Assessing the Suitability of a Conflict Framework for Recreational Fisheries in Nova Scotia and British Columbia

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ABSTRACT

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The recreational fishing experience is highly influenced by the management approach employed in the fishery. It has become increasingly necessary to utilize more precautionary-type and ecosystem-based approaches to improve and/or enhance the sustainability of the fishery. This paper sought to understand the conflict that presents itself in recreational fisheries in two coastal Canadian provinces: British Columbia and Nova Scotia. Additionally, this paper further sought to determine if common conflict episodes in the aforementioned regions could be assessed and potentially mitigated through the use of a conflict framework. This was done using a conflict framework modified from existing frameworks in conjunction with first person questionnaire responses from individuals representing different aspects of the recreational and commercial fishing sectors. The Canadian system of management cannot support this type of framework due to the long multi-level decision-making process; however, there is a large focus on communication as a management tool which increases the possibility of success if a monitoring cycle for communication is implemented. The addition of this stage allows for consistent follow-up and the opportunity to pre-emptively plan for persistent episodes of conflict. In the context of recreational fisheries, instances of mistrust of management processes and distribution of allocation are ongoing persistent problems that may benefit from a communication cycle that enhances the understanding and trust of fishers, stakeholders, and other resource users.

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RÉSUMÉ

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L'expérience de la pêche récréative est fortement influencée par la méthode de gestion utilisée dans la pêche. Il est devenu de plus en plus nécessaire d'utiliser de type précaution de plus en approches écosystémiques pour améliorer et / ou d'améliorer la durabilité de la pêche. Cet article cherche à comprendre le conflit qui se présente dans la pêche de loisirs dans les deux provinces côtières canadiennes: la Colombie-Britannique et de la Nouvelle-Écosse. En outre, le présent document a également demandé de déterminer si les épisodes de conflit commun dans les régions mentionnées ci-dessus pourraient être évaluées et potentiellement atténués grâce à l'utilisation d'un cadre de conflit. Cela a été fait en utilisant un cadre de conflit modifié à partir des cadres existants en collaboration avec personne premières réponses au questionnaire de personnes représentant différents aspects des secteurs de la pêche récréative et commerciale. Le système canadien de gestion ne peut pas soutenir ce type de cadre en raison du long processus de décision multi-niveaux; Cependant, il existe un grand accent sur la communication comme un outil de gestion qui augmente les chances de succès si un cycle de surveillance est mis en oeuvre pour la communication. L'ajout de cette étape permet un suivi cohérent et la possibilité de préventivement plan d'épisodes persistants de conflits. Dans le cadre de la pêche récréative, les instances de la méfiance des processus et de la distribution de l'allocation gestion sont des problèmes persistants en cours qui peuvent bénéficier d'un cycle de communication qui améliore la compréhension et la confiance des pêcheurs, des intervenants et autres utilisateurs des ressources.

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Introduction to Fisheries and Conflict

Introduction

The exploitation of fish stocks has been extensively practiced throughout history for food, employment, and enjoyment. The methods used by different groups of people may vary by gear type, location, and/or season to meet their desired experience or needs. In general terms, a fishery can be defined as "the sum of all fishing activity on a given resource" (FAO, 1997). FAO (2005) classifies fisheries into three general categories: industrial, small-scale/artisanal, and recreational. Industrial fisheries are characterized by being capital-intensive enterprises that rely on advanced technology and systematic tools to increase the production volume with less fisher effort (FAO, 2005). Small-scale fisheries differ in that there are fewer individuals involved in the production resulting in a more labour-intensive process with the level of technology and equipment being significantly lower per person (FAO, 2005). Artisanal fisheries are often linked with small-scale fisheries, but tend to be more traditionally-based, low capital and technology, and the distance travelled for fishing activity is generally lower; however, the defining characteristics differ by global region (FAO, 2005). Recreational fisheries are defined as "the fishing of aquatic animals (mainly fish) that do not constitute the individual's primary resource to meet basic nutritional needs and are not generally sold or otherwise traded on export, domestic or black markets" (EIFAC, 2008 as cited in FAO, 2012). At the local level, the focus is generally considered in terms of commercial, subsistence, traditional, and recreational (FAO, 2005). Commercial fishing can fall under the industrial or small-scale categories depending on the scale of the production, but the purpose is primarily for

profit. Subsistence is characterized by the fact that fish caught are used as the primary source of dietary input, particularly as a protein source. It is more common today that, though the fish catch remains the main staple, portions are traded or sold for other necessities, making it not truly 'subsistence' (FAO, 2005). Traditional fisheries are those that are largely based in cultural customs that have been historically practiced by a small community or culturally distinguished group and orally taught through generations (FAO, 2005). There are some traditional fisheries that may establish special fishing circumstances based on Aboriginal status rights. For example, Canada's First Nations peoples are granted the legal right of priority access for food, social, ceremonial purposes in fisheries managed by the Department of Fisheries and Oceans (DFO), second only to conservation considerations, under the Aboriginal Fisheries Strategy (DFO, 2012). The main differences between these fisheries can be briefly summarized as relating to: species, total allowable catch (TAC), seasons, location, gear types, and, particularly in the Canadian context, the governmental body responsible for the management of the fishery.

There has been a surge of recognition in the past few decades that fishery system degradation is fast becoming a problem with many faces, and reaches beyond the spectrum of environmental degradation (Arlinghaus, 2005; Johnston *et al.*, 2010; Murshed-e-Jahan *et al.*, 2009). An aquatic resource system is tied to economic stability in nations of all stages of development, food security, and cultural beliefs (FAO, 2012). Furthermore, degrading the aquatic ecosystem has the ability to impact other systems at various levels which ultimately results in necessitating a collaboration of stakeholder interests among sectors.

Recreational fishing

Recreational fishing is, at the very core, an activity motivated by leisure and personal

experience. Typically, the technology involved is low-level, although this may exclude recreational fishing activities that take place on charter boats. Since charter boats are technically a commercial operation specializing in producing a recreational experience for paying customers, they often use larger vessels that are equipped with more sophisticated fish-finding technology than the average sport fisher may employ. As such, fishing by charter is not representative of the average recreational fishing experience because its tendency is to focus on trophy catches, meaning that there is considerable value placed on capturing an above-average size of fish that is not limited by the general fishing licence size restrictions. The fisher spends additional money to gain the experience of a guide and superior equipment than what is normally available to him for this opportunity. More often, the average recreational fisher uses simpler forms of equipment. Fishing with line and hook is the most common method, often referred to as simply '*angling*' (Arlinghaus, 2005). Small boats may also be used; however, it is not uncommon, in inland waters to observe individuals fishing from shorelines.

Recreational fishing practices can be broken down into catch and keep or catch and release. Catch and keep fishing can be defined as fishing in which any number of or all of the fish caught are retained for personal uses (e.g., consumption, and, less commonly, taxidermy trophies). This is frequently regulated to define a limited number, size, or weight of the target fish species that the individual is allowed to retain daily or seasonally. Catch and release methods are characterized by not retaining any of the fish caught. Mandatory catch and release may also be used as a management tool which encourages continued activity (in lieu of none) for the experience (Policansky, 2002). The practice of catch and release is thought to enhance conservation agendas; however, there is much debate surrounding the ethicality and efficacy of

the practice (Cooke and Sneddon, 2007). For example, popular animal rights organization PETA (People for the Ethical Treatment of Animals) publicly promotes the idea that catch and release fishing is animal cruelty based on the stress the fish's body experiences with capture and subsequent manipulation to remove hooks (PETA, 2015). Conversely, Rose (2002) argued that due to the lack of neocortex present in fish that the anthropomorphized notion of pain could not be possible. Typically, there are restrictions in place (e.g., circle or barbless hooks) for catch and release to limit the potential of mortality for released fish, in addition to providing notes on how to ethically release fish to limit the level of stress the fish experiences. North American recreational fisheries issue a guide/summary of regulations on a regular basis to distribute that information concerning catch limits (and other regulations) to participating fishers. Fishing tournaments (derbies) can fall under either retention or release fishing. These events are those in which competition is highlighted and a reward is provided on the basis of either (a) size, (b) weight, or (c) number of fish caught in a given time.

The FAO (2012) estimates that 140 million people participate in recreational fishing in North America, Europe, and Oceania alone and referred to Cooke & Cowx's (2004) notion that the global figure likely approaches 700 million when factoring in the lack of adequate data from other regions. Although, the number of fish caught by recreational fishers is substantially lower than those allotted to commercial fishers (Cooke and Cowx, 2006), it does not exonerate the recreational sector as a source of resource and habitat degradation, particularly in inland fisheries (Cooke and Cowx, 2004). Discarded gear, hooks and tangled line in particular, have been identified as a major cause of mortality in both fish and terrestrial animals (Arlinghaus, 2005). Additionally, recreational fishers may be responsible for the introduction of invasive

species or proliferating their presence through waterways by using contaminated gear (e.g., boats, waders, and boots) (Acosta and Forrest, 2009; NS DFA, 2015). Direct harvesting from recreational fishing activity and the indirect unseen mortality from release methods affect declining global stocks, as well as further debilitate the system's functionality and quality (Cooke and Cowx, 2004). Recreational fisheries, although relevant to the discussion, are typically not the primary focus of fisheries research outside of localized examples (Arlinghaus, 2005; Post *et al.*, 2002). One explanation is that the activity is spatially broad, particularly in freshwater and inland waters (Post *et al.*, 2002) where entire river sections may be available for recreational fishing use, as opposed to specifically defined boundaries for commercial fishing. There are economic, social (and socio-political), ecological considerations involved in a recreational fishery system; in addition to a history that suggests an increase in the activity with national wealth (FAO, 2012). Due to those interesting trans-disciplinary considerations, recreational fishing will be the primary focus of this research paper and will further investigate the relationship between management of this fishery sector and existing conflict, particularly with respect to the commercial fishing sector.

Economic Considerations

The recreational fishing industry, particularly in developed countries, is an important supporting financial contributor to local economies in both direct and indirect benefits (DFO, 2003; Arlinghaus, 2005). For example, billions of Canadian dollars are spent annually in complementary industries that supply recreational fishers with equipment (e.g., rods, tackle, boats etc.), localized expertise (e.g., river guides or chartered trips), travel and lodging (e.g., campsites, fishing lodges, charter boats etc.) (DFO, 2003). A percentage of licencing fees are

appropriated for helping to fund the programs promoted by the management division, in addition to supporting the department itself (NS DFA, 2015). The Canadian Government affirms that recreational fishing is a valid use of resources in its first guiding principle of the 2001 Operational Policy Framework for recreational fisheries with the fifth principle iterating that the federal government will give consideration to the sector's needs (DFO, 2003). Indeed, the federal government pledged to contribute $15 million (over two years) into recreational fisheries through the Recreational Fisheries Conservation Partnerships Program which is under a quarter of what was pledged to the commercial sector ($66.1 million), in addition to promised funding that would benefit both sectors (e.g., invasive species protection, community partnerships, contaminated sites) (Government of Canada, 2014).

Globally, recreational fishing is predicted to become the prevailing use, and subsequently the decline of commercial and subsistence fishing, in inland waters due to increases in a nation's economic status (Cowx *et al.*, 2010) (see figure 1.1). As noted in the previous section, recreational fishing tends to be more spatially distributed inland, then assuming fishing activity follows this model, with the further assumption that exponential growth is not likely (indeed, it is expected to level off before economic development does (FAO, 2012)), it can further be expected that communities inland will benefit from the increase in recreational activity.

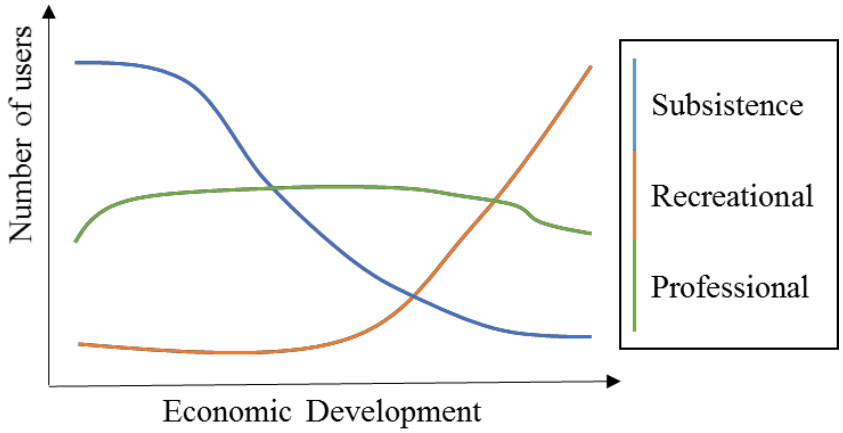


Figure 1. 1 Shift in inland fishing uses with economic development (adapted from Cowx *et al.*, 2010).

In Canada, there were over 2.7 million licensed fishers taking part in recreational fishing for 2010 (DFO,2012), a number just over the 2014 populations of all four Atlantic provinces (Statistics Canada, 2014)., Yukon, Northwest Territories, and Nunavut combined with an average expenditure of $652/individual (greater than $1.6 billion) in 2005 (see table 1.1)(Statistics Canada, 2009). The most recent statistics from DFO made changes to the expenditure measurements by splitting expenditures into (1) direct expenditures, (2) major purchases and investments wholly or partly attributable to recreational fishing, and (3) major purchases and investments wholly attributable to recreational fishing (see table 2) and the average direct expenditures per angler was $766 (DFO, 2012).

Table 1.1 Recreational fishing statistics for 2010. *Expenditure/angler values were taken from the 2005 version (DFO, 2009) due to changes in the survey questions for 2010 (Adapted from DFO, 2012)

Province	Number of licenced anglers	Caught:Kept (*Avg./Angler*)	% Kept	Expenditure/angler*
Nova Scotia	64,112	70:28	40	$464
British Columbia (Tidal)	245,572	14:7	50	$1102
British Columbia (Freshwater)	338,563	31: 8	26	$696
Canada (overall)	3,640,926	59:19	32	$652

Table 1.2 Breakdown of angler expenditure (adapted from DFO, 2012).

Direct Expenditures	Major purchases and investments wholly or partly attributable to recreational fishing
Package Deals	Fishing Equipment
Food & Lodging	Boating Equipment
Transportation Costs	Camping Equipment
Fishing Services	Special Vehicles
Fishing Supplies	Land and/or Building
Other	Other

The stakeholders involved in the recreational fishing industry include all players that are directly involved in or are dependent on, in any capacity, the recreational sector (FAO, 2012). This results in a number of individuals and organizations that have a vested interest in supporting a sustainable fishery. For example, localized bait and tackle shops, many facets of the tourism scene for the region (e.g., lodges, campgrounds, chartered transportation), and equipment rental shops directly profit from a successful recreational fishing season (Arlinghaus, 2005; DFO 2012). There is further spill-over into local economies when fishers spend money that is not attributed to the actual act of fishing, including food, fuel, and

entertainment. Although, these groups may not constitute directly as a ‘stakeholder’ because attribution may not be able to be directly linked to fishing activity, they do benefit financially from the activity.

There are other industries that may not be implicitly involved in recreational fisheries but must consider them in their normal operations. For example, forestry and agriculture operations can impact the recreational fishery through ecological processes. Commercial fishing and aquaculture can impact the experience through interference or decreased stock quality, in addition to competing interests, particularly within the commercial sector. Indigenous peoples are also significant stakeholders for the cultural and legal reasons previously mentioned above. Cowx *et al.* (2010) suggested that concern for fish welfare and conservation awareness increases as participation in recreational fishing grows (see figure 1.2). As such, non- governmental and not-for-profit organizations that specialize in activities that enhance and/or promote the recreational sector become an integral aspect in maintaining fish habitat. They may be partially funded by government programs and assist in research, ecosystem restoration/remediation where important fish habitat is concerned, and executing sector promotional programs that seek to entice individuals to participate.

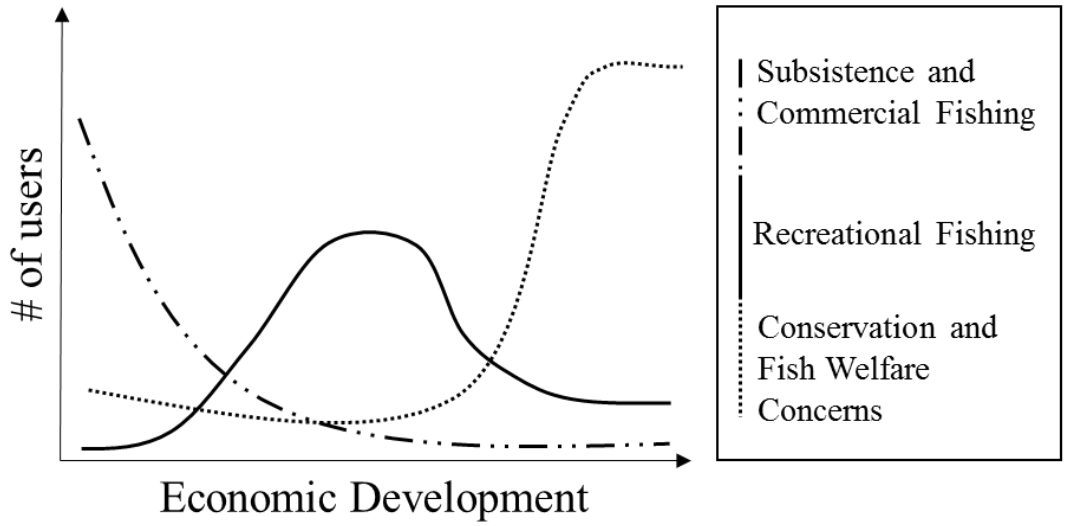


Figure 1.2 Life cycle of inland fisheries (adapted from Cowx *et al.*, 2010)

Social Considerations

Fisheries are a common-pool resource, meaning that resource users (i.e., the fishers) have the opportunity to remove the resource (i.e., the fish) from the pool (i.e., lake, river, ocean). Pooled resources are often tagged with the term "tragedy of the commons", which was conceived by Hardin (1968) and refers to the discrepancy between the individual and collective rationale. In simple terms, the individual fisher, acting in self-interest, will usually choose to exploit the fish stock for personal gain today because it may be not be there tomorrow due to another person acting in the same self-interest manner. This results in a net loss for the collective group if the majority of the resource users choose to act in a similar way because the opportunity for the resource to replenish itself is diminished unless the fishers are provided an incentive to conserve the resource.

Recreational fishing is ultimately about the individual's experience and Johnston (2010) considered the complexity of angler behaviour an important aspect in the satisfaction

of the experience. Furthermore, research has been improving the understanding of human dimensions on recreational fisheries because unsustainable practices are rooted in human behaviour (Arlinghaus, 2005; Aas & Ditton, 1998). Because the limits of the fishery have not always been as fully understood as they are today, researchers have been working towards enhancing management tools that consider the human component within the aquatic ecosystem to promote harmony between the objectives of each (FAO, 2012).

Fisheries Management

Fisheries management cannot be categorized into an all-encompassing definition because of regional fluctuations that must be observed in active management plans; however, FAO (1997) defined it as follows:

> The integrated process of information gathering, analysis, planning, consultation, decision-making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and accomplishment of other fisheries objectives. (p.7)

Recreational fisheries management employs a similar process, but also addresses promotion of the activity, advocates awareness, and encourages stewardship efforts to enhance, conserve, and sustain recreational access (DFO, 2008). Arlinghaus and Cooke (2009) refer to several management challenges faced to address conservation of recreational fisheries:

- Declining participation – particularly in North America (and may be linked with an increase in poaching efforts)
- Stakeholder conflicts – values and beliefs of any parties with an interest in the

resource that do not agree with each other. Also, the increase in animal rights awareness

- Controlling effort and harvest – locally exerted to minimize fish mortality and encourage sustainable (and potentially self-regulated) fisheries
- Compliance – illegal fishing efforts are difficult to contain, particularly inland where fishing areas are spatially distanced

Due to the above-mentioned improvement in fishery limits knowledge, the Food and Agriculture Organization of the United Nations (FAO) developed a code of conduct for responsible fisheries, and subsequently a technical guide to lead managers in incorporating an inclusive approach to fisheries management (FAO, 2012). The original technical guidelines document was not well-equipped to aid recreational fisheries managers and a subsequent guide was later published to better cater to the needs of this socially-dominated sector (FAO, 2012). All fishery systems are complex and dynamic, and must incorporate aspects of human and nature in their management approaches. While natural resource management has typically been dominated by anthropocentric views, fisheries management has entered a transition phase from a focus on increasing the user experience, often by manipulating stock availability (e.g., freshwater stocking or adjusting allowed catch), to one that approaches management by integrating ecosystem considerations (Garcia *et al.,* 2003). The technical guidelines for recreational fisheries include the application of eco-centric focuses approaches like precautionary and ecosystem approaches, adaptive management, and structured decision making, in the management framework for sustainable recreational fisheries (FAO, 2012). The following table (table 1.3) will briefly describe these approaches and the pros and cons to use

them in recreational fishing management.

Table 1.3 Description of management approaches. As suggested in the FAO technical guidelines to responsible recreational fisheries.

Approach	Description	Pros	Cons
Precautionary Approach	Risk management approach to decision-making when uncertainty prevails	Allows continued decision-making to occur	May hinder the process with too cautious or too generous predictions
Ecosystem Approach (Mitchell, 2002)	Integrated strategy involving all aspects of an ecosystem, including humans, to support conservation and sustainability efforts	-Holistic -Can maintain ecological integrity -Promotes sustainable use -Recognizes traditional knowledge	-At odds with traditional unilateral management focuses. -Actions plans may be slow to start -Lacks "sound principles" -Conflicting values
Adaptive Management (Mitchell, 2002)	An approach characterized by small experimental steps allowing for continuous review and revision where necessary	-Tailored to high uncertainty situations -Assumes high degree of learning from errors -Favours rapid action potential -Improves resilience (Mitchell, 2002)	-Can be a slow conclusion due to frequent incorrect predictions -Goal-setting is a constant process
Structured Decision-making (Gregory *et al.*, 2012)	Applies collaborative and enabling approaches to multiple-objective decision-making to complex management and policy problems	-Well-suited to diverse stakeholder groups -Focuses on understanding values and consequences in harmony	-Requires effective communication process -Does not highlight a "preferred solution"

Many of the stakeholders described above, in the economic considerations section, are partners in the decision-making process. The differing views and desires by participants can make managing any fishery difficult; however, democratic societies are

often linked with transparency, and in fact Hollyer *et al.* (2011) found that democratic societies were more likely to release information to the public. When considering the sheer number of participants involved in recreationally fishing globally (estimated at 700 million (Cooke and Cowx, 2004), this has the potential to result in tumultuous relationships between parties when factoring in the variation in users' and stakeholders' wishes, neighbouring or relevant sectors, and management divisions.

Fisheries managers are ultimately responsible for managing the people involved in a fishery, including the fishers exploiting the resource and those required to run the fishery. Today's fishery manager is rarely a single individual, but rather a collective of individuals, each encompassing specific expertise and integrating into a functional management unit. This unit is characteristically multi-disciplinary and should make decisions in a holistic manner that unites the many departments and individuals involved (Cochrane and Garcia, 2009). If the overall goal of fisheries management is to develop and/or maintain a sustainable fishery then it must be managed by considering the natural and social systems together and not as separate entities (Berkes, 2009). How resources are used and allocated are indicative of the overlying values and perspectives of the sitting political party, but also led by the knowledge and experience of management departments. Applying the appropriate management decisions requires intimate understanding of the demographic characteristics of those involved (FAO, 2009).

Fisheries Management and Policy in Canada

The management of Canada's recreational fisheries incorporates both federal and provincial/territorial governments. The 2001 Operational Framework Policy states that

collaboration with other levels of government, the private sector, and stakeholders are a new priority in the plan to develop the recreational fisheries (DFO, 2003). The *Fisheries Act* is the legal document by which all fisheries in Canada are subject to and outlines the responsibilities of the Minister of Fisheries and Oceans, fishers' rights and expectations, and defines the legal uses of the resource and exceptions through regulations enabled under it. This is not, by any means, the sole piece of legislation affecting fishery systems. DFO lists 11 other Acts governing aspects of the fisheries and two with interests affecting fisheries, including the *Oceans Act*, *Species at Risk Act*, *Canadian Environmental Assessment Act*, and the *Canadian Environmental Protection Act* (DFO, 2013). The introduction of Bill C- 138 brought forth changes to the *Fisheries Act* and the *Environmental Assessment Act* in 2012 and these changes shifted the onus of burden, to ensure fish habitat safety, to the project proponents rather than the federal government. In addition to federal legislation each province is controlled by provincial Acts, for example, *Angling Act* (Nova Scotia), *Wildlife Act* (British Columbia), and further regulatory documents such as *Maritime Provinces Fishery Regulations*, or *Pacific Fishery Management Area Regulations*. Each legal document falls under the *Fisheries Act* as the enabling act, but are specifically referenced to the geographic locale to which they specify. Fisheries and Oceans jointly manages fisheries in Canada with departments in each province. The duties of each unit often split over the type of species being sought with DFO generally managing marine species (also anadromous and catadromous species) and provincial management focusing on freshwater species and licensing; however, each province differs slightly in the roles of each level of government. The following table (table 1.4) outlines which areas each level of government is responsible

for:

Table 1.4 Canadian fisheries management by province (adapted from DFO, 2003)

Province/Territory	Federal	Provincial
Yukon	Marine species	Freshwater fisheries
Northwest Territories & Nunavut	Advised by co-management boards on conservation, fishery management, and science	Issue licences under Order-in-council
British Columbia	Manages salmon in marine and freshwater Manages and licences tidal waters	Manages and licences freshwater species Licences inland salmon sportfishing
Saskatchewan	Aboriginal fishing Fish habitat protection	*Saskatchewan Fisheries Act* allows province to make day-to-day legislative fishery amendments.
Alberta, Manitoba & Ontario	Marine species	Manage and licence freshwater species
Quebec	Other marine species	Manages and licences freshwater, anadromous & catadromous species
New Brunswick, Nova Scotia & Prince Edward Island	Manages anadromous, catadromous & other marine species	Manage and licence freshwater species. Licence anadromous species in inland waters
Newfoundland	Manages marine and freshwater fisheries	Licences freshwater fish species

Charles (1992) suggests that fishery policy instruments often focus on two primary goals: (1) improving efficiency in harvesting and management, and (2) allocating access to the resource. Both policy instruments target the users of the resource by altering the experience possible; however, the first option considers the state of the resource through the quality of the available resource. Changes to the Canadian *Fisheries Act* took effect in 2012 and eliminated the legal protection that was previously allotted to fish species and water bodies. Now the concept of efficient harvesting requires greater effort from managers because the available resources and

habitat in which they are found no longer implicitly benefit from the previous legal implications of the habitat's necessities. There are a number of conflicting values associated with policy and regulation and the number of stakeholders involved in the recreational sector are interested in swaying decisions to follow their value system. This leads into the description of the next aspect of this paper's consideration – conflict.

Conflict

The concept of conflict is derived from contradictory opinions that prevent an agreement from forming (conflict, 2015). As previously noted, individual self-interest overrides collective preservation. Thus, the inconsistency in the human view of the natural world can lead to heavy debates on the severity of environmental problems.

Conflicts in natural resources are related to the access to available resources, as well as how the access is controlled, and how the resource is used (Matiru, 2000). Jacob and Schreyer (1980) found that the motivation behind conflict between recreational resource users revolved around four main factors:

1) Activity style – the personal incentives and factors leading to the use of the resource
2) Resource specificity – the relative importance attached to the activity choice
3) Mode of experience – the ways in which the user expects to interact with the resource
4) Lifestyle tolerance – the level of acceptance for another individuals' use for the resource

Natural resource systems are subject to diverging perceptions about the use which can

make the process of delivering effective policy difficult due to the perception that one party (or more) is receiving unfair shares of the resource (Pruitt, 1995). Resource managers have often considered one activity versus another in a given system (or area of use) (Jacob and Schreyer, 1980). Indeed, fisheries managers have traditionally managed single species fisheries as standalone systems, compared to the newer trend of inclusive planning and analysis (FAO, 2012). Problem definition is already convoluted and difficult at the policy level (Adams *et al.*, 2003) that the addition of extra players, indirectly associated with the specifically managed resource, may result in spot-treating single issues that result in a domino effect on other users. Resources are already scarce; thus, further restricting allocation can be a trigger for conflict between fishers, sectors, or other non-fisher users (Charles, 1992). As the resource continues to degrade, and policy must be further changed to reflect this (a reality that cannot be avoided), it will be important to communicate the necessity of such changes to the participants and garner support.

Pruitt (1995) places resource dilemmas within the context of social conflict which arises when two (or more) parties are faced with a choice between self-interest and collective interest, a concept tied with game theory. Adams *et al.* (2003) suggested that conflict in common pool resources originates from the discrepancy in cognitive[1] awareness surrounding the resource from stakeholders and policy makers, and can be considered *cognitive conflict*. Cognitive awareness provides the basis of an individual's system of values and thereby affecting behaviour in conflict situations (Myers and Smith, 2012). Arlinghaus (2005) considered various cognitive drivers as the instigating factor in recreational fishing conflict,

[1] Cognition is defined as the process by which the individual comes to understand something (Kolb and Whishaw, 2011).

acknowledging that there is no single starting point. Conflict in fisheries has been linked to a diverging paradigms of the leading policy directives (conservation, rationalization, and community-centred) (Charles, 1992).

Conflict is not necessarily detrimental; there is also a positive aspect to conflict in that it can be conducive in bringing forth change (Murshed-e-Jahan *et al*., 2009). Engaging participants, researchers, and managers in pre-decision-making communication can inspire more effective policy that is more commonly complied with. When fishers feel shunned or unappreciated they are less likely to report illegal fishing practices or engage in it themselves. Cooperation between parties is dependent on meaningful dialogue and open communication which also encourages matching behaviour actions in debate (Pruitt, 1995).

Adequate communication is critical to understanding the motivation for conflict as well as attempting to mitigate the effects. The communication component has been incorporated heavily in management systems by using adaptive, participatory, or co-management approaches whereby outside input is sought out and applied. Canadian fisheries management, at both the federal and provincial levels, have provisioned for lengthy communication processes between the governing bodies, fishers from all fisheries, other stakeholders, and the general public. This approach drives the transparency agenda by incorporating public participation in the process, but the process is not always as well-received as it intends. The intrinsic uncertainty associated with fisheries magnifies the discordance in the management/fisher relationship by disconnecting the experience with the scientific technique behind the policy. This poses a significant problem if the intent is to encourage sustainable fisheries management which requires trust between parties. It is unlikely that individuals will

comply with regulatory policies if they cannot fully understand the process or reasoning behind the decision. Thus, this suggests that communication is an invaluable management tool to easing conflict over behavioural attitudes (Murshed-e-Jahan *et al.*, 2009).The disparity between management actions and perception will be further explored within the context of the case studies below in chapter three.

Research questions and study justification

Conflict within fishery systems is not a brand new concept, but studying conflict within the context of recreational fisheries is less understood (Arlinghaus, 2005). This paper will examine the conflict implications of recreational fisheries management in British Columbia and Nova Scotia, Canada, in addition to applying a conflict analysis framework that has been modified from existing frameworks and typologies developed by Charles (1992), Arlinghaus (2005), and further influenced by Murshed-e-Jahan *et al*. (2009). These two provinces were chosen for contrast because the fisheries on both coasts exist under the same operational policy framework, but there are a greater number of fisheries on the Pacific coast fisheries with overlapping boundaries and a larger management unit, in comparison to Nova Scotia These differences suggested that conflict may present itself in different aspects and the management approaches would be ideally adapted to the particular needs of the area. To answer the research questions this study considered typologies of conflict and combined frameworks for conflict or conflict analysis. This was necessary to define the prominent existing issues and have a foundation to assess the case studies in chapter three. The research questions were as follows:

1. What implications can a recreational fisheries conflict framework have on conflict

and further on the analysis of such? Can this be applied locally to the regional case studies?

2. What methods are currently being used to minimize or mitigate conflict in each study location and is it a localized methodology or does the application of these methods have broader implications? Are these methods largely focused on a specific type of conflict (re: allocation, access, conservation measures, etc.) and in which way are they being addressed (i.e., through policy measures, community education, etc.)?

3. How have the recent trends of applying less-anthropocentric views (i.e., precautionary principle, ecosystem-based and/or participatory approaches) to fisheries management impacted the incidence of and the methods of mitigating conflict?
4. Can the conflict framework for recreational fisheries be used to address the prevalent circumstances of conflict (re: within specific user groups and/or with regard to a specific trigger) in advance?

Chapter 2

Typologies, Frameworks for Conflict and Methods

Background

The following subsections will detail the typologies of conflict and the frameworks for conflict that were considered to develop the adapted framework for conflict that was used to analyze conflict in the case studies.

Typologies

Many of the conflicts experienced in fishery systems have been noted to follow known patterns (Charles, 1992; Arlinghaus, 2005; and resource conflicts in general Pruitt, 1995); thus, it is both sensible and important to classify them in order to address them effectively.

Charles (1992) developed a typology of four primary classes of fishery conflicts which include fishery jurisdiction, management mechanisms, internal allocation, and external allocation. The following table (table 2.1) provides a brief background to his system of classification:

Table 2.1 Fishery conflict typology (adapted from Charles, 1992).

Classification	Description	Examples
Fishery Jurisdiction	Concerns the control of the fishery through access, governance, or ownership	Property rights – Ownership, access, control
		Role of government – Debate over government's role in management
		Intergovernmental conflicts = Boundary disputes (International or other)
Management Mechanisms	Concerns *short-term* problems in management plan development and application	Fishery management plans – Development or changes result in fisher/government conflict
		Enforcement conflicts – Debates concerning excessive or overly-lenient enforcement
		Fisher/government interactions – Fishers' perception of ill-represented interests
External Allocation	Conflicts between users of a fishery system and those outside of the specific fishery	Domestic vs. foreign fisheries – competitive conflicts with legal implications
		Fisher vs. aquaculture – bio and ecological debated, competing space uses, fish stock quality concerns
		Conflicting interests/concerns between fisher and other type of user
Internal Allocation	Conflicts between users of a particular fishery system	Gear wars conflicts – gear and technological inequality
		User group conflicts – between classes of fishery users
		Fisher vs. processors – cost of doing business disputes

Charles' typology is appropriate for defining conflict within a broad fisheries view, but it was not entirely adequate for considering recreational fisheries as the primary system without manipulation. Arlinghaus (2005) did manipulate this typology into a simplified form

that better suits the types of conflict found within recreational fisheries. The following table (table 2.2) outlines Arlinghaus' typology of conflicts in recreational fisheries:

Table 2.2 Recreational fisheries conflict typology (adapted from Arlinghaus, 2005)

Classification	Sub-classification	Examples
User Conflicts	Intrasectoral	Fisher vs. fisher (any sector)
	Intersectoral	Fisher vs. other non-fisher resource user
Management Conflicts	Intrasectoral	Fisher vs. management/allocation measures
	Intersectoral	Fishery manager vs. outside fishery interests

The recreational fisheries modifications by Arlinghaus can be visualized in the diagram below (see figure 2.1). However, in short, the typology was simplified to user conflicts and management conflicts and by separating these conflicts into either (a) intrasectoral or (b) intersectoral conflicts. Intersectoral conflicts are those that take place between a fishery user and an outside person or entity and intrasectoral conflicts are those between users of the same fishery system. This distinction initiates conflict analysis to begin by considering the source of conflict behaviour and suggests that the methods that may be used to address conflict will differ in order to target the offending unit more efficiently.

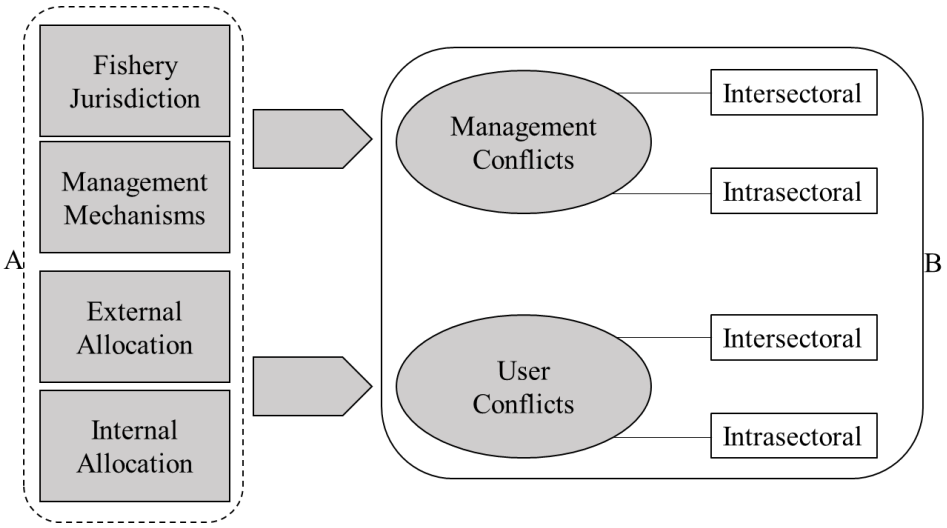


Figure 2.1 Simplified typology of conflicts for recreational fisheries. The shift from Charles' (1992) typology of conflict to Arlinghaus' (2005) typology of conflict for recreational fisheries – where the dashed outline and (A) represents Charles' and the solid line and (B) represents Arlinghaus'.

Frameworks

Much like typologies, the use of frameworks for conflict serves as a beneficial tool to enhance understanding the implications of certain actions. The following two frameworks, Charles' and Arlinghaus' respectively, were investigated for their role in conflict analysis. Charles' framework (see figure 2.2) was then modified to incorporate aspects from Pruitt's (1995) notion of diverging and converging interests in social conflict (see figure 2.3). This modification contextualized the movement of policy ideals and suggested that movement along the planes could be considered 'dual convergence' in which the interests of two paradigms merge to lessen conflict potential between those objectives. Similarly, a 'multilateral convergence' suggests that inward merging would, ideally, result in equally represented policy objectives and could hypothetically be considered the point of least conflict (although, as noted in figure 2.2, this would be in a generic system void of regional

specificities).

Charles' framework takes root in fishery policy paradigms whereby each viewpoint (i.e., policy objective) in its own right, with no other considerations, is a corner point of the triangle. This is unlikely to ever be a real-world scenario, but primary objectives may well find themselves in an extremity of the triangle. The paradigm triangle is composed of following three fishery policy goals:

1) Conservation – Fish stock is controlled by managers around biological considerations intended to limit harvesting to obtain (or approach) scientifically-derived sustainable levels. This has been a traditional management model used by managers where other fishery aspects were expected to follow suit as a result.
2) Rationalization – Fisheries should be attempting to maximize wealth and seeking efficiency. Those fisheries not operating under those terms must 'rationalize' their situation with the use of control methods, such as reducing the number of fishers or re-distributing access/harvest rights.
3) Social/community – Emphasizes social and community benefits over the perception of fishers as economic players. This enhances the prospects for fishery players who may be unable to withstand the pressures of a rationalization objective.

The social and community aspects are particularly relevant to recreational fisheries because these systems tend to be socially-driven with activity promoted on the merits of localized benefits. Additionally, conservation is also relevant and it is not uncommon for freshwater fisheries to employ stock enhancement as a management tool to sustain the fishery. It should be noted that the term 'sustainability' is relative and highly debated under the terms

of stock enhancement approaches. Incidentally, this debate plays into all policy paradigms which suggest that social factors play heavily in all aspects of the paradigms at play.

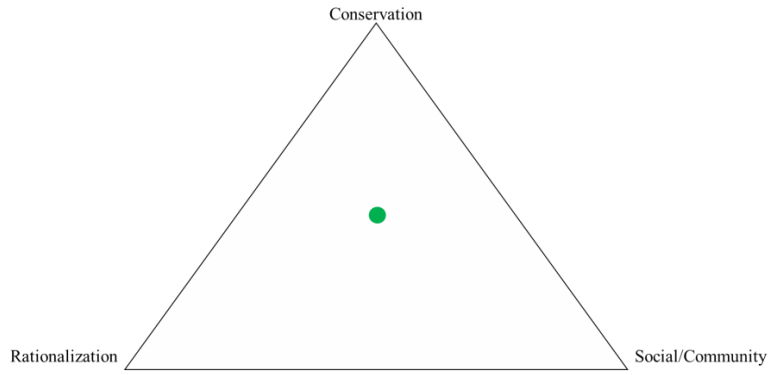


Figure 2.2 Policy paradigm triangle. The centre point represents the point of merging policy objectives (adapted from Charles, 1992). In a generic system this *may* represent the point of least conflict, but not necessarily due to inconsistencies between fisheries and fishery players.

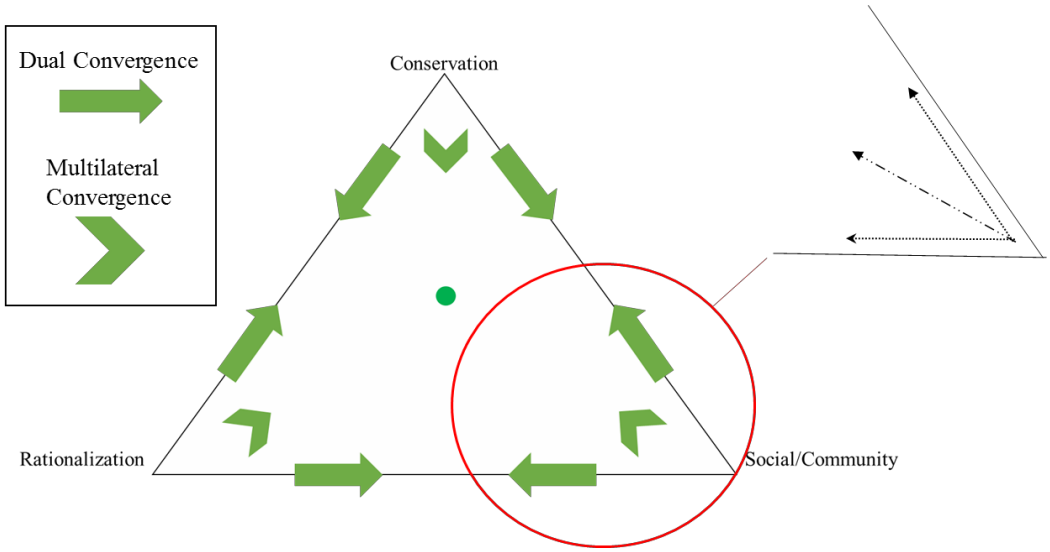


Figure 2.3 Modified policy paradigm triangle. Charles' (1992) triangle of policy paradigms reimagined with Pruitt's (1995) idea of converging and diverging interests. The generalized angle simply demonstrates that, regardless of which opposing corner is considered, the mode of movement remains the same.

Arlinghaus plays into the social and community importance by leading his framework from a set of socially-driven starting points; cultural, institutional, and emotional drivers. These drivers are described as:

- Cultural – specific societal cultures at a socially-identifiable level
- Institutional – methods of organizing societal systems, subject to cultural influences
- Emotional – individual feelings influenced by cultural and institutional drivers

Arlinghaus' framework goes forward to acknowledge that there are multiple barriers from the onset of the source factors (i.e., the drivers) to the point in which satisfaction among fishers declines (see figure 2.4). These fishers then make their dissatisfaction known and management follows through to manage the given conflict.

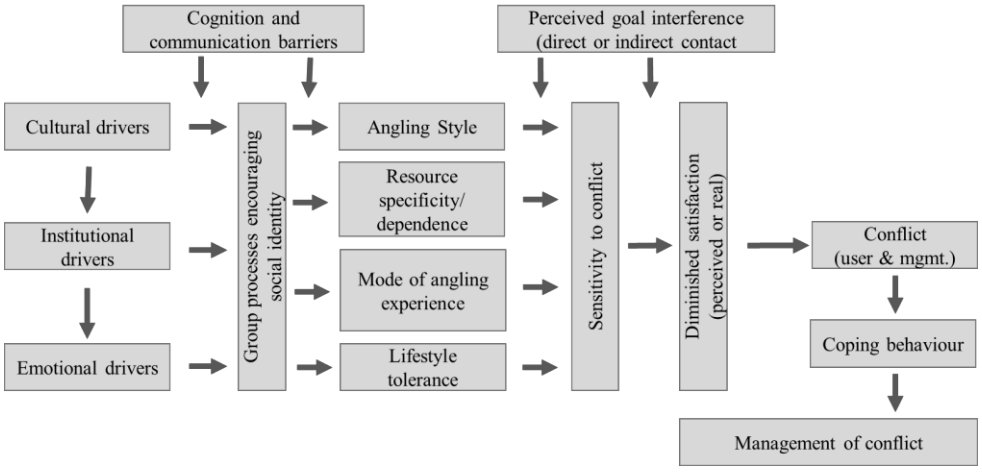


Figure 2.4 Expanded conflict framework in recreational fisheries (adapted from Arlinghaus, 2005).

Adapted Framework

This paper aimed to focus on conflict in recreational fisheries from the management point of view. This resulted in diminished capacity to apply Charles' framework because it did

not entirely suit the recreational fisheries high social aspect. Additionally, using Arlinghaus' framework required a system of direct sampling of the individual fishers for the experiences and perceptions and this was not the aspect for which this paper intended to present. Thus, from the understanding borne from conflicting policy paradigms and that recreational fisheries are socially-driven systems with barriers hindering communication efforts between fisher and manager, the following adaption was developed (figure 2.5).

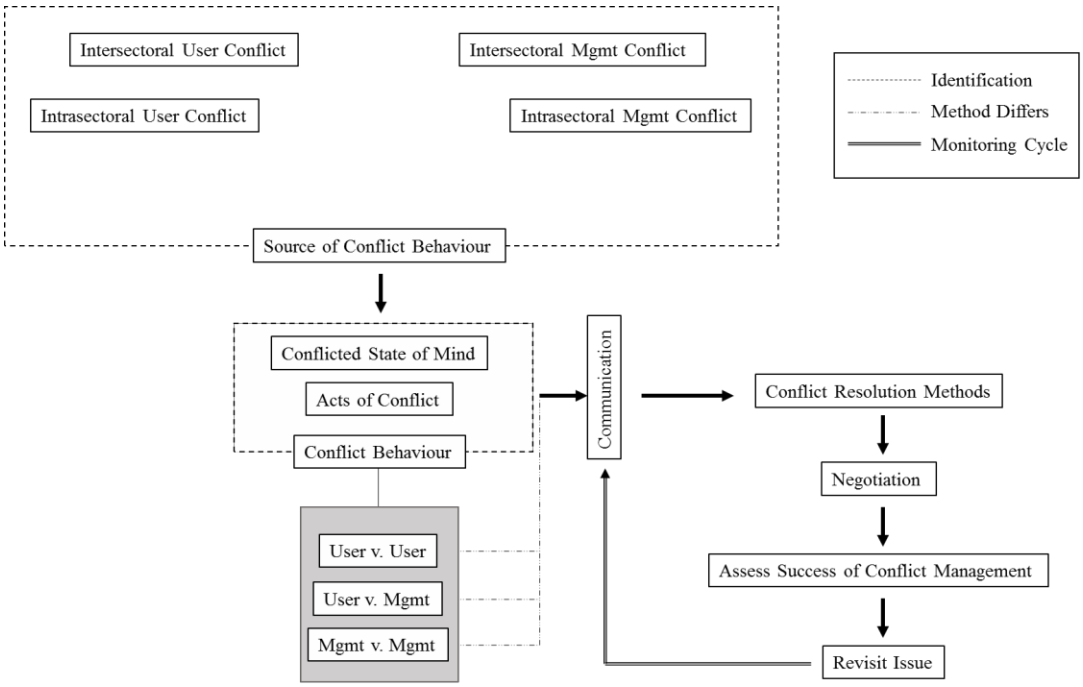


Figure 2.5 Modified framework for conflict analysis (adapted from Arlinghaus, 2005 and Pruitt, 1995)

This framework introduces an identification stage as the initiation point to analyze conflict. Here, Arlinghaus' simplified typology is used to consider the 'source of conflict behaviour', a term identified by Pruitt (1995) as the first of two components to defining conflict. A second identification stage follows with the second of Pruitt's conflict components – conflict behaviour. Conflict behaviour is identified as either (a) a conflicted state of mind, in which dissatisfaction is present but the player has not acted upon it, or (b) acts of conflict, in

which the player takes action to remedy the feelings of dissent. At the point of communicating conflict behaviour, it is noted that the method of communicating may differ depending on the user and perhaps more so on how the communication is received. This frame then leads into an action loop post- communication of conflict where resolution methods are attempted, and/or negotiated, and then assessed. It is at this point that consideration is given to future conflict by incorporating a revisit and subsequent loop of communication to address persistent conflicts. This differs from the previous two frameworks by essentially enabling a system of adaptability through a feedback loop designed to foster trust between conflicting parties by demonstrating a willingness to proactively treat situations, in addition to building a positive relationship for future interactions.

Methods

There were a total of 13 individuals who provided their point of view on recreational fisheries, and any conflict associated with it, for their region. The original intent was to obtain the perspectives, in each province, from:

- Federal government
- Provincial government
- Localized representative from recreational sector
- Provincial representative from recreational sector
- Commercial representative

Table 2.3 Questionnaire participants by province.

Nova Scotia	British Columbia
DFO – Fisheries Management	DFO – Fishery Officer
NS Fisheries and Aquaculture (Inland Fisheries)	Non-government Recreational Fishing Representative (BC)
Non-government Representative for Recreational Fishing (NS)	Non-government Recreational Fishing Representative (West Coast Vancouver Island)
Guides Association*	Commercial Representative (Halibut Fisherman's Association)
Conservation Group*	
Localized Angling Groups*	

*Informal conversation at the Atlantic Outdoor Sport and RV Show 2015 (see appendix)

During the time of the surveying for this paper, an appropriate representative from British Columbia's fisheries management division of the Fish and Wildlife Branch could not be reached. There were two positions vacant, including the manager associated with this division, and the acting manager role was taken on by the best alternative choice. As a result, the provincial management aspect could not be attained through personal contact and the 2007 Freshwater Fisheries Program Plan was used to understand the directive of the provincial fisheries management division. Moreover, there was only one Nova Scotia commercial fishing representative that responded and simply stated that they could not comment on conflict with recreational fishers because, "there is very little contact between them." This lack of interaction was noted by the Nova Scotia DFO representative as well.

Telephone interviews were conducted with three representatives, face-to-face discussions with six individuals present at the Atlantic Outdoor Sport and RV Show, and the remaining four individuals completed the questionnaires electronically. Telephone interviews tended to be more revealing than those completed electronically, meaning that, those individuals appeared more willing to provide candid responses. The face-to-face discussions with those at the Atlantic

Outdoor Sport and RV Show were far more open; however, as noted in the appendix, the conversation was less formally posed and respondents had free reign to detail what they felt was relevant to the subject without being guided by the questionnaire. Additionally, their existence is largely for advocacy purposes and, as such, they are frequently tasked with being the voice of opposition to regulators, so their candor was not unexpected.

The questionnaires served to enhance the knowledge of (1) the management approaches used by managers; (2) any changes that have taken place recently (identified as within the last ten years, but not concrete) and if any further changes were forthcoming; (3) the measures in place to combat incidences of conflict; and (4) the protocols used when conflict does occur.

Federal and provincial recreational fishing policies were examined to provide the contextual basis from which management approaches stem. This exercise established the primary policy direction that management approaches are focused at each level, but could also identify the adaptability of management plans currently in use.

The direct perspectives of fishers were drawn by reviewing public online sportfishing forums centred in each province. This provided context to fishers' concerns, in addition to allowing an opportunity to compare what the representatives indicated as the major issues of conflict with what fishers were saying to their peers. There was some caution involved in searching through online forums. The primary focus remained on threads that were "hot issues" (i.e., the threads that had a lot of activity), but any comments that were derogatorily directed at other users for their opinions were not considered as conflict because the nature of 'anonymous' commentary provides an outlet for any frustration, not just those related to the focus issue.

Chapter 3

Case Studies

Nova Scotia

Background

Nova Scotia has a coastline spanning 7,442 km and a land area of 53,000 km^2 that encompasses 6,700 lakes, 100 rivers and countless brooks/streams (NS DFA, 2012). In spite of the long coastline, the majority of recreational fishing takes place in inland waters. Although, there is a small amount of recreational marine fishing that takes place, including a limited groundfish fishery in the southern Gulf of St. Lawrence and chartered large pelagic activity off the south shore region; however, unlike inland fishing, recreational licenses are not required to fish in tidal waters. The federal Department of Fisheries and Oceans is responsible for managing anadromous[2], catadromous[3], and marine species whereas the Nova Scotia Department of Fisheries and Aquaculture is responsible for managing freshwater species and the licensing of freshwater and anadromous species fished in inland waters (DFO, 2003). The Minister's (Fisheries and Aquaculture) message in the 2015 Angler's Handbook states that recreational fishing in Nova Scotia provides over $58 million to the industry and that licence sales have reached numbers unseen since the early 90s (NS DFA, 2015). The following table (table 3.1) describes the species caught and kept during the 2010 fishing season based on 57,755 active licensed fishers:

[2] Spawn in freshwater, spending most of their lives at sea and return to freshwater to spawn (e.g., salmon, striped bass, smelt)
[3] Spawn in salt water and otherwise live in freshwater (e.g., most eels)

Table 3.1 Fish harvested during the 2010 fishing season (adapted from the most recent survey of recreational fishing in Nova Scotia (NS DFA, 2012)).

Species	Number caught	Number kept
Brook trout	1,621,807	572,967
Mackerel	646,399	441,406
Smallmouth bass	598,869	9,653
Smelt	526,427	430,410
Rainbow trout	114,304	57,849
Yellow perch	104,415	8,533
Chain pickerel	94,769	5,685
Striped bass	94,700	3,710
White perch	75,656	24,698
Brown trout	41,091	16,343
Cod	21,707	11,851
Atlantic salmon	9,181	297
Landlocked salmon	2,112	310
Other	69,367	20,344
Total	4,020,804	1,604,056

Conflict

Conflict in the Nova Scotia recreational fishery is initiated, for the most part, through *intrasectoral management conflicts*. A representative with DFO noted that there is little interaction between the recreational and commercial sectors, and while there are a few species that overlap (e.g., striped bass and groundfish), in general, the "interest is low or there is no recreational fishery" that exists (e.g., lobster and halibut). A manager with the Division of Inland Fisheries identified changes to regulatory and management plans as the general controversy initiator. The following table (table 3.2) describes the points of conflict raised by questionnaire responses, public forum searches, and conversations[4] with stewardship and angling groups:

[4] A representative for recreational fishing encouraged me to attend this year's Atlantic Outdoor Sport and RV Show at Exhibition Park to hear and see what Nova Scotian fishing groups were interested in.

Table 3.2 Conflict behaviour in Nova Scotia's recreational fishery. Specified by contacts and forum discussions

Conflict	Type (source of conflict behaviour)	Resolution Measures
Invasive species overtaking waters of another valued species	- Intrasectoral User Conflict - Intrasectoral Management Conflict	Invasive species initiative
Changing harvest limits or zones	- Intrasectoral Management Conflict	Consultation pre-implementation Awareness promotion
Illegal fishing	- Intrasectoral User Conflict -Intrasectoral Management Conflict -Intersectoral User Conflict	- Enforcement - Voluntary reporting - Education programs
Perceived lack of federal interest by fishers	-Intrasectoral Management Conflict	- Consultation involvement - Working relationship with provincial management unit
Ethically irresponsible fishing methods	- Intrasectoral User Conflicts - Intrasectoral Management Conflicts	- Restricting equipment (e.g., barbed vs. barbless or circle hooks) - Education programs
Fishers' desire for an allowed quota for highly valued species (notably, lobster and halibut)	- Intrasectoral Management Conflict - Intersectoral Management Conflict	Option is not on the table for such allowances currently.

Nova Scotia has two main advisory boards for recreational fisheries: Recreational Fishing Advisory Council (RFAC) and the Inland Fisheries Advisory Committee (IFAC). The RFAC holds annual meetings in each recreational fishing area (RFA) in the province allowing an opportunity for fishery players to come together and discuss each season's changes, in addition to expressing any concerns. This is often the contact point for fishers to learn of proposed changes and the first stage of communication. These meetings provide the opportunity for open discussion by bringing together both levels of government, members of the scientific research realm, conservation and stewardship groups, fishers, other stakeholders, and the interested public. This provides ample opportunity to both "gauge public perception" and make amendments before implementation occurs, and field concerns

in well-rounded and representative environment – as suggested by a manager with the Division of Inland Fisheries. The other advisory board, the IFAC, is comprised of provincially-focused angling groups that advise on issues raised by the sport fishers that they represent.

The Nova Scotia Fishing public forum searches and further discussions with fishing groups have indicated that there is little intersectoral user conflict between recreational fishers. However, discussion and debate have arisen particularly concerning the following:

- Invasive species – including those which are also designated a sport fish due to their proliferation in the waterways
    - One forum user commented (March 26th, 2013), "*This is a sickening situation. These two rivers have spawning Stripers and still contain some great Brown and Brookie fishing."*[56]
    - A representative for the recreational sector also confirmed that member groups are concerned with invasive species, particularly with those that affect the habitat of a more desired fish species.
    - An ongoing trend appeared with the angling and stewardship groups present at the Atlantic Outdoor Sport and RV Show – 'dwindling Atlantic salmon returns' and lack of stocking effort from DFO

[5] Referring to chain pickerel presence at the confluence of the Shubenacadie and Stewiacke rivers
[6] "Brown" and "Brookie" refer to brown trout and brook trout, and "stripers" refer to striped bass

        - The LaHave River Salmon Association has been adamant and vocal that discontinuing salmon stocking efforts will only serve to ensure the decimation of Atlantic salmon populations and actively encourage anglers to fish out of province if salmon is their target (Ware, 2014).

- Irresponsible fishing – including, but not limited to, releasing fish with wounds likely to result in mortality, or killing fish for no purpose
    - A thread from June 2014 titled "This is pretty sad and maddening!" describes finding dead fish hanging on a tree as a "*sick and stupid practice"*, a comment agreed upon by others in that thread.
- Illegal fishing/poaching – this could include fishing without a licence, fishing over the allowed catch, or fishing with unethical methods
    - Inland enforcement is under the jurisdiction of the Department of Natural Resources through Conservation Officers. The fishery system is not the sole responsibility of this department, and spatially distribution fishing areas makes enforcement difficult to keep on top of; thus, the public is tasked with voluntarily reporting illegal activity.
    - DFO's Fisheries Officers are also responsible for enforcement, but their interactions with recreational fishers are far fewer than those with commercial -fishers – DFO representative

Combatting invasive species is a part of the management approach of the NS DFA, and one tool that has been utilized to address this is designating a problematic fish species as a

target fish. This is the strategy that has been used for smallmouth bass in the eastern half of Nova Scotia, excluding Halifax County, recreational fishing areas (RFAs) 1, 2, 6, and Hants County in RFA 5 where bag limits are increased to 25 fish from either three or five in the other RFAs (NS DFA, 2015). Just as the province is split in half for smallmouth bass fishing so divided are the fishers themselves. Some individuals deem the smallmouth bass a nuisance and a hindrance to the salmon return efforts because they can easily dominate and destroy critical salmon habitat, while others consider it a great sport fish due to the exciting landing experience. Smallmouth bass opposition (also, chain pickerel) expressed concern, through public forums, that other users will further introduce the species to encourage that activity elsewhere. The provincial representative noted that the opposing group "wanted smallmouth bass managed as an invasive species throughout the entire province", instead of only half the province managing it as a sport fish and the other as an invasive species.

A recurring theme with the groups spoken with at the Atlantic Outdoor Sport and RV Show was the decline in Atlantic salmon returns. Although, the relationship with Inland Fisheries was considered to be "a good, working relationship", the same could not be said for the federal relationship. DFO was noted to be "disconnected", "evasive", by representatives who stated that they "needed an army to communicate". The NS DFA has a "close, good relationship" with the federal government which enables "good discussion", in addition to a memorandum of understanding for fresh water, but when it concerned Atlantic salmon, angling groups concentrated their frustration at DFO with whom the majority of salmon management lies.

The overall effort required by managers to limit conflict between recreational fishers is minimal and management conflict is primarily dealt with through consultations and a forum for

open discussion. It would not be sensible to include in the management plans a provision to combat interpersonal conflicts between anglers or between anglers and other users (e.g., boaters, swimmers, nature enthusiasts) – *user vs. user*. The exception to this is any instance where illegal activity takes place, and if it becomes a constant problem then management may want to address the source in the future. Thus far, this has not proven to an issue except with poaching and illegal fishing where other fishers are implored to report any activity. There is also a provision in the *Fisheries Act* that allows anglers to cross uncultivated private property to access recreational fishing areas. This may, in some instances, cause friction between property owners and resource users. In these cases, the province "works with RCMP and the Department of Natural Resources to educate anglers and property owners".

British Columbia

Background

British Columbia has a coastline that exceeds 27,000km and a land area of 952,263 km^2 that contains over 20,000 lakes and 750,000 km of streams Freshwater Fisheries Society of BC, 2013). As a result, British Columbia has active freshwater and tidal fisheries, each requiring a separate license. The province is split between nine provincially-managed freshwater management areas and 47 federally-managed tidal water recreational fishing management areas. The following table (table 3.3) outlines the species that are available for recreational pursuit (capture or catch-and-release):

Table 3.3 Freshwater and tidal recreational target fish species (adapted from BC Fish and Wildlife, 2015, DFO, 2014b, and DFO, 2015)

Freshwater Species	Tidal Species*
Chinook salmon	Chinook salmon
Chum salmon	Chum salmon
Pink salmon	Pink salmon
Coho Salmon	Coho Salmon
Sockeye salmon	Sockeye salmon
Rainbow trout	Steelhead trout
Steelhead trout	Cutthroat trout
Cutthroat trout	Brown trout
Brown trout	Bullhead trout
Dolly Varden	Dolly Varden
Bull trout	Pacific Cod
Lake trout	Pacific Tomcod
Brook trout	Pollock
Lake whitefish	Hake
Mountain whitefish	Greenling
Largemouth bass	Halibut
Smallmouth bass	Herring
Kokanee	Lingcod
Arctic grayling	Mackerel
Burbot (ling)	Northern anchovy
White sturgeon	Pacific sand lance
Black crappie	Pacific sardine
Northern pike	Perch
Yellow perch	Rockfish
Walleye	Sablefish
Goldeye	Sculpin
Inconnu	Salmon shark
Crayfish	Spiny dogfish
	Skate
	Smelt
	Sole/Flounder
	Strurgeon
	Albacore tuna Other tunas
	Wolfeel

*There is also recreational shellfish harvesting available in tidal waters, but for the purposes of this paper, shellfish was not considered.

There were 245,572 licenced tidal fishers and 338,563 licenced freshwater fishers (for the 2010 season, DFO, 2012) with an average expenditure per person valued at $1102 and $696 respectively (values are from the 2005 season due to changes in the measurement parameters, DFO, 2009). While this section made an effort to focus on the tidal region due to the large amount of differing fishing activity and groups in the area, it is evident that both freshwater and tidal fishing zones are lucrative.

Furthermore, specific attention was given to existing conflicts in the Pacific Halibut fishery due to fairly recent changes (2012) to the allocation distribution between commercial and recreational harvesters. Currently, recreational halibut fishers are allowed 15% of all TAC. This is an increase of 3% over the previously allowed 12% and was hard-lobbied for by recreational fishing representatives with the intent to continue applying pressure for greater access. Additionally, the commercial representative with whom I corresponded was representing the interests of the commercial halibut industry.

Conflict

The source of conflict on the Pacific coast was found to have initiated from any of the four types. Allocation disputes were not uncommon between fishers regardless of the sector (commercial or recreational) to which they associate with. Additionally, conflict was prevalent on behalf of fishers and advisory groups towards the federal management unit, which was largely attributed to the lack of transparency in decision-making and the process itself. The following table (table 3.4) will outline some of the examples provided by responses from contacts and items noted within the sportfishing public forum for British Columbia with particular attention to the halibut fishery:

Table 3.4 Conflict behaviour in British Columbia`s recreational fishery. Specified by contacts and forum discussions.

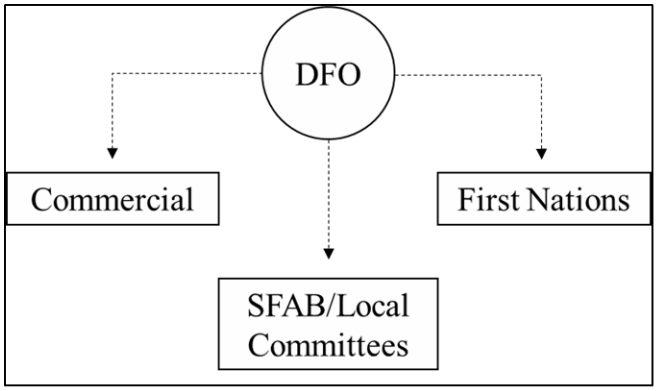
Conflict	Type (source of conflict behaviour)	Resolution Measures
Distribution of halibut allocation	- Intrasectoral Management Conflict - Intersectoral Management Conflict - Intersectoral User Conflict	Consultation
Restriction on fish size/weight (particularly at the end of the halibut season)	- Intrasectoral Management Conflict	- Experimental halibut licencing
Seasonal fluctuations or uncertainty (halibut)	- Intrasectoral Management Conflict	This is an adaption method to approaching TAC limits
Excessive by-catch in other capture fisheries	- Intersectoral Management Conflict - Intersectoral User Conflict	Ongoing research into halibut by-catch
Misplaced trust in decision makers	- Intersectoral Management Conflict - Intrasectoral Management Conflict	- Consultation - Communication
Lack of adequate collaboration between sectors	- Intersectoral User Conflict (noted by the commercial sector) - Intersectoral Management Conflict - Intrasectoral Management Conflict	Enhanced communication measures are needed between all sectors
Lack of public input	- Intrasectoral User Conflict	Fishers have to get involved in some way to make their wants known

The public forums have suggested that halibut fishers are displeased with the existing allocation and the process by which it has been executed. For example, a user called Jencourt stated on February 1st, 2015, "**15% is not enough** [sic] Sure hope I stop hearing so many of you uttering the words "It's not going to happen so get used to it".". This recurred throughout the thread and reiterates the claim from the commercial halibut representative that, "Participants will continually be trying to get a larger share and will seek political solutions by lobbying government.". Forum participants continuously noted that last year's (2014)

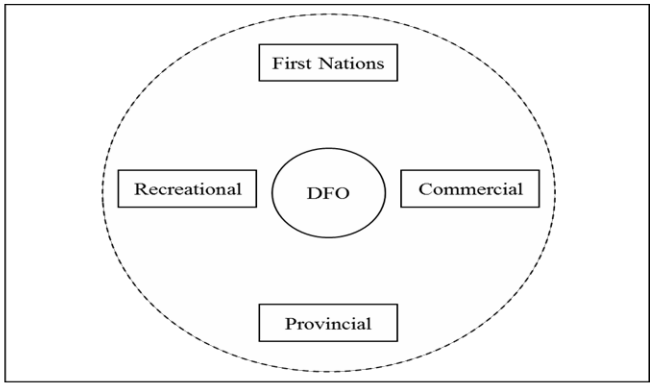
catch statistics indicated that the recreational sector left over 140,000 pounds uncaught from the total allocation to the recreational sector. However, in a show of support for efficient management (suggesting 'too-efficient'), user IronNoggin stated February 2nd, 2015, "Besides the background grumbling, there is very little to indicate to "management" that we require anything further." This uncaught number does not include the number of halibut attributed to catch and release (i.e., incidental) mortality rates which are intended to be a part of the initial allocation of TAC, as per the International Pacific Halibut Commission (IPHC); the authority under which unintended halibut mortality is managed for direct fisheries. A federal fishery officer stated that, "when the resource is bountiful conflict is reduced, but as stocks decrease then conflict increases once again." This makes sense when considering strictly available allocation terms; however, as many of the fishers dispute the overall inequality of available TAC between commercial and recreational halibut fisheries (and others on a lesser measure) it becomes more philosophical and emotionally- charged, thus blurring the sensibility of resource use. The local recreational representative commented that, "many times I have had to "jump up and down", raise my voice or pound my fists on the table to get the ever changing managers to get with the program and not be making back room decisions or side deals that de-rail the process." This sentiment was echoed by the commercial representative, "If allocations are to be changed it has to be done through defined, principle-based process that are open and transparent and not through behind the scenes ad hoc political decisions." Conflict minimisation efforts are heavily based in consultative and communication processes, as noted by the federal fishery officer, but may also separate fishers through spatial or temporal means. Halibut fishing areas have been designated by the IPHC; area 2B covers the entire coast of British Columbia and is the region to which all Canadian fishers are limited, regardless of the sector; however the representative for commercial halibut noted that

recreational and commercial harvesters tend to fish in different areas of the coast. There is evidence that uncertainty is prevalent in the halibut fishery and a precautionary and adaptive approach is warranted as available catch statistics are obtained regularly from commercial fishers. However, without communicating the importance and necessity of accurate catch reporting there will not be an adjustment to (or merging of) the views held by each sector and the perception of inequality will remain.

The following diagram (figure 3.1) summarizes the communication processes, as described by a DFO fishery officer. Complaints between the commercial and the recreational sector are first handled by initiating meetings between commercial participants, then with the Sport Fishing Advisory Boards (or local committees), and also with First Nations to ensure that the provisions for food, social, and ceremonial continue to be met and/or are unaffected by the issues raised by complaints. Alternatively, roundtable meetings may be set up to address issues at the local level. These methods differ in the level of inclusion of cross-sector discussion, a point also raised by the commercial halibut representative with regards to management plans where the recreational sector has the opportunity to review and offer input in the planning process of the commercial sector, but this allowance is not reciprocated for the commercial sector.



Individual Complaint Communication Process



Roundtable Communication Process

Figure 3.1 Individual and collaborative communication processes.

The localized recreational representative noted that the role of the stakeholder holds more influence than previously known. This has both positive and negative aspects to it. On one hand, it has the potential to lead to more meaningful dialogue between parties by allowing those with a vested interest in the industry an opportunity to air their specific concerns, in addition to presenting the values of each sector for mutual understanding, therefore resulting in increased cooperation. On the other hand, it also enables directives to become convoluted with different interests, and this is the most likely scenario in a common pool resource.

There is, and likely will always be, animosity between non-government individuals and government officials and within the recreational fishery is no exception. The individual fishers often question regulatory restrictions, but also lack the fundamental legal and scientific basis on which they are based. It is highly encouraged, among fishers, representative, and government to become involved in the consultative process for many reasons, but a major factor is that by enabling the voices of all actors it encourages stability through collaboration. Furthermore, active involvement promotes

proactive rather than reactive measures due to the knowledge of changes beforehand and incendiary reactions can be diminished. A conspicuous problem arises from the state of the department in that the views upheld are either (a) outdated or (b) overly cautious. The former details the view of an experienced sport fishing representative and the latter a common opinion on the public forums, particularly when referencing the leftover allocation of halibut. Additionally, recreational representatives have noted the struggle to maintain relationships with managers due to the turnover rate in the department, a fact corroborated by DFO's fishery officer's admission that staffing levels are not stable. This frequently leads to stalls in the communication process before final decisions are fully worked out between parties.

The overall rate of cooperation between the recreational sector and other fishery players is seen as relatively adequate, but recreational representatives call into question the structure of DFO's communication and subsequent decision-making process. In general, the process is slow, but is further viewed as inefficient for the needs of a system with as much uncertainty as a fishery. Structured decision-making and adaptive management plans have been encouraged for use in fisheries by FAO (2012) because they provide the opportunity to adjust plans rapidly . As the process currently stands, potential changes are proposed based on data derived from the previous year's (or years') experience and suggestions, submitted for public consultation, further deliberated (multiple times), and then submitted to the Minister for approval. The levels of bureaucracy are not conducive to a process designed to enhance effective momentum in spite of uncertainty. This does not expressly imply that the department is ill-equipped to handle an emergency situation; the *Fisheries Act* allows for quick turnaround decisions when handed down by the Minister, which is based on valid reasoning from the managing body in the

region. Such a situation is not the model for which adaptive processes are intended.

Overall, conflict presents itself in both user and management conflicts, but that seen within user conflicts is primarily allocation disputes which ultimately resonates with the management plan and not the other fishers. The conflict present between recreational fishers is related to differing philosophical views and cannot logistically fall under the conflict management methods used by managers and unless the line of legality is breached is not subject to intervention. That said, highlighting the interests of the department, in addition to the communicating the reasoning behind decisions may encourage individual fishers to be become involved in the process and thereby promoting mutual understanding between management and the individual. For example, utilizing the precautionary approach is almost a default management measure from all of the managing units or associated boards/committees; however, some fishers have taken to public forums to suggest that management measures are too cautious and that restrictions are unfairly shunted onto the recreational sector to favour the commercial sector.

Framework Demonstration

An example of conflict proposed by one of the representative groups at the Atlantic Outdoor Sport and RV Show was related to the lack of a recreational lobster allocation. This example was used as a demonstration[7] to using the framework in active conflict.

[7] This is **not** a representation of actual resolution approaches, or a suggestion of how it should be handled, but merely an example of how the framework could be used in this situation

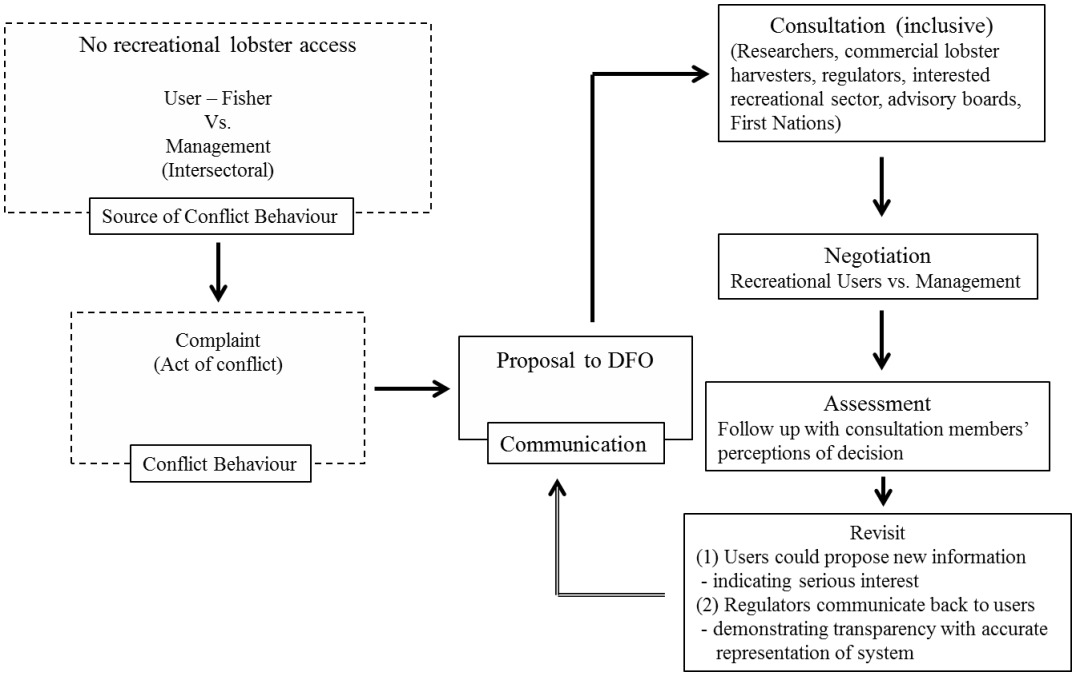


Figure 3.2. Framework demonstration for recreational lobster access.

For this situation, recreational fishers stated that a small recreational harvest (i.e., to satisfy the ordinary personal consumption value) "should be a reasonable request" referencing past overabundances in the commercial lobster harvest[9]. However, lobster is a valuable export and commercial fishers have a limited season with harvest restrictions in place. In spite of regular stock assessments, there is also market research to be considered and that results in uncertainty for the fishery. Conflict for this situation is between the recreational users and federal lobster managers. Once the users have acted on making their wishes known, regulators have to communicate effectively the limits affecting their decision. At this juncture, the users could retreat, but they are likely to remain disgruntled, thus by continuing an open dialogue with the department and the users (or representatives) it builds a mutual relationship that can sustain debate between factions.

Chapter 4

Discussion and Conclusions

Discussion

The two case studies considered two entirely different fishery dynamics. British Columbia has a busy tidal and offshore fishery with varied interests, availability of several species, and differed management plans complete with numerous involved individuals on all fronts (with the exception of the provincially-managed freshwater fisheries). Whereas, Nova Scotia's inland fishery has little to no overlap in commercial-to-recreational species interests, a nearly non- existent coastal/offshore recreational fishery, and a small management unit. In spite of these operational differences, the sources of conflict largely remained the same – allocation and grievances against the management group. Incidentally, the measures for countering conflict were also similar; however, Nova Scotia has far fewer individuals representing the interests of recreational fishers, but the province also does not have as many lucrative and available species obtainable for recreational harvest. The tools for managing conflict, in both study areas, were relatively generic processes that can be used in most settings because they are consultation and communicatively based.

Both provinces present a number of user-management conflicts, with British Columbia presenting both intersectoral and intrasectoral management conflicts for a greater proportion of fishers. Neither province exhibited any truly unique episodes of conflict that required specialized treatment. The FAO (2012) refers to a combined integrated policy with traditional stock management approaches to address the increasing incidences of society's call for conservation measures to preserve the integrity of the entire system, and indeed British Columbia does employ a system of integrated management plans. These are well-suited to a

region with a lot of ongoing activity, but are not as necessary in less busy systems because fewer players decrease the number of conflicting values. Furthermore, both provinces used stock enhancement methods for certain species, notably trout species, to ease allocation disputes, but in tidal systems this can be less precise than when used in a closed lake.

DFO has been described as being "commercially-biased" by representatives from the commercial and recreational sectors in British Columbia. The national mandate insists that recreational fishing is a valid and economically reasonable use of aquatic resources; however, the commercial fish industry is responsible for $2.31 billion (2013 values of freshwater and saltwater fisheries, DFO, 2014a) in comparison to $8.3 billion recreational fishers contributed to local economies (2010 values, DFO, 2012). While it is true that commercial fisheries are a greater threat to conservation by measure of equipment capabilities and the sheer quantity of fish captured (866,873 metric tonnes in 2013, DFO, 2014a) that warrants a more intensive monitoring procedure, it does not explain the level of inequality for catch reporting.

As a result of simplifying the framework for recreational fisheries conflict, the source of conflict can be identified based on the type of conflict that it fits. The adapted framework is less stringent than Arlinghaus' and acknowledges that communicating conflict may differ depending on the parties involved. However, in effect, though the process may change it remains a communication stage with the intent to relay and resolve the issues at play.

Representatives from both provinces highlighted consultative measures as the primary tool for conflict resolution or pre-conflict minimization. However, with these measures already used as a pre-cursor to conflict events and fishers still demonstrating dissent it posed a problem of long-term efficacy in continuing with communication as the primary method of active resolution. The intent was to deliver a framework that could be applied, not only to

regional studies, but, as a general tool for addressing the prevalent circumstances of conflict (as per research question four), and for this I proposed a loop that would help address previously experienced conflict. The addition of this loop can be considered a "communication monitoring cycle" and was influenced by Murshed-e-Jahan's (2009) finding that the behaviours of conflicting parties changed and reflected managed conflict when re-assessed after a series of communication strategies. I argue that this same response could come from implementing the 'loop' in communication processes, particularly with respect to addressing prevailing issues.

Conclusions

In general, adhering to a framework provides a method to follow through a series of steps to lead to a desired outcome. The influence of this study's adapted framework on conflict and further analyzing conflict comes in the identification and communication cycle. By identifying the source of conflict through its type, it means that conflict managers start the process with an understanding of the relationship that needs addressing. There are some instances of conflict that do not progress beyond 'feeling upset' at a regulatory change (for example) but, as the examples in chapter three have demonstrated, it is more likely that this distress results in fishers making their dissatisfaction known in some way. This could be to a relevant person, like an advisory board or committee member or directly to a management office. Alternatively, others may take their complaints 'public', but this may not be addressable by the managing unit without official notification of an issue. In the case study examples, the complaint process constituted as the 'act of conflict' because there were no extreme examples like gear or line sabotage that is sometimes portrayed in the media. Ideally, the conflict manager would have a best approach for preliminary communication that

corresponds to the source of conflict. For example, handling conflict between users would require a fundamentally different approach than that between managers and users, and was noted in the framework as a "method differs" pathway to communication. The regional case studies exhibited similarly persisting conflicts with regards to resource allocation (user-management conflict). The addition of the communication monitoring cycle can be used to prompt meaningful dialogue on a regular basis to promote understanding and trust between conflicting parties.

The long governmental consultation process and open discussions means that conflict rarely grows beyond the source point, and acts of conflict are generally limited to presenting grievances in the advisory process or contacting a fisheries representative. As a federal fishery officer indicated, "there is room for improvement" in the conflict resolution process, noting that staff level changes are making it increasingly difficult for DFO to be involved in the same capacity they have been in the past. This follows in provincial departments where only a few individuals are involved in management planning. As a result, the governing process in Canada may not be favourable to the cyclic framework addition because transitioning to a time-intensive, but proactive, tactic requires time and effort, in addition to establishing or maintaining cooperative relationships between parties. Thus, while applying a cycle of re-communication to the framework because it can result in a more meaningful resolution process between parties because it merges dialogue between fisher and management while actively affirming inter-party consideration, I do not perceive it to be ready to be employed as a general tool. As the current system stands today, the process is not adequate for minimizing the sources of conflict behavior because of the politicization of fishery decisions and too great of a focus on the communicative process as resolution and not a part of the mitigation method. It is

also understood that, although not directly discussed with participants, there are a number of external stakeholders with an influence on the decision-making process, including forestry, mining, and agriculture. These external allocation conflict types require an inclusive, but also informing, communicative process to consider the base interests at play between parties. There are many frameworks for conflict published, and Arlinghaus' fits the scope of recreational fisheries if you are considering conflict from the originating point – the fishers. Any fishery, but particularly a recreational fishery, is entrenched in social value systems, thus approaching from a strictly science-based method alienates the individuals taking part in the activity increasing the potential for non- compliance.

This study did not receive many examples of occurring *user vs. user* conflict, but it has previously been mentioned that amending management plans to cover inter-personal user squabbles in the field would be a drain on resources. Granted, there are educative programs in place to mitigate the type of minor conflict that occurs from a misunderstanding between users and/or their values. In addition, it could not be expected to learn of *management vs. management* conflicts because fisheries management is jointly managed by two governmental departments that are not likely to describe any frustration that they may have with one another.

Organizations like FAO are leading the way of detailing the methods for global fisheries to responsibly counter environmental (and often anthropogenically-caused) issues. Among these recent less-anthropocentrically focused trends are precautionary and ecosystem-focused approaches that are changing the trajectory of traditional single-species management. Berkes (2012) suggested that the use of ecosystem-based management or ecosystem-based fisheries management should be a revolutionary process rather than one that evolves out of necessity. Van Poorten *et al.* (2013) considered that regulatory processes should only be

considered ‘successful’ if harvest levels decline periodically. Fisheries management decisions are based in scientific inquiry that provide an estimate of sustainable harvest levels (Beamish *et al.*, 2006). These views suggest that it can be expected that necessity will force an ecosystem-focused approach if not proactively initiated, and in fact, the province of Nova Scotia has been working on a new strategic management plan that would incorporate some of these features for inland fisheries management, whereas currently an ecosystem-based approach is not utilized. Caution dictates that catch allowances and/or access to the resource will be further restricted. As it was already noted, the reduction of access is a primary source of conflict between users and managers. If this trend continues, as science suggests it must to be ‘sustainable’ then it may follow that conflict will prevail at all sources of conflict (i.e., intrasectoral or intersectoral, management and user). Both provinces actively use a precautionary approach, particularly with catch allocation, and adaptive management could be seen in the Pacific halibut fishery where decisions were ‘to be determined’ depending on the information gathered pre-season and also during the season where changes could be specified if TAC is being approached. When considering Charles’ (1992) notion that policy goals are often directed at either ‘improving efficiency in harvesting and management’ or ‘allocating access to the resource’ then having eco-centric approaches embedded in the underlying policy addresses enhanced efficiency, often through allocation management. Policy-level amendments will be important in achieving a recreational fishery with ensured continued productivity. In following, the merging of policy directives (as seen in figure 2.3, chapter 2) for regional differences in users and stakeholders will address the particular needs of a regional fishery to fulfil that achievement.

Future Considerations

In the future, if this research was expanded, I would likely make an effort to include the direct perspectives of the recreational fishers. It was necessary to modify Arlinghaus' conflict framework in this study because the conflict examples were provided by representatives of fisheries groups. As fisheries policy is redefined to reflect the sustainable practices, advocated by leading fisheries researchers and organizations like the FAO, it will be more important than ever to confer with the participating fishers to encourage compliance with future changes (FAO, 2012). Canadian statistical trends have shown that the average age of fishers has been increasing over the years (DFO, 2012). This trend suggests that Canadian fishers are long-term participants; thus, involving them in the process will be key not only in fostering understanding to the changing process but providing conflict researchers with a candid representation of the timeline of changing views from active participants.

Additionally, because fisheries are so diverse, this research could be augmented by addressing conflict within the same type of fishery in different regions (e.g., examining the approaches used for the same species in different regions, like salmon fisheries on both coasts) or examining the fundamental differences between managing different fisheries (i.e., differing species fisheries) in the same regions.

Given the opportunity, I would also expand upon the experiences of recreational fishers with other fisheries, particularly with Aboriginal fisheries. The provisions for food, social, and ceremonial purposes are heavily ingrained into the management plans each province and federally. Additionally, it was suggested by a Nova Scotia localized fishing organization that collaborating with First Nations will provide the necessary upward momentum to the agenda to bring wild Atlantic salmon back to Nova Scotia rivers, or at the very least open the discussion

with the federal government. The major decline of salmon returns and lack of stocking effort were the foremost source of conflict raised at the Atlantic Outdoor Sport and RV Show, thus addressing the relationships required to pursue meaningful dialogue concerning this potential action would be beneficial, not only to the cause but for considering the environmental impacts of remediating river systems.

Going forward, I hope this work will engage managers in preparing more meaningful and consistent dialogue with fishers. If local fishing groups are seeking higher value fish elsewhere, like many in Nova Scotia do when they choose to plan a salmon fishing trip to New Brunswick because this province has poor water quality that cannot support a desired species like Atlantic salmon, then that is local revenue trickling out of community member's pockets. Recreational fishers have been identified as large contributors to local economies so the effort to maintain meaningful dialogue between is not unfounded and the impact is on a greater number of people than just those purchasing licenses.

To any future researchers considering the use of public online forums to supplement their findings, I would advise caution and encourage you to seek out repeated notions. It is far too easy for individuals to release anger in an anonymous forum, but I would argue for the validity in considering an opinion that has repeatedly appeared and actively debated. I would further advise anglers to become involved in the consultation process and your regional advisory committees. That is the opportunity for individual anglers to directly correspond with regulators in a controlled setting.

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Appendix

The following questionnaires were submitted to participants by email or used as a telephone script as they appear.

Questionnaire – **Commercial Fisheries**

In text boxes simply click the box to begin typing and for check boxes use your mouse to click the box (an x will appear as follows ☒).

1. What is (are) the most common causes of conflict between commercial and recreational fishers?

Click here to enter text.

2. Do your fishers often come into contact with recreational fishers? Yes ☐ No ☐

   2.1. Is it direct or indirect contact? Please describe.

   Direct ☐ Indirect ☐ Both ☐

   Click here to enter text.

   2.2. Please describe the average interaction experience as negative, neutral, or positive.

   Negative ☐ Neutral ☐ Positive ☐ Does not apply ☐

      2.2.1. Is your rating based on the individual fisher(s) actions or due to circumstances related to the management of recreational fisheries? Please describe.

   Fisher actions ☐ Recreational fisheries management ☐ Other ☐

Click here to enter text.

3. In the event of conflict between your fishers and recreational fishers what is the protocol to manage these interactions?

Click here to enter text.

   3.1. Do you consider the current methods adequate considering the frequency and intensity of conflict commonly experienced? Please explain your answer.

   Yes ☐ No ☐ Click here to enter text.

4. Are there individuals from your fishery involved in establishing the management goals in the recreational fishing areas that are related to or have overlapping boundaries with your own?
   Yes☐ Click here to enter text.

   No ☐

4.1. If you answered **yes** (to *question 4*), is the level of involvement adequate for the needs of your own fishery?

Yes ☐ No ☐ Click here to enter text.

4.1.1. If you answered **no** (to *question 4.1*), which aspects of recreational fishing management would you like to be more involved in and/or collaborate management with to achieve the desired results?

Click here to enter text.

4.2. If you answered **no** (to *question 4*), would you like to be more involved?

Yes ☐ No ☐ Click here to enter text.

4.2.1. If you answered **yes** (to *question 4.2*), which aspects of recreational fishing management would you like to be more involved in and/or collaborate with to achieve the desired results?

Click here to enter text.

5. Are there methods that you employ in your own fishery that you would like to or have suggested to recreational fisheries managers to implement, to improve interactions between all users of the resource?

Click here to enter text.

6. Are there changes you would like to or have suggested to minimize the impacts of recreational fishing on commercial fishing?

Click here to enter text.

7. Is there anything relevant that you would like to add, particularly concerning conflict between your fishery and recreational fisheries?

Click here to enter text.

Questionnaire – Recreational fisheries management

1. What management measures are currently being employed?

1.1. Have any of these measures been changed in any way in the recent past?

1.1.1. If yes, what are the changes and are these changes considered significant?

1.1.1.1. Have there been any incidences of conflict that have arisen due to these significant changes?

1.1.2. If yes, have these changes taken place taken place at community-level management, ecological-based management or other?

1.1.3. If yes, has this increased or decreased the level of cooperation between management groups in the region?

1.2. How is the potential for conflict addressed before any specific conflict arises?

1.2.1. What is the protocol to manage the situation after a conflict event?

1.2.2. Do you consider these methods adequate for the most common situations?

1.2.2.1. Please explain your answer.

1.3. What type of cooperation is required to effectively administer this type of management?

2. Please describe the management relationship between the recreational fishery and other fisheries and/or fishery user groups in your jurisdiction.

2.1. Is this impacted in any way by the management of the recreational fishery itself?

3. Please describe the management relationship between the recreational fishery and non-fishery user groups in your jurisdiction, such as birders (or other nature seekers), boaters, various conservation groups.

3.1. Is this impacted in any way by the management of the recreational fishery itself?

4. What type of expertise (and specific disciplines, such as biology, economics, etc.) is employed in the decision-making process by the primary management team for the recreational fishery?

4.1. In decision-making processes, are outside opinions or advice required and/or deliberately sought out?

4.1.1. If yes, please describe the reason (i.e., expert technical information/advice, community response, socio-cultural awareness, political…).

4.1.2. If no, please describe the reason.

5. Are you familiar with any of the following approaches in fisheries management:

- Ecosystem approach
- Structured decision making
- Precautionary approach
- Participatory approach

- Adaptive management
- Aquatic stewardship

5.1. Are any of these approaches employed in managing your recreational fishery? Which ones?

5.1.1. If yes, please indicate the approximate time range that *each* approach has been employed.

5.1.2. If yes, have there been any noticeable changes, since employing *each* approach, in the response from the fishers and/or other groups that interact with the resource?

5.1.3. For those approaches not currently used in your recreational fishery, are there plans in the near future to introduce these approaches to your fishery? Please give details for each.

6. Are there any unique management attributes that you employ in the management of your recreational fishery? For example, community-based management areas, education, training, and/or allowance programs for specific users, or areas designated to research.

7. Is there anything that you would like to add?

Questionnaire – Recreational fisheries (non-governmental position)

1. Please describe your role (as a representative for your organization) regarding recreational fishing in your region.

2. In your position, have you been active in any part of the recreational fishery management plan process for your province or fishing area?

2.1. Are you aware of any significant changes to the management plan in the recent past?

- If yes, were you and/or your organization a part of driving or opposing these changes?

2.1..1. Have there been any incidences of conflict that have arisen due to these significant changes?

- Have these changes impacted the level of cooperation between your organization and management groups in the region? If yes, in which ways?

2.2. Have you had to communicate with fishery management groups regarding conflict experienced by the fishers for which you represent?

- Is there a protocol for addressing conflict experienced by fishers?
- Is the level of cooperation between your organization and management groups adequate for the conflict episodes experienced by recreational fishers?

3. Please describe the relationship between your position in your organization and the recreational fishery.

   3.1. Is this relationship impacted in any way by the management of the recreational fishery itself?

4. Are you familiar with any of the following approaches in fisheries management:

   - Ecosystem approach
   - Structured decision making
   - Precautionary approach
   - Participatory approach
   - Adaptive management
   - Aquatic stewardship

   4.1. Have you or your organization been involved in advocating for and/or the implementation of any of these approaches in the recreational fishery? Which ones?

   4.2. Have you or the fishers in which you represent noticed significant changes in the fishing experience, the interactions between recreational fishers, or the interactions between fishers and other fishery groups?

5. Are there any unique management approaches that you and/or your organization wish to put forth as a prospect for the future? For example, community-based management areas, education, training, and/or allowance programs for specific users, or areas designated to research. Please describe them.

6. Is there anything you would like to add?

Atlantic Outdoor Sport and RV Show 2015 – Informal Script

1. Introduction to myself and this project

2. “Does this organization have a role in Nova Scotia’s recreational fishing scene?”
3. “Is there anything you can tell me about conflict related to recreational fishing for ‘*the area that the particular organization’* represents?”
4. I also spent time listening to the conversations between fishers passing by and organizations present at the show.