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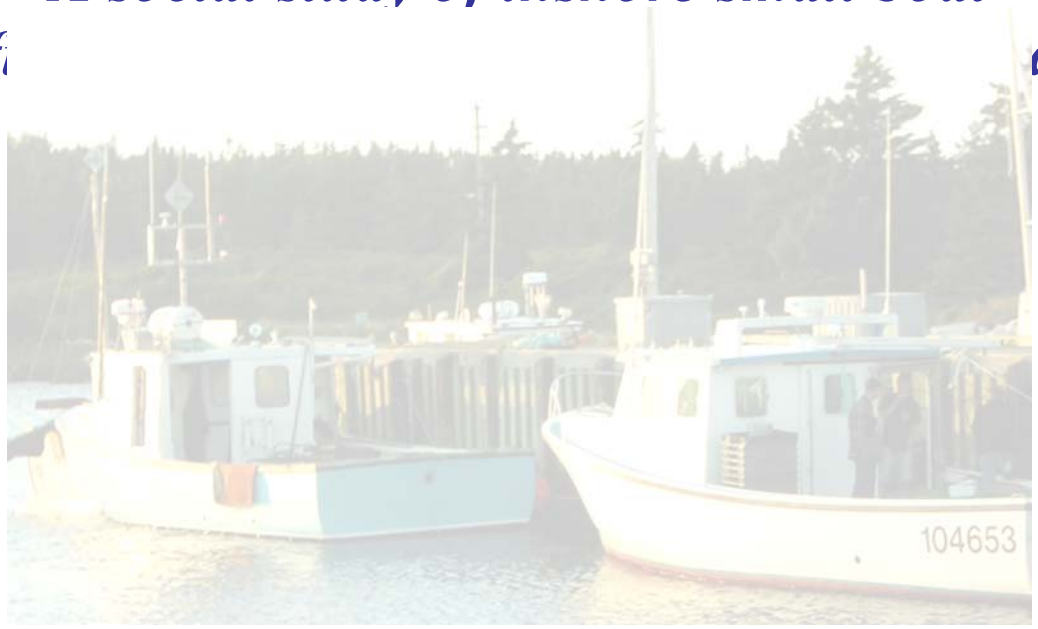
Faculdade de Ciências do Mar e do Ambiente

Co-management towards sustainability. A social study of inshore small boat f a



RELATÓRIO DE ESTÁGIO DO CURSO DE LICENCIATURA EM BIOLOGIA MARINHA E PESCAS

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ESTÁGIO INSERIDO NO PROJECTO SOCIAL RESEARCH FOR SUSTAINABLE FISHERIES.
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O conteúdo deste relatório é da responsabilidade da autora

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Abstract

Guysborough County, located in the eastern mainland extremity of the Province of Nova Scotia – Canada, is a place where the inshore small boat fisheries have played an important role in the community. As in many others places, the marine resources have been overexploited and new strategies have been explored in order to achieve sustainable fisheries. Co-management – a partership arrangement in which government agencies, the community of local resource users, non-goverment organizations, and other stakeholders (fish traders, business people, etc.) share responsibility and authority for the management of a fishery – seems to be arrising with the prospect that it will lead to better management of the resources. The Government of Canada adopted this view, although the extent to which the Canadian Goverment approached this view has lead to some controversies among those most dependent on the resources – fishermen. A social profile telephone survey study, was conducted of Guysborough County (LFA 31A and 31B) fisheries among lobster license holding fishing captains. The participation rate of license holders was 78.9%. The results verify that fishing for a living is deeply rooted within the family and has been transmitted by generations through kin relations. For instance, 70.5% of those interviewed learned about and started fishing with a family member, so highlighting the importance of family recruitment. This way of recruitment is not as prominent nowadays. Several reasons were indentified for this fact and almost all relate to the current management system. These are, among others, limited entry licenses, reduction and elimination of vessel and equipment purchase subsidies, and uncertainty about catches and incomes. Also, the study supports the contention that government is more likely to address the interests of large fishing companies, which have a much greater political and economic influence, than it is the interests of small boat coastal communities. The results also show that Guysborough County fishermen are very dependent of their activity and many are quite active in fisheries organizations and governance initiatives. However, many difficulties associated with their role in current co-management systems and initiatives were identified. The supposed co-management initiative has brought a great variety of bureaucratic functions and responsabilities into fishermen's associations, most associated with down-loaded administrative costs; but, decision-making power is still not being shared by government with marine harvesters or their organizations.

Resumo

O Condado de Guysborough, localizado na extremidade Este da parte continental da Província da Nova Escócia – Canada, é um lugar onde a pequena pesca costeira tem tido um importante papel na comunidade. Tal como em muitos outros lugares, os recursos marinhos têm sido sobre explorados e novas estratégias têm sido exploradas de modo a alcançar a sustentabilidade das pescas. A co-gestão – um acordo em que agentes governamentais, a comunidade de exploradores dos recursos locais, organizações não governamentais, e outros grupos de interesse (comerciantes de peixe, negociantes, etc.) partilham a responsabilidade e autoridade para gerir a pesca – parece estar a surgir com a perspectiva de que conduzirá a uma melhor gestão dos recursos. O Governo Canadiano adoptou esta nova visão, contudo a extensão com que a incorporou tem vindo a levantar controvérsias entre os mais dependentes dos recursos – os pescadores. Foi realizado um estudo do perfil social das pescas no Condado de Guysborough, via questionário por telefone a capitães de pesca que possuem licença de pesca do lavagante americano. A taxa de participação de pescadores foi de 78,9%. Os resultados mostraram que pescar como modo de vida está profundamente enraizado na família e tem sido transmitido por gerações através de familiares. Dos entrevistados, 70,5% aprenderam sobre pesca e começaram a pescar com um familiar, realçando assim a importância do recrutamento via família. No entanto é verificado que nos dias de hoje este recrutamento não é tão efectivo. Muitas razões foram identificadas para este facto e quase todas se relacionam com o corrente sistema de gestão. Este estudo também apoia a ideia de que existe uma maior probabilidade de o governo satisfazer os interesses das grandes companhias pesqueiras, que têm uma influência política e económica muito maior, do que os interesses das pequenas comunidades pesqueiras. Os resultados mostraram também, que os pescadores do Condado de Guysborough estão muito dependentes da sua actividade e muitos são bastante activos em organizações de pescadores e em iniciativas governamentais; mas identificam-se muitas dificuldades associadas com o papel que eles desempenham nestas iniciativas de co-gestão. A co-gestão trouxe uma grande variedade de burocracias e responsabilidades para as associações dos pescadores, a maioria relacionada com custos administrativos; mas o poder de decisão continua a não ser partilhado pelo governo com os pescadores ou as suas associações.

1. Introduction

Aquatic resources throughout the globe have been subject to massive exploitative pressure over the last 30 years or so. Indeed, this pressure has contributed to the near collapse of stocks in some settings as well as triggered alarms concerning the overall depletion of ocean resources (Davis, 1996). Those most dependant upon fishing as a basis of their livelihoods are confronted with widespread reductions in the availability of ocean resources and very uncertain economic and social futures. This situation is certainly true for commercial small boat fishers in Atlantic Canada, and elsewhere (Jentoft & Davis, 1993).

Due to the recent failure of so many fisheries, the conventional management approach has been identified as part of the resource overexploitation problem, rather than the source for a solution. Yet, the changing philosophies of the fisheries development process are reflected in changing approaches to fisheries resource management (Bekers *et al,* 2001).

Jentoft & Davis (1993) also agree that such crises, which threaten livelihoods and community sustainability, frequently renew interest in exploring and developing alternative approaches to issues such as the management of access to and participation in fisheries, and the socio-economic organization of fishers, their communities, and their industry. It also pressures national governments to look for alternative management strategies (Jentoft & Davis, 1993). Many governments view co-mangement as a way to deal with the crisis (Bekers *et al,* 2001). The new DFO's (Department of Fisheries and Oceans[1] - Canada) policy framework for Atlantic Canada reflects the most progressive form of co-management that involves empowering fishing communities in objective settings, defining knowledge base for management and implementing decisions (Chuenpagdee *et al,* 2004a).

Social Research for Sustainable Fisheries[2] (SRSF), funded by the Social Sciences and Humanities Research Council of Canada (SSHRCC) through its Community-University Research Alliance (CURA) programme, is a partnership linking St. Francis Xavier University (St. FX) researchers with three coastal communities in the eastern coast of Nova Scotia. These partners are an aboriginal Mi'kmaq organization - the Paq'tnkek Fish and Wildlife Society (PFWS), the Gulf Nova Scotia Bonafide

[1] DFO website: http://www.dfo-mpo.gc.ca
[2] SRSF website: http://www.stfx.ca/people/adavis/srsf

County Inshore Fishermen`s Association (GNSBFA) and Guysborough County Inshore Fishermen´s Association[3] (GCIFA). SRSF is administered at St. FX, located in Antigonish, Nova Scotia. The basic purposes of SRSF are to develop fisheries-focused social research linkages between university researchers and community organizations, to build social research capacity, and to facilitate specific fisheries social research activities that will examine the concerns of the partnered community organizations (SRSF, 2001a).

SRSF and GCIFA, during a 2001 study among Guysborough and Richmond County fishing captains who presently hold a license to harvest lobster (*Homarus americanus)*, designed and conducted a telephone questionnaire survey focusing on social attributes and fishing livelihood experiences. The following essay, developed from research while completing an internship with SRSF and GCIFA, reports the results from a reanalysis of the data derived of the study mentioned above, in order to examine the effectiveness, implications and influence of fisheries management practices on the fishing community.

This essay opens with a brief overview presentation of the environmental, socio-economic, and fisheries management policy context. This is followed by a presentation and discussion of key findings arising from the reanalysis of the survey data. The essay closes with a discussion of the implications derived from the data re-analysis for understanding fisheries management iniciatives, particularly the situation of marine harvesters and their representative organisations respecting co-management initiatives.

1.1. Guysborough County

1.1.1 Site area, climate and historical background

Nova Scotia is a peninsula on the northeaster edge of North America, located between latitudes 43º to 48º north and longitudes 59º to 67º west. The total length of the province is 575 kilometers and its` average breadth is about 130 kilometers (Department of Development, 1972). Guysborough County, is the second largest county in Nova Scotia (Department of Development, 1974). With a coast line stretching over 512Km

[3] GCIFA website: http://www.gcifa.ns.ca

there are many tiny villages nestled into the bays, inlets and coves (Boudreau, 2001). Established in 1836, the county forms the northeastern section of mainland Atlantic coast Nova Scotia (figure 1). The county is divided into two rural municipalities, Guysborough to the east and St. Mary´s to the west. The only incorporated towns are Mulgrave and Canso, both of which are located in Guysborough Municipality (Department of Development, 1974).

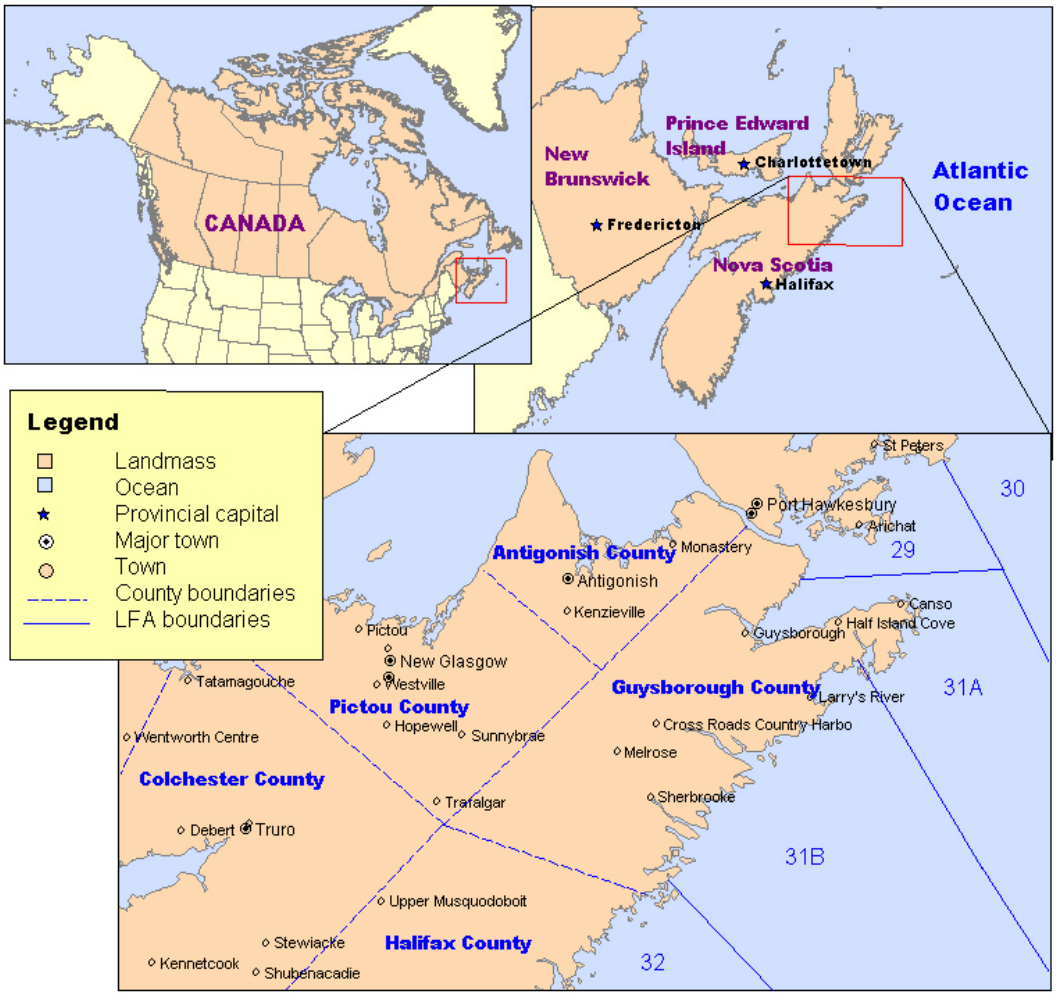


Figure 1 – Guysborough County site area map, showing its location in Nova Scotia (figure on top-right) and the location of Nova Scotia in Canada (figure on top-left). Outlines County boundaries, lobster fishing areas (LFA´s) and some towns (county boundaries and LFA´s boundaries calculated approximately).

The climate of Nova Scotia might best be described as a modified continental climate, extremes of summer and winter temperatures are not as evident as those in Central Canada. In Guysborough County the mean temperatures are, -7ºC in January and 17ºC in July. Occasionally the temperature reaches 31ºC in summer, and drops below -32ºC in winter, but such extremes are relatively rare (Department of Economic Development, 1991).

Guysborough County juts out into the Atlantic Ocean and is subject to unpredictable weather patterns cumulating from the warm Gulf Stream and the cold Labrador Current, as well as the Icelandic Low and the Bermuda High. Most storms and high winds occur in the winter months with moderate precipitation in spring and summer, usually in the form of fog, drizzle or showers. In January, February and March sea ice is formed along the Atlantic coast (Boudreau, 2001).

As might be supposed from its geographical position and the extent of its` seacoast, Guysborough County was visited by adventurous voyagers at a very early period (Hart, 1975). As early as the sixteenth century the Europeans visited and settled in the area, which they found populated by small bands of native Mi'kmaq people whom had survived for many years on the abundant wildlife, river and ocean resources. The Mi'kmaq were later coerced into battles with the Europeans for access to resource and land that was traditionally theirs. There are presently no substantial population of Mi'kmaq in the County (Boudreau, 2001).

The search for new fishing grounds and valuable resources, in turn generating trade and territorial ambition, brought Basques, Bretons, Portuguese, Spaniards, Englishmen and Frenchmen to what they deemed the New World. They all found one thing in common – profit was to be realized from the abundant fishery, especially cod (Fisheries and Oceans Canada, 1989).

Canso was the first and most rapidly developed area of the county, with fish merchants flocking to the area and military bases being established to protect this lucrative fishing trade. Acadian (French) settlers developed county infrastructure such as sawmills, a co-operative lobster factory, co-operative blueberry canning enterprise as well as co-operative stores and credit unions, schools and churches (Boudreau, 2001). In 1713, mainland Nova Scotia became a British possession, forcing the Acadian settlers to search out other areas in which to settle (Watt, 1963).

1.1.2. The Fisheries in the County

The fishermen of Guysborough County are at this time, small boat inshore fishermen who usually spend one or two days on the water, returning to the wharves to unload. The coastal waters of surrounding Guysborough County support varying marine species (Bourdreau, 2001). There have been many changes in the fishing industry in Nova Scotia over the past ten years (Pinfold, 2002).

In the late 1980's and 1990's, and some would argue earlier, there was a great decline in the groundfish numbers, that has resulted in the collapse of the ground fishery in Atlantic Canada. Those in the inshore fisheries holding a variety of species licenses, were enabled to diversify when the ground fishery collapsed, those in the offshore fisheries solely dependent on the groundfish stocks were left with vessels that could go anywhere, but that had nowhere to go (Boudreau, 2001).

With the traditional species of cod all but wiped out, alternative fisheries and fishery methods were needed. Species of crab such as snow crab, jonah crab, and rock crab are now viable and growing fisheries with markets that have far exceeded all expectation (Boudreau, 2001). The amount of snow crab landed has been on a steady increase since 2000 (Boudreau & Boudreau, 2003).

There has been a substantial bluefin tuna fishery in the county since 1980 with fluctuating annual landings ranging from very good to poor, there are also swordfish and shark license holders within the county but, are not substantial. A very profitable species of shrimp, now being fished with shrimp traps, has also increased the value of the fishery in the county along with the scallop drag license holder`s contribution. There are species of soft-shell clams being exploited in some areas as well as a boom in the sea urchin fishery in the waters off of Guysborough County, the new exploratory markets in Japan have been a boost to these fisheries and others. In summary, the species in new fisheries that are now considered substantial were traditionally considered a nuisance or were introduced as exploratory permits to new underutilized species (Boudreau, 2001). See in annex III the species name portuguese-english relation.

1.1.3. The Lobster Fishery

The lobster, small boat inshore fishery, is probably the most economically important, the most sustainable and the most consistent of Guysborough County fisheries. There has been a consistent recorded landing of lobster in Guysborough County since 1927. A review of the last decade`s landings show that these have been reduced by more than 50%. However, but this reduction has not resulted in an anticipated negative monetary impact on the fishery since the total landed value has increased (Boudreau, 2001).

There are 176 lobster licenses in the county. This has remained a consistant number since DFO legislated this as a limited entry fishery in 1968. The majority of licenses are Class A licenses with a 250 trap limit, but there are Class B licenses in the county with a limit of 175 traps. Class B licenses remained in the possession of non-core fishermen after 1968, but cannot be sold or transferred and they die with the holder (Boudreau, 2001). There are four separate Lobster Fishing Areas (LFA`s) in Guysborough County (areas 29, 31A, 31B and 32) (figure 1). The lobster season varies from April to June in the four LFA´s throughout the county (SRSF, 2001c).

The contribution of these fishermen to the county economy in 1990 was $2.2 million, and in 1999 the contribution increased to $2.9 million, although the latter figure is associated with a 59% reduction in actual landed weight. If you are able to increase the landed value but reduce the effort on the stocks and introduce enhancement measures you have some good indicators of a sustainable fishery (Boudreau, 2001).

1.1.4. A Socio - Economic County Profile

The population of Guysborough County has been in steady decline since the beginning of the century. There are no major urban centers in the county but the higher population areas are in the communities of Canso (figure 2) and Mulgrave (Department of Development, 1974). According to Boudreau (2001), the steady decline in the population may be attributed to the natural resource dependency of county employment, with fishing and forestry work as the primary employment categories. There is also a general trend in terms of young people leaving rural areas to pursue further education and not return due to a lack of good jobs that fairly compensate them for their higher education (Pinfold, 2002). Without the employment opportunities you cannot retain

your labour force. This is a continuous problem in Guysborough County (Boudreau, 2001).

a) **b)**

Figure 2 - Canso **a)** town and **b)** harbour

There are hundreds of inshore fishers in the county who depend on shellfish for their income, primarily lobster, scallops, shrimp and snow crab. A significant portion of the crab resource has been shared among almost all of the inshore fishers, providing a reasonable living for them. In the processing sector things are very uncertain. There are three processing plants in the county located at Port Bickerton (closed, recently leaving about 70 people out-of-work, but will re-open), Auld´s Cove (currently closed and it´s future is uncertain), and Canso (currently closed but expected to open in the spring to process shrimp and crab during the period of May to September with a much smaller workforce) (GCRDA, 2003) .

There are 345 full-time and 253 part-time fishermen in Guysborough County. When using the standard method of associating 1 full time or 2 part time fishing positions with the creation of 4 spin off employment positions (e.g., fuel and transport services, loading and unloading crew, engine and boat repairs, dockside monitoring, etc.), the estimated contribution of jobs in Guysborough County from the fishery would be approximately 1886 positions. This represents 25% of the total labour force in the county, and it is the inshore small boat fleet of a size less than 65 feet (19.8m) which creates and supports the majority of these jobs. In a county where the unemployment rates soar as high as 18.0% in the winter months, any job creation has an enormous effect on the county economy (Boudreau, 2001).

The average fisherman in Scotia Fundy (all of the south coast of Nova Scotia) has experienced a 65% increase in their vessel income from $75,000 to $123,000 (annually), which has translated into a 50% increase in their personal incomes, from $29,900 to $44,400 (annually), over the last decade. The inshore has diversified into new species, new markets and various new fishing methods to keep itself sustainable and to remain as a vital part of the county economy. The new inshore fishery has diversified into fishing enterprises that require operators to have the skill sets of accountants, technologists, policy and management planners, legal advisors and as always the physical labour skills (Boudreau, 2001).

1.1.5 Entrance criteria to the inshore fishery

There are three levels or status` of involvement in the fishery; they are part-time, full-time and core. A part-time fishermen has less than two years experience on the water and holds a PFR (personal fishing registration), but cannot have licenses registered in their name. These individuals are usually crewmembers or helpers for a season or in a particular fishery. Full-time status fishermen are required to hold a PFR and log 16 weeks on the water fishing for two consecutive years, with a portion of their income derived from the fishery. Full-time status permits fishermen to purchase and have licenses registered in their name as well as to purchase or hold a core package or enterprise. Core status is granted when a fishermen has a PFR, a registered vessel, two key licenses as defined by the DFO Licensing Policy, or 75% of their income is derived from the fishery as set by the 1996 criteria. This status permits fishermen to have access to new and emerging fisheries or expanding fisheries and benefits, as only core fishermen are eligible (Boudreau & Boudreau, 2003).

There are in Guysborough County, as of 2003, 581 fishermen, of whom 167 are core fishermen and 414 are non-core fishermen (Boudreau & Boudreau, 2003). The prices range of licenses, vessels and gears for the different fisheries are available at annex IV.

1.1.6. The Guysborough County Inshore Fishermen's Association

The fishermen in Guysborough County have belonged to various forms of support groups and organizations since 1967. The Canso Fisherman's Hall Society was incorporated on 1979, as a separate society, in order to access government funding to build a fisherman's hall (figure 3). On 1993 the name of the association changed to its` present name, the Guysborough County Inshore Fishermen's Association. This was an attempt to include all Guysborough County fisherman and for the association to be identified as a county organization (Boudreau, 2000).

a) **b)**

Figure 3 – Fishermen´s **a)** hall and **b)** GCIFA 30 years celebration.

Criteria for membership in the association is to be a fishermen or crew member of a vessel, with a home port registered in the Eastern Nova Scotia fishing area Zone 3 (Guysborough County and part of Halifax County). The majority of the association members are inshore fixed gear fishermen with several fishermen holding mid-shore or mobile gear licenses. During 1994 new members were attracted to the association and members began to volunteer for advisory boards, management boards, and became more involved in decision making within the association. In 1998 the association as became an Accredited Association under the Fisheries Organization Support Act (Boudreau, 2001).

According to Boudreau & Boudreau (2003), the association`s mission statement is to provide community-based management of the fishing resource and to ensure a sustainable fishery resource and habitat, and healthy fish stocks where they do not

inhibit recovery if the industry is in decline; to act as an information liaison between inshore fishermen and the Department of Fisheries and Oceans (DFO), which is the government agency that oversees the fishing industry; as well as to provide effective representation for the fishermen to the industry and other associations; to secure training to meet regulation requirements and to ensure that these are accessible to the fishermen and; to engage in participatory research that is both relevant to and directed by the association members, reflecting their industry´s questions and concerns.

Currently, there are 133 members in the association (Boudreau & Boudreau, 2003).

1.2. Sustainability and Co-management

Sustainability is generally associated with a definition by the World Commission on Environment and Development, 1987 (*in* Cabezas *et al.,* 2003): "…development that meets the needs of the present without compromising the ability of future generations to meet their own needs…" The concept of sustainability applies to integrated systems comprising humans and the rest of nature, the structures and operation of the human component (society, economy, law, etc.) must be such that they reinforce the persistence of the structures and operation of the natural component (ecosystem, trophic linkages, biodiversity, biogeochemical cycles, etc.) (Cabezas *et al.,* 2003).

Viewing the fishery as a system leads to recognition of the variety of closely interacting, dynamically varying components involved. Many different species of fish inhabit the aquatic ecosystem, living out of sight, their populations changing, sometimes dramatically, from year to year. A spectrum of fishers, including full-timers and part-timers, fixed gears (e.g. hook and line or gill nets) and mobile gear (e.g. trawlers), small-scale (artisanal, usually inshore) and large-scale (industrial, typically offshore), try to find the fish and catch them, using a fleet that changes in number and power over time. Beyond the harvesting sector, the system includes processors, distributors, marketing channels, consumers, government regulators and support structures, as well as coastal communities and human institutions. In the background, but also of great importance, are the social/economic/cultural and the biophysical environments within which the fish and the fishers live. Even the recreational angler is part of a system that

includes the pond ecosystem, sport fishery outfitters, managers, researchers, transportation infrastructure and so on. A system perspective involves *integrated* approaches both to studying and to managing the fishery, where the goal is to incorporate key elements of fishery complexity into our thought processes and decision-making processes (Charles, 2001).

The process of sustainable development can be viewed as being based on the simultaneous achievement of four fundamental components of sustainability: ecological, socioeconomic, community and institutional sustainability. Overall sustainability of the fishery system can be seen to require simultaneous achievement of all four components. Although, taking a holistic view of fisheries will not lead to nirvana – a perfect knowledge of the system. Indeed, embracing complexity implies recognising the *limits* to management, as well as the need for such management (Charles, 2001).

Pomeroy, (1995) contends that fisheries management experts need to recognize that the underlying causes of fisheries resource over-exploitation and coastal environmental degradation are often of social, economic, institutional and/or political origins. This author claims that the primary concerns of fisheries management, therefore, should address the relationship of fisheries resources to human welfare and the conservation of the resources for use by future generations. According to this author the main focus of fisheries management should be people, not fish per se. Cabezas (*et al.,* 2003) identifies that one of the challenges of sustainability research lies in linking measures of ecosystem functioning to the structure and operation of the associated social system.

Other authors (Berkes *et al.,* 2001) also emphasize that approaches to management and governance of fisheries resources are undergoing a significant transition. According to this author there is a shift toward conservation and ecosystem-based management, away from stock- and species-based management, also governance is shifting toward community based and co-management approaches, which emphasize fisher participation and decentralization of management authority and responsibility.

Pomeroy, (1998) defines fisheries co-management as a partnership arrangement in which government agencies, the community of local resource users (fishers), non-governmental organizations, and other stakeholders (fish traders, boat owners, business people, etc.) share the responsibility and authority for the management of a fishery.

Charles (2001) states that the second major theme concerning participation in co-management is the balance among the players, specifically, the proportion of responsibility and power held by government, as opposed to stakeholders. The steps on the ladder, ranging from centralised management to self regulation are show in figure 4.

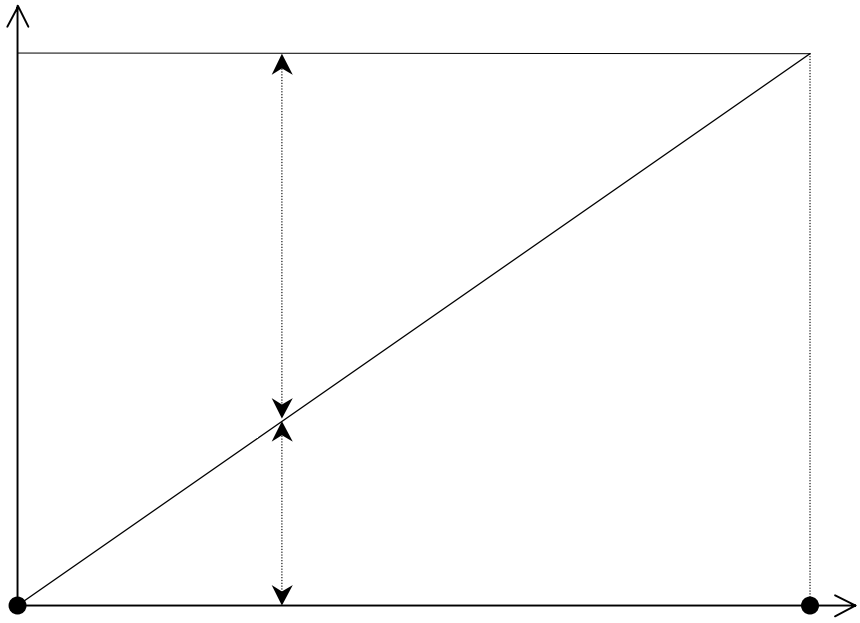


Figure 4 - The *Ladder of co-management* (e.g. Sen & Nielsen 1996 and Pomeroy & Berkes 1997 *in* Charles, 2001).

Levels of Co-management

Instructive: Government is in control, through centralised management. It utilises channels of communication with users and communities to inform (instruct) them about decisions already made and actions to be taken. This has been the 'traditional' top-down mode of operation prevalent in 'modern' fishery management, and is often blamed for management failures.

Consultative: Government makes the decisions in the fishery after gathering opinions and suggestions through consultations with users (and possibly the relevant fishing-oriented communities). This mode often developed as an improvement on the instructive mode when the latter emerged as a failure. The complaint about this mode,

however, is often that those being consulted may have their say, but have no actual power over what decisions are eventually made.

Cooperative: Government and users, as well as communities in some cases, engage as parterns (possibly, but not necessarily, as 'equals') in management decision making. Note that a cooperative approach may well be used for some aspects of management (particularly operational functions such as the setting of annual harvesting plans) but not others (e.g. setting user-group allocations).

Advisory: Users essentially make the decisions and communicate these to government (i.e. 'advising' the government on what decisions have been made), but government evaluates and accepts these decisions only if they are certain overarching criteria.

Informative: Decision-making authority lies with user groups, perhaps reflecting historical realities, or is specifically delegated by government. Government is merely 'informed' of any decisions. This represents fully decentralised management, bordering on self-regulation.

Source: Charles (2001).

Sen and Raakjaer-Nielsen (1996 *in* Pomeroy, 1995) state that there is a multitude of tasks that can be co-managed under a different type of co-management arrangement at different stages in the management process.

Pomeroy *et al,* (1997) states that co-managment is a middle course between state-level concerns on fisheries management for efficiency and equity, and local-level concerns for self-governance, self-regulation and active participation. These researchers also focus that co-management is not a regulatory technique, but should be seen as a flexible management strategy in which a forum or structure for action on participation, rule making, conflict management, power sharing, leadership, dialogue, decision-making, knowledge generation and sharing, learning, and development among resource users, stakeholders and government is provided and maintained.

Pomeroy (1995), further focuses that co-management should not be viewed as a single management strategy and that there is no one model of co-management.

1.3. DFO´s Current Approach To Co-Management

The British Colombia Seafood Alliance held, on October 9 and 10 of 2002, a workshop entitled "Sustainability through Co-management: Managing for a Sustainable, Profitable Fishery". At this workshop a discussion paper on fisheries co-management was presented by Rebecca Reid, Director of Policy of DFO Pacific Region (Reid, 2002). This paper explains DFO´s current approach to co-management in a general view so, although focused on the Pacific Region, it is totaly applicable to the Atlantic Region. This discussion paper, was the best found brief explanation about the current co-management and the following point "DFO´s current approach to co-management" is extracted from this paper.

1.3.1. Advisory/Decision-Making Framework

The first thing to note is that DFO/Minister maintains sole decision-making power and that the fisheries-specific co-management bodies discussed below are strictly advisory bodies providing advice to DFO.

Table 1, outlines the DFO co-management body for a number of fisheries. While the wording is at times different, the mandate for each of these advisory bodies is largely the same.

Table 1 - Some examples of DFO Co-management Advisory Bodies

Commercial Fishery	DFO Advisory Body
Halibut	**Halibut Advisory Board**
Shrimp Trawl	**Shrimp Trawl Sectoral Committee**
Crab	**Crab Sectoral Committee**
Herring	**Herring Industry Advisoy Board**
Geoduck & Horse Clam	**Geoduck Sectorial Committee**

The mandate for the Geoduck & Horse Clam fishery, which is similar to the mandate for the rest, is to:

- allow exchange of information between stakeholders and DFO;

- advise on development of annual management plans and long-term management strategies;
- provide information and advice regarding stock assessment and biological research;
- advise DFO on use of discretionary penalties against harvesters caught violating rules and regulations; and
- recommend representatives to other advisory bodies as required.

While there are some exceptions, advisory bodies are also similar with respect to selection of advisors/chairpersons, openness to multi-stakeholder participation, and procedures by which advisory body meetings are held. As a general rule:

- although there are some differences, the terms of reference of advisory bodies allow for participation of various stakeholders, including licence holders, First Nations, recreational fishers, unions, processors/buyers, Province Government, DFO and, non-consumptive users;
- licence holders elect their advisors, while DFO selects non-licence holder advisors;
- DFO often reserves the right to select additional advisors to ensure adequate representation of industry and other stakeholders;
- advisors are expected to represent the interests of their constituents (not necessarily the long-term interests of the fishery);
- DFO chairs meetings;
- observers are allowed to attend meetings, although this often requires permission of the chair; and
- written minutes of meetings are taken and made available to the public, and written recommendations require consensus - however a written summary of consenting & dissenting opinions should be recorded in the minutes.

There are differences amongst advisory bodies in terms of the relative number of advisors from various stakeholder groups, and selection of the chairperson (e.g., for the Halibut Advisory Board, the chairperson can be either the Halibut Coordinator or an individual selected by the Board, in all other cases DFO must chair). Of course, there

may be differences amongst advisory committees with respect to the actual attendance of various stakeholder groups at meetings, extent of coverage of discussions in the minutes of meetings, and the types of issues discussed.

1.3.2. Provision of Fisheries Management Services

A second possible component of co-management relates to the provision of fisheries management services. Fisheries management requires a number of services, including: gathering catch, fishing effort, biological and other data, development of annual management plans and long-term management strategies, evaluation of enforcement options, delivering enforcement arrangements (e.g., dockside monitoring), stock assessment and other biological research, etc.

Table 2, provides examples of the different types of arrangements used to deliver fisheries management services. For some fisheries, DFO *solely* manages the delivery of all management service.

Table 2 - Service delivery and funding arrangements.

Service Delivery Management	Primary Funding Mechanism	Fishery	Industry Association
(A) DFO management only	Public Funding	Various fisheries	n/a (non-aplicable)
(B) Joint DFO/industry management through Joint Project Agreements (JPA) (i.e. funds from industry flow to DFO to cost share program delivery)	1. Use of resource arrangements 2. Voluntary payments by fishers to associations	e.g. halibut, herring e.g. sablefish, geoduck, praw	Pacific Halibut Management Association, Herring Conservation and Research Society Canadian Sablefish Association; Underwater Harvesters Association; Pacific Prawn Fishers Association
(C) Industry selects a DFO approved service provider and pays directly. There is a JPA, though no industry funds flow through DFO	1. Payment by fishers to their association who contracts provider of services or 2. Direct payment by individual licence holders to service provider	e.g. red sea urchin	Pacific Urchin Harvester Association (PUHA)
(D) Licence holders pay for	Fishers pay provider of services directly.	Ground fish trawl	n.a

monitoring/observer services directly (i.e. no funds flow through DFO and there is no JPA/CA)			

The first model of "co-management" (i.e. "B" in table 2) with respect to service delivery involves Joint Project Agreements or Collaborative Agreements (JPAs/CAs). In the halibut fishery, DFO and the Pacific Halibut Management Association enter into a formal JPA that allows for joint management and funding of certain management and scientific services. Specifically, an agreed work plan is established that sets out various activities that both parties agree to undertake. For example, the association drafts management plans and licence conditions for the commercial halibut fishery for review and approval by DFO. In addition to supplying advice, the association also undertakes to deliver specific management services, such as funding and ensuring the operation of an independent dockside monitoring program. The JPA's work plan also outlines various fisheries management (e.g., making decisions regarding conservation of the resource, opening and closing of the fishery and approval of management plans), enforcement and biological services to be supplied by DFO.

In the second type of co-managed service delivery mechanism (i.e. "C" in table 2), licence holders are required by condition of licence to make arrangements for services from a third party (e.g. for monitoring of catch). In the red sea urchin fishery, licence holders through their association negotiate a JPA with the department outlining very specific requirements for data collection and handling to be performed by the third party service provider. There may also be other co-management responsibilities outlined for DFO and the PUHA in the JPA. There is no provision of funds by industry to the department as part of the Urchin JPA. In this type of example costs for third party monitoring contracts are either paid for by the industry association with funds collected from fishers, or by fishers directly.

In the third type of co-management (i.e. "D" in table 2) licence holders are required by condition of licence to make arrangements for services from a third party for monitoring of catch. The difference from "C" is that there is no JPA/CA with DFO outlining data requirements, or any other responsibilities for either DFO or industry.

1.3.3. Funding Fisheries Management Services

The third component of co-management relates to the funding of fisheries management services. In a number of fisheries, all or most fisheries management services are provided through public funds. In this situation, there is no co-management aspect to funding.

In other fisheries, alternative funding mechanisms are used to facilitate co-management with respect to the delivery of management services. In some fisheries, industry associations are involved in the funding of specific management services via funds received by catching and selling the resource through special licensing arrangements. In other cases, associations' fund management services through voluntary fees collected from members. The establishment of a condition of licence by DFO may create impetus within industry to organize to collect fees from licence holders and to negotiate third party service contracts, e.g. for dockside monitoring (DMP).

Finally, in some fisheries, where licence conditions establish a requirement for third party services such as DMP, licence holders may pay third parties directly for services provided. Whether this should be considered an example of funding co-management is an open question.

As noted, over the last few years the fisheries organizations have taken on increasing numbers of management-related tasks. The connection between these developments and the positioning of GCIFA as a co-management agency is unclear. The connection between these developments and their relation with the social fabric of small boat fishing, fishing families, and communities is also unclear. In the next section various social characteristics of fish harvesters and their involvement in management activities are examined in an effort to better understand the connection and substance of co-management initiatives, as well as qualities necessary for co-management approaches to reflect and to engage these fish harvesters, as well as their families and communities.

2. Material and methodology

In June 2001, SRSF conducted a social profile study of LFA's 29 (southern Richmond County), 31A and 31B (Guysborough County) fish harvesters holding lobster licenses. A telephone questionnarie survey was conducted. The study approached all lobster license holders in each LFA in order to compare to data from different LFA´s and also because the lobster fishery is the most important fishery in the county (SRSF, 2001a).

Several meetings were held in order to develop the questionnaire and to train the group that would be conducting the interviews. The questionnaire was derived, in large measure, from a survey instrument that had been used for similar purposes two years previously in an interview of a stratified random sample of lobster license holders fishing in the St. George's Bay – southern Gulf of St. Lawrence area of northeastern Nova Scotia (see questionnaire in Annex I) (SRSF, 2001a).

A contact letter was developed in which the collaborating organizations were described, the general purposes of the study were outlined, and the confidentiality of individual responses was assured. The letters were mailed out by the GCIFA. Ideally license holders were contacted within seven days of their receipt of the contact letter.

Although twelve persons participated in the conduct of interviews, the bulk were completed by the GCIFA community research coordinator (CRC), student research assistants, and staff (SRSF, 2001a).

There is in Guysborough County 176 lobster licenses (Class A and Class B), these licenses are distributed in LFA 29, 31A, 31B and LFA 32 (Boudreau, 2000). This study will examine and present the data generated from the survey mentioned above, with a focus on Guysborough County LFA 31A and LFA 31B. Since some of data from LFA 29 and LFA 32 was not available and the county is mainly represented by these two LFA´s with 142 licenses belonging there.

The data was analyzed with the program SPSS for Windows, also through descriptive statistics using graphics.

In addition, the study is augmented through personal observations made while living in CansoTown and working in the GCIFA office and with GCIFA staff. There I could participate in meetings (figure 5) concerned with several fisheries issues. While there I also learned from the frequent visits by fishermen to the association hall and office, including substancial time with the president of the association.

Figure 5 – Boards of directors committee in the fishermen´s hall.

3. Results

Of the 142 license holders contacted, 112 participated in the study, 9 declined to participate, and the interviewers, after at least three attempts, were unable to contact 21 persons. The participation rate was 78.9%.

This provides very confident results respecting the representativeness of the survey (SRSF, 2001a).

3.1 Attachment and Recruitment

The attachment to their community and local harbour was highlighted with 65.2% of those interviewed currently fishing from the community or harbour where they grew up and notably, 100% claiming that they feel they either really belong or belong to the harbour from which they are currently fishing.

It was found that 86.6% report their fathers either fished or are currently fishing for their living and that 81.1% of their fathers' fathers fished for their living. At least one in every two reported their wives' fathers fish or fished, that their mothers' fathers fish or fished, that their fathers' brothers fish or fished as well as their mother's brothers, that at least one of their brothers fish or fished, and remarkably, 42.2% claim that their wife fishes or fished for a living (table III).

Table III – Percentage by kin relation of who fishes or fished for a living

Kin relation	Father	Father's father	Mother's father	Father's brothers	Mother's brother	Brothers	Wife's father	Wife
Fishes or fished for a living (%)	86.6	81.1	61.8	64.5	52.3	52.8	54.4	42.2

Also highlighting the importance of the family in the transmission of the fisheries livelihood and knowledge is the fact that 70.5% claimed that they began fishing with one family member, the father being (52.7%) the most commonly identified (figure 6a). Also 70.5% claimed that it was a family member who taught them the most about fishing, again the father (55.4%) is identified most commonly as the greatest contributor (figure 6b). Also notable is the contribution and importance of

friendship and familiarity, with 6.3% beginning fishing with a family friend and 4.5% learning about it with a family friend (figure 6).

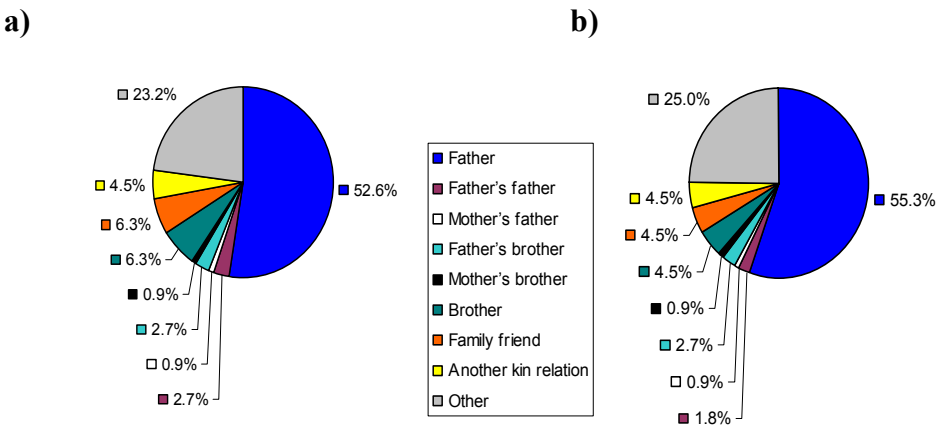


Figure 6 – Graphic of the percentage by kin or other relation of **a)** with whom began fishing and **b)** who taught most about fishing.

The percentage found of study participants having their sons or daughters who fishes or fished for their living is 30.1% and 7.5% respectively.

By analysing the results presented on figure 7, we can see that fathers are unlikely to advise their children to go into the fisheries. If starting from scratch, 84.9% probably or definitely would not advise their child to go into the fisheries. Even if starting with a boat and a lobster license this percentage remains high (55.4%). When asked if they would advise their child to go into the fisheries if they were starting with a boat and all the important licenses the case changes - 83.9% of those surveyed would definitely or probably advise it, with at least one in every two stating that they would definitely advise their child entry into the fisheries. It is also notable that few (33.9%) would definitely advise their child to go into the fisheries if they inherit (the father`s) their boat and licenses.

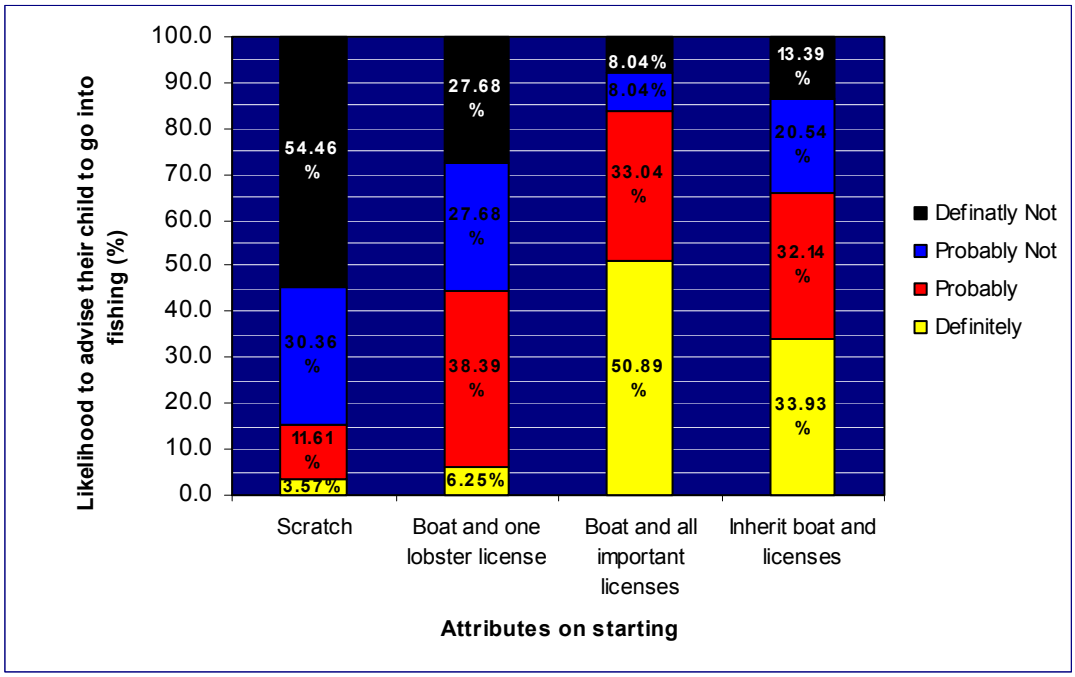


Figure 7 – Graphic of the percentage of likelihood to advise their child to go into fishing by starting with different attributes.

Supporting the idea that this low recruitment is not a matter of current license holder discontentment with the livelihood, is the results when those interviewed were asked if they had their life to live over again how likely they would be to go into fishing. As we can see in figure 8, the vast majority (79.4%) stated that they would probably or definitely enter fishing again. Just 8.9% would definitely not go back to fishing.

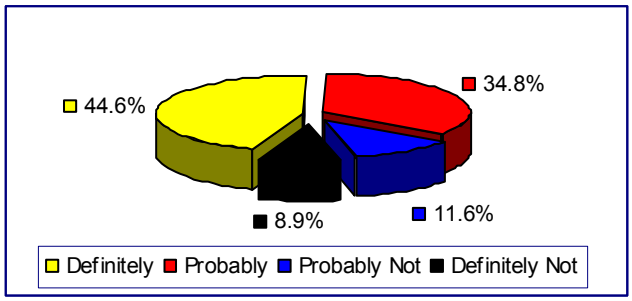


Figure 8 – Graphic of the percentage of likelihood of those interviewed, to go into the fishing if they had their life to live over.

3.2. Dependence and Investment

Some social attributes are shown in table IV, where we can see that 93.8% are full-time fisherman and 74.1% always fished for their living. Just 6.2% are not full-time fisherman and only 25.9% have made their living from another activity that is not fishing. We also can notice their investment in the activity, with 95.5% owning their current boat and one in every three owning more than one fishing boat. The median weeks fishing in 2000 was 17. For the weeks fishing in the year 2000, the median score was used, because the median is the midpoint where there are identical number of cases on each side. Using the mean we take the risk that disproportionately distributed high or low scores will provide a distorting effect.

Table IV – Some social and fishing attributes of those interviewed

Full-time Fisherman (%)	93.8
Always Fished for a Living (%)	74.1
Own Current Boat (%)	95.5
Own more than 1 boat (%)	34.8
Weeks Fishing in 2000 (median)	17

The age between 41 and 60 years old includes the majority of those interviewed and 45.6% are fifty one or older (figure 9). It is also notable that 36.9% have fished for more than 31 years (figure 10).

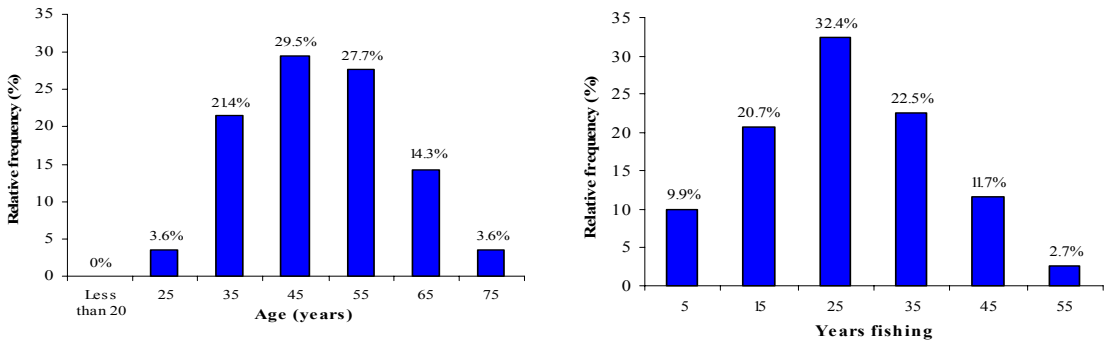


Figure 10 – Graphic of the frequency distribution of years fishing.

As we can see in table V, most of those participating in the study hold a class-A lobster license (97.3%). This assures them a bigger fishing capacity (250 traps) than holding a class B license (175 traps). This class B license also differs by not being able to be sold or transferred and are retired with the holder. There is also high percentage holding groundfish license (76.8%), mackerel license (91.1%), and herring license (74.1%). Also a high percentage hold ´others` categories licenses. Just few (7.1%) of those interviewed hold a tuna license.

Table V – Percentage of those holding some of the commercial, limited entry fishing licenses.

License Category	% Holding the license
Class A Lobster	97.3
Class B Lobster	2.7
Groundfish	76.8
Herring	74.1
Mackerel	91.1
Tuna	7.1
Others	70.5

3.3. Participation Ability

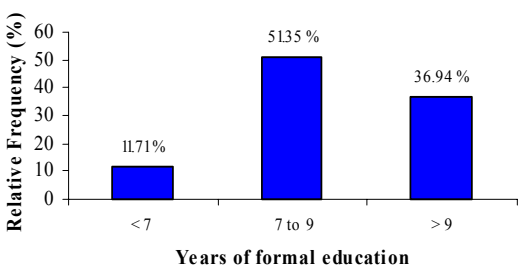
The vast majority (97.3%) of those interviewed are currently paying dues to a fisheries organization. Of those interviewed, 23.2% are or have been elected or appointed to an office with a fisheries organization or committee and, 14.3% of those interviewed are appointed to, or served on any government fisheries councils or advisory committees. A high rate of 76.8% have taken fisheries related short courses, (e.g. geographical positioning system, marine emergency duties, fishing master, etc.), 45.5% had already used a PC, and some had even used internet (34.6%) and e-mail (24.0%) and 68.8% claimed that they would attend a PC training session (table VI).

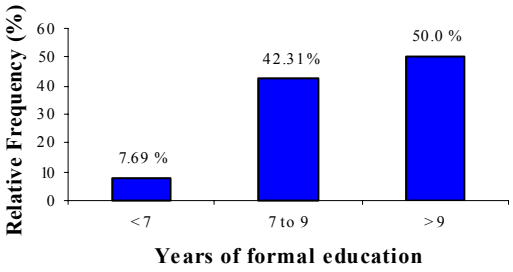
Table VI – Participation in fisheries related organizations and some computer skills background.

	%
Paying dues in a fisheries organization	97.3
Elected or appointed to an office with a fisheries organization or committee	23.2
Appointed to or served on any government fisheries councils or advisory committees	14.3
Taken fisheries related short courses	76.8
Have used a PC	45.5
Have used internet	34.6
Have used e-mail	24.0
Would attend a PC training session	68.8

Almost 89% achieved at least seven years of formal education, while almost 37% achieved ten or more years of formal education (figure 11).

Also notable is the fact that those with more years of formal education, are mostly those appointed to or served on any government fisheries councils or advisory committees, with just 7.7% those filling or having filled such positions having attained less than seven years of formal education (figure 12).





4. Discussion and conclusions

The results clearly show how deeply the study's participants are rooted socially within the fisheries, with most describing at least two generations of their families fishing for a living, all feeling that at least they belong to the harbour from which they are currently fishing and, more then half still fishing from the community or harbour where they grew up. It is likely that by the fact that family and community are located right in the heart of small boat fishing explains the intense attachment to fishing as a way of living and livelihood. The rootedness of the livelihood within family and community settings and dynamics also reinforce attachments, as well influences preferences (SRSF 2001a).

Also notable is the importance and influence of the family on the transmission of the livelihood. Family and community are likewise the sites of the key social processes whereby children from fishing families are recruited to fishing, learn to fish, and become fishermen (SRSF, 2001b). Of those interviewed, at least two in every three learned about fishing and started fishing with a family member, clearly highlighting such importance of the family on the recruitment to fishing and how effective have been such way of recruitment. Becoming a fisherman involves much more than simply getting a boat, gear, fishing licenses and going fishing (SRSF, 2001b).

SRSF (2002b) noted that there is some advantages on keeping the fisheries livelihood in the family. It states that as a family-rooted livelihood, small captains and family members have an economic and social interest in consolidating and keeping fishing, and fishing-related income such as unemployment benefits, within the household, this also supports and maintains the household as well as the fishing enterprise. It also mentions that, given these attributes, there is a considerable economic sensibility in recruiting sons, daughters, and lately, wives to crewing positions. That explains that at least one in every three fishermen participating in the survey, have their wives fishing for a living. But we also found that such way of recruitment is not so prominent nowadays, with just few stating having their sons and daughters fishing.

So if the recruitment doesn't come by family, who will be fishing in the next generations? How will the small boat fisheries and its coastal communities survive and maintain their knowledge, critical skills, attitudes, and mental toughness?

Starting with a boat and all the important licenses is required for at least one in every two fishermen, to definitely advise their child to go into the fisheries. This combined with self desires, self abilities, and self interests puts recruitment to the fisheries at risk. The small percentage having their sons or daughters fishing today, emphatically shows this. This presents a very serious situation, because as we noticed earlier the family has been the most important method of recruitment to the fisheries, and the problem with recruitment does not lie in dissatisfaction with the fishing livelihood. Which 79.4% stated that they would probably or definitely go back to the fishing livelihood if they have their lifes to life over. SRSF (2001a) also found that for many, small boat fishing continues to provide considerable personal satisfaction as a way to make a living. It seems that respondants here are expressing concerns with the fisheries management direction because to start making a living in the fishery, possession of all-important licenses and a boat is required.

Also notable is the small percentage (33.9%) that would definitely advise their child to go into the fisheries if they were to inherite their boat and licenses. This supports the concerns mentioned above with the current fisheries management direction, as this direction seems to be far from promoting new entrants to the activity. The problem with inheriting licenses and boats is that, like a Guysborough fisherman noted (*in* SRSF, 2001b):

" *The government keeps the young people out of the fishery. There are not enough resources to make a go of it. My licenses and boat are my retirement package and if I were to give them to my son or daughter than they would have to support me because I would not be able to survive on a government pension."*

So is the community at a sustainable level? Will, in this coastal community, the rooteness to the fishing activity and livelihood, their local ecological knowledge, mental toughness, attitudes, be sustainable?

It is likely that the current management regime, with limited entry licenses, quota allocation systems, reduction in and elimination of vessel and equipment purchase subsidies, devolution of small craft harbour management and economic maintenance responsibilities to local harbour authorities, pose big challenges or really effective barriers, for anyone that would like to get into fishing, starting from "scratch" (SRSF,

2002b). Pinfold (2002) noted that the cost of acquiring fishing licenses, vessels and equipment (see annex V) has risen dramatically and that this factor is serving as a real barrier to young industry participants becoming owner operators. This author also mentions that it acts as a disincentive for young people to enter the industry in any capacity. SRSF (2002b) mention that the licensing and quota systems are designed to allocate and to regulate ´privileges` distributed by the grace of the government as the proprietor and under the authority of the Minister of Fisheries and Oceans. A study in Barnegat Light fishery community (Wilson *et al,* 1998) also identified regulations to cause parents to discourage their sons and daughters from going into the fisheries business.

What seems to be happening here is that DFO is trying to downsize and rationalize the number of fish harvesters in the small-boat fisheries. In 1993 there were 804 fishermen in Guysborough County (Department of Finance, 1995) and this number has been in steady decline, with only 600 fishermen in the County as of 2001 (Department of Finance 2003). For 30 years now the fisheries management system has targeted the reduction of fishing effort in the small boat sector as essential to achieving economic viability, meaning a reduction in the numbers of boats and fish harvesters and consolidation of those remaining into smaller craft harbours (SRSF, 2002b). Other authors (Newton 1996 and Walter et al., 1999 *in* Pinkerton, 1999) also criticized the directions taken by some management measures by saying that, unfortunately, transferable license programs and fleet reduction programs have tended to remove licenses from the small-boat fleet in rural communities with less access to capital, and to concentrate licenses in fewer hands.

SRSF (2001b) argues that the present generation of fisheries management policies have been intended, from the outset, to impose a corporate industrial-like set of access and participation conditions on the small boat fisheries, thereby down-sizing and rationalizing them, while one of the key approaches has been to assail the small boat fisheries' family and community heartland, and through that process to disable fundamental recruitment processes. It also discusses that for many fishing families, limited entry licensing and quota policies have fermented internal tensions and conflict, and many are now confronting impossibly difficult choices, such as either selecting those who will receive licenses and quota from among sons and daughters wanting to fish, or selling out to others in order to assure access to adequate retirement funds.

These outcomes further disable family and community with regard to nurturing the next generation of participants in the small boat fisheries

Other researchers (Bromley & Cernea, 1989 *in* Pomeroy *et al*, 1997) argue that the promotion of nationalization or privatization as a routine policy solution has not solved the problem of resource degradation and over-exploitation and, in many instances, has deprived large portions of the population of their livelihood.

It was also shown that most of those interviewed are full-time fishermen and that a great percentage always fished for their living. This information emphasizes how deeply these fishermen are attached to their livelihood and dependent of their activity. This dependency increases by the fact that, as we could note, they are fishing just a few weeks during the year. This makes them very dependent on the sucess of those fishing weeks. We also could note their investment in the activity with the vast majority owning their current boat.

Adding concerns to the recruitment is the fact that was verified that almost half of those interviewed are fifty of age or older; because they can retire at sixty-five years of age, in fifteen years there is a chance that there will be almost 50% less fishermen than nowadays.

It has been shown here that those interviewed hold a high variety of fishing licenses, so suggesting that holding just one fishing license may not be enough to make a living. Small boat fishing livelihood success is conditional upon developing the capacity to access and participate in a variety of core fisheries throughout each year's fishing season (SRSF, 2001a).

There has been a moratorium on groundfish since 1992, a limited quota is reflected in all species values and landings (Boudreau, 2001). There is a Community Management Board for the ground fishery and Guysborough County fishermen access quota through the Eastern Nova Scotia Management Board (Boudreau and Boudreau, 2003). So, the quota is shared and it is very low, which sometimes ends up not being lucrative, although the high percentage of those interviewed holding groundfish licenses speak of prospects such as the ground fish recovery.

The high percentages of fishers in the county holding mackerel and herring licenses is due to the fact that, according to Baker (2003), all fishermen in Guysborough County use mackerel as their main species for bait, some other species being used are herring, squid, flounder, redfish, gaspereaux and crab. This author also identifies that

fishermen have some obstacles to overcome when bait fishing, such as damage due to seals and green crabs as well, the costs of gear, and prices they obtain for their bait.

The tuna license in Guysborough County is correspondent to bluefin tuna (Boudreau, 2001). Bluefin tuna fished in Atlantic Canada are part of the West Atlantic stock and because of their migratory nature, bluefin are managed under the jurisdiction of the International Commission for the Conservation of Atlantic Tunas (ICCAT). Over-fishing in late 1960s and 1970s caused a great deal of concern for the health of West Atlantic bluefin stock. Since the early 1980s, ICCAT has set quotas for the West Atlantic bluefin tuna (DFO, 2002).

Despite that there is just a few licenses available and that the quota is also few, where by DFO (2002) the quota for the Gulf of Nova Scotia in 2002 was 105 tonnes, Boudreau (2001) states that the tuna fishery in Guysborough County has added a substantial contribution to the inshore landed values over the last twenty years.

The high percentage of those interviewed holding "other" category licenses is explained by the fact that, according to SRSF (2001a), the wide variety of 'other' licenses detailed by many, further characterizes the central place of diversity and flexibility within small boat livelihoods.

Assuring access through possession of licenses, is a key personal strategy within the context of a limited entry approach and, it is also a reflection of the fact that economically viable and sustainable small boat fisheries require a capacity to participate in a diverse set of fisheries, as well as an ability to respond quickly and with flexibility to available resources and opportunities. Some obtained and maintain certain licenses 'just in case' circumstances such as downturns in current fisheries dictate that they enter 'new to them' fisheries (SRSF, 2001a).

This need to hold several licenses 'just in case', as a strategy in a limited entry licensing system, can cause associated issues. For example, if the license is held by someone that is not using it, this could be at the same time, depriving someone else from using that same license, and this person might need that license to make his living from the fishery.

The shifting of multi-species fisheries is identified by Wilson *et al.* (1998), to have some problems. These authors states that although Wanchese fishers are used to jumping from species to species, management causes everyone to jump at the same

time, and as a respondent put it, "this may be good for a specific species at a specific time but it is not good for the whole system" because the price of the fish dives when fishers have to shift their effort all to the same species and, some marginal fishers get driven out when these shifts happen.

Other possible problems associated with holding several species licenses, as a strategy for success, are that it implies that fishermen must posses different kinds of equipment for the different fisheries.

In an overall view, we notice that those fishermen hold a wide variety of fishing licenses, with most not being dependent on only one fishery. It is not possible, via the questionnaire, to establish the extent to which those interviewed are not presently using all their licenses held. The licenses, because they are limited entry, have to be renewed each year, which means the fishermen, in order to not lose their licenses, have to pay a fee (revenue) every year for each license.

One important issue is focused on by SRSF (2002b), by stating that, to become a fisherman nowadays, as a Guysborough County small boat harvester insisted, "the fishery nowadays is all about who you are not what you are". In this view, being 'made' a fisherman is no longer sufficient for participation and success. SRSF (2002b) explains this, saying that the current climate advantages and privileges those with connections and access to means, especially when it comes to purchasing boats, equipment, and most importantly, government regulated licenses and/or quotas. These authors also state that the character and development of the federal fisheries management system has been central to these processes.

Relative to their participation ability, the portion paying duties to a fisheries organization expresses their fishermen status. All core fishermen are obligated to be associated with a fisheries association (Boudreau & Boudreau, 2003). So this means all core fisherman are associated and paying fees to a fisheries association, but it does not mean that they are currently participating in the association.

The positions in an office with fisheries organizations or committees are on boards of directors (eight positions) and on executive positions (president, vice-president, secretary and treasure) (Boudreau, 2000). So there are not many positions to be filled, which explains the small percentage (23.2%) observed. This percentage also

indicates that the work relies on the few participating and occupying (or having occupied) these positions.

Advisory committees are usually DFO-chaired committees, bringing together fishermen, processors, scientists, fishery managers and federal and provincial officials to advise DFO on conservation and management issues. These positions are representatives, such as the chair of advisory committees and boards (Reid, 2002).

The low percentage (14.3%) participating in these councils or committees is probably related with the difficulties associated. As such, these meetings may occur during fishing seasons and it includes time and travel costs. It also implies that those participating feel free, confident, and comfortable to express their feelings and concerns. Also, it involves the extent to which, those once participating get results from their inputs, otherwise they would lose their time and effort by trying to make management suggestions that government simply ignore. This can bring some frustration for those participating. An example of this situation is presented at annex II, regarding the process of consultation for lobster conservation measures for 2001. Another fact justifying the low percentage of fishermen participating is that these committees include a large sector of management with only few positions.

SRSF (2002a) pointed that while participating in these committees it is necessary to review documents and create new documents reflecting historical or future trends within a fishery (e.g. creating a regional species management plan), also writing and comprehension skills are paramount to gaining and retaining access to new quotas or sustaining existing ones. The rates verified of years of formal education of those engage on this advisory boards showed this fact, which the ones with more years of formal education are mostly those occuping such positions.

The rates of those verified to have had used PC, internet and email, suggests a group of fishermen quite interested in learning new skills and some of them already engage in it. These kinds of skills can help them with business applications, provide fisheries-related information through internet and also facilitate communication through the use of email. PC´s, internet and e-mail are all provided in the association hall. It also suggests that being a fishermen nowadays requires much more than just harvesting. SRSF (2002a), also noted that many different skills are now required to be a fishermen, it mentions that it is apparent that fishermen must have access to the services of engineers, accountants, lawyers, market analysts, consultants and scientists. It also

states that with a 25-cent license and a small boat, you could once engage in a very satisfying and uncomplicated livelihood, but that this is no longer possible.

The new approach to manage the fisheries, the co-management notion, is in part responsable for the many skills now required of fishermen and their associations. But, as SRSF (2002a) mentions, rather than give away real power, their (DFO) practice to date has been to download a variety of bureaucratic functions onto fishermen's associations, that´s DFO approach to co-management.

Since fishermen are not able, for time, money and possibly education or capacity reasons, to take over management roles fully, they are now forced to hire professional managers and consultants with specialized training in management and business administration to carry out these rules (SRSF, 2002a). Their association is also required to conduct research, so while participating on the advisory boards, fishermen can scientifically justify their claims and propose management plans to specific fisheries. The requirement of so many skills and to engage in so many different courses by their own investment also causes difficulties in the recruitment to the fishing livelihood.

Pomeroy & Berkes (1997) noted that, increasingly government policies and programs stress the need for greater resource user participation and the development of local organizations to handle some aspects of resource management. But it may be insufficient for governments simply to call for more community involvement and fisher participation, they must also establish commensurate legal rights and authorities and devolve some of their powers (Pomeroy, 1995). One of the issues associated with such user participation and bureaucratic funtions to fishermens associations is financial costs. As some researchers (Pomeroy & Berkes, 1997; Chuenpagdee *et al,* 2004b) mentioned, governments must not only foster conditions for fisher participation, but also sustain it.

The increasingly strong role of fishermen's associations, supported to some measure by recent changes in DFO policy, is thus a double-edged sword. It presents fishermen with the opportunity to play a stronger role in fisheries management, but also with the challenge of having to build strong, independent and financially sound organizations that are mere branch plants of DFO (SRSF, 2002a).

Guysborough County fishermen, to ensure stock status progress, practice conservation methods such as lobster and scallop enhancement as well as carefully developed conservation management plans, they have initiated research questions that

they feel are relevant to their industry, are presently engaged in research projects, affiliated with fisheries organizations, participating on as many as 28 advisory boards (SRSF, 2002a), and are ready and prepared to have more involvement in decision making.

DFO (2004a), in the Policy Framework for the Management of Fisheries on Canada´s Atlantic Coast, states that:

"*To achieve the vision of biologically sustainable resources supporting self-reliant and viable fisheries, there will be a continued shift away from strictly top down management to shared stewardship. Participants will be given opportunities to communicate and work together, to contribute specialized knowledge and experience, and to be effectively involved in decision-making.*"

These opportunities to communicate exist through the advisory committees. But to what extent are these committees effective, if they are just advisory and there is not decision power sharing?

Investigations of coastal fisheries management around the world and namely in the Southeast Asian region have shown that when left to their own devices, communities of fishers, under certain conditions, can regulate access and enforce rules through community institutions and social practices to use fisheries resources sustainably (Hviding & Jul-Larsen *in* Pomeroy *et al*, 1997). Davis & Bailey (1996) focused the great role of communities, which communities are fundamentally important to the human experience, representing the personally meaningful physical, social, and psychological-emotional territories within which people are born, enculturated, marry and establish families, and perform the roles of producers and cosumers and finally elders and ancestors. These authors argue that the potential exits within such understandings and experiences of community for people to organize themselves in ways that promote some sort of local-level collective good and, community-based management and co-management proposals express a fundamental conviction with respect to these potencial benefits and consequences.

Although, policies favouring co-management are a necessary, but not sufficient condition for successful co-management (Pomeroy & Berkes, 1997). It is understandable that fishermen have to be participative, interested and form associations, which can help them successfully accept and engage with many bureaucratic functions.

Chuenpagdee *et al.* (2004a) suggests that key features critical to the success of co-management schemes are the strength and ability of the communities to take a leadership role in managing their own resources and to work with the local and regional governments to develop sensible and effective management policies, as well as their interests and the desirability in co-management. These authors also propose that an appropriate management scheme for positive and sustainable participation of local communities is the one that enables the communities to take an active role in 'leading' the management, not management that is based simply on consultations with the communities.

Why can't scientists, fishermen, government, public, and all with fishery or resource involvement, work together if they all want a sustainable development? It was pointed out earlier in this document, by Charles (2001), that sustainable development can be viewed as being based on the simultaneous achievement of four fundamental components of sustainability: ecological, socioeconomic, community and institutional sustainability. It seems, in the case of Guysborough County fisheries, that some of these components are not in equilibrium. Community sustainability seems to have less weight, which ecological sustainability is used to be the apparent reason to that but, what really seems to be is the extra weight of economic sustainability when decisions are taken by governments.

According to Pinkerton (1999), in the commercial sector, those having the greatest physical plant investments and the most higly capitalized vessels have been perceived as the major client group that DFO is supposed to serve, thus they have tended to have the greastest influence on fish harvesting policy.

The corporate offshore sector has been in a far better position to influence policy than have been small boat fishing associations. To some extent this influence derives from the corporate and offshore sector's economic power, which provides them with ready access to government ministers and bureaucrats. It is also the case that government ministers, policy makers, managers and analysts hold a common worldview and set of preferences with those of the corporate industrial and offshore sectors (SRSF, 2001b).

Davis (1996) also states that many of the regimes intended to manage human use of aquatic resources have shown themselves more adept at pleasing specific economic

and political constituencies than at achieving control of fishing capacity and exploitative pressure.

Corporate organization and behavior is valued as representative of modern and developed industry. Consequently, the corporate sector is held to embody the core economic principles of rational organization within a market and profit dedicated economy. In contrast, the small boat sector has been characterized as backward, chaotic and inefficient. Its family and community attributes are neither understood nor valued, its skills, knowledge base and economic strengths are debased and dismissed (SRSF, 2001b). Will this be the fait of Guysborough County small boat fisheries community? Or will governments realise on time, that small communities are to be preserved, so they carry traditional attachments, attitudes, knowledge, etc. that are being lost every day around the world.

Some suggestions point towards a better management of the resources. A co-management system would be one where fishermen´s words mean as much as DFO´s words. Also, on advisory committees, if the advice of the committees is not retained, then DFO should as a matter of policy, explain why (Reid, 2002). A co-management system should focus on conservation, not politics and economics. DFO should foster the development of fisheries associations and promote and facilitate scientific research within such associations, where even DFO scientists and associations would work together. This would bring more understanding and awareness to fishermen when measures are applied (e.g. conservation measures). DFO should also, once these associations already exist, help them to build capacities as they bring them responsibilities for provision of services. Communication should be constructive, clear, and welcoming where issues and solutions can be discussed openly.

Co-management, like any relationship, only works if the parties are committed to making it work. If either party makes commitments verbally, in a management plan, or in a Join Projects Agreements, they must do everything in their power to honour both the content and spirit of their commitments. If changes are necessary for conservation or other important reasons, both parties should work together to find agreeable solutions (Jones, 2002).

5. Final comments

The research for this essay gave us an understanding of the concept of co-management. Not just a definitional one; but, also in the way co-management inter-relates with the evolving systems (e.g. community, government, ecosystem). It noted, by analyzing social aspects, how deeply socially related and dependent the coastal communities (the case of Guysborough County) are on the fish resources and on fishing for a living. It also noted the fatefull challenges that these communities are facing nowadays. These lessons were mentioned and discussed. I would like to think that the best achievement arising from this research is demonstration of the great importance of the human system and its relation to the natural resources, in this case, marine resources. As well, the matters discussed here demonstrate why it is so important to incorporate consideration and analyses of human systems when analysing whatever resource that is being exploited by humans. This importance is not just in the fact that there is an obvious dependence and so a relation. It is also evident in the fact that, as human beings (although predators in the system as any other such positioned animal), we have hopes, ambitions, expectations, social relations, social structures, roots, connections, interests, values, fears, needs, etc. that will influence whatever act we do, whatever way we incorporate concepts, whatever way we conduct our lives, whatever way we relate and interact with the ecosystems around us. So there is a great need to incorporate this human system with all its complexities and dynamics. The challenge is to manage ourselves first and not the ecosystem.

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Annex I

Annex I. Questionnaire

Interviewers: Fill in relevant blanks as indicated before interview starts.

Interview code: _____

INTRODUCTION

May I please speak with
Mr./Mrs./Ms._____
(Notes for interview callbacks if the person is not available.

1st Callback (date and
outcome)_____

2nd Callback (date and
outcome)_____

3rd Callback (date and outcome)
_____

My name is _____.

I am a Researcher working with Social Research for Sustainable Fisheries, a partnership between the Guysborough County Inshore Fishermen's Association and St. Francis Xavier University.
Recently, you received a letter from us describing our research project and asking for your participation in our research. [PAUSE FOR A RESPONSE INDICATING RECEIPT OF THE LETTER]
Our study is concerned with learning about important characteristics of your fishing experiences.
The purpose of our research is to document characteristics of fishing histories, practices, and local knowledge about the fishing ground. All information you provide will be treated as confidential. This interview has five parts and will take approximately 10 to 15 minutes to complete. Once this research is completed all those agreeing to participate will be receiving a summary report of our findings.
Do you have any questions about this research project and its purposes? [PAUSE AND WAIT FOR A REPLY, ANSWERING AS COMPLETELY AS POSSIBLE ANY QUESTIONS ASKED]
Will you agree to participate in this study? Yes _____ No _____ [IF NO, ASK: WOULD YOU MIND TELLING ME WHY YOU DON'T WANT TO PARTICIPATE IN THIS STUDY? (Record a summary of the reasons in the space provided).

Date of Interview: _____(M/D/Y)
Time Interview Started: _____

SECTION I: ATTACHMENT

To start, I am going to ask you several questions about your feelings concerning fishing and your fishing experiences.

1. Would you tell me, what is the name of the community or harbour from which you are currently fishing?

NAME OF COMMUNITY OR HARBOUR
_____

2. Would you tell me, how do you feel about fishing out of (ENTER NAME OF COMMUNITY OR HARBOUR) _____?
Do you feel that…. (CIRCLE THE NUMBER CORRESPONDING TO THE RESPONSE INDICATED)

1. you really belong here? 1

2. you belong here?.....2

3. you don't belong here very much?.....3

4. you don't belong here at all?.....4

3. Now, thinking of the past, do you think that people fishing from this place help each other out less,
the same or more today than they did in the past? Do people help each other out…
(CIRCLE THE NUMBER CORRESPONDING TO THE RESPONSE INDICATED)

1….less than in the past?.....1

2….the same as in the past? 2

3….more than in the past? 3

4. Thinking for a moment about your working life in fishing…..if you had your life to live over, how likely do you think it is that you would go into fishing again? Do you think that you would definitely, probably, probably not, or definitely not go into fishing again?
(CIRCLE THE NUMBER CORRESPONDING TO THE RESPONSE INDICATED)

1. Definitely.....1

2. Probably.....2

3. Probably Not 3

4. Definitely Not.....4

5. Now, turning our thoughts for a moment to young people and the present day fisheries,
how likely are you to advise a child of yours to go into fishing? Would you definitely, probably,
probably not, or definitely not advise....(CIRCLE THE NUMBER CORRESPONDING TO THE RESPONSE INDICATED)

	DEFINITELY	PROBABLY	PROBABLY *NOT*	DEFINITELY *NOT*
1...a child of yours to go into fishing if they had to start from scratch?	1	2	3	4
2..a child of yours to go into fishing if they could start with a boat and only a lobster license?	1	2	3	4
3...a child of yours to go into fishing if they could start with a boat and all of the important fishing licenses?	1	2	3	4
4...a child of yours to go into fishing if they were going to inherit your boat and licenses?	1	2	3	4

SECTION II: FISHING HISTORY

Now, I am going to ask you several questions about fishing for a living.

6. First of all, about how many years have you been fishing for a living?

_____years

7. Currently, would you describe yourself as a fulltime fisherman?

Yes.....1

No..... 2

8. Have you always fished for your living?

Yes.....1

No.....2

9. From the list that I am about to read to you, would you tell me who else in your family fishes or fished for their living? (CIRCLE THE NUMBERS CORRESPONDING TO THE RESPONSES INDICATED)

	YES	NO
1. Did or does your father fish for a living?	1	2
2. Did or does your father's father fish for a living?	1	2
3. Did or does your mother's father fish for a living?	1	2
4. Did or do any of your father's brothers fish for a living?	1	2
5. Did or do any of your mother's brothers fish for a living?	1	2
6. Did or do any of your brothers fish for a living?	1	2
7. Did or do any of your sons fish for a living?	1	2
8. Did or do any of your daughters fish for a living?	1	2
9. Did or does your wife fish for a living?	1	2
10. Did or do any of your sisters fish for a living?	1	2
11. Did or do any of your sisters' husbands fish for a living?	1	2
12. Did or does your wife's father fish for a living?	1	2

10. Thinking about when you began fishing, did you begin fishing with... (CIRCLE THE RESPONSE NUMBER INDICATED)

1. your father?.....1

2. your father's father?.....2

3. your mother's father?.....3

4. one of your father's brothers?.....4

5. one of your mother's brothers?.....5

6. one of your brothers?.....6

7. a family friend?.....7

8. another kin relation?.....8

9. none of the above.....9

11. From the list that I am about to read, who would you say taught you most about fishing?

1. your father?.....1

2. your father's father?.....2

3. your mother's father?.....3

4. one of your father's brothers?.....4

5. one of your mother's brothers?.....5

6. one of your brothers?.....6

7. a family friend?.....7

9. another kin relation?.....8

12. Do you own your current fishing boat?

Yes _____ No _____

13. Do you currently own more than one fishing boat?

Yes_____ No_____

14. What is the length and width of the boat in which you currently fish?

Length_____

Width _____

15. Approximately, how old is this boat?

_____ years old

16. Approximately how many weeks did you fish last year (2000)?

Weeks fished _____

17. Would you tell me which of the following commercial fishing licenses do you hold? Do you hold……..
(CIRCLE THE RESPONSE NUMBER)

	YES	NO
1. a Class A lobster license?	1	2
2. a Class B lobster license?	1	2
3. a groundfish license?	1	2
4. a herring license?	1	2
5. a mackeral license?	1	2
6. a tuna license?	1	2
7. other licenses?	1	2

(Please specify [RECORD EACH LICENSE TYPE]

18. [IF YES TO Q. 17 # 1 OR 2, ASK THIS] Now thinking about lobster fishing for a moment,
have you always fished on the same lobster ground? (CHECK MARK THE INDICATED RESPONSE)

Yes _____(IF YES, GO TO Q. 19) No_____(IF NO, ASK Q. 18a)

18a. Since you haven't always fished lobster on the same ground, would you tell me what other lobster grounds have you fished? (PRINT YOUR RECORDING OF THE RESPONSES)

19. Have you had any fishing experiences with Green Crab?

Yes_____(ASK Q. 19a)

No_____(GO TO Q. 20)

19a. Have you ever landed Green Crab in your lobster pots?

Yes_____(ASK 19b, 19c)

No_____(GO TO Q. 20)

19b. Approximately how many years ago did you first begin seeing Green Crab in lobster pots?

_____years ago

19c. From the time that you first noticed Green Crab in lobster pots, have the numbers of Green Crab increased, decreased or stayed about the same?

1. increased.....1

2. decreased.....2

3. stayed about the same.....3

20. Thinking for a moment about where you land your catches, I would like to ask a few questions about where you land your catches.

20a. If fishing lobster, at what port or wharf do you ordinarily make your landings?

_____ (Print Name of Port)

20b. If you fish herring, at what port or wharf do you ordinarily make your landings?

_____ (Print Name of Port)

20c. If fishing groundfish, at what port or wharf do you ordinarily make your landings?

_____ (Print Name of Port)

SECTION III: EXPERIENCE WITH FORMAL ORGANISATIONS

Now I'm going to ask you a few questions about your experience with fisheries organisations.

21. To begin with, are you currently paying dues to any fisheries organisation or association?

Yes _____ No _____

22. Have you ever been elected or appointed to an office with a fisheries organisation or committee?

Yes _____ No _____

23. How frequently do you attend fisheries organisation meetings? Do you attend....
(CIRCLE THE NUMBER FOR THE RESPONSE INDICATED)

1. Always.....1

2. Frequently.....2

3. Seldom.....3

4. Never.....4

24. Have you ever been appointed to or served on any government fisheries councils or advisory committees?

Yes_____ No _____

SECTION IV: PERSONAL BACKGROUND

Now I'm going to ask just a couple of questions about you.

25. Would you tell, in what year were you born?

Year Born _____

26. Also, would you tell me the name of the community in which you grew up?

NAME OF COMMUNITY _____

27. Finally, would you tell me what was the highest grade or year you completed in school, college or university ?
(Note: THIS MAY REQUIRE PROBING. IF COLLEGE, TRADE OR VOCATIONAL SCHOOL FIND OUT IF THEY COMPLETED HIGH SCHOOL FIRST, BEFORE ENTERING. IF NOT, FIND OUT THE LAST GRADE THEY COMPLETED IN HIGH SCHOOL. ALSO, FIND OUT THE LENGTH OF COLLEGE, TRADE OR VOCATIONAL EDUCATION. CIRCLE THE NUMBER CORRESPONDING TO THE YEARS OF EDUCATION COMPLETED.)

Primary School 1...2...3...4...5...6

Junior High School 7...8...9

High School 10...11...12

Vocational School 1...2...3...4

College 1...2...3...4

University 1...2...3...4...5...6...7...8

28. Have you taken any fisheries related short courses?

Yes _____(ASK Q. 28a) No_____(GO TO Q. 29)

28a. Would you please tell me the names of the courses that you have taken? (RECORD NAMES OF COURSES)

29.Now I'm going to ask a few questions about personal computers. First of all, have you used a personal computer?

Yes _____(If Yes, Ask 29a,b) No_____(If No, Go To Q. 30)

29a. Have you ever used the internet?

Yes_____ No_____

29b. Have you ever used electronic-mail (e-mail)?

Yes_____ No_____

30. If training on computer use for fisheries was offered free of charge and in a local place, do you think you would attend a training session?

Yes_____ No_____

SECTION V: LOCAL KNOWLEDGE EXPERTS

This section is excluded in this essay, because no results analise was made of this section. Full questionnaire is available at the website of SRSF.

Annex II

Annex II. Lobster Policy

"The Minister, in collaboration with other ministers, boards and agencies of the Government of Canada, with provincial and territorial governments and with affected aboriginal organizations, coastal communities and other persons and bodies, including those bodies established under land claims agreements, shall lead and facilitate the development and implementation of a national strategy for the management of estuarine, coastal and marine ecosystems in waters that form part of Canada or in which Canada has sovereign rights under international law" (DFO, 1996). The lobster fishery in Canada was first regulated in 1873 and since then, regulations have continually been adjusted in response to industry pressure. Trap limits were introduced in 1966, limited entry licensing was introduced in 1968, licenses were categorized as Class A and Class B in 1977, and transfers of some licenses were restricted in 1979. A government funded buyback program, introduced in 1978, removed 1300 licenses from the region's fishery to improve the incomes of remaining license holders (SRSF, 2001c). There is no total allowed catch (TAC) in the inshore lobster fishery. It is managed through input controls that have remained unchanged for decades and include the use of limited entry licenses, seasons, trap limits, regulations on the size and types of traps, trap design and minimum carapace size limitations (DFO, 2004b).

The number of licenses available for the fishery is strictly limited, thus controlling the number of vessels and effort in the fishery. Limited entry is not used simply as a conservation measure but also as a way of making sure that lobster fishing will be profitable for those engaged in it. The lobster fishery is also organized into regulated seasons, there are specified times of the year when fishers cannot fish for lobster, thus allowing lobsters to molt, grow and mate. Fishermen support this regulation. In addition to effort and seasonal regulation, fishermen are required to release berried lobsters (lobsters carrying eggs). In addition to these regulatory measures, the number of traps that each license holder can use is limited, thus reducing pressure on the stock and limiting the effort and cost to individual license holders. Finally, minimum carapace size restrictions on saleable lobster are used to stop the capture of lobsters before they can mature and contribute eggs to replenish the stock.

This measure also has the effect of maximizing the total yield in both weight and value from the fishery (SRSF, 2001c).

Advisory committees and formal consultation processes were developed to allow the fishermen to provide input and participate in the management of their lobster fishery in the 1980´s (SRSF, 2001c). In December 1997, the Canadian Minister of Fisheries asked lobster fishers in Atlantic Canada and Quebec to prepare conservation harvesting plans (CHPs), which would lead to the doubling of lobster egg production (DFO, 1998). According to SRSF (2001c), with DFO encouragement, fishers have become more involved in management strategies which in theory involve a process of negotiation leading to the creation of the CHPs.

These CHPs would came on 1998, where according to DFO (2004b), these include increase the minimum legal size, v-notching (v-shape cut on the lobster's tail, which takes two years to rebuild the tissue, and such lobsters can not be market so allowing two years of conservation), prohibition on the retention of female lobsters with only one claw, maximum size and restricted "window" size for females lobsters. Also according to DFO (2004b), fishers in each LFA have been able to select measures best suited to their area.

According to SRSF, (2001c) new policies are introduced after consultation with fishers but, in many situations DFO appears to simply ignore fishermen input although, DFO says that it is committed to a relationship in a good standing with the fishers, but in the case of lobster policy there is a distant relationship. This author justifies the above mentioned by saying that, the fishers agreed to increase the minimum carapace size by one-eighth inch a year for three years, while in the four year conservation plan to increase egg production, and that then in 2001, the final year of the program, DFO proposed that fishermen themselves should choose to implement one of four conservation options. After the fishermen voted to adopt the option of land, report, verify, v-notch and release a set amount of mature female lobsters, throughout the course of the fishing season, the amount to be determined by DFO; DFO officials advised them that that option was no longer available and that they would have to adopt the closed window (throw back lobster between 114 to 124mm in length) system. Despite the processes of consultation that have been put in place, fishermen were given no choice regarding conservation measures for 2001 (SRSF, 2001c).

SRSF (2001c) also notes that DFO appears to be quite lax, however, when it comes to the enforcement side, despite the fact that loses due to poaching may well be

greater than those gained through the conservation measures followed by licensed fishermen.

Fishermen realized that manpower is limited, but feel that more emphasis could and should be placed on enforcement issues. As DFO states, the fishery must be protected if it is to be viable and sustainable. The fishermen feel that they are being required increasingly to police illegal fishing activities on top of everything else that is required from them (SRSF, 2001c).

Fishermen question DFO's commitment to the processes of consultation that are now supposed to be an integral part of fisheries management. Lobster fishermen agreed in 1998, when the four year conservation measure was imposed, that releasing mature females back into the water would provide the best chance for further growth in the industry. The females are not just released on the fishermen`s word, but by a technician hired by the fishermen. In 2001, fishermen in LFA 31B v-notched their lobster before release, to provide several years protection for the lobster as V-notched animals cannot be marketed. But fishermen in LFA 31A were not allowed to use this method and were forced to throw back lobster between 114 to 124mm in length (the "closed window" measure). But if these lobsters stray across the LFA boundary line, they can be captured and sold by other fishermen, Why were fishermen in LFAs 31A and 31B not allowed to use the same conservation measures? (SRSF, 2001c).

Many fishers do not trust studies done by DFO. Fishermen want more say and involvement in the management system. The balance of influence, they feel, is too heavily weighted in favor of administrators, bureaucrats and politicians. It is imperative that all involved in the use and management of this resource be able to communicate and trust each other to ensure continued viability in this fishery (SRSF, 2001c).

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Annex III

Annex III. Species name - relation

English common name	Scientific name	Portuguese common name
American lobster	*Homarus americanus*	Lavagante americano
Atlantic cod	*Gadus morhua*	Bacalhau do Atlântico
Atlantic halibut	*Hippoglossus hippoglossus*	Alabote do Atlântico
Atlantic mackerel	*Scomber scombrus*	Sarda
Atlantic salmon	*Salmo salar*	Salmão do Atlântico
Atlantic snow crab	*Chionoecetes opilio*	Caranguejo das neves
Blue mussel	*Mytilis edulis*	Mexilhão vulgar
Bluefin tuna	*Thunnus thynnus*	Atum rabilho
Common Hake	*Urophycis spp.*	Abrótea
Haddock	*Melanogrammus aeglefines*	Arinca
Herring	*Clupea harengus*	Arenque
King mackerel	*Scomberomorus cavalla*	Serra real
Northern (pink) shrimp	*Pandalus borealis*	Camarão ártico
Oyster	*Crassostrea virginica*	Ostra americana
Pollock	*Pollachius virens*	Escamudo
Redfish	*Sebastes marinus*	Cantarrilho dos mares do norte
Rock crab	*Cancer irroratus*	Sapateira de rocha do Atlântico
Sea scallop	*Placopecten magellanicus*	Vieira americana
Swordfish	*Xiphias gladius*	Espadarte

Source: Maritime Resource Management Service (1982)
Sanches (1989).

Annex IV

Annex IV. Licenses, vessels and gear prices range

Prices range for licenses depends on the area fished and projected landings or income gained from the access. These price ranges are with no gear or vessels attached. All prices in canadian dollars.

A lobster license in LFA's 29, 31A, 31B, 32	$15,000.00
A snow crab license for CFA 24 Scotia Fundy	$750,000.00 to $1,000,000.00
A mobile shrimp license Scotia Fundy	$800,000.00 to $1,000,000.00
A shrimp trap license	$75,000.00 to $100,000.00
A Groundfish license	$5,000.00
A bait license (mackerel, squid or herring)	$2,000.00
A tuna license	$50,000.00 to $100,000.00
A scallop drag license	10,000.00 to $50,000.00

All vessels engaged in the commercial fishery must be registered at a cost $50.00 annually. These vessels must pass Canadian Safety Inspection for vessels engaged in the commercial fishery. It is a four-year process with portions of the inspection to be completed annually. This is regulated by Transport Canada at a cost to the fisherman, which varies and is based on the size, construction and the fishery that the vessel is engaged.

Vessel Cost Estimates (new):

<18 ft. fibreglass = Hull	$10,000.00 to $15,000.00
= Engine and electronics	$5,000.00 – $7500.00
<35 ft. fibreglass = Hull	$100,000.00
= Engine and electronics	$55,000.00
<45 ft. fibreglass = Hull	$350,000.00
= Engine and electronics	$150,000.00
<65 ft. fibreglass = Hull with engine and electronics	1,200,000.00

Gear costs estimates per fishery - (lines and buoys):

Lobster Gear	*($85.00 x 250 traps)*	*$21,250.00*
Snow Crab	*($400.00 x 45 traps)*	*$18,000.00*
Shrimp Trawl	*(net, doors, grates and cod ends, bridles, foot gear)*	*$36,000.00*
Shrimp Trap	($130.00 x 100 traps)	$13,000.00
Tuna	(4 rod, reel, kites, balloons, harpoon, hooks, leader, darts)	$12,000.00
Scallop drag		$15,000.00
Gill nets		$2,000.00
Groundfish trawl	($250.00 x 12 tubs)	$3,000.00
Rock crab	($85.00 x 150 traps)	$12,750.00

Source: Boudreau & Boudreau, 2003.