, research institutions or even the state can only be realized if all of those involved are aware of what it is others can offer and understand the motives behind participation. This is not possible if effective communication does not occur. Co-management represents governance that takes place across several levels of jurisdiction. Good governance is only possible if ties between jurisdictions, such as those which exist between user organizations, external institutions and the state, are strong. Such ties are dependent on and reinforced by effective communication.

Also included in the response to Dr. Felt's presentation was the following:

This type of research-strangers interviewing local residents-is very intrusive and there is a real risk that someone might take offense or be suspicious of the researchers and their motives. ...we don't want to risk this unrelated activity generating any doubt about or negative reaction to the MPA, or creating any idea that there is a "hidden agenda" at work. If one person has a negative or questionable experience with the researchers, the impact could quickly ripple throughout the community and we (meaning those of us on the planning group) would then be put into a position of having to fight brush fires and rebuild trust that has been so carefully nurtured to date...(Planning Group, e-mail, March 27, 2001).

The suspiciousness and lack of trust displayed in the above quote may exist because of the Planning Group's lack of knowledge about the socio-cultural objective in the GEOIDE project, but it also raises an important point to consider in marine resource management research. Initiatives such as the one seen here, put forth by the Planning Group, encompass a bottom-up approach. It was the community, represented by the non-governmental organization the Conservation Council of New Brunswick, that put forward the application to designate Musquash as a MPA. The community is quite involved in the process and takes responsibility and pride in the initiative. External involvement carries the potential to be viewed as an intrusion. The community (by this I include all of those involved with the Planning Group, the Conservation Council and other represented organizations) is protective of the MPA designation process and is suspicious of external involvement as it may compromise their own work and runs the risk of taking over a project which they view as rightfully theirs.

Much of the opposition to Dr. Felt's presentation was due to impressions on the part of the Planning Group that he was attempting to carry out research that had already been done by the community. One resident in particular who voiced strong resistance to the GEOIDE project was an environmental activist and intermittent Conservation Council employee who had independently carried out historical, cultural and social overviews of the Musquash area. He felt that the community had already completed all of the social research that was required for MPA designation and that the GEOIDE project was attempting to redo work that had been done. Due to this belief he viewed the GEOIDE project as redundant and any further proposals made on behalf of GEOIDE as an indignity to himself and the existing work.

Acceptance of state and external organizational involvement in the management process on the part of resource users or non-governmental organizations may be difficult.

Acceptance of co-management arrangements is largely dependent on those involved employing an open-mind. Co-management implies that governance is shared, in all stages, from implementation to enforcement. The MPA program itself is built upon and dependent on the value of partnering and integrated management as it is a new program which operates most effectively by availing itself of all sources of knowledge and experience. This means that many organizations and stakeholders will be involved in the process. The willingness displayed on the part of those involved to incorporate others who may aid in the process should not be taken for granted. This is an especially

pertinent issue as MPAs may be initiated by local groups who may take a rather 'possessive' stance toward the process. I believe this point is reiterated in the content of the concluding paragraph in the correspondence:

...there is a need for a process through which researchers can rationally approach the community and the MPA managers and stewards. We would like to suggest establishing a Musquash Research Advisory Committee. This group could suggest new research to be done and vet (sic) research proposals such as Mr. Felt's as they come along (Planning Group, e-mail, March 27, 2001).

In light of the opposition toward this aspect of the GEOIDE research initiative, it was modified to such an extent that only secondary data were collected. The research team respected the wishes of the Planning Group and did not continue with their plans to collect primary data by interviewing or any other technique which could be viewed as "intrusive" by the Musquash Planning Group. Ultimately, this left me in a position where I no longer conceived of my original research as a feasible or viable option. As a result of this situation, it occurred to me that it would be an intriguing and even befitting idea to study co-management, particularly the challenges inherent in the implementation of co-management in the proposed Musquash MPA and investigate the factors which would come to shape its final formation. However, I was limited in the research tools which could be ethically utilized. No opportunity existed for any community interviewing. That was obvious as the Planning Group had made its stance quite clear and I felt that it was overly presumptuous to assume that they would approve of any such measures that I would propose. However, the data I was able to gather are extensive in nature and are

able to sufficiently address the modified research problem.

Methodology

Much of the data gathered are secondary in nature, compiled from public data bases, copies of personal communications such as e-mail, minutes from community meetings, published and unpublished reports and documents from DFO and the Musquash community, and information sources that are readily available such as those from the internet. Primary research was also conducted including such things as personal communications and correspondence with DFO officials, personal communications with some members of the Musquash community group and the Conservation Council, and observations of the Musquash estuary.

Secondary research includes:

- Property data and deed records of the Musquash Parish compiled from Service New Brunswick
- DFO published reports and documents compiled from the DFO website concerning Musquash, MPAs and co-management practices
- DFO unpublished reports gathered from DFO personnel regarding physical and ecological characteristics of Musquash, the Musquash MPA designation process, co-management practices, and MPAs
- Physical characteristics of the Musquash estuary from both the Musquash Planning

Group and the Conservation Council of New Brunswick's website

- Information about the management process from the Musquash Planning Group's website
- Documentation concerning the state of Musquash MPA designation compiled from DFO, the Musquash Planning Group's, and the Conservation Council's websites
- Minutes from the Musquash Planning Group (currently titled the Friend's of Musquash) meetings
- Copies of e-mails circulated in the Musquash Planning Group, e-mails to and from DFO, the Conservation Council, GEOIDE, Dr. Felt and specific members of the Musquash community
- Demographic profiles of Musquash from DFO and the Musquash Planning Group
- Report on the social, cultural and economic background of Musquash from the Conservation Council's Musquash MPA Campaign Coordinator and community member
- Musquash proposal for area nomination from the Conservation Council and Planning Group
- Friends of Musquash by-laws
- DFO draft management proposal and recommendations
- Census data from Statistics Canada

Primary data include:

- Trips to view the Musquash estuary, observations made August 10-21, 2001
- Personal communications/informal interviews with the DFO official responsible for implementation of the Musquash MPA, Maria-Ines Buzeta
- Personal communications with other DFO officials concerning Musquash and DFO policy in general
- Personal communications with Janice Harvey, Marine Conservation Director at the Conservation Council
- Attendance at DFO meetings concerning Musquash
- Feedback from presentations delivered to joint DFO and GEOIDE meetings
- Attendance at meetings and personal communications with GEOIDE
- Interviews with Dr. Felt

Through the compilation of the above research a comprehensive background and knowledge base has been gathered about Musquash's MPA designation and management processes. The MPA designation process itself is a public one, which makes its development relatively easy to follow. Due to the fact that GEOIDE played a part in Musquash MPA designation and I was a GEOIDE research assistant, various forms of internal information became available concerning the workings of the management process which otherwise would not be possible to collect. Through the use of these means and traditional literature review in the area of co-management I believe I have

been able to present a comprehensive and valid account of the management process involved in the designation of the Musquash MPA.

Chapter 2: Marine Protected Areas

MPA Definition

The Government of Canada has mandated three departments (Environment Canada, Parks Canada and DFO) responsible for conservation and protection of living marine habitats and their resources. Each department has its own particular focus. These three federal government departments work together in a coordinated approach under the direction of the Oceans Act. Under the Oceans Act the Minister of Fisheries and Oceans has been given the authority to develop a National Strategy for Oceans Management and coordinate federal involvement in all oceans related issues (DFO, 1997). All federally designated protected areas operate complementary to provincial, aboriginal and community conservation strategies. The first two departments have been operating for some time and have extensive experience in managing protected areas.

Environment Canada is the first of these departments with a mandate to protect unique, critical and productive ecosystems for wildlife through the establishment of Migratory Bird Sanctuaries, National Wildlife Areas, and Marine Wildlife Areas (DFO, 2003a). Canadian Heritage (Parks Canada), the second federal department, protects and commemorates the country's natural and cultural heritage through Marine Conservation Areas (DFO, 2003a). These two departments existed prior to the creation of the Oceans Act and have since been integrated into the Oceans Act's broad-based network of

protected areas. The newest addition to Canada's conservation strategy, in effect since the advent of the Oceans Act, is The Department of Fisheries and Oceans' MPA program.

The term "marine protected area" is defined by the World Conservation Congress as:

"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" ("Background Paper", 1999, p. vii).

According to the Oceans Act, a "marine protected area" is:

"An area of the sea that forms part of the internal waters of Canada, the territorial sea of Canada (12 nautical miles) or the exclusive economic zone of Canada (to 200 nautical miles); and that has been designated for special protection under the Oceans Act for one or more reasons:

- a. the conservation and protection of commercial and non-commercial fishery resources, including marine mammals and their habitats;
- b. the conservation and protection of endangered or threatened marine species and their habitats;
- c. the conservation and protection of unique habitats;
- d. the conservation and protection of marine areas of high biodiversity or biological productivity; and
- e. the conservation and protection of any other marine resource or habitat necessary to fulfill the mandate of the Minister of Fisheries and Oceans" (DFO, 1997, p. 6).

Introduction to MPAs

Marine resources are an integral part of Canada's economy and culture. As Canada's marine ecosystems face many challenges such as contamination, habitat degradation and

threatening industrial development there becomes an ever-increasing need to develop and implement strong conservation tools. In light of such ominous circumstances the Government of Canada, under the 1997 Oceans Act, implemented a conservation strategy known as a Marine Protected Area. MPAs are a federal government initiative aimed toward furthering the protection, sustainability and ecological integrity of marine resources (DFO, 2003a).

Drawing from a historical perspective it becomes apparent that MPAs are not a new idea. Internationally there have been many conservation efforts paralleling that of the Canadian MPA program. The first known MPA was situated in Florida in 1935 (Gubbay, 1995). From that point on, several international actions took place that promoted MPAs as a vital component of any marine conservation effort. Today, MPAs are endorsed by a variety of organizations in the international community including, the United Nations Environment Program and the World Wildlife Fund (DFO, 2003b). There are approximately 1 300 MPA's worldwide, with Australia as the world leader boasting over 300, including the largest, the Great Barrier Reef Marine Park (DFO, 2003b; Gubbay, 1995). MPAs have existed along the coasts of North America for several decades. Mexico and the United States have federally legislated, well developed MPA programs often existing as partnerships with provincial jurisdictions. These MPAs, in varying stages of implementation, serve as learning tools for Canadian initiatives. Canada's own responsibilities in environmental protection are driven by international commitments to

marine biodiversity conservation. Canada is required to protect its coastal and marine resources under the Convention on Biological Diversity (1992) and the 1982 United Nations Convention on the Law of the Sea (DFO, 2003a). Today, MPAs are an essential part of Canada's conservation effort, with 192 existing MPAs in 2000 (DFO, 2003a)

Given the diversity in Canada's marine ecosystems, MPAs must necessarily serve a variety of needs and purposes to fulfill the program's mission statement. Therefore, MPAs require a flexible approach in design, management and enforcement (DFO, 2003a). The role of any given MPA can differ widely. For instance, the extent of restriction is dependent on the purpose for designation and can vary from a no-take zone which prohibits resource extraction to a multiple-use zone which permits certain activities (Gubbay, 1995). What is implied is that there can be no steadfast rules in the implementation of MPAs, only underlying guidelines as offered by the federal government. One such primary guiding objective in the MPA program is that of partnering (i.e. co-management) (DFO, 2003b). Partnering, which is of vital importance to the success of any MPA, involves cooperation and collaboration among stakeholders, affected communities and different levels of government. Partnering promotes development in various areas of importance in the MPA program including the gathering of information, public awareness, research, training, regulation and enforcement (DFO, 2003b).

MPA Designation

A specific framework exists for establishing MPAs. This is a generic framework that all potential candidate sites must follow, as it is the framework which guides the Minister of Fisheries in making a final decision to designate an elected area as an MPA or not. The MPA designation process involves six steps, with completion taking an unspecified amount of time. Taken from the DFO website (DFO, 2003b), the six steps are outlined below:

Step 1: Identification of Areas of Interest

DFO accepts nominations of areas for consideration as MPAs. Any concerned persons, including community groups, aboriginal organizations, the fishing sector, environmental organizations or the general public can submit a nomination to DFO through some of the following means: individual stakeholder proposals, fisheries management plans or ecosystem overviews. Once a nomination is submitted the particular area becomes a proposed Area of Interest.

Step 2: Initial Screening of Areas of Interest

In this step Areas of Interest are assessed and evaluated. Suggested Areas of Interest are screened to ensure that they fulfil the purpose of MPAs as outlined in the Oceans Act. Detailed information about the intended MPA is not necessary, what is required is some basic information such as: the location of the Area of Interest, the purpose of establishing

an MPA in this particular locality, a socioeconomic profile of the area, proposed management measures which might apply and suggested stakeholder involvement. Areas of Interest which qualify for MPA status are placed on a list which is made public. Areas on the list are monitored to ensure ecological integrity while awaiting final recommendation concerning MPA status. If ecological integrity is believed to be threatened at any time, interim protection can be implemented. An example of interim protection would be the establishment of controls by other government agencies to ensure protection measures such as deferral of tenures including leases or licenses.

Step 3: Areas of Interest Evaluation and Recommendation

An Area of Interest is evaluated through a number of means. A detailed proposal must be prepared through a planning process that includes all affected agencies and interests. Scientific, traditional and local knowledge will all be included in the proposal. The proposal will contain ecological, technical and socioeconomic evaluations. The ecological assessment addresses such issues as the need to control human activities, restoration needs and the recovery of natural ecosystems functions. The technical assessment determines such things as the international importance of a site, proposed boundaries, management resources and stakeholder support. The socioeconomic assessment consists of such issues as the effect of the MPA on human activities, community uses, aboriginal uses and culture and tourism uses. After the assessments have been completed DFO will review the information and make a recommendation that

a site be either designated as an MPA candidate or that it be considered for other forms of protection.

Step 4: Development of a Management Plan for a Candidate MPA Site

A management plan will be prepared based on the proposal, the comments of stakeholders, public and government agencies. The management plan will include; reasons for MPA designation, MPA goals and objectives and how these are to be met, how success of the MPA will be measured, and how it will be managed. The MPA, through the partnering objective in the MPA program, may be co-managed. If so, the plan will state the proposed arrangements, commitments, responsibilities and roles of the involved organizations. The need for co-management depends upon the social characteristics of the area (if indeed the area is populated) and the scale of the MPA. Also included in this stage is a discussion concerning sources of funding, zoning levels specifying which activities are to be permitted or prohibited, boundary issues, and a comprehensive list of existing activities within the proposed MPA.

Step 5: Designation of MPA

The Minister of Fisheries and Oceans recommends that the MPA be designated through regulation under the Oceans Act. In this step two things occur, first implementation of designation regulations and MPA management plans occur, second, enforcement of the MPA is activated.

Step 6: Management of MPA

Each MPA is managed on a site-to-site basis; therefore each MPA has its own unique management plan reflecting the purpose for which it was established. Management occurs utilizing a variety of resources including on-going research and traditional ecological information. Three continuing processes occur throughout the life of an MPA. These include: research and monitoring, public awareness and education programs, and periodical review and evaluation. A commitment to scientific research is made in the MPA program. MPAs provide an optimal environment to carry out much-needed research on marine ecosystems and environmental change which may be challenging to gather otherwise. MPAs are one of the most visible initiatives of marine conservation around the world, and thus tend to attract substantial public attention. In fact, MPAs rely on the public greatly as they are visited frequently and individual action can ultimately affect larger success or failure (Gubbay, 1995). MPAs are not established in perpetuity, original reasons for designation may change over time and periodic reviews are necessary to determine if it is in the best interest to continue MPA status, relocate boundaries, enlarge or re-designate.

MPA Management

There are various guiding principles identified in the Oceans Management Strategy under the Oceans Act which influence the management practices of MPAs. The principles as outlined in DFO regulation (DFO, 1997) are discussed below:

Sustainability Principle: The Oceans Act defines sustainable development as:

“...development that meets the needs of the present without compromising the ability of future generations to meet their needs” (DFO, 1997, p. 40).

Sustainability is a cornerstone in marine resource management. The issue has become especially pertinent in light of past marine resource misuse. As a result, emphasis has shifted toward responsible management. MPAs are an integral part of marine conservation and therefore aid in achieving an acceptable degree of marine resource sustainability.

Precautionary Principle: The precautionary principle is defined as “erring on the side of caution” (DFO, 1997). The essence of this principle lies in the belief that a lack of understanding about MPA development should not hinder the process, but simply signify that caution should be practiced. MPA establishment is foremost and the fact that the process is a new one, without the benefit of accumulated previous experience, implies that much is to be learned and this should be done by trial and error.

Consultation Principle: This principle states that any interested groups or persons who are affected by MPA establishment should be consulted in the making of decisions. The Oceans Act emphasizes the need for consultation and collaboration to be employed throughout the MPA process. DFO recognizes the benefits of consultation and acknowledges that it can contribute positively to MPA designation and management by encouraging equity, commitment and cooperation.

Integrated Management Principle: Integrated management encompasses a proactive approach toward marine management. It is characterized by a commitment to collaboration and involvement with stakeholders at all stages of MPA development. Practice of integrated management may range from stakeholder advisory roles to co-management of MPAs. Ultimately, the management style is left wide-open and dependent upon the specific characteristics of any given MPA. Under the Oceans Act the Minister of Fisheries and Oceans has the authority to “lead and facilitate the development and implementation of plans for the Integrated Management of all activities or measures affecting estuaries, coastal and marine waters” (DFO, 2003c). This implies that the ultimate authority rests with the state. There is a strong commitment to involve stakeholders in the process whenever possible but the degree of participation is ambiguous and vague as it can range from high levels of stakeholder involvement to little at all.

Adaptative Management: Adaptive Management rests on the assumption that all of the pertinent information needed to make sound decisions concerning MPA management is not currently available to DFO. Regulations and guidelines need to be flexible to accommodate the discovery of new information as it is revealed.

Ecosystem Principle: An MPA is part of an ecosystem. The effects of an MPA upon the greater ecosystem must be considered when contemplating designation. While

conservation of the MPA itself is important, it is also essential not to lose sight of the surrounding area. The integrity of the entire ecosystem must not be jeopardized for the sake of conservation of a portion of it. All individual parts of any ecosystem affect all of the others; no decision should be made in isolation.

Regional Flexibility Principle: Standardized policies are impossible for MPAs given the diversity of Canada's marine resources. The oceanic environment can vary in terms of ecosystems, socioeconomic and cultural systems and best complimenting management plans. MPA programs need to be relevant to the specific area in which they exist and policies and guidelines need to accommodate such diversity through a flexible approach.

Partnering Principle: The MPA program is designed so that cooperation and alliances with interested and affected parties are always possible. Opportunities for stakeholders to become involved in the MPA process are available. Partnering benefits many interests and allows the sharing of information and resources.

Summary

The MPA initiative is in its early stages. Any new program faces many challenges. One considerable challenge is the fact that MPAs are put into place for a variety of reasons and consequently, their internal organization and management, contingent upon their purpose, varies across cases. This variation makes implementation arduous as the

program is in its infancy and there are no steadfast rules. Each MPA can be thought of as a learning tool, with more experience being gained in the designation process as time progresses. DFO has characterized the situation as one in which they are “learning-by-doing”(DFO, 2003b). One can only hope that efficacy and consistency in implementation of the MPA program will accrue over time.

Chapter 3: Co-management Literature Review

The Need For More Effective Management

It is generally accepted that a country's economic well-being is related to the conservation of its natural resources (Berkes, 1989). While resource exploitation may have short-term economic benefit, the long-term consequences of such exploitation may be disastrous. Canada's marine resources, particularly in the Maritime and Atlantic provinces, have been ravaged by overexploitation. This crisis in resource depletion can be regarded as a symptom of a larger crisis in resource management (Crean & Symes, 1996). The effectiveness of existing marine resource management practices in achieving sustainable resource use is questionable (Sen & Nielsen, 1996). Increasingly, there is a need for alternative institutional arrangements and management systems which are more viable and responsible than the current systems in place. One of the reasons that resource depletion plagues state management may be the fact that the state ignores the value of local knowledge and input in management practices.

With increasing state involvement in the regulation of economic and social life, local and traditional forms of social organization and resource management have been replaced by centralized bureaucratic state management. State management policies tend to marginalise resource users and exclude them from taking an active role in management issues (Crean & Symes, 1996). Generationally transmitted knowledge and understanding

gained through experience by local users is ignored in state management practices. Centralized management undervalues the contribution of human capital, defined by Pinkerton and Weinstein (1995) as, “what individuals and communities build up over time in the way of knowledge, skills, experience, attitudes and values about how to solve problems”. The information that only human capital can provide about local ecological conditions, which may be imperative for effective resource management, has been replaced by state research and scientific knowledge. The more that traditional systems of understanding are ignored, the more likely it is that local knowledge based systems will disappear. The state’s reliance on research and scientific knowledge has been ridiculed as being biased by political agendas and for failing to represent the true reality of current resource situations (Durrenberger & King, 2000).

According to Jentoft and McCay (1995) institutional rules and regulations shape the incentives, motives, intentions and actions of those whom they affect. State rules and regulations deny resource users involvement in management practices and as a result alienate them. The state has placed restraints on resource users’ traditional freedoms and rights through imposing resource regulations. These regulations control social processes by means of legal and administrative instruments (Dubbink & van Vliet, 1996).

Regulation by these means is characteristic of a command-and-control state such as our own. It is considered by some that the command-and-control system is outdated and inadequate (Dubbink & van Vliet, 1996). Under this system resource users are deprived

of the rights and status that their knowledge, skills and experience should rightfully provide for them. The imposition of external controls upon users and the inability to meaningfully contribute in any way results in a loss of confidence in personal identity and in state management systems in general (Crean & Symes, 1996). Consequences of state processes such as those outlined above include the display of discontent, hostility and disobedience on the part of resource users.

The current state-run system of marine resource management appears not to be working. The industry has been riddled with problems of overexploitation, resource depletion, sustainability tensions and civil disobedience. An alternative management system is called for in light of these problems. No easy management solution exists which is capable of addressing the wide array of issues, demands and interests at hand. One viable option in comparison to other alternatives is the more bottom-up decentralized approach of co-management in which users are granted both rights and responsibilities through delegation of management authority.

Co-management Defined

Co-management can be defined as a broad spectrum of collaborative and participatory processes aimed at establishing administrative arrangements and regulatory decision-making among representatives of user groups, government agencies and research institutions (Jentoft, McCay and Wilson, 1998; Felt, et al., 1997; Sen & Nielsen, 1996).

Co-management arrangements are usually a method of last resort in an attempt to deal with management and resource crises (Kaplan, 1998). Co-management exists as a solution to resource overexploitation by involving user groups in all stages of implementation. Resource users demand a voice in decision-making as they have lost confidence in government ability to solve management problems (Pinkerton, 1989).

Co-management arrangements can be viewed as negotiated agreements (Pinkerton, 1989). Instead of one-way processes of decision-making, regulation and enforcement characteristic of state management, co-management is a shared process. These arrangements work by altering relationships that exist among actors involved with a resource, primarily between users and government. By providing a two-way channel for communication of information and knowledge, the decision-making process becomes more open, less hierarchical and more decentralized (Jentoft & McCay, 1995). The distinction between local and scientific knowledge that exists in state management is abandoned in co-management arrangements as both ways of knowing are valued in order to gain a more comprehensive means of understanding ecological processes. A beneficial arrangement to all actors involved, co-management provides support and sharing of responsibility.

Co-management arrangements have various advantages. According to Pinkerton (1989) these advantages include, equity, efficiency and appropriate management of resources.

Equity refers to the extent to which stakeholders are represented in management arrangements and the equal distribution of any benefits stemming from such arrangements. The role of efficiency pertains to the cost effectiveness of any given arrangement. The role of appropriate management refers to the degree in which management arrangements successfully meliorate sustainability. This may include mechanisms for limiting access, determining allocation and ensuing adequate enforcement (Felt et al., 1997). A general consensus exists in relation to the fact that co-management arrangements are possibly the most desirable way to promote sustainability as they reduce conflict by forcing all involved parties to conceive of the rules themselves and commit to being accountable to implement the very rules for which they are responsible for creating (Pinkerton & Weinstein, 1995).

Within co-management arrangements, responsibility for a variety of management functions become delegated to user organizations. For co-management to be effective, users must be given a certain amount of autonomy. This implies that the greater number of functions delegated to users, the greater the amount of autonomy (Jentoft, 1989). Autonomy is important as it is indicative of a democratic influence and denotes that users are active and responsible in the regulatory process. Although delegation is important, the amount of management functions delegated to user groups depends on their resources and capability to carry out these functions (Sen & Nielsen, 1996). As Durrenberger & King (2000) point out, co-management emphasizes *appropriate* local involvement. As

new organizational arrangements surface in light of delegation of certain functions, the management process becomes more ambitious and complicated (Jentoft, 1989). The success of any new organizational arrangement is dependent on its ability to function as a viable institution.

The need exists to clarify the difference between delegation and decentralization. Often these two terms are used interchangeably to describe the transferring of regulatory power from government to user groups in defining co-management. In actuality, the correct terminology in describing this situation would be that co-management involves the delegation of management functions to user groups. Delegation denotes the transfer of responsibilities to user groups and decentralization denotes the moving of government responsibilities to a lower level of government (Sen & Nielsen, 1996). While co-management may involve some decentralization of power, the term used to describe the transfer of government functions to user groups is delegation.

Legitimacy, meaning acceptance and compliance on the part of resource users, of state policy is a problem. The effectiveness of any marine policy is challenged if users do not comply with regulations (Kaplan, 1998). This lack of legitimacy is thought to exist in state policy because of its ineffectiveness, unnecessary bureaucratic involvement and the distance perceived to exist between government and citizens (Dubink & van Vliet, 1996). It is believed by many that the state's failure to meaningfully incorporate users in

the management process results in high levels of rule avoidance and lack of policy acceptance (Felt et al., 1997; Kaplan, 1998; Jentoft, 1989). Co-management addresses the problem of legitimacy by involving resource users in the formulation and implementation of management policy.

Users are thought to possess valuable knowledge based on their unique opportunity to interact first hand with the environment and can add to management policies by producing more effective, knowledgeable and equitable solutions to many management challenges (Jentoft et al., 1998). By participating in the management process the legitimacy of policy regulation is increased. Compliance and involvement are connected, as participation contributes to compliance through involvement (Jentoft et al., 1998). Compliance is enhanced as users become supportive of regulation which they have had a part in implementing and enforcing. The legitimacy of regulation is contingent on the decision-making process itself, namely the involvement of those whom are affected by it. To reiterate, resource users experience greater incentive to comply with regulations if they have been involved in the formulation and enforcement of policy. However, the notion of involvement includes many facets.

According to Jentoft (1989), legitimacy encompasses the extent to which users willingly accept regulations as appropriate and consistent with their values. Legitimacy and compliance are fostered by the following hypotheses as outlined in Jentoft (1989):

Table 1
Factors Influencing Legitimacy and Compliance in Co-management

Content of the regulations	The more that regulations coincide with the way users define their problems, the greater the legitimacy
Distributional effects	The more equitable that restrictions are imposed in the users view, the greater the legitimacy
Making of the regulation	The extent to which users are involved in the decision-making process influences legitimacy
Implementation of regulations	The more directly involved users are in implementing and enforcing regulations, the greater the legitimacy

Note. From Jentoft (1998)

Co-management arrangements address the issue of non-compliance by altering the structure of incentives and deterrents. Shared decision-making systems set-up a scenario in which compliance yields greater rewards than opposition (Pinkerton, 1989). The success of any management regime is ultimately dependent on resource users voluntarily advancing their collective interests at the expense of their private ones (Jentoft, 1989).

In defining co-management it is necessary to situate it in context, relative to other management regimes. Co-management can be distinguished from other management systems such as those which are state-run and those which are community-based. Co-management arrangements differ as they take a middle-ground (Jentoft, 1989). They are unlike state-run management which exists at the macro-level of state bureaucracy and

community-based micro-level arrangements which involve decision-making at the individual and local community level. Co-management is a meeting point between these two as it is a new form of institutional arrangement involving the state, industry and user representatives. Co-management can be said to exist at the meso-level (Dubbink & van Vliet, 1996).

A distinction also needs to be made between community-based or folk management and co-management. Throughout much of the literature on marine resource management these two terms are often used interchangeably to refer to varying degrees of co-operative management between the state and resource users. In fact, community-based management is something entirely different from co-management, it is self-governance. In distinction, co-management involves the shared governance between users and government. Although some of the fundamental principles of folk management are incorporated into co-management, such as a reliance on local traditional knowledge and the belief that users are entitled to and are capable of handling resource rights without leading to overexploitation, they are still best considered as two separate means of managing resources.

State management can be characterized as a top-down approach. Initiatives derive from central, formal, hierarchical leadership and control which allow no room for public participatory processes to exist (Jentoft, 1989). Co-management, in comparison, is seen

as a tool which does away with the distant, impersonal bureaucratic approach which defines state management (Jentoft et al., 1998). Co-management involves the distribution of influence, it involves the participation of stakeholders in the formulation and implementation of management policy. It is formal in the sense that regulations are made explicit and public and that decision-making has to follow procedures to ensure the active participation of stakeholders. However, it is somewhat decentralized as rules are less formalistic and detailed and are made in a more ad-hoc fashion. Co-management has advantages over state management as it is less legalistic and, existing at the meso-level, is flexible enough to adapt to the complexity of governance which is characteristic of modern marine resource management (Dubink & van Vliet, 1996).

Community-based or folk management systems, although well documented, tend to exist on a small scale (Durrenberger & King, 2000). Marine resources are utilized for subsistence or small market arrangements, not generally for large industry as such.

Considered a bottom-up management approach, folk systems are regulated by unwritten norms and enforcement is carried out through informal sanctions (Jentoft, 1989).

Initiatives are local and organization informal. Leadership is mutual among members and a high degree of participation and autonomy concerning resource rights and regulation exists (Jentoft, 1989). Regulations take the form of territorial use rights. Users agree upon conditions of use and protect against intruders in their territory (Jentoft, 1989).

Regulations are established for reasons of protection, order and conflict avoidance.

Types of Co-management

Throughout marine resource management literature several types of co-management arrangements are discussed. Each varies in terms of the degree of user participation and the roles which the state and user groups assume. There are many tasks that can be co-managed at various stages of implementation. The roles that user groups will take are dependent on their relative power, including the ability to negotiate as well as the knowledge and strength that the group possesses (Sen & Nielsen, 1996). Taken from Sen & Nielsen (1996) and Jentoft and McCay (1995), the following types of co-management are said to exist:

1. Instructive:

In this management arrangement there is minimal exchange of information between the government and users. What does tend to exist is one-way communication from government to users, informing them about particular initiatives. This management arrangement is marginally different from centralized state arrangements due to the fact that opportunities exist for dialogue between government and user groups.

2. Consultive:

In this instance government consults with users, but any final decisions fall under the jurisdiction of the state. Although consultations with user groups exist, often they may be a symbolic gesture of cooperation consisting of nothing more than a form of tokenism.

3. Cooperative:

In this arrangement government and users cooperate together as equal partners in

decision-making.

4. Advisory:

Users advise government, generally through the mechanism of an advisory board, of the way in which they would like to see decisions handled by providing opinions, guidance and knowledge. The government ideally takes these suggestions and endorses them.

5. Informative:

In this situation government has delegated authority to user groups to make decisions. User organizations are responsible for informing government of any decisions that have been made.

Many social scientists believe that the only type of co-management arrangement which is legitimate is the cooperative type. By definition co-management implies that resource users not only have a voice in the decision-making process, but also have the authority to implement regulatory decisions (Jentoft, 1989). Co-management represents meaningful participation of resource users in the management process which signifies the sharing of power to make decisions not merely the allocation of advisory power (Felt et al., 1997). Co-management, according to a majority in the marine resource management field, does not exist within the implementation of consultative arrangements such as advisory boards (Jentoft, et al., 1998; Pinkerton & Weinstein, 1995; Sen & Nielsen, 1996; Felt et al., 1997). These types of arrangements merely pay lip-service to the process of meaningful user involvement.

Co-management Example: Japanese Fisheries Cooperative Associations

The example to be discussed is a case of cooperative management. The term cooperative management will be used interchangeably with co-management to signify the same process as cooperative management is the most accepted type of co-management.

Most examples of cooperative management exist on a small scale and are not characteristic of the leading pattern of resource management in the area in which they exist. An exception to this rule is Fishing Cooperative Associations in Japan (Sutinen & Hanson, 1986). Here, the most successful examples of cooperative management in the world can be seen. In Japan the accepted means of regulation in the inshore fishery is co-management. This is impressive as Japan is one of the world's leading fish producing, importing and consuming nations (Pinkerton & Weinstein, 1995). Inshore fisheries are dominated by small-scale and household enterprises which are co-managed through Japanese Fisheries Cooperative Associations. These enterprises are quite productive as they contribute a substantial portion to the country's annual catch. The inshore fishery has exclusive legal rights under national legislation to harvest designated resources in a defined territory (Felt et al., 1997).

The Japanese inshore fishery is based on four major principles stemming from long-held traditions of local user involvement and rights in the fishery. These principles include exclusive use rights, control of fishing intensity in defined waters, establishment and enforcement of conservation measures, and the promotion of coordination and

cooperation among users (Felt et al., 1997 and Sutinen & Hanson, 1986). Fisheries Cooperative Associations are given exclusive legal territorial rights, responsibility to define management rules, including implementation and enforcement and the power to develop management plans for each fishing right held (Felt et al., 1997).

In 1990 there were approximately 2 127 Fisheries Cooperative Associations with a combined membership of 535 000 (Pinkerton & Weinstein, 1995). Each Association has about 250 members and is linked to larger associations at various levels of jurisdiction. Regulatory commissions are composed of appointed and elected representatives which deal with management organization and dispute settlements (Felt et al., 1997). By all outward appearances it seems that these Associations encompass an effective management arrangement which successfully deals with the tension between sustainability and economic growth.

Evaluating Co-management Arrangements

Co-management involves the restructuring of institutional arrangements. Change to any institution takes place in small increments and occurs over time. Concurrent with any change are challenges. Co-management arrangements face several challenges. One area of uncertainty lies in the process of determining an appropriate amount of regulatory authority that should be delegated to user groups and organizations. While the concept of co-management hinges on the sharing of power and involvement of resource users, it also strongly emphasizes *appropriate* local involvement (Durrenberger & King, 2000). There

are no definite means to determine exactly how much power should be delegated in a given case. Limitations on what functions can be transferred to user groups depend to a large extent on the resources and skills of users themselves and their ability to deal with management functions.

The social dynamics at work within user organizations can impede or support the management process. The extent to which user groups are organized and are cohesive as a social system will contribute to the level of efficiency in management (Pinkerton, 1989). Often user groups are susceptible to internal conflicts and disputes which affect their ability to deal with regulatory power. Competition among stakeholders can develop, which undermines the integrity of management arrangements. The participatory process itself is fundamentally democratic. Democratic organizations are susceptible to oligarchic tendencies, group rivalry, conspiracy and elite expropriation (Jentoft, 1989). Delegation of responsibility does not necessarily ensure fair practices. The chance does exist that members will be subjected to inequitable power structures in their own user organizations due to corruption of the management process and may be limited to a somewhat less involved version of power sharing than was intended.

According to Pinkerton (1989), Felt (1990) and Felt et al. (1997) the following conditions are conducive to favourable co-management:

1. Users who demonstrate a willingness to support rehabilitation of a resource
2. Agreements made between government and users are formalized and legal

3. Any wealth which is accrued is re-circulated
4. Recruitment of external support
5. The co-managed area is not too large in scale to restrict effective communication
6. User groups are able to effectively define boundaries so membership is clear
7. A strong tradition of cooperation and trust among users
8. Allocation of some resource ownership rights to users
9. Allocation of decision-making authority to users
10. Equitable allocation of restrictions among users
11. Enforcement that involves users
12. Incorporation of traditional and local knowledge
13. The inclusion of all residents whose actions influence the ecology of the resource in the management process

In evaluating co-management arrangements it is not only the impact management has on users which must be examined but also the impact management has on the resource.

Most importantly, it is imperative that co-management arrangements meet sustainability objectives. Co-management currently exists as a management tool because of the need to find more effective management in light of resource crises. The purpose of co-management ultimately is to manage marine resources effectively and responsibly.

Chapter 4: Theoretical Foundations Underlying Co-management

Introduction

Current marine resource management debates, in actuality, revolve around a greater human nature debate. State governance is based on a belief that humans are intrinsically selfish social actors who will exploit resources at the expense of others and the integrity of the resource. According to this belief users must be governed by strict regulation which focuses on incentives and deterrents to control behavior in order to achieve sustainability of resources. The state expropriates property rights from users and places them under state jurisdiction. This results in a sort of self-fulfilling-prophecy. By assuming users are capable of nothing more than self motivated behavior and taking regulation and property rights away from them, users are left in a situation where they have little choice but to act in a self interested manner as they have no means to control use of the resource and must compete with other users to ensure that they receive their share. Overexploitation is the end result of such processes.

Community-based management systems and co-management arrangements hold a different view of human nature. According to these views human nature is not inherently selfish but embedded in social, cultural and economic relations and as such users take these ties into consideration when utilizing resources. When given property and regulation rights users find themselves in a situation where they do not have to fight for resources, but instead find it more beneficial to cooperate as a group to manage resources

in a way that ensures equity and resource integrity. Many examples of community and co-management arrangements demonstrate that under the correct circumstances where users possess property rights they are able to manage resources responsibly and promote sustainable use. In light of this reality, institutional change is called for. Current management regimes must change to reflect the true nature of human motivations and accommodate a system that promotes user involvement. Institutional change is not impossible as institutions themselves are embedded in social relations and do not exist as an entity in and of themselves. However, change is always a slow process, occurring in small incremental steps.

Common Property Resources

It is necessary to define the type of resources under consideration when referring to co-management arrangements. Most marine resources are classified as common property resources (CPRs). Some social scientists prefer to use the term common-pool resources to signify the same thing. Common property resources are defined by the characteristics that they share. The first of these is that CPRs are subject to problems of exclusion.

Exclusion refers to control over resource access by potential users (Berkes, Feeny, McCay and Acheson, 1989). In CPRs, the ability for users to exclude others is a problem. The second characteristic is that of subtractability. Subtractability refers to the fact that when users take from a resource they are in essence subtracting from the welfare of other users. The problem that this creates is a possible divergence between individual and collective rationality. Users take from the resource potentially at the expense of the 'greater good'.

In actuality, usage of the term common property resource is subject to some controversy. Social scientists use it to signify a variety of concepts, some embodying quite different meanings than in comparison to that which is mentioned above. In contemporary Western view property is either private or belonging to the state. Resources which are not privately owned are considered common property (Berkes, 1989). Others use it to signify property which is collectively owned, such as incidences in which communities have property rights and use informal institutional arrangements to manage a resource. Still others use the term to refer to property which is a free good, not owned by anyone. In some Western nations marine resources are defined in that nature, as being owned by no one and belonging to everyone. Lastly, there are other social scientists that use the term to signify the physical locality of a resource, such as fish. Fish can transcend borders and as such are difficult to designate as a resource which specifically belongs to a given area. Resources such as these are sometimes called common-pool resources (Pinkerton & Weinstein, 1995). The definition of CPRs used here is the definition discussed above: CPRs are a class of resources for which exclusion is difficult and subtractability is an issue.

Common Property Regimes

A distinction exists between a resource itself and the way in which it is governed. There are four common property regimes, which include the following:

1. Open Access:

Within this property right regime there are actually no defined property rights. Access

to resources is free and open to all. In some cases this term refers to instances where rights are owned in common, but are open access to everyone. This property right regime rarely occurs in reality. Several centuries ago the ocean was considered open-access but in 1982 the United Nations Law of the Sea passed a regulation that in effect the sea would be considered state property or joint-use internationally property (Berkes, 1989).

2. Private Property:

Individuals or corporations regulate the resource and have the right to exclude others from use (Berkes et al., 1989).

3. Communal property:

In this regime the resource in question is not privately owned or managed by government, but is controlled by an identifiable group. The users have the right to exclude others and regulate use. This regime is often referred to as community-based management.

4. State property and governance:

In this regime the state has legal ownership of resources and makes all decisions about management. Most fisheries are managed in this manner. In Canada, DFO has a constitutional mandate to protect and conserve resources (Pinkerton & Weinstein, 1995). DFO carries out research, enforces regulation, is responsible for upholding conservation regulation and shapes and enforces policy. Often DFO will consult outside stakeholders in the form of advisory boards, but are not required to take the advice offered (Pinkerton & Weinstein, 1995).

These categories are analytical and are used for reasons of clarity in analysis. In reality, resources can be held in any instance of these ideal types, and in any combination (Berkes et al.)

The “Tragedy of the Commons”

In most of Western society resource management falls under state control. The need for state control is based on an ideology which guides most resource management. This ideology holds that resources held in common will unvaryingly be overexploited. This has been popularized by the “tragedy of the commons” model proposed by Garrett Hardin in 1968 (Hardin, 1968). Using a metaphorical village common in which herdsmen increase their herd without concern or limit, Hardin postulates that resource depletion is the inevitable outcome for CPRs because of their nature and the fact that left to their own devices users will overexploit resources. The only means of recourse are strict state control or privatization of resources.

The Hardin model, which shapes nearly all modern government management ideology is based on several assumptions, the first of which is that all CPRs are open-access. This implies a lack of property rights. Hardin also assumes that each resource user acts in an individually rational manner when appropriating resources. In his model, benefits of use exceed individual cost. Emphasizing the divergence between individual and collective rationality, Hardin predicts that users will act to maximize their interests in the short-term and be unwilling to consider the fact that they are limiting use for other users and

jeopardizing long-term viability of the resource. The result is destruction of resources.

The only way in which to prevent ruination is through strict state regulation. This rationale for state intervention means that the government must control efficiency, equity and administration in resource use (Jentoft, 1989).

Challenging the “Tragedy of the Commons” Model

Through ethnographic analysis of many resources such as the fishery, it has been shown that many of Hardin’s fundamental assumptions are incorrect (Durrenberger & King, 2000). First, Hardin confuses CPRs with open-access, but the two are not synonymous. Most CPRs are held under state, communal or private property regimes. Open-access regimes like the type Hardin has based his model on simply do not exist (Berkes, et al., 1989). By associating CPRs with open-access and then assuming that open-access will inevitably lead to overexploitation, the model therefore fallaciously associates the commons with overexploitation (Berkes et al.).

Second, Hardin assumes that users are individually motivated ‘selfish’ actors unable to cooperate toward common interests. The model assumes users are unable or unwilling to limit access or establish rules to regulate use. This has been proven to be untrue.

Collective action has been documented to exist in instances where communities enact rules and regulations regarding resource use in the absence of other property rights.

Under specific circumstances users can possess the motives and means to act collectively.

Third, Hardin incorrectly assumes that only state intervention or the enactment of private

property rights will address the issue of overexploitation. Hardin overlooks the role of other institutions in providing exclusion and regulation of use. Traditional institutional arrangements which have cultural and historical bearing have the ability to constrain individual interests (Berkes et al.).

Ultimately, Hardin attempts to explain a complex situation through the means of a simple deterministic model (Berkes et al., 1989). His assumptions and conclusions have provided justification for state intervention which shuts-out local user involvement. Even though this ideology is flawed, it remains the basis on which state management is run and shapes the policy which is implemented. W. I. Thomas once said, pardon the sexism “ If men define situations as real, then they are real in their consequences” (Merton, 1967). In order to break the cycle of self-fulfilling prophesy the initial definition of the situation which is responsible for all that has followed and indeed furthers incorrect assumptions, needs to be abdicated. Only when a new definition of the situation has been put in place will the error in judgement concerning human nature which underlies the majority of policy become apparent (Merton, 1967). Until such time contemporary policy will reflect the fallacious assumptions inherent in Hardin’s guiding model. As Durrenberger & King (2000) so fittingly point out, sometimes “...policy reshapes the world to fit its own assumptions.”

The consequences involved with this type of ideology can themselves be quite tragic. There are numerous examples of state property which has been mismanaged. None is

more profound than the demise of the state managed cod fishery in Newfoundland. Many overcapitalized and overexploited state managed resources are not in the condition that they currently are due to policy and decision-making practices implemented on behalf of resource users (Durrenberger & King, 2000). The forest in Thailand is one pertinent example. Traditionally, the exploitation of high-value timber was regulated through local management arrangements (Berkes et al., 1989). Over time, all forests became nationalized. State management failed to provide adequate enforcement of regulatory rules and also disallowed local users from exercising any authority to manage the forest themselves. The end result was wide-spread illegal logging which severely compromised conservation in the area. As Durrenberger & King (2000) observe, centralized management systems themselves can cause ‘tragedies’, and thus the tragedy of the commons can alternatively be coined “the tragedy of mismanaged state property.”

As stated above, success in promoting sustainability can be achieved in other ways besides Hardin’s proposed state governance or allocation of private property rights. Communities which are dependent on CPRs have implemented their own management practices which have been successful in many cases. One such example is the James Bay beaver resource management system (Berkes et al., 1989). James Bay is a CPR which is community managed. Local users, through the use of territorial boundaries, act as stewards and ensure the sustainability of the resource. Through the examination of case studies such as James Bay, where communities themselves manage resources, two key factors have been found to contribute to the successful management of CPRs.

These factors include resource users' ability to exclude others from appropriating the resource and their ability to regulate the resource themselves through locally acknowledged property rights (Berkes et al., 1989). Destruction of resources is more likely to occur in the absence of user property rights. Users cannot exclude intruders from utilizing the resource because they have no regulatory power. Without these rights users have little incentive to conserve resources because of competition among users. In essence, this line of thought, coined the 'fox in the henhouse' mentality, runs in this manner, "If I don't get my share now, then someone else will take it from me". Without the allocation of property rights, competition will invariably ensue and sustainability of resources will be in jeopardy. Users will be able to experience the benefits of their own restraint only when they possess the power to exclude intruders (Berkes et al.).

To avoid the destruction of resources, rights must be granted to individuals or groups. Therefore, one alternative is private property regimes where users are granted property ownership. This regime is generally regarded as one which formalizes property instead of giving it back to users in social and cultural contexts (Jentoft et al., 1998). The principle of private property operates under a market-based perspective. This perspective assumes that public problems arise from market failures, where the market system is said to fail to bring about a social optimum (Dubbink & van Vliet, 1996). This is because individual actors behave in ways that are not conducive to the social optimum due to an underlying incentive structure where private and public interests diverge. The state attempts to control market failures by means of legal and administrative measures, but this fails to

change the incentive structure, and instead works only through fear imposed by sanction. Instead, those who employ the market-based perspective suggest that the solution to the problem lies in property ownership rights. In this way the incentive structure is changed to such an extent that private and public interests reconcile (Dubbink & van Vliet, 1996). If one owns a resource then one will act in ways which safeguard the resource. An example of privatization is the implementation of individual transferable quotas in the fishery.

In comparison, co-management arrangements do not require any particular ownership system. Co-management works within already existing property right regimes. For example in Norway co-management operates under the convention that both fish and waters are no one's property, in Japan property rights are exclusive to communities, and in parts of Canada co-management arrangements exist in privatized systems (Jentoft et al., 1998). Co-management arrangements are an attempt to recognize and build upon a set of already existing options for resource management (Jentoft et al., 1998). Co-management does not imply *ownership* of resources but instead emphasizes the allocation of *rights* to make decisions about regulations. Co-management calls for the structure of governance itself to alter. It seeks to incorporate the meso-level in decision-making and replace presently existing governance at the macro-level in the case of the state or in the micro-level in the case of privatization.

Human Nature Debate: Rational Choice vs Embeddedness

Whereas state and private property regimes view society as a market and the individual strictly as a rational economic actor responding to incentives and deterrents, co-management perspectives view the individual and society as encompassing much more. In recognizing that users are embedded in social systems and so too are the institutions in which they are a part, it becomes apparent that institutions cannot operate in isolation, and that users possess the potential to act in ways which represent the best interests of the group and resource in which they are a part and as such need to be involved in the management process for it to be effective.

State and private property regimes employ a rational choice perspective when characterizing the role of the individual in CPR management. This perspective is the dominant ideology endorsed by Hardin's model, the tragedy of the commons. According to this perspective the individual is the starting point in understanding behavior of groups (Ostrom, Dietz, Dolsak, Stern, Stonich and Weber, 2002). CPR questions revolve around how individual motivations and actions affect the larger populace. The human disposition is seen as individualistic, egocentric and atomistic. Behavior is rational and self-interested. The human constitution is one in which the individual seeks to maximize personal gain at the expense of others and the integrity of marine resources. According to this perspective, people relate to others and to rules in a strategic, cost-benefit manner (Jentoft et al., 1998). Society is thought to be composed of the aggregate of individualistic atomistic actions and therefore the only means to ensure compliance with

regulation is to shift the nature of incentives, deterrents and sanctions so that compliance instead of noncompliance is the only option which lies in the best interest of the individual.

Despite the dominance of this perspective which inundates most of contemporary marine resource management and subsequent economic theory, considerable evidence suggests it is an inadequate portrayal of the true nature of human motivation. The unrealistic reliance on the concept of rationality fails to take into account the impact of social relations on individual action. A more realistic understanding of human nature, supported by ethnographic evidence is the embeddedness perspective. The embeddedness perspective views economic actions as social actions, made not through individualistic cost-analysis calculations but through actions embedded in systems of social relations (Swedberg, 1997). Embeddedness emphasizes the importance of recognizing the historical, social, cultural, geographic and ecological contexts in which action is rooted. This perspective not only places the individual within a social system but also the economy. Instead of a society composed of the aggregate of individual atomized actions as rational choice predicts, embeddedness sees the economy as an integrated whole, a functional system of organized and negotiated relations (Jentoft et al., 1998).

As mentioned previously, the level of analysis varies between the two perspectives. I would like to reiterate this point. The rational choice perspective employed by state and private property regimes reduces the commons dilemma to a micro-level by emphasizing

individual rights and points to the relationship between users and the state as the primary one (Jentoft et al., 1998). The embeddedness perspective employed by co-management focuses on the meso-level of governance seeing relationships and interconnections between user groups, organizations and the state as the focal point in relation to understanding CPR management.

The embeddedness perspective postulates that action is embedded in social relationships which are shaped by cultural and structural forces (Jentoft et al., 1998). Hence, this perspective holds that choices are not driven by egocentric atomistic self-interest but by the connections, commitments, social routines, obligations and positions that people hold as members of social groups (Jentoft et al.). The values and norms inherent within a group influence all of its members. The basic traits of selflessness, solidarity and shared identity which exist within groups are internalized by its members. Individual action is influenced by the nature of the interrelationships which exist within groups.

Groups, organizations and communities do not consist of the aggregate of their atomistic parts as rational choice models propose but are instead integrated systems held together by legitimate interrelations within the group. The embeddedness perspective relies on certain principles from systems theory. The main premise of which is the concept of holism. Holism asserts that the whole is greater than the sum of its parts. What this implies is that any attempt to understand the dynamics of a group cannot be successful by reducing the group to the actions of its individual members. Groups essentially take on

new meaning when they are formed as they become an entity in and of themselves.

Another premise of systems theory borrowed by embeddedness is a concept concerning interrelations. This consists of the idea that as one aspect of a system changes all other aspects are affected. Members of groups are affected by any factor which affects the group as they are interrelated and reflect this interdependence in their actions.

In reflecting on concepts such as these, the opportunism which is said to exist in CPRs as predicted by rational choice models seems unrealistic and unlikely. In reality resource users are linked with each other through shared history and ties of association (Ostrom et al., 2002). As a result of these affiliations, opportunistic behavior is less likely to occur as it would be morally condemned by the group in which the offender belongs (Jentoft et al., 1998). Self-motivated behavior would be conceived of as a misuse of trust, and sanctioned by informal means such as guilt and shame. Instead of opportunism, the potential exists for resources users to engage in coordinated and cooperative action as they are members of groups in which they relate to each other through terms of loyalty and allegiance not competitiveness. Rational choice models fail to comprehend the sense of camaraderie which can reside among members. Through the use of the embeddedness perspective the commons dilemma can be better explained by the existence of competing rights and claims to the legitimate use of a resource between different social groups instead of emanating from competition between rational individuals who are part of a group in which no social ties exist (Ostrom et al., 2002).

Social Theory and Embeddedness

It is necessary to situate the embeddedness perspective within the context of social theory. One fundamental issue in sociology and social theory is understanding how individual actions and institutions are affected by social relations (Granovetter, 1985). The embeddedness perspective can be seen as alternative to both agency based theories and social structural based approaches. These theories can be viewed as encompassing polemic extremes in their interpretations of the nature of individual and institutional behavior. The discrepancy lies in the extent to which each theory emphasizes the role of social structure.

Agency based theories reflect rational choice models of behavior (Ostrom et al., 2002). These theories underpin much of CPR management ideology. Agency based theories view society as the aggregation of independent individual behavior which is guided by “...the rational pursuit of utility...” (Ostrom et al.). These theories reinforce the belief that resource users only pursue their own interests and will inevitably overexploit CPRs. On the other extreme lies a group of theories which emphasize the role of structural forces. Structural social theories see resource users as products of their class or group (Ostrom et al.). Users comply with the norms and values of the groups as they have internalized them through the process of socialization (Granovetter, 1985). These theories see behavior as pre-scripted and resist equating individual action with self interest but instead see it as dependent upon the dictates of the group in which the user belongs. Ostrom et al. (2002) sees structural theories as portraying an idealized society in which members

conscientiously use CPRs which belong to all but which are exploited by capitalism and commercialization.

Both of these theories tend to lie at extremes and may not be overly applicable in relation to situations in reality. The embeddedness perspective seeks to find a middle ground between these two theories. Embeddedness attempts to integrate both agency and structural theories. It postulates that actors do not behave outside of a social context nor do they adhere to a script, instead social actors are embedded in ongoing social relations (Granovetter, 1985).

The term 'embedded' was first coined by Polanyi in 1944 in the text "The Great Transformation". The theory of embeddedness was further developed by Mark Granovetter in a classic article entitled "Economic Action and Social Structure: The Problem of Embeddedness" which was published in 1985 in the American Journal of Sociology (Granovetter, 1985). Granovetter proposed the theory that economic action was embedded in structures of social relations in an attempt to put forward a theory that was more realistic than the already existing 'over' and 'under' socialized depictions of economic action that existed in contemporary social theory. Granovetter thought that agency based theories portrayed an under-socialized image of economic actors making decisions in isolation and upon which social structure and social relations had no impact. Structural theories portrayed an over-socialized image of economic actors who were idealistically obedient to the prescripts of the group in which they belong. Granovetter

felt that both neglected ongoing structures of social relations (Granovetter, 1985). Embeddedness, alternatively, postulates that actors are embedded in patterned interactions and that these patterned interactions can be seen as social structure which influences behavior, but, also obvious is the fact that an individual possesses agency and that they are more than just representatives of social categories (Ostrom et al., 2002).

Defining Institutions

One requirement necessary for the implementation of successful co-management arrangements is that institutions be understood as socially constructed and changeable (Jentoft et al., 1998). This indicates that a change in the way in which institutions are defined is required. Rational choice models of human behavior frame marine resource management practices and the way in which institutions are defined and operate.

Institutional theory which relies on rational choice models is referred to as neo-institutionalist. Neo-institutional work has focused on building incentive structures that alter perceived costs and benefits to ensure compliance as users are thought of as rational actors interested only in the pursuit of personal gain. Those who employ rational choice or the neo-institutional perspective see institutions as constraints that restrict human behavior in the interest of the greater good. Institutional focus then, necessarily lies on rule implementation and governance systems.

Co-management arrangements focus on more than just the rules. Co-management concerns the communicative and collaborate ways in which rules are formed (Jentoft et

al., 1998). It addresses issues such as how the decision-making process evolves and who should participate. Co-management at its root attempts to empower and enable users by involving them in the decision-making process. For this to be possible the definition of institutions need to change from one which focuses purely on rules and restrictions to a definition which accommodates cooperative action.

An institutional definition is required which does not revolve around the concept of rational individualism but instead addresses the social, cultural and ecological realms within which the social individual and groups are embedded (Ostrom et al., 2002).

Institutions themselves consist of more than rules; they are embedded in patterns of behavior, norms and values. This is not related in current institutional definitions which are shaped by rational choice models. A new definition is imperative.

One alternative to current definitions of institutions is W. Richard Scott's definition which is in keeping with the embeddedness perspective. Scott views institutions as encompassing culture, social structures and routines within several levels of jurisdiction (Jentoft et al., 1998). According to this definition institutions embody more than rule formulation but also consist of normative and cognitive issues. Scott's definition of institutions is as follows:

Institutions consist of cognitive, normative and regulative structures and activities that provide stability and meaning to social behavior. Institutions are transported by various carriers, cultures, structures and routines and they operate at multiple levels of jurisdiction (Scott, 1995 pp 33).

According to Scott, institutions incorporate symbolic systems, cognitive constructions and normative rules, and regulative processes which are carried out through and shape social behavior (Scott, 1995). *Regulative* structures refer to the ability of institutions to constrain and regulate behavior. This is what conventional definitions of institutions embody. The need for regulative structures is consistent with the line of thought inherent in rational choice models. The need for rules exists because people make rational choices which are based on self motivation and cost-benefit logic. Institutions are required to alter cost benefit calculations in such a manner that it is more likely that people will conform as it serves their interests. *Normative* ‘pillars’, to quote Scott, consist of norms and values which define goals, objectives and roles (Scott, 1995). They are the prescriptive, evaluative and obligatory dimensions of institutions. Normative rules impose constraints and enable social action by delegating rights, responsibilities and privileges (Scott, 1995). This is the manner in which co-management arrangements improve legitimacy and compliance. By prescribing the ways in which social actors ought to behave, these rules shape behavior. The *cognitive* pillar of institutions represents the ways in which meaning is made. This element takes into consideration the subjective reality of the individual. It values the contribution of local traditional knowledge as it broadens the knowledge base and makes for more sound regulatory policy.

Through the use of Scott’s definition of institutions and others which are similar in nature, institutional change can occur that reflects cultural and social elements rather than

continuing to reinforce the neo-institutionalist perspective which reduces social action to individual choice (Ostrom et al., 2002). One important aspect of Scott's definition is the pivotal role of communication. The success of co-management arrangements depend upon ties that link one level of jurisdiction to another, this kind of interconnectedness is quite impossible without open paths of communication.

Institutional Change

The way in which CPRs are understood and operate is changing. Synonymous with the introduction of co-management is institutional change. Change occurs starting with the way in which institutions are defined and continues further by altering the way in which roles, responsibilities, interests, values, learning processes and rationalities are conceived (Jentoft et al., 1998). The way in which this type of change occurs is important to its success. Dominant rational choice mentality such as that displayed by the 'fox in the henhouse' metaphor can endure and be difficult to change. Several social scientists point to a method of change which is effective and beneficial termed 'muddling-through'(Ostrom, 1990; Ostrom et al., 2002).

Muddling-through refers to a method of public policy making which is realized through small incremental steps. In this perspective institutional change is said to work best when implemented slowly. Small steps have the benefit of low initial economic costs and carries the potential for early successes which can alter the decision-making atmosphere into one which is more conducive and open to new processes. Proceeding slowly has the

benefit of providing a chance for learning, refining goals and means and avoiding considerable public criticism (Ostrom et al., 2002). The process of muddling-through affords all involved the chance to adjust, adapt to and accept new ways of thinking and operating. New management systems, such as co-management, which require substantial change to existing institutional arrangements are more likely to be successful if implemented slowly as this allows for adjustments which are required on behalf of all those involved including users, user organizations and the state.

Conclusion

Ultimately, people are not selfish, rational, individually motivated actors. They are embedded in social, cultural and economic networks and reflect such ties in their actions. State reliance on Hardin's assumptions about human nature creates a situation where individuals possess no regulatory authority and are pitted against one another in competition for the use of resources. Overexploitation in such a situation is inevitable. Institutional change is called for which reflects the reality of human nature, that given rights and responsibilities as in co-management arrangements users have the capability to act as selfless conscientious individuals able to achieve sustainability in resources.

Chapter 5: Musquash Process

The intent of this thesis is to investigate the implementation of a co-management arrangement in a proposed MPA site. More specifically, this thesis attempts to examine the factors which helped to shape and influence the final model of management that was assumed. This chapter is devoted to a discussion of such factors and the ways in which they played a part in determining the final model of co-management which was employed.

Musquash: The MPA Designation Process

The purpose of this section is to review the history of the Musquash MPA effort to date. This includes a review of the Musquash case as it proceeds through the six steps required for MPA designation. Area nomination is the first step in the designation process. After this a planning committee is created which is responsible for overseeing the process toward MPA designation and ensuring public participation in the development and implementation of a management plan for the proposed MPA (DFO, 1997). The proposal is constructed through an effort involving all affected interests including landowners, agency stakeholders and community members. The proposal is submitted to DFO as part of the documentation necessary for designation as an Area of Interest. Once this step has been realized a management board must then be created which is responsible for conducting further ecological, technical and socio-economic assessments of the area and which also affords a forum for stakeholders to participate in the protection and

management of the proposed MPA once/if it is officially designated. DFO emphasizes the importance of involving stakeholders in all stages of MPA implementation from area nomination to MPA designation. This is reflected in the organization's principles of integrated management, partnering and consultation (DFO, 1997).

In 1997, the Gulf of Maine Estuaries Restoration Project, of which the Conservation Council of New Brunswick was a part, conducted a habitat assessment of estuaries in the Gulf of Maine, including the Bay of Fundy. The findings from this project indicated that all of the Bay of Fundy's estuaries had been significantly altered and their ecological functioning impaired, except one. This exception was Musquash estuary which was found to be intact and relatively untouched by the forces which degraded all other estuaries in the Fundy vicinity. As a result of this assessment the Conservation Council, partnering with the Fundy North Fishermen's Association (Fishermen's Association), in 1998 decided to organize a joint proposal which would formally nominate Musquash estuary as a proposed MPA site to ensure future integrity of the estuary.

The Fishermen's Association represents a small boat inshore fishery which operates in and around the boundary of the estuary. The Fishermen's Association agreed to support the Conservation Council in their pursuit to nominate Musquash as they endorsed the sentiment that healthy estuaries are critical to healthy fisheries. However, the Fishermen's association would only participate if one provision was upheld. This provision includes a clause to allow existing small-boat fisheries to continue within the

estuary. At the time, twelve boats which participated in a trap-based lobster fishery operated within estuary boundaries. Also, a scallop fishery which operated six weeks a year and included six boats existed near the mouth of the estuary. As another Fishermen's Association stipulation, the scallop fishery was also to be allowed to continue. The Conservation Council approved of the conditions proposed by the Fishermen's Association and hence secured their support. Together, they formed a committee which refined the original Conservation Council proposal for nomination into one which reflected joint interest.

Upon receipt of the Conservation Council/Fishermen's Association MPA nomination DFO facilitated three community meetings to raise awareness and to inform local citizens of the impending designation process. The first meeting took place in November of 1998 with the Musquash Local Service District, which represents residents (Maria-Ines Buzeta, personal communication, February 21, 2002). In October of 1998 DFO mailed an information letter to coastal landowners, both residential and commercial, and to members of communities who resided adjacent to the proposed MPA, to inform them of an impending meeting which was to take place in December 1998. The notification contained information about MPAs in general, the original Musquash MPA proposal and a call for input (Maria-Ines Buzeta, personal communication, February 21, 2002). The Landowner meeting took place December 14, 1998. Various areas of concern were raised by attendees and addressed by DFO. Such concerns included whether hunting would still be permitted, who would have final authority in management decisions, and if

landowners would be allowed to develop their land in the future (Maria-Ines Buzeta, personal communication, February 21, 2002).

In January of 1999 DFO facilitated a third meeting with all residents of Musquash. Presentations were made concerning DFO policy in general, MPAs, the ecology of Musquash estuary and the initial MPA proposal by the Conservation Council and the Fishermen's Association (Maria-Ines Buzeta, personal communication, February 21, 2002). The DFO initiated meetings led to the conception of the Musquash MPA Planning Group (Planning Group) which included representatives of the community, provincial and federal governments, and first nations. The first meeting was held in February of 1999 and regular monthly meetings followed.

The Planning Group consisted of the Conservation Council, the Fishermen's Association, Musquash community members, neighbouring communities, Musquash Local Service District, Union of NB Indians and Ducks Unlimited. The purpose of the Planning Group, in part, was to assist in creating a management plan for the proposed MPA. The management plan was part of a proposal necessary in order to gain Area of Interest status. The proposal provided an overview of community objectives and highlighted the main issues surrounding conservation. It also included background information about the area, such as an economic, social and cultural evaluation. DFO regards management planning as a continuous process which builds upon the participation and input from communities, other governmental departments, external research institutions and the public (DFO,

2001). The Planning Group's official mandate included the following statement:

To facilitate input from, information flow to, and representation of community, NGOs [non-governmental organizations] and Government Agencies with respect to the designation and management of the Musquash Estuary as a Marine Protected Area under the Canada Oceans Act (Musquash MPA Campaign Website, 2003).

In March of 2000 the Conservation Council felt that a public information session was required to inform community members about the current stage of the MPA project. The Council felt as if "...there was a duty and obligation to do this, and the CCNB [Conservation Council of New Brunswick] will bear the costs" (Maria-Ines Buzeta, personal communication, February 21, 2002). The meeting was strictly the Conservation Council's initiative and DFO was invited to be present, but was not part of the presentations. It took place on March 31, 2000. The meeting provided an opportunity for the community to get updated information about the MPA. It was decided that further Planning Group meetings would be open to everyone and that the minutes from those meetings would be available to ensure that each person was aware of previous discussions. Also decided was that the local DFO official should contact the Fishermen's Association President to provide a summary of the MPA project and to inform the Association that a representative attends Planning Group meetings regularly and that information is available through that representative (Maria-Ines Buzeta, personal communication, February 21, 2002).

In compiling the proposal the Planning Group refined the initial draft and also carried out other research in greater depth concerning biological, cultural and anthropomorphic

issues pertaining to the estuary with the assistance of the Conservation Council. The Conservation Council's Musquash MPA Campaign Coordinator is responsible for a large amount of research collected for the proposal, and has drafted a social, cultural and economic background paper on Musquash titled, "Settlements & Landscapes of the Musquash Estuary: Past and Present" (Musquash MPA Campaign web-site, 2003). The paper includes such things as settlement history, land, artifact and burial ground information, work, leisure, local fishing and hunting detail.

It is interesting to note that the Conservation Council's Musquash MPA Campaign Coordinator is also an active and respected member of the Musquash community and Planning Group (Dr. Felt, personal communication, January 2003). In fact, he played a large part in the formation and running of the Planning Group. This individual was a 'link' between the Planning Group and the Conservation Council. He often spoke on behalf of the Planning Group and was responsible for making various presentations to stakeholders and to both the provincial and federal governments. The Conservation Council exercised considerable influence in the Planning Group. They often facilitated meetings, directed projects and guided Planning Group processes as is evident in the minutes of the meetings. The Council's influence is strengthened because the Campaign Coordinator provides a link to 'local credibility' for them as he is also a valued member of the community. The mandate of the Council and the Planning Group seemed to be one in the same.

The Planning Group submitted the Musquash MPA proposal requesting Area of Interest status to DFO as required in late 1999. Upon review of the proposal the Minister of Fisheries and Oceans in February of 2000 announced that Musquash had been accepted as an Area of Interest under the MPA process. Further ecological, technical and socio-economic assessments are required to support the development of a management plan.

Part of the technical assessment to be carried out is delineation of MPA boundaries. In September of 2000 the GEOIDE project “Good Governance of Canada’s Oceans: The Use, Value and Significance of Marine Boundary Information” was offered Musquash as a case study by DFO’s Director of the Oceans Act Coordination Office. DFO was interested in GEOIDE’s project as it could be of benefit in defining boundaries and dealing with subsequent legal issues in the Musquash MPA. The project’s objective included investigation of boundary issues and examination of socio-cultural aspects of boundary delineation for MPAs. Although GEOIDE is an independent project, its work could benefit the Planning Group by offering complex mapping and charting of the estuary at no cost, and provide socio-cultural information which could be used to further develop the MPA management plan.

In January of 2001, at a Planning Group meeting, a member of GEOIDE introduced the ocean mapping component of the project. This is documented in the minutes of the Planning Group’s meeting. “Ted Byrne, from the Ocean Mapping group at UNB [University of New Brunswick], presented the information on GEOIDE. This project will

provide the coastal boundary delineation for the Musquash MPA.” (Musquash MPA Planning Group, January 2001). In an additional Planning Group meeting February, 2001 the project leader of GEOIDE and other members made further presentations concerning the project’s role in the MPA. Quoting from the minutes:

Documents used for the meeting were brought to everyone’s attention - Good Governance for Canada’s Oceans and the draft agenda. An overview of the Musquash case study was provided by Dr. Sue Nichols - Creating the information infrastructure for good governance of Canada’s offshore. Michael Sutherland presented the topic “Marine boundary requirements for ocean governance”. Ted Byrne presented an overview of the ocean mapping work scheduled for the spring time “Case study in marine boundaries” (Musquash MPA Planning Group, February 2001).

In March of 2001 the socio-cultural aspect of the GEOIDE project was presented at a Planning Group meeting by Dr. Felt as indicated in Chapter 1. The presentation was met with opposition and resistance on the part of the Planning Group. The Group felt that this particular research was unwarranted, and had already been done by the Conservation Council’s Musquash MPA Campaign Coordinator and Planning Group member as apparent in the “Settlements & Landscapes of the Musquash Estuary: Past & Present” report. At the time of Dr. Felt’s presentation the Planning Group indicated that it did not have any prior knowledge of the GEOIDE group, despite the previous delivery of several presentations on ocean mapping as documented in earlier minutes of meetings. The Planning Group felt that research of this nature could potentially impede the MPA designation process and might arouse suspicion in the community which would jeopardize trust that had already been fostered between the Planning Group and the

community. A letter was issued stating the Planning Group's position (see Chapter 1).

Despite efforts on the part of several GEOIDE participants, including Dr. Felt and project leader Dr. Sue Nichols, to clarify the objectives of the project, the Planning Group still requested that GEOIDE not initiate any socio-cultural research until after MPA designation. Dr. Sue Nichols attempted to rectify the issue through an e-mail to the Conservation Council's Marine Conservation Director, which is partly quoted below:

In this e-mail I would like to clarify a few issues that you raised and give you more information about the project. We had hoped to use Musquash to do actual [socio-cultural] fieldwork, but we understand this may not be possible. As a research team we have no intention of conducting such fieldwork without the support of the local community and in no way do we want to appear to create any problems that would delay the MPA designation. As a first step, Dr. Felt attended your meeting two weeks ago to solicit input on the boundary issues from the Planning Group and to explain its relation to the overall GEOIDE project. We hope there will be other opportunities to discuss the research with the Planning Group. At this stage we would like to ask your advice as to 1) what appropriate mechanisms (if any) we should take in any future liaison with your Committee? 2) how we can discuss the socio-cultural fieldwork on boundaries we had hoped to do and its connection to existing studies (Dr. Sue Nichols, personal communication, April 9, 2001).

The Director's response is partially quoted below:

Having read the full story, however, it doesn't change the concerns people have at this point in initiating new socio-cultural research in the estuary communities prior to the final designation. I understand that the boundaries will not be finalized before the designation; therefore, there will be ample opportunity to design and conduct any useful socio-cultural research once we have the word from Ottawa....Of course, everyone was aware of the mapping (at least in vague terms) and is supportive of this undertaking (Dr. Sue Nichols, personal communication April 9, 2001).

In light of such opposition, the intended socio-cultural research was abandoned and secondary forms of data were collected that would not be perceived as intrusive by the

Planning Group.

For the Planning Group, achieving Area of Interest status meant taking the next step in the MPA designation process which included a transition from a planning committee dedicated to furthering the designation process to a management board, which deals with how the MPA will be managed and in what capacity. DFO stipulates that a management board must be created which ensures the participation of all stakeholders, especially community members. Goals for the Musquash management board according to DFO are to include consideration of the following (DFO, 2001):

1. Maintaining a healthy fishing industry
2. Protecting highly productive habitats
3. Increasing the natural habitat and bird life in the marsh and surrounding land
4. Preserving the area for future generations
5. Ensuring conservation and sustainable use of the marsh

The previously known 'Planning Group' needed to define the way in which they would be represented as a group in the MPA process. Since achieving Area of Interest status almost a year and a half ago, the group had been considering what type of management form they would take. Any new management type that they may incorporate would influence the extent of authority and power that the group had over the MPA process. During a regular meeting of the group in May 2001, as they discussed possibilities concerning the new organizational form that they would take, the Marine Conservation

Director of the Conservation Council offered to summarize the group's options as to their new organizational structure. The Council possessed considerable influence over the Planning Group as one of the Group's most predominant members was also the Conservation Council's MPA Campaign Coordinator and was well respected in the Group. It is likely that the Conservation Council and this individual shared the same ideas as to which way they wanted management to go and was able to persuade the Planning Group as the Group trusted these figures and were relatively inexperienced in the area themselves (Dr. Felt, personal communication, January 2003).

The Conservation Council's summary of options made available to the Planning Group incorporated several examples of organization that amounted to mere advisory capacity. Quoting from the summary entitled, "Options for the Evolution of the Musquash MPA Planning Group":

According to DFO, a formally associated, legally constituted advisory body is required to represent the community and stakeholder interests as the Musquash MPA moves towards designation, and as the management plan is developed and implemented. This paper outlines the various options for such a body (Janice Harvey, e-mail, May 16, 2001).

In fact, Musquash is not "required" to take on an advisory capacity at all. DFO policy, guided by the partnering principle, states that MPA management can vary from advisory models to cooperative management arrangements (DFO, 2003b). The type of management form assumed is dependent on the social characteristics of the particular area in question. The limited scope of these options may have been influenced by a DFO draft management proposal of the Musquash Estuary, released in May of 2001, in which

it is stated that the Planning Group will:

...remain as an “advisory committee” providing a consistent forum for community input and solutions for a variety of issues in the area. The establishment of a Musquash Advisory Board with representation of all affected/interested parties within the community and nearby...to develop the management plan, define future regulations and provide continuous advice to the Department of Fisheries and Oceans. Therefore the formation of a Musquash Advisory Board is recommended; this Board would recommend a management plan to DFO (DFO, 2001).

Whether the decision for the Musquash management board to serve in an advisory capacity originated from DFO or from the Conservation Council, it is clear that the Council accepted and endorsed the advisory role.

In any case, all of the options made available to the Musquash group were advisory in nature. Five options were outlined including, an advisory board, a multi-stakeholder model, a “keeper” model, a “Friends of...” model, and a watershed protection society model. The mandate of the models were described as follows:

Table 2
Management Models and Corresponding Mandates as quoted from “Options for the Evolution of the Musquash MPA Planning Group”

Management Model	Mandate
Advisory Board	...advise DFO and the Musquash MPA Management Board on issues related to the management of the MPA. Other responsibilities would include community liaison and consultation. Independently initiated projects would be undertaken infrequently if at all
Multi-stakeholder	...to advise DFO and the Musquash MPA Management Board on issues related to the management of the MPA, to conduct community outreach and consultation, to initiate research projects and manage activities, and to manage contracts as appropriate

“Keeper”	...to adapt this to Musquash we would form a standard non-profit corporation (see the “Friends of...” model)
“Friends of...”	Friends of Musquash could: serve an advisory role to DFO and the MPA management committee; serve as a watchdog on issues; serve as community liaison around MPA issues (reporting community concerns and information to DFO and vice versa); develop and run interpretation and education programs in the MPA; carry out contract activities on behalf of government, where appropriate
Watershed	This is usually a group of anglers, and other outdoor enthusiasts...They undertake education around threats to the watershed and wildlife, promote best management practices, try to influence land use, undertake habitat restoration projects, sometimes stock fish, and more recently, undertake water quality monitoring

(Janice Harvey, e-mail, May 16, 2001).

In relating the description of each, the Director tended to endorse the “Friends of...” model. This is apparent in the fact that it is the only positively described model and the best described in relation to how it would operate in the Musquash MPA. The other models were not described in such elaborate or favourable terms. It is debatable if the other models were fairly and correctly explained.

In a June 2001 meeting of the Musquash Group, in which the official responsible as a liaison between the Musquash group and DFO was present, it was agreed that the organization’s mandate would be limited to serving as an Advisory Board to DFO. Part of the minutes from the June meeting are as follows:

The Musquash Group reviewed several examples of structural organization. There is much discussion that is still required, but in the end the following key items were agreed upon by those present on June 14. That the organization’s mandate should include an Advisory Board role to DFO on the management plan for the MPA. That its mandate might also include education, awareness, research and advocacy. That the

structure would include the formation of several working groups to address various issues. The key working group initially might be a “Consultative” working group, charged with ensuring that those not actively participating are kept informed, consulted and are invited to participate (Musquash MPA Planning Group, June 15, 2001).

This mandate stipulates that the board would operate in a consultative manner and address such issues as regulation, education, awareness, research and advocacy. The advisory model that the group chose was the “Friends of...” model. Its official mandate includes the following:

1. To serve in an advisory role to DFO as the lead agency in charge of MPAs and to other federal, provincial and research agencies with respect to the Musquash MPA;
2. To participate with and on the MPA management committee as established by DFO, in developing, monitoring and amending as necessary the management plan for the Musquash MPA;
3. To serve as a vehicle for community liaison with various agencies with respect to the Musquash MPA and its management;
4. To serve as a watchdog on issues related to the Musquash watershed;
5. To carry out education, communication and community research and monitoring programs as appropriate (Conservation Council of New Brunswick, 2001).

Presently, in August of 2003, the “Friends of Musquash” group is officially incorporated, operating under the guidance of its by-laws. The proposed Musquash MPA is still awaiting official MPA designation status from the Minister of Fisheries and Oceans.

Musquash Discussion

As an integral component of the MPA program, DFO emphasizes the need to involve all stakeholders in the management process. This is apparent in DFO’s management

principles as stated in the Oceans Act. One principle, the consultation principle, states that any interested groups or persons affected by MPA establishment should be consulted in the decision-making process (DFO, 1997). Integrated management emphasizes DFO's commitment to collaboration and involvement with stakeholders throughout all stages of MPA development. Lastly, the partnering principle holds the MPA program is designed so that cooperation and alliances with interested and affected parties are possible (DFO, 1997).

In the Musquash case, several stakeholders including community members, non-governmental organizations such as the Conservation Council, and resource users such as the Fishermen's Association were involved in various aspects of MPA management. A planning group was created which was responsible for composing a proposal to be submitted to DFO to achieve Area of Interest status. From the initial planning group a management board was created which was to represent stakeholder interests in the management of the MPA. One form of management, according to DFO management principles, could constitute a co-management arrangement in which stakeholders would possess decision-making authority in the MPA process. This would be the most desirable form of management as it would ensure stakeholders meaningful participation in management practices and also ensure that the MPA would operate in an equitable and effective manner. The form of management that stakeholders chose in the Musquash case was not that of a cooperative model where decision-making power could be employed, but instead, an advisory form in which no decision-making power was shared.

As stated earlier, co-management arrangements can take various forms. These forms vary in terms of the degree of user participation and the role which state and user groups assume. Advisory boards operate on the premise that government will take suggestions that the board offers and endorse them. Alternatively, in cooperative forms users have authority in the decision-making process and are able to elicit change and implement regulation. It is widely accepted in co-management literature that cooperative forms command more legitimacy in management practices as users not only have a voice in decision-making but also possess authority (Jentoft et al., 1998; Pinkerton & Weinstein, 1995). Meaningful participation in resource management implies the sharing of power to make decisions not merely the allocation of advisory power (Felt et al., 1997). Advisory boards are susceptible to becoming nothing more than a symbolic gesture by the state to involve users in management processes. As the state does not have to take the advice of advisory boards, often these arrangements run the chance of amounting to nothing more than mere tokenism. The following discussion is devoted to examining why it is that the Musquash group chose to operate in an ineffectual advisory capacity instead of taking a management form that could guarantee authority in the decision-making processes of MPA management.

The Role of the ‘Community’

The way in which community is defined and the way that a community is represented in a particular situation influences the form of management which may be taken. First, it is important to clarify what is meant by the term ‘community’ as it is an integral component

of any co-management arrangement. Given the elusive nature of the word 'community' it is often difficult to understand what or who is implied by the term. There are several useful ways to conceptualize 'community' in relation to co-management. Defining what is implied by the term is vital. It is imperative that the people who are to be considered the 'community' are the actual people who will be most affected by resource regulation, as these are the ones who may be given a voice in the management process.

Community can be defined in a number of ways, some more conducive to co-management than others. Definitions that include those who utilize a resource are referred to as functional definitions of community. Community in this sense is determined by shared participation and implies no geographical or social relation between members (Jentoft et al., 1998). This is a rather narrow definition of community and is not very useful within the context of MPA co-management arrangements as issues concerning conservation affect more than resource users specifically, but also those who reside within or adjacent to the resource. Traditional notions of community are associated with territorial definitions. A territorial community encompasses all of the people who live within a specific region. Community defined in this manner takes into consideration bonds of kinship, shared identities and histories. This is a useful way to conceptualize community for the purposes of analysing MPAs.

Another beneficial definition is that of epistemic definitions of community. An epistemic community may consist of scientists, conservation organizations, industry members or

any other group which shares common conceptions concerning a problem (Jentoft et al.; Haas, 1989). The terminology, ‘epistemic community’ is borrowed from ...”literature on sociology of knowledge and is most commonly used in international relations to refer to a specific community of experts sharing a belief in a common set of cause-and-effect relationships as well as common values to which policies governing these relationships will be applied” (Haas, 1989: 384). In the case of co-management the term ‘epistemic community’ is adapted to refer to a community of people which may include users, scientists, government personnel or NGOs who share common beliefs in relation to the conservation of a given area and subsequent management issues pertaining to conservation. This type of community allows for effective communication and sharing of knowledge across diverse groups with various expertise and skills which creates the potential for dynamic and innovative solutions to develop.

The type of community that developed in Musquash can be best described as an epistemic community. The community was represented by a Planning Group which consisted of fishers, residents, landowners, conservation groups, and government officials. The way in which community is represented influences the type of management arrangement that will form. The role that user groups take is largely dependent on their relative power, including their ability to negotiate and the knowledge and strength that the group possesses (Sen & Nielsen, 1996). In the case of Musquash the management form that is employed is an advisory board. This is less than desirable as it does not guarantee the group any legitimate authority in the MPA management process. One of the reasons why

this form was chosen was because of the way that the Musquash community was represented, i.e. through the Planning Group.

The Conservation Council played a dominant role in structuring the outcome of the final management model for the Planning Group. As a member of the Planning Group, the Council exercised considerable power. The Council's influence stemmed from a number of sources. First, the Council was responsible for the initial MPA nomination proposal and, as a result, possessed valuable knowledge and prior experience. Second, the Conservation Council's MPA Campaign Coordinator was a respected member of the community and Planning Group. He was individually responsible for carrying out much of the background research needed for MPA designation. He acted as the Conservation Council's link to 'local credibility' as he was part of the community, had their trust, and was able to legitimize the Council's beliefs in the eyes of the Planning Group. Third, the other members of the Planning Group were relatively inexperienced and unfamiliar with the MPA program. Due to this fact they relied on the Conservation Council to provide expertise in the MPA process.

It can be argued that the Conservation Council, or at least the Director and the MPA Campaign Coordinator who was also a prominent Planning Group leader, had some clear ideas about how the management process should unfold (Dr. Felt, personal communication, January, 2001). Through the influence of the Council over the Planning Group, it was able to structure the management process so that it fit its own idea of

appropriate management. This is why the Planning Group took on an advisory capacity; they were heavily influenced by the Conservation Council who endorsed such a management form. At the two Planning Group meetings that Dr. Felt attended, he observed that both the Conservation Council Director and the Planning Group member who served as Campaign Coordinator dominated discussion. The members of the Planning Group likely felt fortunate to have access to the considerable experience that the Council possessed pertaining to conservation issues. Due to their relative lack of knowledge surrounding management options, the Planning Group accepted the Council's suggestions without opposition.

The Conservation Council's involvement would not go without consequences which would affect all others in the Planning Group. The Council served as a sort of 'gatekeeper' for other potential locally-based organizations, controlling access to the management process. They framed the management options from which the Planning Group would choose a management model. The list of options excluded certain management forms, such as cooperative management, from being considered. The only options made available to the Planning Group were advisory roles. As no other member of the Group raised any opposition to the options, either because of lack of knowledge that the options were severely limited or due to the power that the Council wielded in the Group, the fate of the future management board was sealed.

The Role of the State

State involvement, namely that of DFO, played a part in shaping the form of management which was assumed in the Musquash case. In particular, the experience, assumptions and expectations of local government employees which are responsible for initiating the process of community involvement help shape the eventual form management will take. Local level government personnel are responsible for initiating the process of community consultation in MPA designation processes. Even with the best formalized rules, implementation depends upon the assumptions, experience and desires of those who carry them out. This is a tenet of organizational theory.

Organizations are thought to be dichotomous in nature as they are composed of both formal and informal structures. Policies, rules and regulations constitute the formal organization (Scott, 1987). Formal structures and normative systems provide a blueprint for behaviour in the organization. They are designed to regulate behaviour in pursuit of specific goals. Formal structures are supplemented by informal structures which constitute the actual behaviour in institutions which is not prescribed by official rules. The organization of any institution does not correspond exactly to a blueprint of behaviour. More exists in organizational structure than prescribed rules. Individuals enter an organization with individually shaped ideas, expectations and agendas. They also bring with them differing values, interests and abilities. Informal structures are those based on the personal characteristics or resources of specific personnel (Scott, 1987).

In the Musquash case, the experience of the government official responsible for implementing the MPA process was minimal. When appointed by upper-management she was not given any support or guidance. Such inexperience affected DFO's ability to carry out MPA policy. The MPA management process is one in which stakeholder involvement is strongly emphasized. Whenever possible management should include community groups. While this is the desirable way in which MPA designation should unfold, in actuality, this was not at all what happened in Musquash. When the Planning Group was making the transition to a management board, DFO should have guided the shift by outlining possible management alternatives. The DFO personnel deemed responsible for taking on such a role was unfamiliar with management practices. While this person was involved with the Planning Group, she did not contribute to the group's knowledge of management alternatives. When a narrowly defined set of management options was presented by the Conservation Council, DFO should have taken the initiative to clarify the error in management options. However, due to the DFO personnel's inexperience and unfamiliarity with the process, the original set of options proposed by the Conservation Council was endorsed instead of challenged.

Chapter 6: Summary & Conclusion

The intent of this chapter is to summarize the research findings and highlight the challenges associated with MPA designation and subsequent management. This research investigates the implementation of a co-management arrangement for a saltwater marsh to be designated as an MPA. The purpose behind the research is to highlight the challenges, problems and potential limitations associated with MPA management by way of a case study. In the case study the process and form of community participation in the designation process was examined based on several sources of documentation. It is hoped that this particular case study may prove useful in the subsequent designation of other potential MPAs given the likelihood that MPA designation will increasingly become an important sustainable management strategy under the Ocean's Act.

The Musquash case study

Several obvious problems occurred in the Musquash MPA management process. First, inexperience with the MPA program on the part of government personnel, particularly at the 'delivery level', and the community allowed more experienced groups to frame management dialogue and limit consideration of possible management outcomes. As a result, a full range of management options was not made available to the community and an advisory role emerged. This is a case where specific MPA designation policy concerning management practices was not enforced due to lack of experience and

unfamiliarity with MPA policy on the part of all those involved. Even with formalized rules, implementation depends upon the understanding and experience of those who carry them out.

Second, the management form taken in Musquash was shaped by the substantial involvement of a non-governmental organization, the Conservation Council of New Brunswick. This raises important issues such as what constitutes a community and who speaks for a community. Communities inexperienced with MPA processes, and custodial resource management generally are vulnerable to domination by other organizations or stakeholders. Often, external organizations such as the Conservation Council have extensive experience in public consultation and resource management and have their own 'preferred' means to address these issues. The potential exists for external organizations to dominate MPA processes and enforce their ideas of what should take place upon others in the community. In the Musquash case, the Conservation Council served as a 'gatekeeper' for the MPA designation process. To some extent the Council single-handedly controlled access to the management process. The Council clearly possessed the most influence in the designation process and shaped the choice of community participation. Their dominant role in the representation of the community enforced their vision of management upon all others in the group.

A third point relates to the importance of communication in MPA designation processes. Several instances of miscommunication and misunderstanding occurred in the Musquash

case. The Planning Group that represented the community was not informed of an external research organization's participation in the designation process. When the research organization, GEOIDE, attempted to present material concerning the project to the Planning Group it was met with hostility and resistance as the Planning Group knew nothing of the initiative and felt that the progress made in their own work was threatened by GEOIDE's presence. As a result, members of the GEOIDE project had to modify the extent of social and economic research so that no primary data were collected in order to meet the request for limited involvement made by the Planning Group. Other components of the GEOIDE project were completed, such as acoustic ocean floor mapping in the estuary to establish possible marine boundaries. Only the social and economic component of the GEOIDE project was halted. This highlights the issue of vulnerability of the social sciences. Social science is often seen as lacking legitimacy and validity as in the case of Musquash. Certain groups hold the belief that they are capable of carrying out social research themselves and do not understand the value of scientific social research.

Musquash is a pertinent example of what can occur when communication processes in management arrangements breakdown. Co-management is structured around the belief that the contribution of stakeholders, research organizations and resource users are important to the management process as each has the potential to contribute essential knowledge and skills. However, this contribution can only be realized if all those

involved are aware of what it is other contributors can offer and are willing to take into consideration the motives behind their participation.

Given that the management model in Musquash is an advisory form, the community does not possess authority to introduce regulation in the MPA. This has unfortunate consequences for the community. Unable to enforce regulation themselves, the management board must accept DFO regulation. While the advisory board can make suggestions to DFO, by no means are DFO obliged to endorse such suggestions. The end result is that the community has less say in the MPA process than if a co-management arrangement existed.

The Musquash case study has several MPA policy implications. In light of the Musquash situation it becomes apparent that the MPA designation process has shortcomings. The designation process fails to clearly articulate how MPA management is to unfold. MPA policy states that each MPA is to be managed on a site-to-site basis, therefore each MPA has its own unique management plan reflecting the purpose for which it was established (DFO 2003b). Management is to be based on several guiding principles such as partnering, consultation, and adaptative management, which ideally are to be followed. In reality, the lack of clear guidelines results in a situation where government personnel responsible for MPA designation and the involved communities fail to have a clear sense of what it is that MPA management should be and what their part in the process should entail. MPA management policy is ambiguous. The consequence of this ambiguity is

chaos in the management process. A much more effective management policy is called for which clearly states the role of DFO and the community in MPA management, and also comprehensively outlines management options for all those involved. This sort of clarification is the responsibility of DFO and it is essential that MPA policy be modified to such an extent that the confusion and lack of understanding as seen in the Musquash case does not occur in future MPA endeavours.

Challenges are inherent in the implementation of any co-management arrangement. Often, the ideal version of what should happen fails to take place. Social dynamics at work within user organizations strongly affect the management process, as is the case with Musquash. The implementation of any management regime is largely dependent upon the ability of those responsible for carrying it out. As both co-management and the MPA program are relatively new ideas, at least in the Canadian context, it will take time to clarify implementation processes. As previously stated, the best way to create change is slowly and incrementally. The evolution of any institutional arrangement is dependent on the accumulation of experience and learning from past mistakes. Most importantly, institutions and organizations must learn by trial-and-error and apply the knowledge gained to future endeavours.

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Appendix

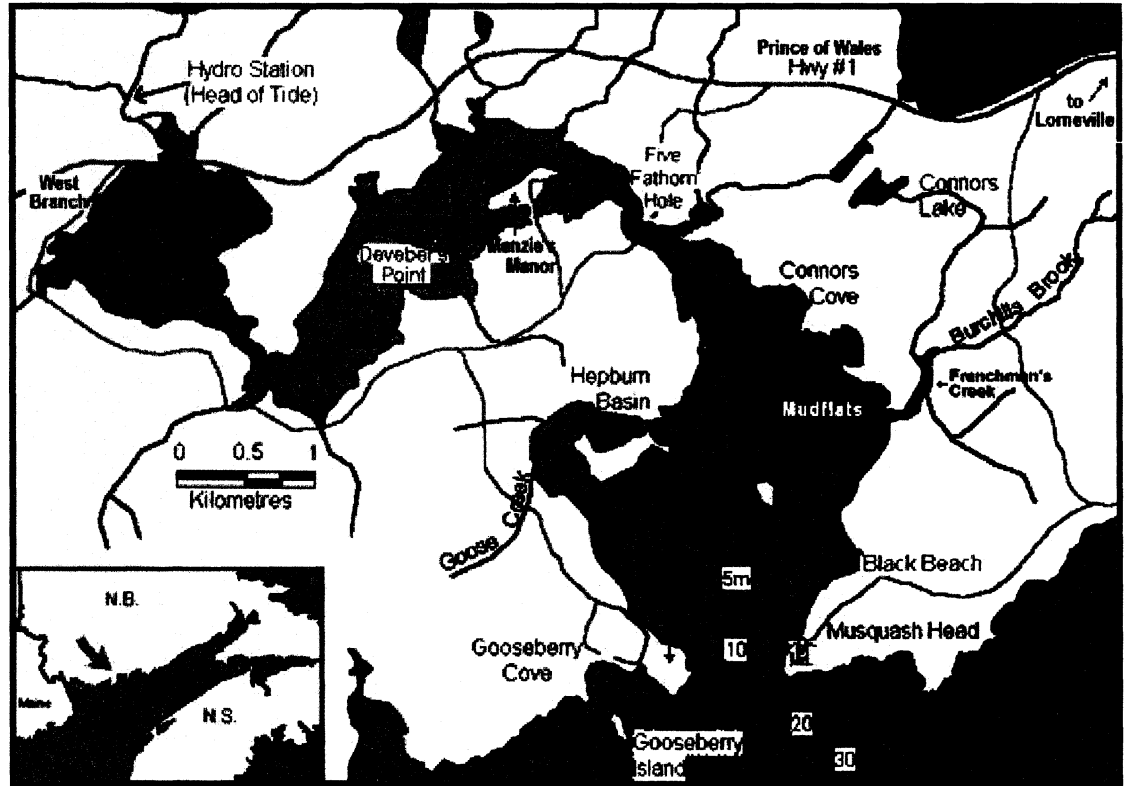


Figure 1 Map of Musquash, located in the Bay of Fundy, New Brunswick. Obtained from Musquash Marine Protected Area Campaign Website. (2003). MPA campaign. Online at URL: <<http://www.musquashmpa.ca>> Accessed: 05 February 2003.



Figure 2 Picture of Musquash mudflats. Obtained from Musquash Marine Protected Area Campaign Website. (2003). MPA campaign. Online at URL: <http://www.musquashmpa.ca> Accessed: 05 February 2003.

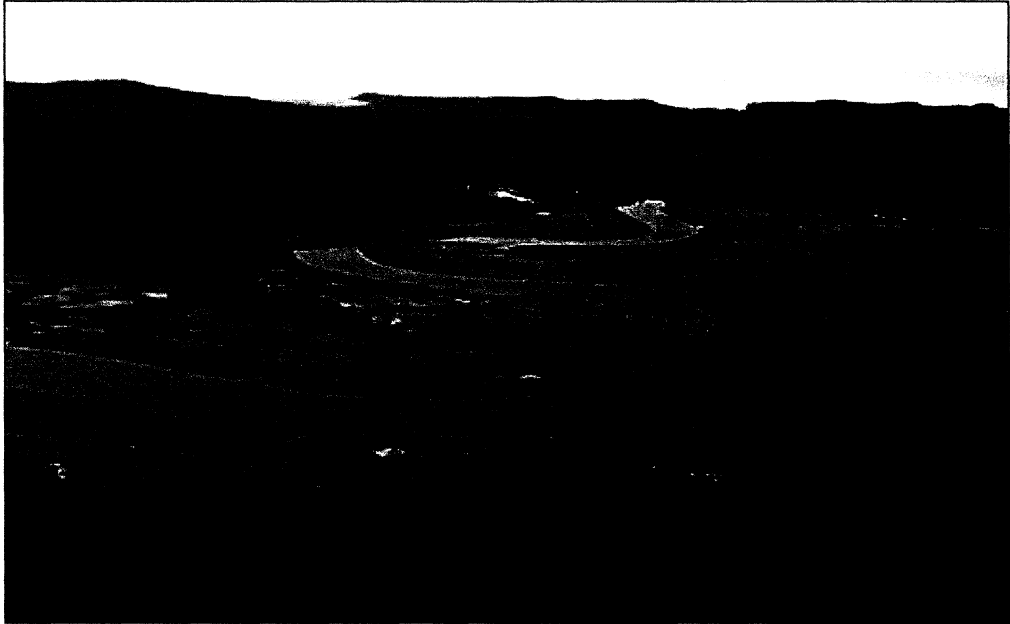


Figure 3 Picture of Musquash salt marshes. Obtained from Musquash Marine Protected Area Campaign Website. (2003). MPA campaign. Online at URL: <http://www.musquashmpa.ca> Accessed: 05 February 2003.



Figure 4 Picture of the Musquash Hydrostation. Obtained from Musquash Marine Protected Area Campaign Website. (2003). MPA campaign. Online at URL: <http://www.musquashmpa.ca> Accessed: 05 February 2003.

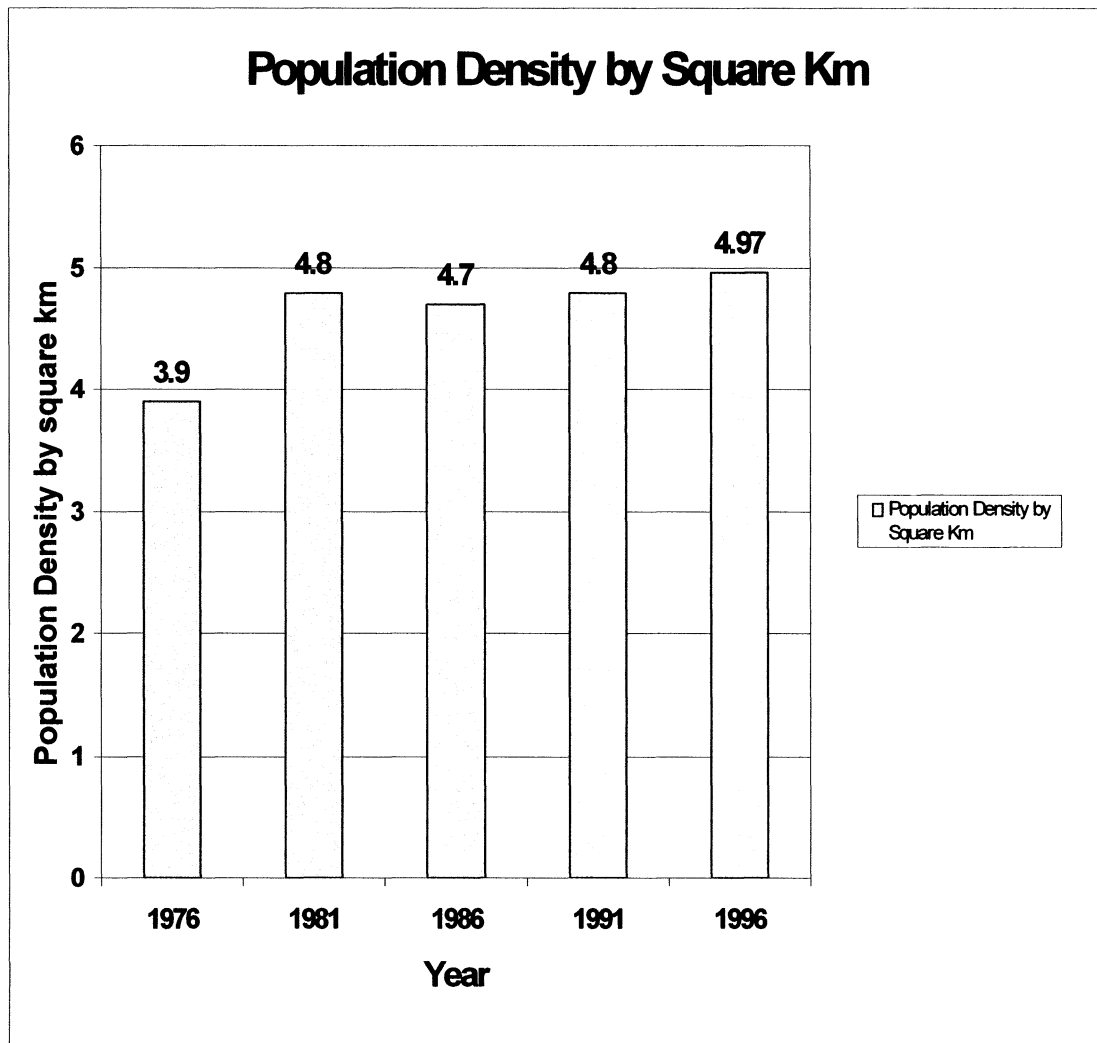


Figure 5 Population density in raw numbers, by square kilometre in Musquash. Obtained from Statistics Canada. (2001). New Brunswick census. Ottawa: Ontario: Statistics Canada.

Population of Musquash



Figure 6 Population Of Musquash. Obtained from Statistics Canada. (2001). New Brunswick census. Ottawa: Ontario: Statistics Canada.

OWNER TYPE	PROPERTY TYPE	Total Area of Land Type (Ha)	% of Total Sum
Ducks Unlimited (Canada)	marsh land	280.4400	3.7%
	abandoned farmland	88.0000	1.2%
	Total	368.4400	4.9%
Province of NB Department of Natural Resources & Energy	residential lots unserviced	.0050	.0%
	utilities	21.3757	.3%
	water lots	1241.1000	16.6%
	recreational land unimproved	37.9000	.5%
	marsh land	1042.4500	13.9%
	Total	2342.8307	31.3%
Province of NB Business NB	tower satellite sites	2546.0000	34.0%
	institutional land unimproved	.4000	.0%
	Total	2546.4000	34.0%
Private Estates & Holdings	residential lots unserviced	7.5000	.1%
	residential improved	55.8500	.7%
	recreational land unimproved	22.2674	.3%
	recreational private improved property	82.6300	1.1%
	marsh land	46.5550	.6%
	timberland	330.2700	4.4%
	Total	545.0724	7.3%
Commercial (Ltd.)	residential land vacant	10.1400	.1%
	gravel pits, quarries	146.3000	2.0%
	light houses & range light sites	28.3200	.4%
	marsh land	60.2600	.8%
	abandoned farmland	85.0000	1.1%
	timberland	437.4500	5.8%
	Total	767.4700	10.2%
NB Power Corporation	utilities	327.7200	4.4%
	water lots	597.0000	8.0%
	Total	924.7200	12.3%

Number of Lots and Total Area of Property Type Owned By Each Owner Type

Figure 7 Property ownership data. Obtained from Service New Brunswick. (2001).
Deed records for Musquash parish. St. John: New Brunswick: SNB.

Unemployment Rate for 15+ Years of Age

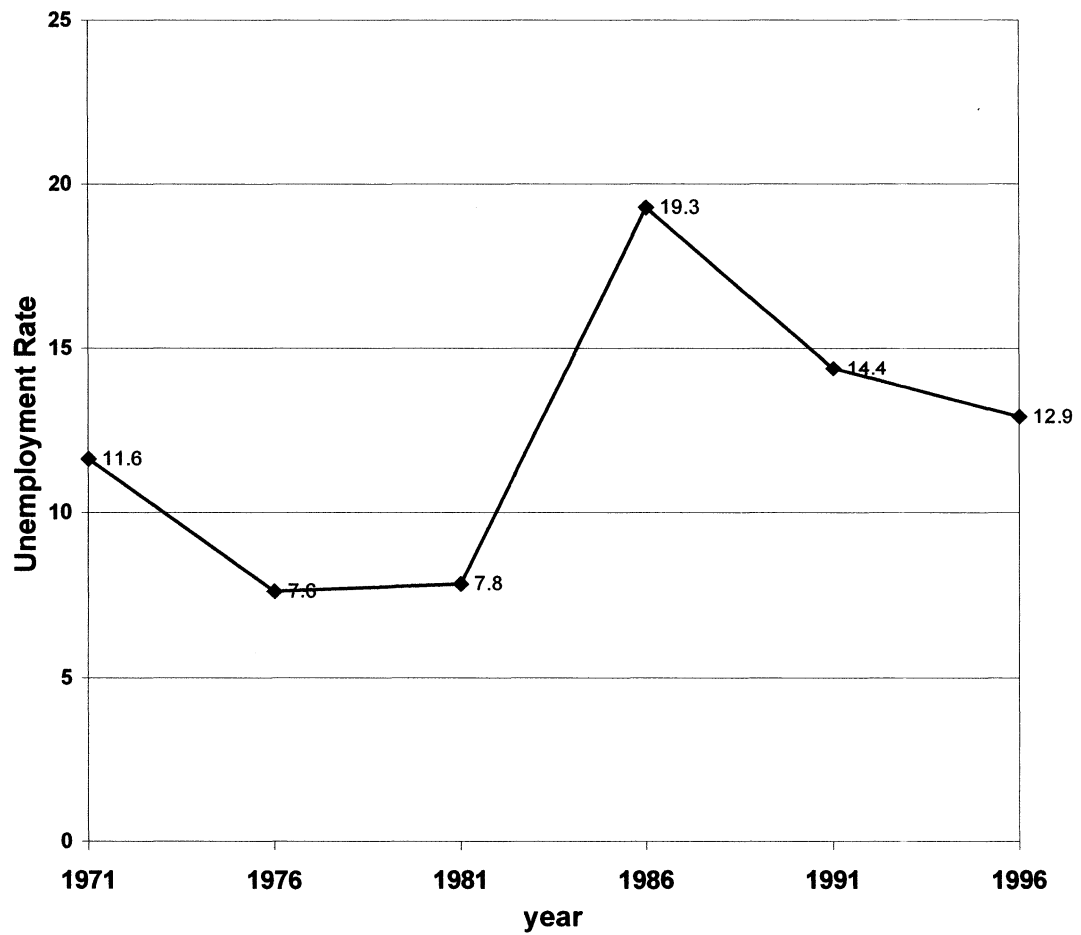


Figure 8 Unemployment rate for Musquash. Obtained from Statistics Canada. (2001). New Brunswick census. Ottawa: Ontario: Statistics Canada.

Mean Total Income

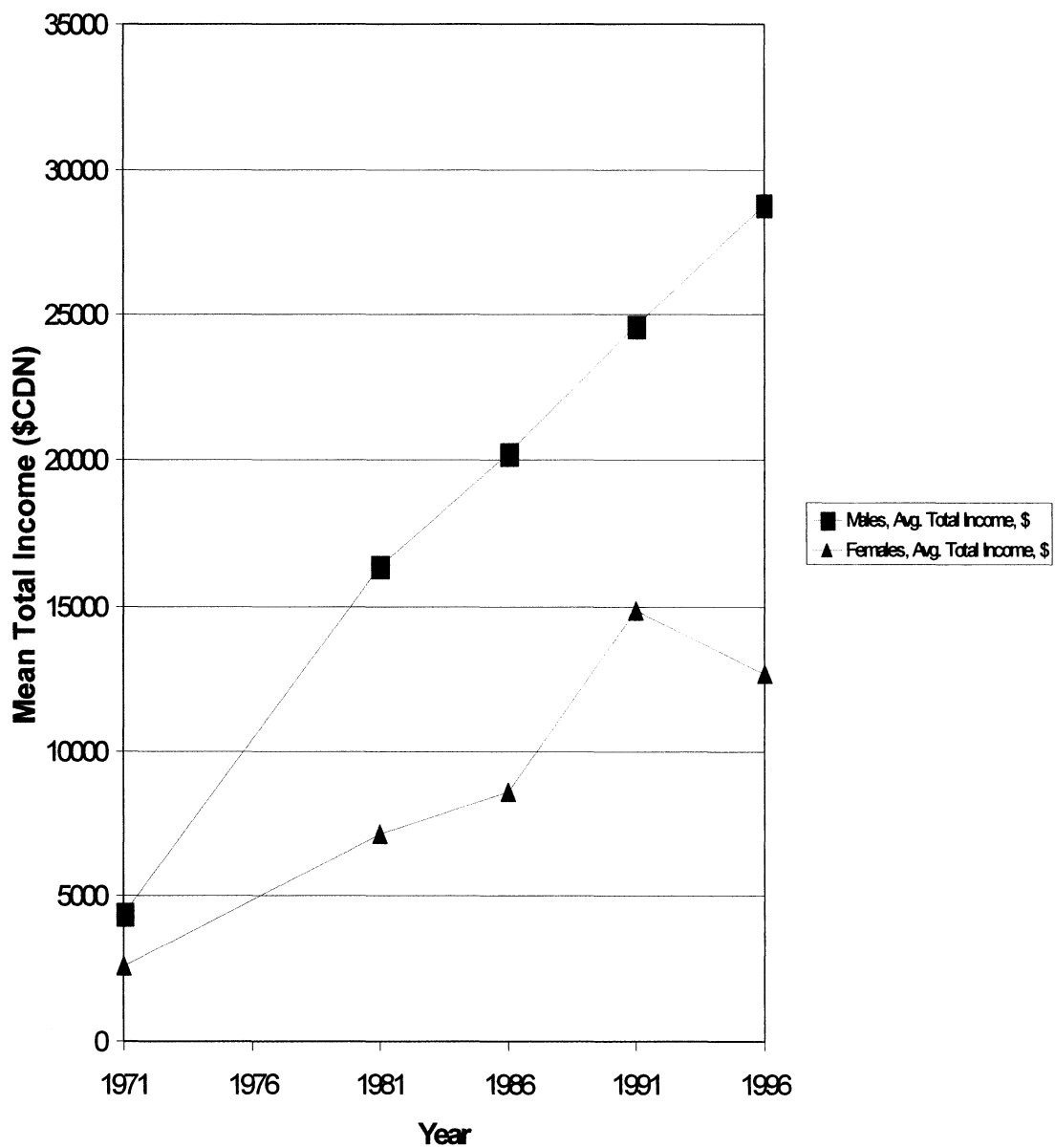


Figure 9 Mean income by gender. Obtained from Statistics Canada. (2001). New Brunswick census. Ottawa: Ontario: Statistics Canada.

Primary Industries Labour Force

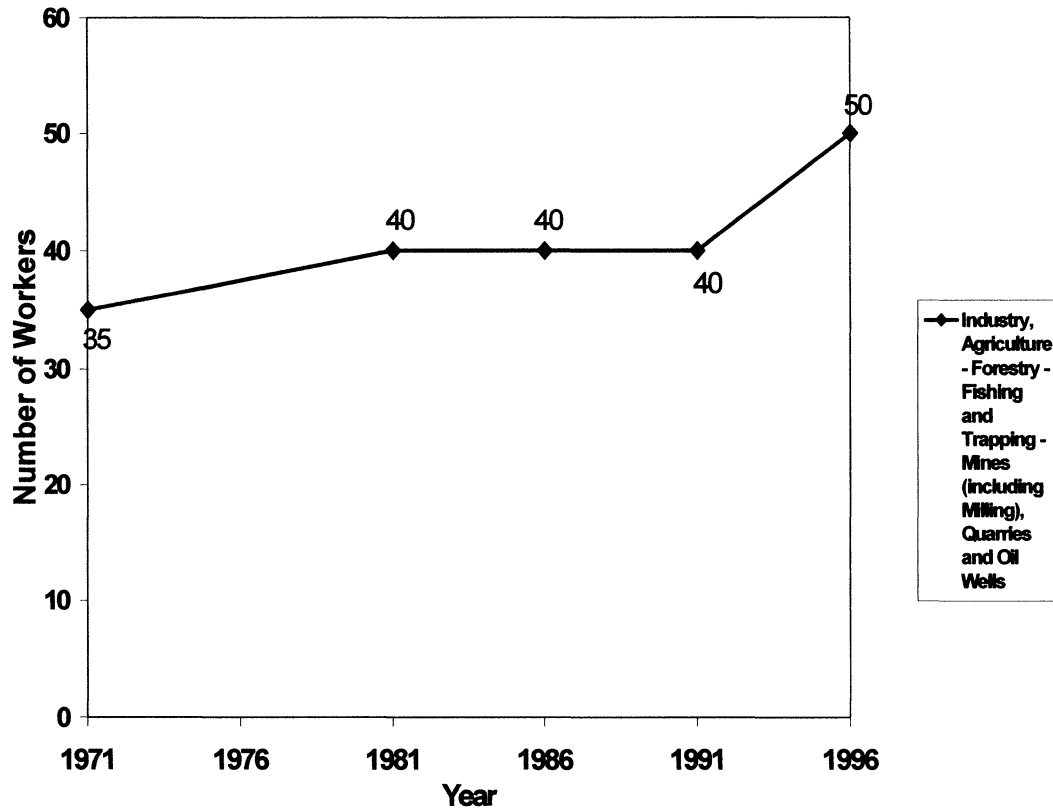


Figure 10 Number of workers in primary labour force in Musquash. Obtained from Statistics Canada (2001). New Brunswick census. Ottawa: Ontario: Statistics Canada.