

**Planning for Fisheries Co-Management in Canada's Northwest
Coast: The case of Prince Rupert, B.C.**

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Abstract

This major paper explores co-management in Prince Rupert, B.C., between active fish harvesters and Fisheries and Oceans Canada (DFO), the government body responsible for fisheries management. By analysing a combination of DFO policies, Integrated Fisheries Management Plans and eleven interviews conducted between March and April 2019 with fisheries participants in Prince Rupert, this paper explores how co-management is currently configured in the Canadian context and how the fisheries management system impacts access to seafood for local residents in Prince Rupert. Findings suggest that trust between fisheries participants and managers has eroded over the last several decades, largely due to a breakdown in communication between active fish harvesters and DFO, and the loss of visible scientific monitoring on the part of DFO. Barriers to improving co-management were identified, including inequity in the licensing and quota system (leaving active harvesters disempowered and economically vulnerable) and an inaccessible and inadequate advisory process. Meanwhile, the current management system presents significant challenges to improving seafood access for local residents, such as fishermen's indebtedness to large processors, an export-oriented supply chain, and complex, unsupportive regulations for local sales; these factors have eroded connections and benefits to communities from the fishery. What emerges from this analysis is that active fish harvesters and managers seem to be operating under divergent assumptions of how to participate in co-management, *who* should participate, whose knowledge system is prioritised and what relationships between competing user groups with different legal and historical ties to the fishery should look like. Despite these conflicts, participants seem willing to work towards a system of co-management that is effective and just. The paper concludes with recommendations on how to move forward with fisheries co-management that can help to empower active fish harvesters, and draws a tentative link to how co-management could improve local seafood access.

Keywords: Fisheries co-management, Prince Rupert, B.C., Local seafood access, Common-pool resources, Small-scale fisheries

Foreword

This Major Paper is a contribution to and culmination of two years of study in the Master in Environmental Studies (MES) Program at York University. In this section I will briefly outline how the research carried out for this paper contributes to my Plan of Study (POS), which is the guiding document of my MES program. This research paper connects most closely to components one and two of my POS, although there is some resonance with the third component as well.

Community Planning

Exploring participation in planning within a resource-dependent community through co-management in its key resource sector – fisheries – has allowed me the opportunity to learn how communities experience 'participation' in practice. The literature on both community planning and co-management emphasize the necessity of involving the people most affected by policy and development in decision-making. This paper examines the prescriptions of that literature in practice to learn how people respond to formal participation and co-management arrangements, and explores what participation might look like if designed from the participants' perspective. Through this research, I have also gained a deeper understanding of how critical inclusion and participation is for both the health of the resource being managed (in this case, fisheries) and the communities that depend on that resource.

Two of the specific learning objectives for this area centered on understanding the Canadian policy and development landscape on fisheries management as food planning. Analysing the case study of fisheries management in Prince Rupert, and more broadly, B.C., I was able to examine the evolution of fisheries management policy to date, and learn where the

needs and opportunities for further evolution exist. Most importantly, I have also learned where the gaps are – for example, in the failure to value fish as food within the management discourse.

Community Food Systems

The site of the case study that this paper explores is Prince Rupert, which is a remote coastal city in northern British Columbia. Although not the most central city, Prince Rupert is a fascinating place to study both food systems and development in a resource-dependent coastal community. My learning objectives in this area were to understand how fisheries connect to food systems and how global economic and political processes affect access to local food. Through the research I was able to examine fishery supply chains, explore issues of power and privilege and learn about challenges and opportunities to re-embed fish in coastal community food systems.

Justice and Decolonization

Questions of justice emerged throughout the research process and allowed me to explore how political and economic trajectories within fisheries management have privileged access to fish for certain users over others. Discourses around 'rights-based fisheries management,' privatization, dispossession, and conflict between Indigenous and non-Indigenous fishermen competing for access to a shrinking resource pool underlie many of the themes that are discussed in this paper. There are however, many more questions to be explored on the themes of justice, decolonization, fisheries and food access.

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List of Abbreviations

- DFO – Fisheries and Oceans Canada (formerly Department of Fisheries and Oceans)
- EEZ – Exclusive Economic Zone
- FOPO – House of Commons Standing Committee on Fisheries and Oceans (Fisheries and Oceans/ Pêches et des Océans)
- TAC – Total Allowable Catch
- ITQ – Individual Transferable Quota
- IFMP – Integrated Fisheries Management Plan
- AFS – Aboriginal Fisheries Strategy
- ATP – Allocation Transfer Program
- PICFI – Pacific Integrated Commercial Fisheries Initiative
- CFE – Commercial Fishing Enterprise
- AAROM – Aboriginal Aquatic Resource and Oceans Management program
- NIFI – National Indigenous Fisheries Institute
- SCC – Supreme Court of Canada
- MSY – Maximum Sustainable Yield
- EBM – Ecosystem-Based Management
- PA – Precautionary Approach
- SSF – Small-Scale Fishery/ Small-Scale Fishermen
- FAO – Food and Agriculture Organization of the United Nations

Chapter 01: Introduction

'Canada's Pacific Fisheries are in a crisis.' Statements to this effect are common in introductions to policy documents and government reports about Canada's west coast fisheries in recent decades¹. Fisheries as they are currently managed, especially on Canada's west coast, can legitimately be considered to be in a crisis: existing fishermen are aging and close to retirement, while the introduction of the individual transferable quota (ITQ) system has led to an unprecedented privatization of a once-commonly owned resource. Speculation and export-orientation of the industry have created high barriers to entry for a potential next generation of fish harvesters, leaving the small-boat fleet² in danger of disappearing (Ecotrust Canada and T. Buck Suzuki Foundation 2018). On the other hand, research on small-scale fisheries (SSF) shows that SSF tend to contribute directly to food security, especially in the Global South, and distribute benefits from the fishery to adjacent communities (Berkes et al. 2001; St. Martin 2007). Corporate concentration and industrial fishing are not only draining coastal communities of their historic social and cultural relationship with fish as both a key food source and driver of local economic activity, but also represent a highly ecologically unsustainable method of wild fish harvesting (Levkoe, Lowitt, and Nelson 2017).

The underlying problem is as old as the industrialization of the fishery: how to equitably and sustainably manage a valuable, scarce resource that is invisible, does not respect political boundaries and is subject to lifecycles and ecosystem interactions that are poorly understood. The need for solutions to the questions of fisheries management is becoming ever more significant, as fish stocks continue to collapse globally with little agreement on the cause

¹ Some examples: "Tangled Lines" A report of the Pacific Salmon Revitalization Plan Review Panel (Canada and BC 1996) and "Turning the Tide: A New Policy for Canada's Pacific Fisheries," A report of the Pearse Commission on Pacific Fisheries Policy (Pearse 1982)

² 'Fleet' refers to a collection of vessels

(Ferguson-Cradler 2018). Fisheries, and the ocean ecosystems that they are a part of, are critical to earth's biodiversity and ecosystem functioning. In addition, wild capture fisheries yield around 80 million tonnes of fish every year (FAO 2018), about half of which is contributed by small-scale fishermen³. Although small-scale fisheries are difficult to define, Gibson and Sumaila (2017) place SSF on one end of a spectrum, associated with factors such as smaller boats, lower-intensity gear, lower yields and greater ties to coastal communities than larger-scale operations on the other end of the spectrum. Small-scale fishermen are especially important in contributing to food security; two-thirds of fish produced for human consumption is provided by the small-scale sector (FAO 2015). Small-scale fisheries are also a critical source of healthy, wild protein for some of the world's most marginalised coastal communities (FAO 2015; Berkes et al. 2001). Collapse of key stocks of food fish has devastating impacts on marine and human communities. Yet with the current state of commoditization of the fishing industry, the economic incentive to overfish is strong, and the consequences typically too far removed from the industrial operators to induce self-regulation (Pauly et al. 2002). Thus, the need to create management systems that can prevent overfishing, protect ocean ecosystems and ensure enough food access in perpetuity for coastal communities, especially rural, remote and indigenous coastal communities, is urgent.

1.1 Connection to Prince Rupert, British Columbia

My introduction to the complex world of fisheries and its connection to food systems within coastal communities came through an internship with the non-profit organization Ecotrust Canada in the summer of 2018. Working with the then new North Coast Innovation Lab, a

³ Although 'fishermen' is not a gender neutral term, it is used throughout this paper because it is the term that women in the fishing industry voted on in 1996 through a vote held by the United Fishermen and Allied Workers Union (UFAWU). Since this paper is concerned with fisheries in BC, this term seems appropriate given that Canadian women in the sector prefer it. All of my interviewees for example, men and women, used the term 'fisherman' to describe themselves and their fellow harvesters, regardless of gender.

project of Ecotrust Canada that aimed to bring social innovation principles and practises to a rural/ remote context, I was hired as a researcher to investigate a question that a significant proportion of the Prince Rupert community was concerned about: why did residents of a coastal fishing community have such limited access to locally caught seafood, and what were some local, small-scale projects that could address this problem? Although not the focus of this study, the results of that project were published in a report on Ecotrust Canada's website and are publicly available⁴.

In the course of conducting that research, however, I heard repeatedly, usually from fishermen, that the questions I was trying to answer were rooted in problems that went beyond what small-scale, local projects had the capacity to solve; that I needed to look higher up, at the policy and regulatory realm if I wanted to fully understand why coastal communities were becoming so distant from the significant amount of fishing being done along their coasts. This project is therefore an attempt to follow the advice I was given by small-scale fishermen in a small coastal community, to understand what is happening to what was once a critical food source for coastal people all along the Pacific coast.

This story of course is not unique to Prince Rupert, the Pacific coast or even Canada – the 'urbanization of the fishery resource' as it was referred to by the Standing Senate Committee on Fisheries and Oceans (Canada 2005, 32) is a complex phenomenon rooted in factors such as globalization (Arbo and Hersoug 1997; Kramer et al. 2017) and colonialism (Harris 2008). Bavington pinpoints the beginning of this disconnection process further back, to the start of Western industrialization, which necessarily had to force a change in traditional relationships between humans and fish in order to transform the ocean into a productive, stable and predictable

⁴See *Growing the Local Economy for Fish and Marine Products in Prince Rupert* (Ecotrust Canada 2018)

factory and fishermen into professionalised fish harvesters that worked within a controlled industrial fish-producing system to produce a product for sale (2010).

The increasingly industrialised fishery, already oriented towards maximising profit through a commoditised export fish trade, leaves little room for small coastal communities to access and thrive off of what was once a key local food source (van Mulekom et al. 2006). Coastal communities around the world are feeling this drain; it is felt more acutely in global South countries where subsistence fishing has traditionally been a critical source of food and livelihood for the most marginalised members of society (Kent 2003) – but it is also being felt in industrialised Global North countries, for many of the same reasons (Neis, Jones and Ommer 2000).

1.2 Introducing Co-Management

Research on the management of common-pool resources suggests that neither central control nor privatization of a resource as complex as fisheries is likely to be effective over the long term – and more importantly, that there exists no panacea that will be effective for all fisheries or all common-pool resources (Ostrom 2010). Scholars propose the concept of community based management or management between communities adjacent to the resource and central governments, known as *co-management*, as likely to provide greater opportunity to succeed. At the very least, community-based management or co-management provides the opportunity to collaborate and incorporate critical local knowledge into management systems, while providing a mechanism for long-term cooperation and adaptation (Pinkerton 1989; Berkes 2009). Canada's west coast fisheries are a prime example of experimentation with several different management methodologies, from open access to centrally controlled to the most recent

introduction of elements of privatization (Swenerton 1994). In policy and planning documents, co-management has also recently become a key component of fisheries management discussions.

Research on co-management mirrors trends in participatory governance of natural resources more broadly; this has taken place from both bottom-up and top-down trajectories (Berkes 2009). As central governments face a reduction in resources and capacity due to neoliberalization, the need to devolve management responsibility for natural resources to communities adjacent to the resource has become necessary (Wilson 2008). In a parallel, arguably linked trajectory, publics around the world have been pushing for a greater role in management and decision-making (Chhotray and Stoker 2009). The justification for this is age-old: the idea that those who live closest to and rely on the resource for culture and livelihood are best equipped to take care of it (Berkes 2009). The push to recognise local ecological knowledge and traditional indigenous knowledge as valid alongside Western conservation science is driven by the acknowledgement that the dominant scientific paradigm of natural resource management has failed to deliver the ecological benefits it was ostensibly designed to deliver, and has dispossessed and disenfranchised local communities in the process (Quimby and Levine 2018). The conservationist approach is criticised for a claim to superiority over other types of knowledge and it is inextricably intertwined with European colonialism (Shultis and Heffner 2016). A return to community based management and co-management therefore can be seen as a way to incorporate more traditional methods of managing and living with natural resources into modern management systems (Castro and Nielson 2001). This is especially true in cases where co-management is attempted with indigenous communities.

The aim of this paper is to understand how co-management is configured in practice in the Canadian west coast context, and to investigate how co-management might affect local food access in a remote coastal community. In order to investigate this question, I aim to answer the following five sub-questions, using Prince Rupert, BC as a case study:

1. What is the current state of co-management in fisheries management in Prince Rupert, BC?
2. How does the current state of co-management affect the health of the fishery resource?
3. What are the barriers to more effective co-management?
4. What are the opportunities for improving co-management?
5. How could improved co-management affect local food access?

The paper is divided into 5 chapters. Chapter 1 provides context on the background of the research, as well as introduces the research questions, significant challenges facing fisheries, and the concept of co-management as a potential opportunity to improve fisheries management. Chapter 2 discusses significant trends in fisheries management ideologies, from privatization to commons theory, and explores the limited literature on fish as food. Chapter 3 begins with a discussion on research methodology and limitations, then provides some background on Prince Rupert and the Pacific fishery before moving into a discussion of research findings. Chapter 4 explores three key areas of dissonance uncovered by the research and discusses the implications of these themes for current and future fisheries co-management. The paper concludes in chapter 5 with a discussion on the future of co-management on the west coast while offering recommendations based on interviewee suggestions and research findings.

Chapter 02: Fisheries Management Institutions: State, Private and Co-Management Systems

Globally, marine resources are facing significant challenges brought on by overfishing, climate change, human-induced ecosystem degradation and lack of effective management capacity. In this chapter, I discuss some of the most foundational and relevant literature on the problems facing fisheries management. The chapter begins with a discussion of common-pool resource management theory before moving on to an examination of neoliberalism and privatization in the fisheries sector. The emergence of co-management as a possible response to the failures of state management and privatization is considered, and parallels between privatization and co-management are explored. The chapter concludes with an exploration of the emerging literature on fisheries management for a fish-as-food priority.

2.1 Common-pool resource management: moving beyond the 'tragedy of the commons'

Hardin's 'Tragedy of the commons' (1968) has been instrumental in shaping policy on natural resource management⁵. Hardin⁶ argued that resources left in common would necessarily result in overexploitation due to the selfish nature of 'rational man'⁷ in the absence of either intervention from the state or division of the resource into privately owned parcels (1978). Over a decade earlier, Gordon articulated this theory in an article on ocean fisheries as a prime example of a resource susceptible to degradation by common use (1954).

⁵ Garrett Hardin was a biologist and philosopher and his famous article was primarily concerned with population control. However, his description of the 'rational man' overgrazing a pasture through compulsion of individual self-interest, which Hardin showed necessarily led to destruction of the pasture for everyone, has been highly influential in economic thinking.

⁶ Although Hardin's 1968 article popularised the 'tragedy of the commons' the theory itself is much older; the concept was used by the mathematician William Forster Lloyd (1833) and can be traced further back to Aristotle, who wrote "that which is common to the greatest number has the least care bestowed upon it. Everyone thinks chiefly of his own, hardly at all of the common interest," (Jowett 1885, 30 [*Politics*, Book II, ch.3]).

⁷ 'Rational man' or *homo economicus* is a model of an individual from economic theory who is perfectly rational – that is, acts in his or her own best interest in every instance. Gintis (2000) shows how this idealised model does not fit in situations of natural resource sharing.

As a response to Hardin's 'tragedy,' much scholarly work has been devoted to understanding the conditions under which 'commons', better called common-pool resources, have been sustainably managed. Perhaps the most well-known critique of Hardin's 'tragedy' comes from Elinor Ostrom, who has written extensively on the principles and conditions required for successful management of common-pool resources, conditions that she developed over decades of analysis of case studies from around the world, including historical cases (1990). Common-pool resources refer to resources that are a) non-excludable: that is, excluding users is either impossible or too difficult; and b) rivalrous (sometimes also referred to as 'subtractable'): where use by one user directly impacts the quality and availability of the resource for other users (Ostrom and Ostrom 1977). The physical nature of the resource – common-pool, in this case, as a resource that is difficult to manage effectively as private property by virtue of it being too readily available to anyone seeking to use it – is distinct from the legal institution used to govern or manage the resource (Ciriacy-Wantrup and Bishop 1975).

In the literature, four overarching property types exist, referring to the organization or status of the property holder: private, public, community based and open access (Pomeroy and Berkes 1997; Ostrom 2000). Hardin and other early writers on the 'tragedy of the commons' conflated open access systems, which refer to situations where no individual or collective has rights to a resource, and 'common property' which is a resource held in common by a group of people (Ciriacy-Wantrup and Bishop 1975, 715). In practise however, there can be many combinations of these four property types. Schlager and Ostrom (1992) further complicate these distinctions by defining property as a 'bundle of rights' that include some or all of the following five rights: access, withdrawal, management, exclusion and alienation to the resource in question. Access refers to the right to enjoy a resource in a non-subtractable way, such as

members of the public using national parks. Withdrawal refers to the right to remove resource units, which reduce the opportunity of another user to withdraw those units – such as fish in a fishery. Management refers to the right to make decisions regarding how the resource may be used, but not who can use it. Exclusion is the right to decide who can and cannot use the resource. Alienation refers to the transferability of the resource, "in any way the owner wishes that does not harm the physical attributes or uses of other owners," (Ostrom 2000, 341). Combinations of these rights can be held by individuals or collectives. 'Common property' as it is typically defined involves a group of people having the right to four of these five rights – all except the right to alienation of the resource (Ostrom 2000). Economic theorists argue that the right to alienation is fundamental in the creation of private property, because the ability to trade or sell the property is what provides the incentive to improve it; without this incentive, it is argued that the owner will have little reason to invest in the resource (Demsetz 1967).

Ocean fisheries are a prime example of a common-pool resource, as marine resources are both non-excludable and rivalrous – and the history of oceans management illustrates attempts to apply all four of the above mentioned property systems. Under the conditions of open-access which existed until the events of national enclosures in 1977, marine resources were subject to significant overexploitation (Rogers 1995). Nationalisation of fisheries within a 200 mile Exclusive Economic Zone (EEZ) by coastal nations effectively changed the property type of marine fisheries from an open access regime to one of public property. However, centralised management of a resource as complex and invisible as fisheries has proven challenging, and has had little success in improving the conditions of overexploitation; fisheries continue to collapse around the world under imperfect centralised command and control (Bavington 2010). Attempts at privatization as a response to the failure of centralised management, most commonly in the

form of Individual Transferable Quotas (ITQs), are becoming common (Pinkerton and Davis 2015). Finally, community based or common property systems have emerged as another potential method to manage fisheries, in an attempt to achieve sustainable use (McCay and Acheson 1987; Pinkerton 1989). With regards to common property regimes, there is a strong tradition to rely on, as some fisheries, especially small-scale fisheries around the world's near-shore and inland waters, have a promising history of local user management (Ostrom 1990).

2.2 Neoliberalism: A response to failed State management

Changes within fisheries management must be contextualized within broader trends of neoliberalization within Canada and globally, which have shifted fisheries management from a primarily top-down, centralised state-controlled system to one which favours a market-driven approach (Mansfield 2004b). The recent history of marine management has unmistakably moved to enclose, de-centralise and privatise the global ocean commons. Enclosure first definitively took place during the discussions of the United Nations third conference on the Law of the Sea (1973-1982), which resulted in nation-states declaring 200 mile exclusive economic zones, effectively nationalising significant segments of the oceans and all resources found within (Rogers 1995). The second wave has been less uniform across states and fisheries, but is the subject of a vast amount of scholarly and popular discourse – that of privatization of access to a defined segment of the total allowable catch (TAC) within a fishery, typically carried out through the creation of Individual Transferable Quotas (ITQs). Neoliberalism as a theory is a set of political economic principles that posit that "human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterised by strong private property rights, free markets and free trade" (Harvey 2005, 2). Much scholarly debate had been devoted to how and how well this theory works in practise, but

that is outside the scope of this paper. However, fisheries are considered to be a key case study on how neoliberalism has re-configured natural resource management and the implications this has had for social relations within coastal communities and social-ecological relations between fishermen and fish (Mansfield, 2004a; Delaney 2016, 194).

In the midst of state restructuring to accommodate neoliberal reforms, which has presented most significantly in the form of sweeping cuts to social welfare programs and attacks on institutions that have historically held capital accountable to social considerations, such as trade unions (Harvey 2005), budgets for government departments responsible for fisheries management have been steadily shrinking (DFO 1998). In the absence of strong regulation, monitoring and enforcement capacity by well-funded central governments, which increases the success of top-down management, governments are necessarily turning to the narrative of privatization as the solution for low-cost sustainable management (Melnichuk et al. 2017; Pinkerton and Davis 2015).

2.3 Rights-based fisheries management

Recent attempts to create private property-like access rights, in the form of transferable quotas for the amount of fish that can be taken out of the ocean, arose in the 1970s and have begun to concentrate access rights to a previously commonly accessible resource in the hands of a small number of large industrial actors (Pinkerton 2017; Olson 2011). This is sometimes referred to as a transition to 'rights-based fisheries management' which seeks to create secure tenure for access to fish (Townsend and Shotton 2008). Quotas are implemented by dividing the Total Allowable Catch (TAC) into parcels which are then assigned to the first generation of fishermen at the time of implementation, typically based on past fishing history. For the first generation quotas are seen as a boon, because fishermen gain greater security of tenure without

the associated cost. Quotas have been created in several different forms, such as individual vessel quotas (IVQ), which are attached to a vessel; individual quotas (IQ) which are assigned to individuals but have limited transferability; and the most contentious form: individual transferable quotas (ITQ), which are both individually owned and fully transferable (Pinkerton and Davis 2015). ITQs are a type of quasi-private property right in which the owner or holder gains transferable withdrawal rights to the resource, but not the right to manage the fishery or exclude participants, and so do not constitute full private property rights (Ostrom 2000, 342).

Privatization of ocean resources has been justified by the need to prevent overfishing and reduce the number of boats on the water (Townsend and Shotton 2008), as well reduce the 'race to fish' in a competitive fishery that incentivises overcapitalization and reduces safety at sea (Olson 2011; Sumaila 2010). However, a decrease in the number of small-boat fishing operations has not led to a decrease in the amount of fish being taken out of the ocean – in fact, the opposite effect is being seen with fewer numbers of large, industrial-scale vessels removing record numbers of fish from the ocean while the benefits from this economic activity accrue to ever fewer stakeholders and investors (McClanahan et al. 2008; Olson 2011).

Proponents of privatization through ITQs argue that the gains of economic efficiency through the reduction of the number of boats on the water, and the incentive for owners to invest in increasing value from the catch (Batstone and Sharp 1999), such as processing at sea, are desirable outcomes of the fishery that have improved safety⁸ through providing security of access to quota holders and therefore reducing the incentive to fish in dangerous conditions (Pfeiffer and Gratz 2016) and improved profitability for quota holders overall (Deweese 1998;

⁸ The question of whether or not ITQs improve safety is a contentious one, and case studies yield varying results. Windle et. al. (2008) posit that the design of incentives within the ITQ system may have more to do with occupational safety than the fact of ITQs themselves.

Grafton 1996). While these results may be demonstrated through case studies, scholars opposed to ITQs challenge the benefit of these results to the fishery and question whether these changes can reasonably be attributed to the ITQ system and not other parallel factors. For example, Olson (2011) questions how the apparent success of ITQs in New Zealand might be conflated with the success of explicit development policy in New Zealand which prioritised deepwater fishery development, and whether these results can be considered successful in light of their greater social implications. Olson provides a detailed overview of the social impacts of the introduction of ITQs in cases from across the global North, concluding that although ITQs and privatization may lead to gains in economic efficiency (narrowly defined), they often come at a steep price (2011): significant loss of employment (Brandt and Ding 2008; Casey et. al. 1995), disproportionate loss of fishery access for small-scale fishermen (Stewart and Walshe 2008) and a breakdown in traditional circulation of capital within kinship and community relations, incentivising divestment from small coastal communities and encouraging capital out-migration to large industrial operations (St. Martin 2007). Thus, the question of whether ITQs are beneficial for the fishery must be contextualised within a discussion on values: who should benefit from the fishery, and who should decide? Pure economic efficiency may be furthered by ITQs, but the research clearly demonstrates that coastal communities and small-scale fishermen are not the ones to benefit (Olson 2011, 361).

To complicate matters, ITQs are only as useful to conservation as the science that is used to set the TAC; in cases where the data to measure sustainable yields is inadequate or uncertain, ITQs are only marginally more sustainable than a competitive-style fishery, and both systems easily run the risk of allowing overfishing (Copes 1986). Ostrom adds to this that the creation of transferable withdrawal rights for a mobile resource such as fish, is much more complicated in

practise than theory, and that mobile resource units are difficult to measure, creating an opportunity to overharvest which can ultimately raise monitoring and enforcement costs (2000).

Although critique of this model of ocean privatization is ubiquitous (Wiber 2000; Carothers and Chambers 2012; Ecotrust Canada and T. Buck Suzuki Foundation 2015), national governments and transnational organizations such as the Food and Agriculture Organization of the United Nations continue to encourage the implementation of the ITQ system as a successful and necessary model for sustainable ocean management (Townsend and Shotton 2008); proponents of the model even argue for more permanence in entrenching private access rights (see Featherstone and Rogers 2008).

2.4 A third way emerging: co-management

An alternative to the failures of both state management and privatization can be found in the literature on co-management. Pinkerton (1994) makes a distinction between community-based management systems and co-management systems; the latter, broadly defined, are systems of resource management carried out in cooperation between government and local user groups. Pinkerton posits that community based management (also known as local self-management) is likely to be most effective in smaller or more remote communities while co-management can be more effective in managing "distant water resources" – more developed, larger fisheries (1994, 2366). Pinkerton also acknowledges that fisheries that may have historically been managed through a community-based system "have weakened or collapsed under political domination or pre-emptive fisheries by colonial powers or national governments," (1994, 2368). Some of these previously community-based systems however, have transformed into co-management systems, where local user groups continue to have a significant contribution to management, in partnership with a centralised government (Pinkerton 1994) – a possible 'third way' emerging.

Commons theorists examine these cases to understand what benefits might exist from managing common-pool resources through such collaborative systems, how co-management tends to work in practise, and what factors are important in successful co-management regimes (Ostrom 1990; Pinkerton 1994; Seabright 1993).

The main impetus for studying common property systems and co-management arrangements stems from a desire to develop management systems that might adequately regulate the use of common-pool resources. There is a growing body of literature that asserts that co-management or some form of collaboration with local user groups is necessary for successful sustainable fisheries governance (Jentoft and Kristoffersen 1989; Pinkerton 1989; Feeny et al. 1990), considering the lack of capacity of central governments (Townsend and Shotton 2008; McClanahan et al. 2008). Pinkerton summarises the push towards co-management succinctly:

Co-management agreements between government and fishing interests have arisen out of crisis caused by rumoured or real stock depletion or from political pressure resulting from claims that the government's ability to manage is insufficient to handle specific problems... fishermen demand a real voice in decision-making because they have lost faith in government's ability to solve management problems: they point to government's lack of adequate data and to its role in making the problems worse. Government officials, who may equally distrust fishermen, whom they see as unrelenting predators who will eliminate the last fish unless more strictly regulated, become willing to surrender some power in exchange for fishermen's co-operation and assistance in management. (1989, 4)

Commons scholars argue that the physical characteristics of common-pool resources (non-excludability and subtractability/ rivalry) that make them difficult to manage effectively under one property type may be mitigated or even eliminated under a different property type (Ciriacy-Wantrup and Bishop 1975). Ideally, a common property system will change the incentive structure of resource use so that there is a greater benefit to all parties from cooperating

than acting in individual self-interest – to reverse the pressures in the classic prisoner's dilemma⁹ from which the 'tragedy of the commons' theory was derived (Pinkerton 1994). Theorists suggest that co-management can alter relationships so that cooperation becomes the most rational course of action for actors within the system (Pinkerton 1989; Axelrod 1984). However, a key commonality among common-pool theorists is that they do not suggest a single, common property system as a panacea for managing all common-pool resources everywhere; Ostrom argued that there are situations under which a 'common property' type might be appropriate, and other situations where it is not (2010). Polycentricism and adaptability are key characteristics of the complex governance systems that have evolved and continue to evolve to manage common-pool resources (Carlisle and Gruby, 2017; Ostrom 1990; originally V. Ostrom et. al. 1961). Polycentric governance refers to "a system where citizens are able to organize not just one but multiple governing authorities at differing scales," (Ostrom 1998, 27). Adaptability is the ability to learn as a group and evolve the management system along with changes in the natural resource. It also refers to the experimental nature of the management system, in that participants must be willing to make changes and innovate, without assurance that the new changes will lead to success. Therefore, polycentric governance systems, as Ostrom refers to them, are not a sweeping third category to challenge the binary between public/ state and private/ market

⁹ The Prisoner's dilemma is a model in game theory that illustrates the tragedy of the commons idea: in the game, 2 prisoners are captured and questioned separately; each is given a choice – to blame the other for a crime they are being accused of – with the promise that the first person to confess will go free – or stay silent. If both betray each other, both go to prison. If neither confesses, both go free. If one betrays the other but the second person stays silent, the betrayer goes free but must pay a fine while, while the other goes to prison. If they were to both cooperate, they would each get the best outcome. However, since they are perfectly rational actors and cannot communicate with each other, the game predicts that each prisoner will betray the other, for fear that the other will do the same, and ultimately both will go to prison (Kuhn 2019). This is seen as a metaphor for common-pool resource use: the idea that each user will take too much, for fear that if they don't, other users will, and in the end the resource becomes degraded from overuse. See Ostrom (1990) for a detailed analysis of how this game has been applied to common-pool resource theory and a discussion of its flaws in real-life situations.

systems – the key is that each system adapts to the local social and environmental context in order to be successful (2010).

Learning from the development of common property management systems and experimenting with new co-management systems, common-pool theorists argue that common property systems may lead to better, more effective and equitable management of natural resources (Pinkerton 1989). Better management refers to management that can maintain the resource over the long term, by keeping exploitation levels within a sustainable yield. More effective management aims for systems that have increased compliance from users and a reduction in the level of non-authorised/ illegal users exploiting the resource. Equitable management, theoretically, aims to improve user participation and democratic decision-making, so that all users, even the most small-scale, are well represented (Pinkerton 1989).

Theoretical and empirical benefits of managing common-pool resources within community-based or co-management systems include: improved conflict resolution for high traffic resources and competing interests among users (Jentoft and Kristoffersen 1989; Pourcq et. al. 2015; Butler et. al. 2015); more effective rules and regulations to maintain a sustainable yield brought about by the combination of scientific knowledge with local knowledge (Jentoft and Kristoffersen 1989; Kearney 1989); improved compliance with rules and regulations due to a sense of fairness in the creation of these rules and regulations (Jentoft and Kristoffersen 1989; Baerlein, Kasymov, and Zikos 2015); improved relationships between managers and users through user participation in resource stewardship and data collection, and over time, the building of trust (Butler et. al. 2015; Pinkerton 1989) and increased flexibility and adaptability in the management system to respond to changes in the natural resource system through proximity of decision-makers to the resource, use of local knowledge and accessible data (Pinkerton 1989).

Fisheries are a key common-pool resource and scholars have investigated the conditions necessary for successfully managing fisheries under a diverse array of community-based and co-management systems. There is an extensive literature on these conditions, derived both from case studies and quantitative analysis. Pinkerton proposes the following six lessons from a study of a range of community-based and co-management systems, from small-scale traditional fisheries to watershed-level multi-party co-management systems (1994):

1. **Clear boundaries:** the ability to exclude non-members and define the area under a group's management system is a key condition for long-term success.
2. **Clear Criteria for membership or participation in local area management:** similar to establishing clear geographic boundaries, establishing clear group boundaries is also necessary – although this does not need to only privilege local/resident participants.
3. **Management units of a scale appropriate to human resources and the ecology of any particular area:** trade-offs between the cost and benefit of managing a particular size of area need to be taken into consideration.
4. **Clear interception agreements:** this condition is best illustrated by an example: with a migratory species such as salmon, enough salmon must be allowed to travel upriver to terminal areas so that the communities in the terminal areas have an incentive to continue participating in conservation activities. The benefit to each participating group must be significant enough to create an incentive to participate.
5. **Local all-stakeholder co-management boards:** as the location of planning and management activities, these boards must represent all interested parties, and ideally incorporate everyone's interests so that the incentive to participate is greater than the incentive to disrupt the process. Government must also respect the co-management board's authority to make certain decisions.
6. **A co-ordinating role for a province-wide management board:** the aim is to create checks and balances for the local boards, while also serving as another locus of polycentric governance in the overall system.

Certain conditions to manage the costs of such as system are also proposed:

1. **Cost recovery related to local management activities:** local organizations should be able to derive a benefit from local management activities, raised through methods such as use of fish, landing taxes or license fees.

2. **A local volunteer force:** to both contribute to management activities and foster a sense of connection and responsibility in the local community for the health of the resource.

Finally, Pinkerton outlines the need for certain political conditions to exist:

1. **A degree of local control:** local control can generate local social capital and a sense of ownership that is necessary for the effective functioning of co-management.
2. **Clear local definition of local powers:** legislated security that local decision-making will carry some weight with government and other decision-makers.

(Pinkerton 1994)

Gutierrez, Hilborn and Defeo found from a global scan of 130 fisheries from 44 countries that the most important factors for successful co-management were prominent community leaders and robust social capital (2011, 386). Other factors included incentives through defined access rights (including quota) and conservation benefits derived from protected areas (2011, 386).

Pinkerton et al. (2018) compared co-management arrangements in the Canadian halibut fisheries between the East and West coasts to determine what some of the necessary conditions were for the success of each (the West Coast co-management system was informal and is no longer in use, whereas the East Coast system is more recent and still successfully in operation). They suggest that the factors which allowed these two co-management arrangements to succeed were: 1. The perception of fairness and equity in allocating access to the resource by the majority of participating fishermen; 2. The presence of a united, non-governmental organizational leadership; and 3. The presence of "independent supportive bridging organizations" who can facilitate the relationship between the governmental and non-governmental partners (2018, 993). There is an abundant literature on the conditions necessary for successful collaborative management, both for the global North and global South contexts. Is it clear through a scan of

this literature that there is a diversity of management systems that fall within the category of co-management.

2.5 Neoliberalism and co-management: exploring parallels

Although this 'third way' has taken inspiration from research on the commons, what has emerged, at least in the global North, is a decidedly institutionalised form of co-management (Bresnihan 2019). Scholars are beginning to question whether co-management, especially as it is formulated by central governments infatuated by the ideology of neoliberalism, is really a challenge to the state-privatization binary – or simply a continued adaptation of neoliberal ideas in practise (Bakker 2008; Mansfield 2007). Bakker questions the effectiveness of community management as an alternative to privatization where it absolves the state of responsibility (2008). Mansfield analyses how the creation of fishery co-ops in the Alaska Pollock fishery has further entrenched neoliberal ideology in the fishery through a fishery reform process that favoured the creation of property rights in the fishery, closed the fishery to new entrants, and ultimately facilitated capital accumulation through the assigning of these property rights (2004a; 2007). However, Mansfield complicates the idea of neoliberalism by arguing that the case of the Alaska community development quota (CDQ), which allocates a certain percentage of the fishery quota to marginalised, mostly indigenous communities, demonstrates the creation of spaces of diverse practises within neoliberalism, whereby the creation of private property is the tool through which wealth redistribution for the purpose of social justice occurs (2007). In this example, the processes of enclosure and commoditization of the fishery take place, but some of the profits are then redistributed to disadvantaged community members. Communal ownership of the quota does not challenge the capitalist orientation of the fishery; relations between humans and nature remain subordinate to the logic of the market.

In an effort to distinguish co-management that appears to be an extension of neoliberal practises and co-management that might offer a true alternative, scholars have been focusing on changes in social-ecological relations created by a re-configuration of the commons in certain global North contexts (Pinkerton and Davis, 2015; Pinkerton 2017). St. Martin (2005) describes the dominant narrative of difference between First World and Third World fisheries as a binary between capitalist and pre-capitalist/ capitalist-becoming systems, respectively, before complicating the narrative with an example of fishermen's imaginaries from the Northeast USA that resist organization along purely capitalist modes of production. St. Martin outlines the aspects of community, territoriality and cooperation that came up in interviews with USA fishermen that link them to small-scale fishermen in the Third World, complicating the trajectory of neoliberalisation in First World fisheries (2005). Knutson describes the alternative social relations created through direct marketing of seafood by fishermen that, despite the challenges, are a direct resistance to corporate control in small-scale fisheries (2017). Foley, Mather and Neis analyse a case study in Newfoundland and Labrador where neoliberal re-structuring of the fishery (through enclosure and commoditization) has been tempered with the introduction of social objectives insisted upon by local community organizations to prevent some of the negative effects typically associated with neoliberal re-structuring (2015). In this case, offshore¹⁰ quota was allocated to co-operatives who used revenue generated by leasing the quota and licenses to create and maintain a thriving inshore processing sector, generating significant employment. Key to the success of this case were the Department of Fisheries and Oceans (DFO) policies of

¹⁰ In Atlantic Canada, DFO divided the fishing fleet into 3 sectors: the inshore sector is composed of boats that are less than 35 ft in length; the midshore fleet is composed of boats between 35 ft and 65 ft; the offshore fleet is composed of boats longer than 65 ft. Owner-operator and Fleet Separation policies, which mandate that the owner of the license must be present on the boat to fish and that processing companies cannot own licenses or quota, respectively, apply to the inshore and midshore fleet. These policies have been instrumental in protecting small-scale fishermen in Atlantic Canada from the consolidation and inequities present on the Pacific Coast (Foley, Mather and Neis 2015)

adjacency and owner-operator, which mandate that benefits from fisheries should flow to adjacent communities, and that in the inshore sector, licenses can only be granted and transferred to active harvesters. Ultimately, tempering of neoliberal practices occurred through strong pressures by fishermen's groups on both Provincial and Federal governments to create protective regulation (Foley, Mather and Neis 2015). Thus, even in the case of privatization and commoditization, the presence of strong community organization and prioritization of social benefits can prevent some of the more harmful effects of neoliberal re-structuring. These examples illustrate Karl Polanyi's assertion that capitalism functions on the primacy of the market to determine social and environmental relations – and that resistance to this market-dominated society comes from re-centering social and environmental relationships above the market by re-localising social and economic life (Pinkerton and Davis 2015; Valderrama 2012; Polanyi 1947; Polanyi 1957).

2.6 'Fish sovereignty' and food as commons

There is a significant gap in the discourse on fisheries management around fish as a food source, especially from a food sovereignty¹¹ perspective (Levkoe, Lowitt, and Nelson 2017). Fish has been treated as a natural resource commodity in the industrial and policy discourse, and the academic literature reflects this orientation. Existing literature has focused on how fisheries contribute to food security for coastal communities (Cruz-Trinidad et al. 2014; Fabinyi, Dressler and Pido 2017; Loring, Gerlach and Harrison 2013), improving access to fish for food by poor

¹¹ Food sovereignty is a concept that was originated by La Via Campesina, a global grassroots peasant movement originating in Latin America in the 1990s as a response to the entrenchment of neoliberal perspectives on food and food security by prominent transnational organizations such as the World Health Organization and the World Bank (Coté 2016). Food sovereignty is defined as "the right of each nation to maintain and develop its own capacity to produce its basic foods respecting cultural and productive diversity. We have the right to produce our own food in our own territory. Food sovereignty is a precondition to genuine food security." (Via Campesina 1996) This definition has since been expanded to include non-agrarian forms of food sovereignty, such as Indigenous practices of hunting and gathering (Morrison 2011).

coastal communities in the global South (Bell et al. 2018), and how climate change may impact food security for coastal peoples, again typically in the global South (Dey et al. 2016; Le Cornu et al. 2018). Literature also explores fish from a food safety perspective, typically to provide advice on contamination levels and safe consumption guidelines (Dabeka et al. 2007; Wang et al. 2013). Recently, literature on sustainable seafood marketing and consumer preferences has encouraged research on eco-certification and seafood labelling efforts, which can be seen as an opportunity to improve communication with consumers (Gutiérrez et al. 2012) but also as a strategy that further entrenches fish within a commoditized, market paradigm as the eco-certification becomes a commodity in itself (Guthman 2007). However, fisheries management still primarily discusses fish as a natural resource to be managed for the purpose of economic exploitation and conservation (Berkes 2010; Olson et al. 2014). The emphasis continues to be on managing harvest, with little to no interest from fisheries management on distribution or use of fish (Olson et al. 2014) – despite the fact that globally, most wild-caught fish is used for food (FAO 2001). Presently, interest in the commercial value of fish supersedes interest in fish as food.

Olson et al. (2014) provide a notable exception in arguing that co-management and adaptive management in fisheries may provide a useful opportunity to connect consumers and fishermen through community-based dialogue and information sharing. By re-orienting fisheries management conversations towards fish as food, and involving local community members in the co-management process, interest and stewardship could be fostered for sustainable fisheries through the transformation of passive consumers into active community-builders. However, the authors' focus is on eco-certifications and consumer information, rather than on an investigation of co-management as an enabler of more localised seafood access. The evidence presented in the

article is from grassroots organizations that have been working to bring fishermen and communities together, such as the Northwest Atlantic Marine Alliance (NAMA), and not from examples of co-management between government and fishermen in practise (Olson et al. 2014). Evidence from case studies is needed to determine the strength of the connection between co-management and its potential to embed fish within coastal food systems.

The food sovereignty literature has also largely left fisheries unexamined; Levkoe, Lowitt, and Nelson address this gap by applying the seven pillars of food sovereignty to fisheries to expand on areas where future research is needed (2017). They discuss collective fisheries management as relating to the food sovereignty pillar '*puts control locally*' (2017, 68). There is also a growing body of literature on the need to re-frame food and the resources needed for food production as part of a global commons (Vivero Pol et al. 2018). In an earlier article, Vivero Pol (2013) argues the need to view food as a commons from both a moral and legal perspective, as necessary to meet the human right to life for everybody. He concludes with a proposal for a tri-centric governance model for food, that incorporates markets, states and collective action groups. Vivero Pol advocates for an application of Ostrom's polycentric governance model, arising through collaboration and experimentation with actors at multiple levels, to the food system (2013). Thus, although the literature on managing fish as food is nascent, it is clear that participation from eaters as well as harvesters is a necessary link in a potential 'commoning' of food. Although more research is definitely needed to determine mechanisms by which fish and food can be made accessible through a commons framework, it seems that fisheries co-management is likely a step in the right direction.

Chapter 03: Prince Rupert's Fishing Community: Background and Findings

3.1 Objective

This research project aimed to examine fisheries co-management in a small coastal community in northern British Columbia in order to understand how co-management is configured in practice and to investigate how co-management might affect local access to seafood. More specifically, I am interested in expanding the literature on co-management of resources by user groups as well as how more localized forms of management might increase benefits to communities adjacent to the resource.

A global scan of alternatives to the current ITQ system of fisheries management completed by the non-profit organizations Ecotrust Canada and the T. Buck Suzuki Foundation put forward 5 recommendations to improve the social, economic and ecological outputs of Canada's west coast fishery, two of which were to manage fisheries with greater input from participants in the fishery and to create fishermen's cooperatives or collective membership organizations. I aimed to build on these findings and the suggestions I heard from fishermen during my time as an intern for Ecotrust Canada in the summer of 2018 and work towards understanding how to implement these two recommendations in Prince Rupert as a case study for transitioning towards greater co-management of the British Columbia fishery.

3.2 Methodology

The objective of this research project was to understand how participants in a small, remote fishing community presently participate in fisheries management and decision-making, how that affects their relationship to the fish and to their community, and what kind of future management system they desire. Specifically, I wanted to understand the opportunities that active fish harvesters and local community members have to participate in forms of co-

management with governing institutions such as the Department of Fisheries and Oceans (DFO), what participants would ideally like their participation to look like, and the barriers and opportunities that exist for moving towards this desired future state of co-management and user participation. The goal was to discern what barriers could be managed and opportunities harnessed to enable a transition towards a system of co-management that aligned with the needs of active participants, and that might ideally improve access to locally caught seafood for local residents.

In order to study these questions Prince Rupert, BC, a quintessential coastal community that was formerly reliant on the fishery for livelihoods, culture and food was selected as the site for a case study. Applying a qualitative content analysis method, literature, key policy and planning documents were reviewed and eleven semi-structured interviews were conducted between March and April 2019 with a wide range of participants involved in the fishing industry in Prince Rupert. Interview participants included active (and retired) fishermen, representatives of fishermen's organizations, policy advocates, local restaurateurs, processors and a fishery manager from DFO. A purposive sampling method was applied to select interview participants with a variety of roles and experiences within the fishing community. I started by speaking to contacts I had made during my internship in Prince Rupert. Interview participants were asked if they knew of others who would be interested in contributing to the project, and some participants were introduced to me through referral. I also walked along the public docks at Prince Rupert's three main harbours – Rushbrooke Harbour, Cow Bay Marina and Fairview Harbour, in order to connect with fishermen who were not already connected to my network, to make sure that I heard from a breadth of perspectives. I wanted to speak with people with a range of viewpoints, interests and roles within the fishery in order to gain a broad and multi-faceted understanding of

the key debates and points of friction within the sector. Of the fishermen that were interviewed, most would be classified as small-scale, along Gibson and Sumaila's spectrum (2017), which compared characteristics of SSF from the literature to create a scoring system for how relatively small-scale or large-scale different fisheries were in B.C. Interview questions centered on understanding what opportunities participants currently had to participate in decision-making conversations, how participants understood these opportunities and how they participated in these conversations. Interviewees were then asked about how they would ideally like to be able to participate in decision-making, and what barriers and opportunities they saw for an ideal co-management scenario. Finally, I attempted to turn the conversation towards understanding how the current management system and any potential future changes might impact access to fish for the local community¹².

Another key source of data for this project came from the House of Commons Standing Committee on Fisheries and Oceans' (FOPO – Fisheries and Oceans/ Pêches et des Océans) recent study on the regulation of the west coast fisheries¹³. Witnesses from both the west and east coasts, including several fishermen, local advocates, license holders and processors, as well as academics and experts from across Canada and Alaska were invited to Ottawa to present evidence before the Committee during meetings on January 30th, February 4th, February 5th, February 6th, and February 20th, 2019. The 40 witness testimonies are available to the public online, on the House of Commons website¹⁴. The five days of audio testimonies, in which witnesses presented their perspectives and answered questions posed by the Committee, were

¹² See Appendix A for a sample interview guide

¹³ The Committee published its report following this study on May 7th, 2019; it is included in the reference list (Canada 2019)

¹⁴ [Canada, House of Commons Standing Committee on Fisheries and Oceans \(FOPO\): Regulation of the West Coast Fisheries \(2019\)](#)

reviewed and incorporated into interview questions and used as supplementary data for this research.

Data from interviews was transcribed, coded and analysed for emerging themes. Data from the FOPO review was annotated and compared to interview themes. There was significant alignment between what witnesses presented to the FOPO Committee and what I heard during my interviews, especially from active fishermen. Having listened to the FOPO witness testimonies prior to conducting my interviews, I was able to pursue certain lines of inquiry with interviewees regarding interesting themes emerging from the testimonies to the FOPO Committee, especially as some of my interviewees had participated in the FOPO review as witnesses, and because almost all of my interviewees were aware of and following the FOPO review.

In order to understand the official DFO stance on co-management in Canadian Fisheries, I also reviewed three Integrated Fisheries Management Plans (IFMP), which are the principal planning documents used by DFO to both consult with and communicate with participants on the management of specific fisheries. The three reviewed plans were the 2019-2020 Crab IFMP, the 2018-2019 North Coast Salmon IFMP and the 2019-2020 Pacific Groundfish IFMP. IFMPs were reviewed with special attention to references to and examples of co-management. These three plans were chosen for the following reasons: the Crab IFMP because it was referenced by several interviewees; the Groundfish IFMP to gain a greater understanding of how co-management was implemented in examples of ITQ fisheries, of which halibut is a key example referenced by both interviewees and FOPO witnesses; and the North Coast Salmon IFMP because although the IFMP was rarely mentioned by interviewees, salmon fisheries were discussed extensively by

several interviewees. Therefore, these three IFMPs were useful to contextualise and inform interviewee comments.

3.3 Limitations

Certain limitations that came about through the research for this major paper must be acknowledged. The first is that, as I carried out the research, I learned that the scale of my case study did not neatly fit the context within which I was working. I quickly learned from interviewees that a discussion on co-management in Prince Rupert could not be separated from a coast-wide discussion on co-management. Most fishermen on the B.C. coast are not specifically Prince Rupert fishermen or Nanaimo fishermen, although small-scale fishermen do retain important ties to their communities; the complex multi-species nature of the Pacific fishery meant that fishermen travelled all along the coast and were connected to many different communities. This meant that in order to gain a deeper understanding of the kinds of community relationships that are possible at such a vast geographic scale, use of multiple cases along the coast would have provided a more robust analysis. Inclusion of the witness testimonies to the FOPO Committee has helped to include other perspectives along the Pacific coast.

The second important limitation arises from the sampling used in the research design. Although I attempted to include participants with a diversity of roles in the fishing community in Prince Rupert, most interviewees were either directly connected to my network or one degree removed, so findings are possibly biased as a result.

Finally, use of the single case study design limits the generalizability of results and recommendations (Yin 2003). However, as discussed in the previous chapter, co-management is

by design a context-dependent arrangement, so this is not an unexpected limitation; the results of this research are most useful for this particular case being discussed.

3.4 Prince Rupert: Background

Prince Rupert is a small city on the north coast of British Columbia in Canada. The city is located on Kaien Island, nestled below the Alaskan panhandle and close to the mouth of the Skeena river. The present-day city sits on the traditional territory of the Coast Tsimshian First Nations, a group of nine allied tribes settled in Metlakatla and Lax Kw'alaams (Ames and Martindale 2014). Coast Tsimshian peoples have lived in the region from as far back as 5000 years ago, according to the archeological and oral historical record, relying on fishing as a key subsistence and trading activity (Martindale and Marsden 2003). Fishing focused mostly on salmon, eulachon, shellfish and other marine fish species (Martindale and Marsden 2003). First Nations along the coast lived in harmony with the natural resources around them, despite evidence of high population pressure that could have resulted in overfishing (Trospen 2009, 10). With the movement of European settlers westward in the 1800s, First Nations in the region were steadily dispossessed of their access to lands and fish (Harris 2001); this is discussed in more detail in chapter 4.

The city of Prince Rupert was incorporated in 1910 and currently has a population of 12,687¹⁵. Due to its location at the mouth of the Skeena River and as the final Canadian port in northern B.C., Prince Rupert has historically been an important centre for landing fish, especially at the height of the canning industry. Fishing has been a significant part of the town's economy since World War I, and both Indigenous and non-Indigenous residents of the area have a long-standing connection to fishing as a cultural, economic and subsistence activity (Ecotrust Canada

¹⁵ Statistics Canada, 2016 Census.

2018). In recent decades the rapid development of the Prince Rupert Port with export connections to East Asian markets and other resource-based sectors have eclipsed the declining fishing industry (Artibise and Favrholt 2019). The reasons for the decline of the fishing industry are complex and will be discussed throughout this paper.

3.5 Governance of the Fishery

Canada's marine, coastal and inland fisheries are governed by the *Fisheries Act*, 1985. The Fisheries Act grants the Minister of Fisheries and Oceans and the Canadian Coast Guard (the Minister) broad powers over commercial, recreational and Aboriginal fisheries management. The Department of Fisheries Oceans, recently re-named as Fisheries and Oceans Canada and still known widely by the acronym DFO, has authority over Canadian Fisheries, Oceans and the Canadian Coast Guard. The mandate of this Federal body is to sustainably manage and control fisheries in order to realise desired objectives, such as economically and environmentally prosperous fisheries, and to maintain the safety of Canadian Oceans for all vessels, foreign and Canadian (DFO 2019). DFO is also strongly influenced by five other key pieces of legislation that shape its mandate: the *Oceans Act*, 1996, which provides the Minister with the responsibility to create and implement integrated oceans management plans, provide Coast Guard and marine science services; the *Species at Risk Act*, 2002, where the Minister is responsible for aquatic species at risk; the *Coastal Fisheries Protection Act*, 1985, which gives the Minister the authority to manage access for foreign fishing fleets on Canadian waters; the *Canada Shipping Act*, 2001, which outlines the Coast Guard's responsibility with respect to Transport Canada functions, such as wayfinding and safety at sea; and *Fishing and Recreational Harbours Act*, 1985, which grants the Minister jurisdiction over harbour lands. Provinces have the responsibility for inland waters, which are subject to the *Fisheries Act* but are not within the jurisdiction of DFO (DFO 2019).

3.6 Policy Context of the Canadian Pacific Fishery:

The goal of fishery regulation and monitoring according to DFO is primarily to conserve fish stocks and protect the marine environment (Reid, January 30, 2019)¹⁶. These goals are accomplished through a complicated and historically layered system of input controls – such as restrictions on gear types, limited entry licensing, time and area controls¹⁷ – and, more recently, output controls, such as quotas. The concept of Total Allowable Catch (TAC) is another key tool to manage the fishery: it is a set amount of weight of fish that is permitted to be harvested in a given year, and the amount is set prior to the start of the fishing season based on what fisheries managers believe can be safely harvested without damaging the fish stock.

Within a context of increasingly industrialised fishing fleets globally, the recent history of fisheries management in the Pacific region is characterised by increasing regulations to manage overcapacity in the fishing fleet¹⁸. In the 1990s, regulations came into effect through the 'Pacific Salmon Revitalization Strategy,' commonly known as the infamous 'Mifflin Plan,' which divided the Pacific coast into areas and assigned licenses by area, restricting the former ability of fishermen to travel the coast; the Mifflin Plan also introduced gear-based licensing (Canada and BC 1996). So, for example, a boat that had previously been able to fish along the entire coast and use whichever type of gear was most effective for the fishing to be done, was now restricted to a particular area of the coast and only permitted to use, a gillnet. If the fisherman wanted to fish in more than one area, he or she had to buy a license for each area separately, and stack them on his or her vessel. In addition to this, the Mifflin Plan came with a 'buyback' program – salmon fishermen who wanted to retire from the industry could sell their licenses back to the Federal

¹⁶ Rebecca Reid, Regional Director General, Pacific Region, DFO, [Evidence](#), 30 January 2019.

¹⁷ Details on this system of input controls can be found in Appendix B.

¹⁸ For an overview of the history of the Pacific fishery see Appendix C.

government at the market price. This was another attempt to reduce fleet capacity, and 798 licenses were bought back by the Federal government, although the instability created by the drastic measures of this new plan led 1,274 fishermen offering to sell their licenses (Canada and BC 1996, 6). Finally, a key objective of the Mifflin Plan was to transition DFO towards a risk-averse approach to managing the fisheries, especially in view of the Atlantic Cod collapse of four years prior. This ultimately reduced opportunities to fish even further. The Mifflin Plan was badly received by fishermen and coastal communities, causing job losses, financial instability and gutting small coastal communities that had relied on a few fishing licenses to sustain them (Canada and BC 1996). It is still remembered as one of the turning points for why the industry is in such decline even today.

More recently, debates in Pacific fisheries management centre around individual transferable quotas (ITQ). ITQs are the latest management tool that DFO is using to address fleet overcapacity; however, it represents a fundamental shift in how fisheries are managed, and who access rights are being transferred to (Pinkerton and Edwards 2009). Quotas are a management tool in which the TAC for each species is divided into parcels that are then assigned to fishermen; fishermen are only permitted to catch their share of quota (typically delineated by weight of catch). ITQs are both assigned to an individual – in the Canadian case, held through a commercial fishing license – and are fully transferable¹⁹. The transferability is mitigated somewhat on the Canadian east coast, where owner-operator and fleet separation policies have been in place since 1996 and 1979 respectively (DFO 2003a, 5-6). These policies require that

¹⁹ In Canada ITQs can only be held by those who hold a commercial fishing license. In order to hold a commercial fishing license on the west coast, the owner must be a Canadian citizen or permanent resident, or owner of a BC registered business (Andrew Thomson, Regional Director, DFO, [Evidence](#), FOPO West Coast Fisheries Policy Review. 30 January 2019) However, these limits have not prevented the migration of quotas and licenses out of fishing communities and into urban/ financial centers (German et al. 2019).

license holders must be active fishermen, and that processing companies cannot hold licenses (and therefore quota), so that fishermen remain active and independent operators.

However, in many ITQ fisheries, and BC is a prime example of this, ITQs are freely transferable, along with the commercial fishing licenses through which they are transferred, so owners are free to buy, sell, or lease at whatever price the market will bear. The lack of regulations on who can buy a license and the transferability of quota essentially packages the right to fish into a marketable, tradable asset, and this has had the effect of transforming the right to fish into a quasi-private property asset in the last 2-3 decades²⁰. Each license is attached to a permanent allocation of the TAC – a permanent quota of 0.1% of the TAC; additional quota can be temporarily (through a lease) or permanently (through purchase) added to the license (Ecotrust Canada and T. Buck Suzuki Foundation 2015, 24). Haas, Edwards and Sumaila (2016) conducted a study of ITQ ownership in BC and found that in the absence of government controls, licenses and ITQs were being bought up by processing companies, who in turn leased out the licenses and quota to active fishermen. Recent investigations also suggest that corporations and investors from outside the fishery and in some cases outside Canada are also buying up quota and licenses (German et al. 2019, 262-263; Silver, February 5, 2019)²¹. Aside from reports of exorbitantly high lease prices (Simpson 2016), this practice also effectively makes fishermen price takers, because they are forced to sell all of their catch to the company that leased them the quota (Pinkerton and Edwards 2009); with the processor's need to compete

²⁰ An important caveat here is that licenses and quota confer weak property rights on the holder; under current *Fisheries Act* legislation, the Minister has absolute discretion with regards to granting of licenses, and formally, licenses must be renewed every year (although in practice they are rarely revoked or disputed). In addition, quota has an even weaker foundation as property, because quota is not protected by legislation and it is fully within the Minister's power to reduce, re-allocate or eliminate the TAC, without compensation, as long as the Minister uses this discretion with reasonableness. These details have been outlined in several recent court cases, discussed by Kegan Pepper-Smith, UBC Faculty of Law, in a report for Ecotrust Canada and the T. Buck Suzuki Foundation (2015).

²¹ Jennifer Silver, Associate Professor, University of Guelph, [Evidence](#), FOPO Review, February 5, 2019.

for fish essentially eliminated, fishermen are forced to accept whatever price the quota owner sets. Furthermore, Pinkerton and Edwards found that even fishermen who owned quota preferred to lease their quota through processing companies:

Many quota owners prefer to lease their quota out through a processor as a broker because the processor is in a better position to get the highest price and because, as several fishermen stated, they do not want to be ‘guilted by other fishermen’ about the high lease price they are asking. Similarly, many lessee fishermen do not wish to deal directly with the quota owner because of their hostility toward the high lease prices. (2009, 709)

This puts the processing company in a position of considerable power, and creates a market in which lessees do not have full access to information – for example, they do not know what price the processor leased the quota for or whose quota they are leasing (Thorkelson February 5, 2019)²². Thus, fishermen are not only paying around 70% of their catch value in lease fees, they have also lost a competitive market to sell their catch to, leaving them with all of the risk of fishing and only marginal returns²³ (Pinkerton and Edwards 2009).

From a management perspective, the transferability of quota eliminates the need for managers to intervene in assigning or re-assigning the right to fish, because it is up to the market who gets to fish – whoever can afford to buy quota. As the price of quota rises, the opportunity cost to smaller fishermen of staying in the fishery and fishing their quota versus selling their quota to a larger operation favours the exit of small-scale fishermen (Olson 2011). This effect, of consolidation and funnelling of access rights to larger efficient industrial operations, is a key

²² Joy Thorkelson, President, United Fishermen and Allied Workers' Union – Unifor. [Evidence](#), FOPO Review, February 5, 2019.

²³ A report containing valuations of licenses, vessels and quota for 2016, prepared for DFO, helps to clarify these costs: as an example, the 2016 average price for a Halibut license was \$64,200, the average quota price was \$95/lb while the average lease price was \$8.40/lb (Simpson 2016). For the same year, a report prepared for DFO by GSGislason and Associates found that the average ex-vessel price for Halibut (the price paid to the harvester) was \$7.07/lb – leaving a potential lessee operating at an average loss of \$1.33/lb in this scenario (GSGislason and Associates, 2017, 5).

design feature of ITQs; this is the effect fisheries managers and economists call 'fleet rationalization' – incentivising smaller-scale fishermen to exit the fishery in order to reduce the number of boats on the water so that only the most economically efficient operations are able to fish (Mansfield 2004b). The high cost of operation and entry, especially since the addition of quota leasing or purchase cost to the equation, has resulted in very few new entrants to the small-scale fleet (Ecotrust Canada and T. Buck. Suzuki Foundation 2015).

ITQs as a management tool are different from previous tools employed by DFO because ITQs control output – the amount of fish harvested – rather than input or fishing effort. However, more fundamentally, ITQs represent a shift from thinking about fish as public or common property that can be caught by authorised licensees to thinking about fish as private property to which access must be obtained through the market (Ecotrust Canada and T. Buck Suzuki Foundation 2015). The issues with ITQs and the privatization they represent is discussed in detail in other places in this paper, so for the purpose of this section, this concludes the overview of fishing policy on the Pacific coast.

3.7 Research Findings

The aim of this project was to gain a full understanding of the current state of fisheries management in Prince Rupert to both determine whether it can be considered co-management, and how the management system can be improved from the perspective of fisheries participants, especially active fishermen. Over the course of 11 interviews, I heard a range of perspectives and the answers to these broad questions are described here. The following section is organized thematically to answer the questions of *What currently exists* (understanding the current state)? and *What needs to change* (identifying problems and barriers)? The chapter concludes with a discussion on barriers to prioritising fish as food from the perspective of interviewees.

3.7.1 The current state: lack of trust between parties

One of the strongest themes that emerged from interviews was a lack of trust between DFO and active fisheries participants, and, to a slightly lesser extent, a lack of trust towards other user groups within the fishery, such as the recreational (sport fishing) and First Nations Food, Social and Ceremonial (FSC) fisheries. Since all of my interviewees were participants in the commercial fishery or professionals working with the commercial fishery (such as with non-profit organizations or DFO), I cannot speak for how participants within the recreational or First Nations FSC fisheries perceive their relationship with the commercial fishery. Trust for DFO by commercial fisheries participants (and, to some extent, a reciprocal loss of trust on the part of managers towards fishermen) has eroded significantly due to two distinct trajectories over the last two decades. Although participants' reflections indicated that there was a more robust relationship between managers and users in the past, it was clear through articulations of frustration and stories of how Pacific fisheries have come to be in the state they are today that a consistent breakdown in communication and the loss of visible scientific monitoring are two key contributors to the decaying relationship.

3.7.1.1 Breakdown in Communication

The lack of trust between managers and fishermen is evident in overt descriptions of the relationship, mostly expressed in fishermen's interviews. One of my first interviewees described the relationship between fishermen and the Pacific Region of the DFO as "devoid of good feeling... adversarial" and noted that instead of trying to build constructive management, it seemed DFO had created a destructive management structure (Interviewee 1, 2019). When another interviewee was asked if there had been a breakdown of trust between fishermen and DFO, he responded "I'll tell you now, we didn't break it, we had it broken... we're struggling to

repair it and get back to where we were," (Interviewee 9, 2019). From the perspective of an interviewee working at the regional DFO office, there was the perception that fishermen aren't always honest in communicating what they see on the water, and that it is influenced by "personal agendas" of those trying to keep the fishery open for their own benefit (Interviewee 6, 2019). Participants also shared experiences that illustrated to them that DFO reciprocated their distrust, such as the example one interviewee gave about a recent meeting with local DFO staff to determine whether to close the crab fishery to protect a crab moult:

I told him we looked at the data, we looked at the 3 tests, this is the trend... and so we think it's a good time to close, and the fleet all agrees, and his comment was 'huh, the fleet all agrees, we must have left it too long.' And he wasn't even around when we designed [the softshell monitoring program], and in the 20 years we've done this we've never ever gotten it wrong, you know we've closed too early but we've never endangered the resource and this stuff only works if you have people with knowledge and cooperation, if you don't have the same mutual respect then it doesn't work. (Interviewee 9, 2019)

The comment, 'huh, the fleet all agrees, we must have left it too long' was upsetting to the interviewee, who went on to explain the history of the program, indignantly. The statement from the DFO staff member also illustrates that on some level, he did not trust the fishermen's intentions, even if the statement was only made in jest.

A suspicion that DFO doesn't participate meaningfully in consultations with fishermen was repeated through several interviews, with one interviewee commenting that it seemed as if DFO viewed meetings and consultations with fishermen as "just a lipservice" and that it felt as if they (DFO) came to meetings "not prepared... not taking it seriously" and with "decisions already made" (interviewee 7, 2019). This was one of the most common criticisms of the current DFO management system and came up in almost every interview.

The current DFO management system, sometimes called co-management by DFO (DFO 1999a) prioritises official communication between DFO and fishery participants through DFO-mandated Advisory Boards. Advisory Boards are meant to be representative bodies that meet at least once annually to discuss management details and concerns from fishermen. However, interviewees pointed out several structural flaws, from the history of these Advisory Boards to who has the ability to participate, and finally, the general perception that regardless of what is said at these meetings – or any other meetings between DFO and participants – that advice rarely gets implemented.

Initially the advisory boards were connected to fishermen-created organizations who appointed members to the advisory boards from among their membership. Eventually however, the process was changed so that license-holders were the ones with the power to vote on who sat on these advisory boards. Commenting on this change, an interviewee explained how the direct-voting system that privileged license-holders²⁴ has led to the disconnect between DFO and active fishermen:

DFO just dismantled all of these advisory boards – 'we're not dealing with them anymore, we're going to have this process where your license-holders are going to be directly involved' and then they instituted quotas, which divorced many fishermen from being license holders – they weren't license holders anymore, they were sharecroppers, so they had no input into any of those advisory committees. (Interviewee 10, 2019)

²⁴ As discussed in the previous section, license-holders are not necessarily active-fishermen in the Canadian Pacific fishery context; due to the lack of limitation on who can buy a commercial fishing license (the only limitation being that licenses must be owned by Canadian residents or BC registered businesses), licenses have been bought up by corporations, processing companies and, according to recent research, even foreign investors (Pinkerton and Edwards 2009; German et al. 2019). Active fishermen in many cases must now lease licenses and quota in order to fish; since DFO still considers license-holders to be synonymous with active fishermen, license holders are given priority in communication and decision-making spaces, regardless of whether they fish.

The move towards a system of communication and consultation in which DFO primarily gives credence to advisory boards that are made up of members voted in by license holders in the fishing industry, paralleled with the separation of license-holders from active fishermen, has left active fishermen in a position where they have a difficult time participating in any management conversation with DFO, and in decision-making conversations even more so.

The disconnect between being consulted and having their advice acted on was another source of frustration for many interview participants. One participant commented that he thought the current process could be made to work, but only if DFO participated meaningfully: "It's set up to work, but it'll only work if DFO listens – what I mean is that they listen, then they go about their merry business – this is not doing anybody any good," (Interviewee 2, 2019). Another participant described the frustration of taking part in the advisory processes with DFO: "The same problems are here as they were 10 years ago, but there's less and less important representation there from DFO, they just send their lower level managers," (Interviewee 9, 2019).

Due to this perception that DFO doesn't listen or value their input, many fishermen no longer participate in meetings and consultations – one interviewee described it as a double withdrawal, with fisherman withdrawing from the process and then DFO withdrawing as well by reducing communication opportunities. He described the change from 30 years ago to today as one that has left fishermen "severely beaten and bruised" and that fishermen have been "demoralised" over the years (Interviewee 1, 2019). Another participant explained why he stopped going to meetings:

Well, I stopped going to the meetings about 10 years ago, and the reason is that I've seen all these knowledgeable skippers with herring especially giving

up their time to advise DFO about what's happening with their stocks and everything, but government seems to not care about what fishermen have to say, and it's more like they have to talk to us, so they do, but they don't care about the ideas that we come up with or what we say, or what we think is happening, they don't think that that's what's happening. (Interviewee 2, 2019)

The breakdown in communication between active fishermen and DFO has manifested in a loss of engagement from active fishermen and a concurrent shift in power away from active fishermen towards license-holders and quota owners, many of whom are not active fishermen and don't always have a connection to the fishing industry or coastal communities. Both these results – the loss of engagement and the shift in power towards owners also amplify each other, in that the more active fishermen recede from what little advisory process is available to them, the more decision-making power shifts away from active fishermen. Similarly, the locus of decision-making power moving steadily into the hands of non-active participants further entrenches the exclusion of active fishermen from the advisory process, especially as the interests of active fishermen and investor-owners²⁵ become less and less aligned – even polarised.

3.7.1.2 Loss of Visible Scientific Monitoring: No more 'eyes on the ground'

The other main factor that has led to a loss of trust between active fishermen and DFO is that of the loss of visible scientific monitoring on the part of DFO. Most interviewees commented on the reduction in DFO's data collection and monitoring efforts, and many fisherman indicated that this reduction had significantly eroded their confidence in DFO's management. One interviewee commented: "They [DFO] have no boats on the ground, no eyes

²⁵ See note 24 above for details.

on the ground." This participant explained why fishermen are distrustful of the computer models that DFO now uses:

If you're pumping in garbage into the model, you're going to have garbage come out, I don't know how good the model is – and their data collection, they've stopped it. They have no one walking the creeks, no one out on the grounds, no one out on the boats and getting a feel for how big the run is or if it's fading. (Interviewee 2, 2019)

Another participant explained how old data and data collected for different purposes was used in modelling to make decisions that fishermen believed were very poor:

A good example is the Yelloweye threat – it was put into a computer model, it was done based on data that was from shrimp surveys, and really old data, the fishing industry was never consulted in it... so they make a decision, they say it's based on science, but the data they're using for the science is no good, it's not accurate – I won't say it's no good, it's good for certain things, and I would say they've got a huge amount of people going into science that have no real experience of being around the ocean. (Interviewee 9, 2019)

The switch to computer models is a change that another participant described as leaving fishermen feeling "alienated" (Interviewee 1, 2019), because it has led to decisions being made that do not align with fishermen's own experiences of the ocean. For example, two interviewees explained how they believed DFO's decisions on granting access to salmon was resulting in "over-escapements" – too many fish going up the river to lakes, which they effectively considered to be a waste of salmon that could have been fished.

DFO is aware of the fact that the data they use sometimes comes from very old stock assessments; this short exchange from the FOPO review meeting illustrates this point:

Mr. Mel Arnold (North Okanagan—Shuswap, CPC):

"Are the current stock assessments up to date with the programs?"

Ms. Rebecca Reid (Regional Director-General, Pacific Region, DFO):

"Well, some are, but we are relying on some very old datasets in some cases."

(Evidence, January 30th, 2019)²⁶

An interviewee from DFO commented that:

In a perfect world, [we would] have a much bigger sampling program, the more you put into it the better data you get. We have huge fisheries, and we're only doing the bare-bones science to ensure that we're staying out of the red zone. (Interviewee 6, 2019)

Another complaint that interviewees expressed was that they believed DFO staff had little experience with being out on the water and developing an understanding of fishermen's lived experience. One interviewee explained how this has changed over the last two decades:

I think a lot of people come to DFO with having done a very specialised Master's or PhD and maybe necessarily haven't worked on the ground... they have more of an academic experience, rather than understanding people working 18 hours a day and having mortgages and payments. (Interviewee 7, 2019)

This complaint is one that is familiar to DFO, as an interviewee from DFO explained how he was working to address this issue:

One complaint I'm hoping to get around because I just went out on this is that DFO is never actually physically present on the water – the armchair manager, like the armchair fisherman – is that we sit in an office and make rules that we don't understand the consequences of because we don't actually see out on the water what's happening, which is valid, I would love to spend more time out in the field, and it is very handy – I definitely learned a lot just being out on that few days on the boat. (Interviewee 6, 2019)

Both these issues – the reduction in data collection and the reduction in visible DFO staff interacting with active fishermen – can be traced back to a reduction in DFO's funding, and a

²⁶ Rebecca Reid, Regional Director General, Pacific Region, DFO, [Evidence](#), FOPO West Coast Fisheries Policy Review. 30 January 2019.

change in funding priorities (DFO 1998, 29). Several interviewees commented on this change, noting that not only had DFO lost funding overall, but that what funding did remain had been redirected away from "knowledgeable officers on the ground, taking numbers and talking to knowledgeable fishermen on the ground" (Interviewee 2, 2019) around the country and towards bureaucrats in Ottawa (Interviewee 11, 2019). This geographic and experiential distance between manager and user has led to a reciprocal loss of confidence in each other's experiences and intentions. Just as fishermen feel that DFO doesn't have the data to justify their decisions, DFO also seems to value fishermen's lived experience less and less, as evidenced by the move away from active communication with fishermen and towards computer modelling. The result is a manager-user relationship in which neither group seems to trust the others' intentions, and significantly, where active fishermen are losing confidence in DFO's ability to manage the fishery resource well.

3.7.2 What needs to change? Identifying Problems and Barriers

Most of the discussion on the present state of fisheries management with interview participants identified deeply rooted problems and barriers to progress and collaboration. In the following section, I highlight some of the more prominent barriers identified by interview participants.

3.7.2.1 Inequity in Licensing and Quota Ownership

A major barrier to the creation of a robust, thriving small-scale fishing fleet is current licensing policy, and the quota system in some fisheries. This was the main topic of discussion at the recent FOPO West Coast Fisheries Review, and it is also one of the most commonly criticised features of west coast fishing policy (see Pinkerton and Edwards 2009; Ecotrust

Canada and T. Buck Suzuki Foundation 2015). Interview participants generally agreed with statements made by independent fishermen to the FOPO committee, which highlighted the inequity in profit and risk sharing between investor-license/quota-owners²⁷ and active fishermen. Investors and non-active owners, commonly called 'armchair fishermen,' are increasingly in control of fishing licenses and the quota sometimes attached to those licenses. An active fisherman aptly described why licenses and quota have become investment assets instead of rights enabling small-scale fishermen to harvest sustainably, which was their original stated intent:

The reason so much access is held by non-harvesters is the prohibitive prices of licences and quota. Speculative investors, both domestic and foreign, are realizing a safe return on investment since the harvesters are bearing all the risks and have no other means of attaining access in many cases... High prices led to high lease rates and high lease rates lead to struggling harvesters. Struggling harvesters cannot afford to purchase quota or licences. (Lawson, February 6th, 2019)²⁸

Ryan Edwards, a fisherman from Vancouver Island, commented that the effect of current policy has left fishermen giving 80% of profits to armchair quota owners:

With our vessel, we pay 20% of the landed value—80% goes to somebody who has quota. There's absolutely no way for our boats...to maintain our vessels. My boat's 91 years old and I have to pay my crew or else I won't have crew. Things get sacrificed. We have to work too hard and things suffer. (Edwards, February 6th, 2019)²⁹

Another fisherman, Michael Barron from Nova Scotia, comparing between his experience on the East Coast and that of fishermen on the west coast, explained the inequity in

²⁷ This inequity is seen even in fisheries that have not transitioned to quota-based management. License ownership in the hands of anyone other than active fishermen causes the same inequity as the quota system.

²⁸ James Lawson, Fisher, as an Individual. [Evidence](#), FOPO West Coast Fisheries Policy Review. February 6th 2019.

²⁹ Ryan Edwards, Fisher, as an Individual. [Evidence](#), FOPO West Coast Fisheries Policy Review. February 6th 2019.

current licensing and quota policy using dollar amounts to highlight the incongruity between risk and profit for active harvesters:

In British Columbia, if you take the same \$1,000 worth of harvested fish and you take off the fee you would have paid the owner of the quota, it leaves approximately \$200. That means as much as 80% of the harvest is going to potential foreign interests. How do you keep a vessel in good repair? The wages paid to crew are disrespectful, and this represents sharecropping to an extreme. The effort is significant and the returns on the wages and well-being are minimal. (Barron, February 6th, 2019)³⁰

Interview participants explained how this system has left fishermen having to work much more than in the past, while still earning less and therefore demoralised and too worn out to feel empowered to participate in advisory and consultation processes. Duncan Cameron, speaking to the FOPO Committee, summarised this disenfranchisement and the effect it has had on who is able to participate in advisory processes:

At the heart of this problem is a very simple cause: licensing policy with no consideration for cultural or socio-economic concerns. This led to consolidation of licences and concentration of ownership, seafood companies vertically integrated to control costs and secure supply. Specifically for the fishing industry, it gave them the control of the advisory board process. (Cameron, February 5, 2019)³¹

One interviewee commented that most fishermen were too busy to be able to focus on selling fish to the local community, "right now, lots of fisherman are busy catching as much fish as possible to fill their quota, because they're not owner-operators, they're working for somebody," (Interviewee 4, 2019). Another participant explained what an ideal seasonal balance looked like in the past for fishermen:

³⁰ Michael Barron, Fisher, as an Individual. [Evidence](#), FOPO West Coast Fisheries Policy Review. February 6th 2019.

³¹ Duncan Cameron, Fisher, as an Individual. [Evidence](#), FOPO West Coast Fisheries Policy Review. February 5th 2019.

A good balance would be 6 months of hard fishing, and 6 months of time off or working on your boat – or even 4 months of being gone all the time, there's still so much work that you're doing on either end, so the fact that we've now got most professional fishermen working around the clock to try to make a living, where do they have time to go to these meetings and try to push for things that matter to them? (Interviewee 7, 2019)

3.7.2.2 Accessibility and Effectiveness of Advisory Boards

The most common barrier to effective participation in DFO advisory and consultation processes by active fishermen was the structure and accessibility of the advisory boards. A major source of inequity in who participates in this advisory process is the fact that only license-holders can vote to elect board members. Interviewees explained the barriers to getting a seat at the table: "Well, [active fishermen] have to get nominated and then they have to get elected, and other fishermen can't vote for them unless they have licenses," (Interviewee 7, 2019) so although active fishermen can participate on the advisory boards, the selection process is not set up to facilitate their participation. A related challenge is that representatives have no mechanism or requirement to actually behave as representatives – there is no process for representatives to consult with fishermen in their community so that what they bring to the advisory process reflects the views of that community; many interviewees believed that most representatives acted in their own interests. One interviewee who currently sits on one of these boards described how she thought all representatives should be getting input from those they represent, but acknowledged that this was not the case: "The best thing we'd see... the Area Harvest Committee having a fishermen's meeting, which we do in the summer, and say 'bring your complaints, we'll bring them forward for you' – but not all the other directors do the same thing," (Interviewee 8, 2019). Another interviewee described the process of local advisory boards which existed in the past as a possible alternative, that gave fishermen an opportunity to come together on a

community scale and select a representative to speak for them on the regional board (Interviewee 1, 2019). This was prior to the direct-voting system that privileged license-holders and marginalised many active fishermen from the advisory process.

Another barrier to participation included the location of the meetings: "most meetings are held in Nanaimo or Vancouver or something very central, whereas someone on the North Coast is never going to have the capacity to get there," (Interviewee 7, 2019). There is also the perception that meetings are timed to exclude active fishermen: "A lot of it [decisions] is controlled by big companies – the active fisherman is usually fishing and a lot of these decisions are made between now [April] and the end of September, active fishermen don't have time to attend these meetings," (Interviewee 9, 2019).

Participants believed only a small group of license and quota owners were participating in co-management with DFO within the current advisory system. The general perception of co-management was summarised by one participant:

Many people would say it's the regular getting co-opted by a small group of people who have a lot invested, millions of dollars invested that want to manage the fishery so it meets their needs, not the needs of fishermen, not the needs of community, and the DFO is co-opted into maintaining that system because they have so much invested, so much time and energy into creating it. (Interviewee 10, 2019)

Although some interviewees expressed faith that the current system could be made to work if both active fishermen and DFO exerted more effort to communicate, others were not so hopeful. There is an argument to be made that the existing structure is too exclusive and doesn't facilitate conversation among active fishermen and between active fishermen and DFO. Even if more diverse voices are elected to these boards, it does not necessarily mean that policies will

change or that the structure will yield better results for active fishermen, because it is not clear that the board is effective at communicating with the represented, nor that the advice of the board is implemented by DFO.

3.7.3 Barriers to a 'fish as food' priority

An important focus of this research project was to understand why fish is difficult to access in coastal communities, and how more fish could potentially be made available for local communities under a co-management system. Fish as food did not naturally come up in most interviews; however, I asked questions to understand fishermen's perception of their role in providing food access to local communities. Most interviewees agreed that providing food for local communities was important to them; when asked if feeding the local community was a priority, one fisherman answered: "Always has been. But now with quotas and all this other stuff, a fishermen can't even afford to give a fish away – we used to give them away," (Interviewee 2, 2019).

From conversations with fishermen, it seemed that in the past, fish was circulated through fishing communities through several mechanisms: fishermen brought fish home to their friends and families; the regulations around selling fish at the docks were simpler, so fishermen could sell locally; there was much more fish being circulated through communities, in part because a significantly larger proportion of the community was engaged in fishing, and also because there was a thriving local processing sector which has since collapsed. Fishermen as independent operators were free to choose where they sold their fish – and even though most of the catch in the past also went through processors,³² the processors were embedded in small coastal

³² The history of salmon canneries on the west coast is closely tied to colonization and European settlement in B.C. See Harris (2008) for more details.

communities. Much of the fish was still exported, but there was much more of it being circulated by the small-scale fleet, and as more of it stayed in the community, more of it tended to circulate (Ecotrust Canada and T. Buck Suzuki Foundation 2013).

However, the economic realities of a globalized, export oriented fishery have weakened the connections between fishermen and communities significantly. One Interviewee responded to the question of whether fish as food was a priority for fishermen today with: "I don't know, in the crab fishery the biggest market is – well it used to be in the salmon industry too... all the money was in foreign markets... You had to get 95% of your fish ready for export grade." (Interviewee 9, 2019). Another interviewee, speaking from a processing perspective, commented that although food for the local community was a priority for him, from a business perspective it did not make sense: "For dollars and cents, it doesn't help, and it might even hurt the bottom line," (Interviewee 11, 2019). Presently the division between license/ quota owners, who in many cases are also the processing companies, and active fishermen results in owners and processors having control over how and where the fish is processed and where it is distributed. The processing sector in small coastal communities along the BC coast has mostly collapsed; most processors closed their doors as DFO reduced catch amounts to put a greater emphasis on conservation, as the small-scale fleet that supplied the local processing sector has been decimated, and also because in many cases the processing sector has outsourced labour-intensive operations to cheaper labour markets (Interviewee 1, 2019). In this system, where almost all fish must go through a large, typically centralised processor, export-orientation becomes inevitable (Olson 2011; see Witter and Stoll 2017 and Knutson 2017 for some important examples of resistance to this phenomenon).

Putting economic realities aside, interviewees identified a number of barriers to being able to sell food locally. The three main themes discussed by interviewees were: lack of community demand for seafood; complicated, prohibitive regulations; and lack of practical infrastructure to allow fishermen to sell locally. Commenting on her experience growing up in a fishing community, one interviewee noted: "We ate lots of lobster... and my dad gave out lots of lobster but my [friends] that I went to school with, they never ate lobster... seafood just isn't super popular in Canada it seems," and "people think it's really expensive... people don't have the literacy to use it," (Interviewee 7, 2019). 'Fish literacy' was an important theme emerging from my research with Ecotrust Canada as well (2018). Another interviewee noted that fish is typically overlooked in conversations on food security and food systems, possibly because "staff in the food movement feel under-qualified to speak on fisheries issues," (Interviewee 3, 2019).

Regulations around selling fish as a fisherman directly to consumers or local food establishments was a large part of my project with Ecotrust Canada. The project report goes into detail on the different licenses and rules for different scenarios of fisherman-to-consumer sales (Ecotrust Canada 2018). The main theme in common between what is published in that report and what interviewees said during interviews for this paper is that the regulations are complicated to understand and there is a lack of information around navigating the rules. There are special licenses that fishermen need to purchase in order to be able to sell directly to consumers, and the specific license required changes with the scenario – for example, whether fishermen wish to sell fish off of their boats or whether they want to sell it at a local market affects the type of license needed. One interviewee believed the regulations as they exist were sufficient, but the process to get licensed could be made more transparent: "I think it is pretty

easy to get licenses – I think it's just making that process understandable and available – so I'm not sure if any policy needs to change there," (Interviewee 7, 2019).

Conversely, others believed that the regulations as they exist currently make it impossible to have direct-to-consumer sales on the west coast, because the rules keep even properly licensed fishermen from being able to package the fish appropriately for sale: "You can't touch a fish on this coast. You need a license to sell it off the boat but you have to sell the whole fish. You're going to sell a 50lb halibut it's going to cost you \$500 – and people don't want that," (Interviewee 2, 2019).

Although there was some debate among interviewees about the ease of obtaining licenses, this must be contextualised within a system that does not favour small-scale fishermen, and large scale operations are not interested in small, local markets in remote coastal communities. Regardless of whether licenses are easy to obtain – if there are no small-scale fishermen with connections to coastal communities, or these fishermen exist but are tied to processing companies – there will be no fish available to sell locally, licensed correctly or not.

From the perspective of a local food establishment, accessing local seafood can still be a challenge. An interviewee from a local seafood restaurant commented that due to connections with a local processor he was able to access fish, "But if they don't exist in Prince Rupert or Port Ed., then fishing regulations will affect small business a lot because everything has to be validated, and there is no fisherman-to-direct restaurant ability – unless you have a processing license," (Interviewee 4, 2019). A processing license is a significant investment for a small restaurant³³.

³³ Processing licenses, which can be costly depending on the specifics, require the applicant to meet specific construction, equipment, food safety, sanitation, processing, record-keeping and reporting requirements. Additionally, the applicant may be asked to register with the Canada Food Inspection Agency, which adds another barrier to the licensing process (Government of BC 2019).

A related issue that was investigated extensively in the report published by Ecotrust Canada on local seafood access is the logistical challenge of selling fish to local residents (Ecotrust Canada 2018). The most obvious challenge is that most small coastal communities no longer have waterside markets or the infrastructure needed to enable dock-side sale, even if a fisherman were to navigate the licensing and regulatory complexity to be able to sell at the dock. Other factors that make selling locally a logistical challenge for fishermen were: "the costs to do that [sell locally] of your time is not balancing out. There is no really good avenue for you to do that," (Interviewee 7, 2019). Another fisherman cautioned, "You must remember, they [local markets/ consumers] can only handle so much fish, how much the market can stand, so then they're only going to buy a third of your salmon, so you'd still have to go to the canneries," (Interviewee 5, 2019). This cost-benefit issue is discussed in more detail in my report for Ecotrust Canada (2018).

Despite logistical and regulatory challenges to selling fish and seafood locally, some fishermen would be willing to work through these challenges, if they believed it would be worth the time and effort (Ecotrust Canada 2018). However, with the state of the fish supply chain as it is today, there are few independent fishermen left, and those that are around are struggling to make a living by stretching themselves thin across fisheries and seasons. With an increasing amount of licences and quota controlled by corporations and centralised processors, there is little fish left to circulate in coastal communities. As the advisory and consultation processes shift to favour these same license holders and companies, opportunity to prioritise the interests of small-scale fishermen and coastal communities becomes ever more elusive.

Chapter 04: Diverging Worldviews: Co-management, Reconciliation and Conservation

This chapter explores higher-level themes that emerged during conversations with interview participants, in an attempt to understand broad barriers to effective co-management and trust between fishermen and managers. An interesting phenomenon observed throughout my conversations with participants was that there seemed to be a significant disconnect between management paradigms and worldviews among managers and users. I argue that this is a major contributor to the distrust that exists between users and managers, and I have parsed these barriers into three interrelated themes. The first is that DFO and fishermen define co-management differently, definitions that may be in direct opposition to each other. Since co-management is presently designed by DFO, one system is privileged over the other, which users do not perceive as co-management. Related to this disconnect is that privatisation and commoditization has shifted who has the power to participate in these existing co-management arrangements, and this system has marginalised active fishermen. The second is that it seems commercial fishermen, DFO, and First Nations are all operating under different worldviews in terms of what reconciliation looks like and how it plays out in practise with regards to fisheries allocations. This has resulted in significant tension between commercial fishermen and First Nations communities, with much of the blame directed at DFO and the Canadian government's handling of the relationships. Finally, it appears that managers and commercial fishermen are operating under two different conservation paradigms that reflect two different ideas of the human-nature relationship – that of the older, more established single-stock Maximum Sustainable Yield (MSY) method of natural resource management, and the newer, more dynamic Ecosystem-Based management (EBM) regime that DFO is attempting to adopt. All three of these themes represent a disconnect between how different user groups in Canada's west coast fisheries

relate to each other and the fishery resource; these disconnects will need to be resolved if the fishery resource is to be managed and used equitably by the many communities along the Pacific coast, and if trust is to be restored between those who manage and those who use the fishery.

4.1 Disparate Expectations of Co-management: DFO, Industry and Fishermen

Definitions of co-management are numerous in the literature (Castro and Nielson 2001) yet this is also a defining feature of co-management: that it is context dependent and therefore a prescriptive formula cannot be applied from one case to the next, only lessons learned (Ostrom 2007; Pinkerton 1989). Sen and Raakjaer-Nielson propose five types of co-management that range in the degree of power-sharing and participation of user groups: Instructive – "only minimal exchange of information"; Consultative – governments consult users but retain decision-making power; Cooperative – both government and users cooperate as equal partners (the authors note that this is most often what is referred to by scholars as co-management); Advisory – "users advise government of decisions to be taken and government endorses these decision"; and Informative – decision-making authority is delegated to user groups, who inform government of decisions they have made (1996, 406). Beyond this typology, Pomeroy argues that still more complex co-management arrangements exist in practice (1998). For the purposes of this paper, it seems that the different user groups in the Pacific fishery all define co-management differently and make distinct choices about who should participate in co-management, choices that are deeply connected to issues of power.

4.1.1 Co-management as designed by DFO

The divergent expectations of co-management are a major source of conflict among user groups and with managers. In the case of DFO, there is also a discrepancy between what is stated as co-management in policy and what takes place in practise. From Sen and Raakjaer-Nielson's

typology above, DFO appears to be engaging in 'consultative' co-management at the policy level.

In practise however, even this level of co-management is not necessarily uniform across users.

The following excerpt from DFO's "Framework and Guidelines for Implementing the Co-Management Approach, Volume 1: Context, Concepts and Principles" (Framework V.I) defines the different roles in a co-management relationship from the DFO perspective:

DFO will continue having a strong presence in the areas of policy development, scientific research, aboriginal affairs (to ensure that land claims and fiduciary obligations are addressed), international issues and in conservation and protection of the resource through required enforcement activities...

With co-management, participants in fisheries will be encouraged to play a greater role in the identification and implementation of management measures and activities related to their specific fishery and to share responsibility for the management of the fishery. This could involve specific management issues as well as contributing to data collection for science, reporting systems, sampling, supervising local initiatives, etc. (DFO 1999a)

Furthermore, this framework makes explicit the DFO expectation that co-management will take place through the existing, formal advisory boards. Co-management is defined on two levels, the first being through user participation in the development of Integrated Fisheries Management Plans (IFMPs), and the second is a less common and voluntary arrangement to share responsibilities through Joint Project Agreements (JPA) that must be signed with a formal body representing the co-management partner. With regards to the first level, the level that most fisheries and fisheries participants would take part in, the framework outlines that input to IFMP's takes place through the existing advisory system (DFO 1999a). In light of the discussion from the previous chapter on the limitations and accessibility concerns highlighted by interview participants regarding the existing advisory process, the fact that DFO privileges this process to carry out co-management immediately leaves out a significant proportion of fishermen from

participating. The second voluntary level, JPAs, are no more inclusive: a requirement of entering the JPA process, which functions as a binding contract between DFO and the body representing the co-management partner, is that the representing body must be a formal entity that has obtained the approval of a majority of license-holders in that particular fishery to enter the JPA. The 'Framework and Guidelines for Implementing the Co-Management Approach, Volume III: Joint Project Agreements' (Framework V.III) recommends that the co-management partner in the case of JPAs also be the existing advisory board (DFO 1999c). Therefore, both levels of co-management as envisioned by DFO automatically privilege existing power structures and within them, license-holders, rather than active fishermen.

The 'Framework and Guidelines for Implementing the Co-Management Approach, Volume II: Integrated Fisheries Management Plans' (Framework V.II) (DFO 1999b) provides an outline for what should be included in an IFMP: this includes a section on 'Consultative Process' which should "describe types of committees which are part of the process" (DFO 1999b, 10). A review of three IFMPs for the Pacific Region – the Crab IFMP for 2019-2020, the Groundfish IFMP effective February 2019 and the Salmon, Northern B.C. IFMP for 2018-2019 – confirms the focus on the formal advisory process as the only reference to consultation or co-management. All three IFMPs contain brief sections on 'Consultation' which reiterate the role of the advisory process, as well as comments on the inclusion of mandated consultation processes with First Nations. References to 'consultation' throughout the documents also focus for the most part on either the established consultation process through advisory boards, or to the responsibility of DFO to consult with First Nations. Beyond leaving comments during a 30-45 day window in which the draft IFMP is presented to the public (Interviewee 6, 2019), active fishermen and other

members of coastal communities have little opportunity to participate meaningfully in fisheries management.

The other major concern with this configuration of co-management is the delineation of roles and responsibilities; based on the Framework V.I (1999a), it is clear that DFO does not – and cannot, under the current *Fisheries Act* legislation, (since the Minister retains 'absolute discretion' on fisheries management decisions) share decision-making power on fish access and allocations. Furthermore, DFO retains the authority to make all decisions regarding conservation priorities and actions. Therefore, the only part of the management process that is shared is the responsibility, which includes monitoring and research costs and activities. As an example, the Crab and Groundfish IFMPs provide a short section called 'Shared Stewardship Arrangements' which outline responsibilities between the Commercial sector and DFO. Both IFMPs indicate that costs of monitoring and some research initiatives are borne by fishermen; as an example:

Vessel owners/licence eligibility holders are required to make arrangements with an industry-funded service provider for the delivery of in-season information to DFO as required by conditions of licence regarding electronic monitoring, biological sampling, and catch reporting. (Crab 2019-2020 IFMP)

Interviewees commented on this point as well:

The fishermen in BC pay for all the management costs... The license cost for this boat every year is around \$13,000/ year, and then we pay for softshell, that's just for crab, that pays for my monitoring, that pays for the softshell survey, whatever else DFO, and then there's a huge thing for biosampling, we don't mind – we're not saying we don't want to pay anymore, what we're saying is that we want a say in how the money is spent. (Interviewee 9, 2019)

This arrangement is delineated in the 'Strategic Framework for Fishery Monitoring and Catch Reporting in the Pacific Fisheries' (2012) which is a policy that outlines the roles and responsibilities of different user groups in meeting DFO monitoring requirements:

Harvesters are individually and collectively responsible for complying with management regimes and controls and providing fishery monitoring and catch reporting data. This includes collecting, recording and communicating all catch and fishery monitoring information. DFO will work with harvesters on planning and implementing the specific monitoring and reporting programs for individual fisheries. Increasingly in Pacific fisheries, harvesters have been assuming responsibility for the costs of monitoring and reporting. Over the long term, all harvesting groups in every fishery are expected to bear their share of costs to meet these information requirements. (DFO 2012)

However, interviewees expressed their frustration with the fact that currently, they believed all monitoring costs were carried by the commercial fishery, while the recreational and First Nations FSC fisheries neither had the same reporting requirements nor the equivalent burden of cost. The rationale behind this cost is outlined in DFO policy, where, in 1996 license fees were increased "To have those who benefit from a public resource pay a fee reflecting the value of the fishing privilege," and "To have industry pay for a share of fisheries management costs, i.e. the "user pay" principle." (GS Gislason Consulting and Gardner Pinfold Consulting 1999). Wilson states that co-management partnerships in the form of Joint Project Agreements "appear to be driven largely by economic considerations. It was easier [for DFO] to negotiate with small groups of organized fishermen than with large numbers of disorganized fishermen," (2008, 129).

4.1.2 Co-Management as Privatization

The increase in costs to the commercial fleet, the need for this cost-sharing arising from a reduction in DFO operating budgets and the rise of the co-management rhetoric are co-incident

(OECD 2003, 50; Wilson 2008, 128). However, there is a particular flavour to this version of co-management: it can also be called 'industry self-management' (James 2002; Wilson 2008). The literature on British Columbia's experience with co-management in the fisheries sector is disproportionately focused on the role of industry, often represented by associations of license-holders. James (2002), writing about BC's experience with Co-Management, exclusively focuses on industry associations as the co-management partner, and in that regard, writes fairly favourably about the state of co-management. The typical arrangement includes significant cost-sharing borne by the industry partner, sometimes through permission to assign a part of the commercial TAC towards funding research and monitoring costs (Groundfish IFMP 2019). The common complaint brought up in the literature is that these co-management systems cannot become more effective and thus deliver on the benefits promised (such as improved sustainability and access to information) unless co-management partners are given more security of access (ie. have quota rights be defined as full private property) and co-management partners are given decision-making power. "The stronger the property right, the more likely that co-management will successfully take hold and flourish," (James 2002). This sentiment is echoed in the case studies in Townsend, Shotton and Uchida's edited volume for the FAO *Case studies in Fisheries Self-Governance* (2008).

This is a particular type of co-management that James notes has raised suspicions from the public in the past, when DFO was considering changes to the *Fisheries Act* to enable DFO to share decision-making power with industry: "the general public was skeptical about the industry managing itself," (2002, 3). This is a valid concern; this configuration of co-management privileges large-scale, industrial actors, and requires that strong private property rights should be created for a public resource in order to have effective co-management. This is likely what

interviewees were referring to when commenting on the type of co-management that does currently exist, and who it gives power to: "that would be co-management with a small group that purports to represent the industry, but it isn't representing communities and it's not representing fishermen, it's representing owners and owners and DFO are working together to create a management plan," (Interviewee 10, 2019). The literature on co-management, especially in industrialised countries, tends to refer to this type of co-management – and it seems that this is the type of co-management that is becoming entrenched in Canada. Berkes (2009) and Castro and Nielson (2001) also warn that this type of asymmetric power-sharing can take place if the co-management system is not designed with all users taking part.

This configuration of 'industry self-management' also requires conformity from all participants, outlined succinctly in one of James' recommendations: "providing the authority for co-management associations to compel all sector participants to contribute to co-management activities supported by the majority" (2002, 7). Although the theory of commons management and co-management generally does require buy-in from all participants and mechanisms to prevent free-riding in order to be successful (Ostrom 1990, 100-101), when done through a program of 'industry self-management,' compelling conformity with the majority further marginalises the interests of small-scale fishermen, who are a minority in the sector as it stands and are unlikely to have much of a contribution in the initial co-management planning phase. This type of co-management gives undue power to large-scale industrial actors who may already own the majority of access to fish through quota, and who advocate for further privatisation of a public resource. A small group of powerful private corporations with strong private property rights to a common-pool resource regulating themselves is the antithesis of a type of co-management that empowers small-scale fishermen and communities.

4.1.3 Community Based Co-Management

On the other end of the spectrum from industry self-management is community-based co-management, which is characterised by a commitment to being "people-centered, community-oriented, resource-based and partnership-based," (Pomeroy 1998). Community-based co-management adds a further layer of complexity to the term; however, generally speaking, the inclusion of the term 'community-based' here invokes a system that prioritises the needs of communities adjacent to the resource and small-scale fishermen participating in community-based fisheries. Traditional community-based fisheries are characterised by close connections between fishermen and community members; close, often kinship ties within fishing enterprises³⁴; and class relations that prioritise the sharing of risks and rewards among fisheries participants rather than individual wealth accumulation (St. Martin 2007). Although interviewees did not explicitly express a desire to return to this traditional fishing culture, there is clearly a desire to prioritise benefits to small-scale fishermen and communities from the fishery through improved co-management.

Additionally, in the case where there is a diverse array of participants, leaning too far towards either end of the industry-community spectrum creates a system of co-management that is unsustainable and ineffective. Besides the issues with power-sharing among user groups, a system that does not take into account the interests of all stakeholders in as heterogeneous a context as the west coast cannot generate sufficient cooperation to be effective (Berkes 2009). It is clear from conversations with research participants that the relationship between DFO and fishermen on the Canadian west coast is not considered co-management by active fishermen, and

³⁴ Enterprise here is referring to the combination of captain and crewmembers that work together to harvest fish; it does not imply a corporate relationship.

is therefore ineffective at delivering the benefits that may be seen in a fully subscribed co-management system.

Based on responses by interviewees, it seems participants' desired co-management system aligns with elements of functioning co-management systems that prioritise community benefits in the literature. Several interviewees, for example, commented on the need for polycentric governance systems. Local boards which facilitated participation from active fishermen in the past were suggested as one way to increase active fishermen' voices in the larger regional advisory boards, as local boards could feed into the regional system:

Ideal situation is more along the lines of what I've seen on the East Coast, where every collection of fishermen or every community has an association... each fishing community has its own little collection, and then say that whole collection would be put under West Prince Lobster Association, and then every little community on the other half of PEI would have its own little group, and then they would be put under the Eastern Lobster Association, and whenever things come up, they would have votes, and each little community, so you don't have to travel super far, has its own little vote. (Interviewee 7, 2019)

In addition, several interviewees argued that the Provincial government needed to play a greater role in fisheries management, such as creating legislation to have all active fishermen involved in a representative organization and ensuring that everyone took part in the conversation:

It will take the Provincial government to adopt legislation similar to the East Coast provinces, which will be mandated organizations... so no more freeloaders, right, and everybody has to be party to those conversations, but the difference is those are fishermen, so that's why the Provincial government does it because it's labour legislation, and labour is a provincial responsibility and so the legislation has to say 'fishermen who are active' not license holders. (Interviewee 10, 2019)

There was significant discussion on the need for collaborative science or 'co-science'³⁵, to improve the data collection and information available to perform scientific stock assessments and other marine research. The belief is that fishermen's participation in scientific activities would mitigate the lack of capacity that DFO currently experiences, while also allowing fishermen an opportunity to use their time and experience on the water towards building a better understanding of the state of marine resources. Furthermore, this presents an opportunity to incorporate fishermen's experiential knowledge into management decisions. Berkes argues that this is one of the key advantages to co-management: the ability to involve participants at different scales in knowledge production. When co-management partners communicate across scales, a more holistic picture of the resource emerges than would be possible if either group worked at its own scale alone (2009). Almost all interviewees believed that although there was a deficit in the science available on marine ecosystems, fishermen were well placed to make positive contributions:

I'll be a fisherman, or I'll go out and do the biological sampling, it's completely overlapping skills... I think it would be great if fishermen were doing plankton tows and collecting samples instead of having to send people out on these boats, and costing the fishing industry a whole bunch of money to do it. (Interviewee 7, 2019)

One promising example of collaborative science that was discussed in several interviews was the Area A Crab Association's Softshell Monitoring program. This is a program that has been running for about 20 years, according to interviewees. The Area A Crab Association funds

³⁵ An example of a successful collaborative science/ knowledge production initiative is the "Arctic Borderlands Ecological Knowledge Co-op" in the Yukon, Alaska and NWT, which monitors the health of the Caribou population. This program has been evolving since 1994 and uses Indigenous knowledge at the small scale, and then compares that knowledge with science at a larger scale, to generate knowledge that is more holistic than if only one scale and type of knowledge was in use. A significant reason for the success of the program is that local participants pushed to have their knowledge recognised and resisted the hegemony of conservation science. In addition, the long time period of program development is also considered a critical factor for the program's success (Eamer 2004).

and runs a sampling charter boat during the crab off-season (typically March 1st to August 1st) that collects data to determine whether or not crab are in their moulting phase; moulting crab are not commercially valuable, and also face higher handling mortality³⁶. The charter not only collects valuable scientific data on the status of crab and their annual life cycles, it also allows the commercial fleet to fish safely during what would otherwise be a long closed season, without harming the crab population. Data is collected by the softshell charter, with a DFO observer onboard, and then the data is brought to a meeting between local DFO crab managers and Area A Association members, where a discussion takes place on whether the fleet should continue to fish or stop until the next sampling charter goes out in order to protect the crab (Interviewee 6, 7 and 9, 2019).

Although this case is a good example of collaborative science, there were still complaints from participants that although it is meant to be a co-managed approach, the final decision always rests with DFO. This is indicative of imbalanced power-sharing. Additionally, there are problems such as the fact that the softshell program is expensive to run, and there are many crab fishermen in Area A who do not pay into the program, but benefit from it regardless, because once the fishery is opened it is open for all eligible fishermen. This is an example of incomplete buy-in from participants. Thus, this program exhibits incomplete co-management, and as a result, the sustainability of the program is in question.

Fishermen also have extensive experience with the marine environment and the daily realities of working on a fishing boat and were frequently frustrated by rules and regulations that they believed were unnecessary or detrimental to sustainable fisheries management:

³⁶ Handling mortality is the risk to the crab's survival if it is caught in a crab trap and must be returned to the water.

Even such decisions as, you have some species brought on board that may be prohibited, but you may have a limited number, that came on board, they got caught in the net, why can't you give it to food – you have to throw it all overboard... it can be monitored, to make sure it's not abused, but it's a food source. (Interviewee 8, 2019)

Despite some significant challenges, participants were optimistic that if DFO agreed to meaningfully participate in a co-management system that took participants perspectives on how it should be designed into consideration, there would be meaningful participation from active fishermen: "I know that fishermen could get together and do that [come up with a 'blue sky' future for their individual fisheries], if they knew that their advice was going to be implemented – the trouble is that nobody wants to waste their time and then just be told 'no'," (Interviewee 10, 2019). Participants did recommend that such conversations, especially initially, needed to take place in-person, and with all active fishermen present, to build trust and alliances, allow a sense of community to grow organically, and to allow fishermen to set meeting times and locations that suited them, rather than logistics dictated by DFO (Interviewee 11, 2019).

Witness testimonies to the FOPO Committee argued that certain policy changes could go a long way towards empowering the small-scale, independent fleet. Although witnesses only commented on the consultation and advisory process in passing, mostly to explain how the system did not work for active harvesters, they did argue that implementing owner-operator and fleet separation policies, such as on the east coast, would be helpful in reinstating the agency of small-scale participants. Testimonies did acknowledge that the BC context was different enough from the east coast that there needed to be considerably more consultation and research done on how to put licenses and quota back into the hands of active harvesters without causing significant harm to current owners – however, harm to current investors was not a reason to refuse to

address the situation. Several witnesses even provided ideas on a BC-specific transition plan, such as:

"First, enacting owner-operator policies, which would result in Canadians holding access to the resource, food sovereignty and the distribution of wealth to where fisheries take place. Second, the transferability of choke species should be dealt with effectively. An open market among harvesters of choke species, but owner-operator policies for target species, is an option. Third, every fisher from each fleet has to join an organization that has the harvesters' interest in mind." (Lawson February 6, 2019)³⁷

Although what co-management should look like and who should participate seems to be different between DFO, the large-scale private sector, and active fishermen, it will be necessary to find a common understanding of what co-management of a large-scale, multi-species fishery like the Pacific region's should be. Active fish harvesters are ready and willing to participate in a change process, and have many detailed, context-specific ideas for how to transition from where the fishery is today to where they want it to be in the future. However, in the current state, there is only one group with any type of significant co-management powers, and it has left small-scale independent fishermen disenfranchised. Breakdowns in communication, lack of access to scientific information on the resource, unfair cost burdens and incongruities between the interests of different user groups results in ineffective attempts at co-management: DFO still does not have the capacity to understand the marine ecosystem, local knowledge is going unutilised and undervalued, and the future of the fishery as an open, accessible opportunity for independent small-scale fishermen is quickly eroding under significant privatisation pressures.

³⁷ James Lawson, Fisher, as an Individual. [Evidence](#), FOPO West Coast Fisheries Policy Review. February 6th 2019.

4.2 Tensions between First Nations, Commercial Fishermen and DFO

4.2.1 Tensions between Commercial Fishermen and First Nations

A further source of conflict that was referenced by several interviewees was that of the competing interests between divergent user groups – specifically, commercial fishermen and First Nations³⁸. In recent years, DFO has officially incorporated reconciliation with First Nations into its formal mandate. This has become a priority area of focus, due to political changes at the Federal level (such as the current Liberal government's focus on reconciliation) (Exner-Pirot 2018) and, perhaps more importantly, several important court cases that grant First Nations who can establish a history of continuous occupation of coastal areas priority access to fish for Food, Social and Ceremonial purposes (FSC). However, how DFO has gone about managing this transfer of allocation of a shrinking resource has created significant conflicts in coastal communities. Furthermore, there is a fundamental disconnect between what DFO views is their responsibility with regards to First Nations, what commercial fishermen believe the relationship and allocation structure should look like, and what First Nations argue they are entitled to.

³⁸ Important to note here is that the First Nations perspective will be commented on using existing discourse and literature; since the relationship between commercial fishermen and First Nations was not the focus of this study and this theme only arose during interviews with participants that for the most part do not identify as belonging to a First Nations community, I cannot in good faith claim that my analysis of the situation is an accurate representation of the relationship from the First Nations perspective. I can only report on the tensions that came up in my interviews and what I can discern from publicly available information. This is however, an important area that merits further study, especially as First Nations communities sign treaties with the Federal and Provincial governments. In light of the need to maintain the fishery resource at sustainable levels while sharing it across competing user groups, the development of governance systems that allow for a sustainable level of exploitation and cooperative, constructive relationships between all users is critical.

Participants indicated in interviews that in recent years, part of the reason they believed their access to fish was being reduced was due to allocation of fish from the commercial fishery to First Nations FSC fisheries or to First Nations commercial fisheries:

What they're doing is taking away our rights to fish and giving it to someone else, without any negotiation or mitigation or compensation and it's been pretty clear in the Ahousaht court case... First Nations might be entitled to certain aspects of this, but you have to include, or have some sort of compensation mechanism in place with the industry if you're going to take it away. (Interviewee 9, 2019)

This has resulted in a climate of uncertainty and insecurity, in a fishery management system that is already characterised by instability: "I don't care if you own 100 thousand pounds of halibut quota right now, you're not going to be okay... because the Minister could allocate it to First Nations or give it to the recreational [fishery]." This participant did clarify that he didn't believe the conflict was between commercial fishermen and First Nations, but rather between commercial fishermen who were feeling under-represented and DFO: "Our problem is not with the First Nations, our problem is with the Canadian government not representing us, and not keeping us informed of what they're doing, or not even considering that they're taking our livelihoods away." (Interviewee 9, 2019)

There is an understandable sense of fear and uncertainty surrounding this re-allocation process, as expressed by interviewees. However, it is also clear from participants' comments that there is a disconnect between what they believe the relationship with First Nations should look like, and how it appears in a legal sense. It seems that commercial fishermen feel that First Nations communities should be at the table negotiating for access alongside other user groups. This is clear from comments explaining how First Nations representatives had stopped participating in association or advisory board meetings: "They're [First Nations] going directly to

these negotiations [with DFO] and they're getting what they want, so they're not dealing with us anymore," (Interviewee 9, 2019). Another participant gave an example of the herring fishery along the central coast, where stocks are healthy according to DFO, but the fishery has been closed down to commercial fishing because the Heiltsuk do not want commercial fishing within territory to which they have a claim. The word 'inequity' was used by the participant to describe the differentiated relationship between DFO, First Nations, and commercial fishermen, where First Nations are being privileged over the commercial fleet (Interviewee 11, 2019). These comments reveal the belief that First Nations should be treated like any other user group in the fishery – like any other citizen in Canada. However, the relationship between the Canadian government and First Nations is justifiably more complex due to historic failings on the part of the Canadian government.

4.2.2 Legal Framework of Aboriginal Fisheries Access

It is important to contextualise this modern re-allocation process of fishing rights *to* Aboriginal³⁹ peoples within a history of allocation of fishing rights *away* from Aboriginal peoples in Canada, especially on the west coast, and to understand the legal context within which changes are now taking place. There is a need for education and dialogue to develop an understanding of what equitable sharing of the resource looks like, in the context of complex Nation to Nation relationships, rather than simplistic citizen to citizen relationships that ignore historic realities. Although a detailed analysis of Aboriginal rights to the fishery is not possible here, a brief history is necessary.

³⁹ The term 'Aboriginal peoples' is used here for legal precision: Aboriginal is a term that encompasses all First Nations, Métis and Inuit peoples living in the land now called Canada. First Nations, although an accurate term to describe Aboriginal peoples who have territorial claims in BC, does not include Inuit and Métis communities. Since the Supreme Court of Canada cases referred to in this section refer to all First Nations, Inuit and Métis peoples across Canada, Aboriginal is the accurate term for this discussion (Harris and Millerd 2010, 84).

Since the movement of European settlers westward in the 1800s, control of the fishery resource was claimed by the Federal government and allocated to non-Aboriginal individuals and communities (Harris 2001). This transfer took place under a discourse that painted Aboriginal communities as destroyers of the fishery resource – a resource that Aboriginal peoples on the Pacific coast have managed sustainably for hundreds of years, despite high population levels and technological advancements (Trospen 2009, 8-11). Traditional fishing practises were painted as destructive and wasteful, and subsequently outlawed, while access to the resource was allocated to more 'productive' settler fishermen (Harris 2001, 125). By the 1890s, Aboriginal participation in the fisheries had been reduced primarily to wage-labour in the growing cannery industry while commercial fishing privileges were granted to Europeans to encourage settlement; as the commercial value of the fish grew, access was steadily re-allocated to enterprising settlers (Harris 2001, 74-78). The history of Canada's Pacific fisheries is marred by a history of colonial dispossession. Even the right to fish for food was at times so severely restricted as to no longer serve its purpose of allowing Aboriginal communities subsistence access (Harris 2008).

The outcomes of recent legal challenges have resulted in the re-establishment of a priority 'Food, Social and Ceremonial' (FSC) fishery for Aboriginal peoples who can establish a history of continuous occupation of coastal lands and the integrity of fishing to their culture. There are many court cases that have resulted in the recognition of title and treaty⁴⁰ rights of Aboriginal peoples, and ongoing court cases and appeals will continue to shape the legal framework in which allocation of fish is distributed back to Aboriginal communities. In this

⁴⁰ Aboriginal right or title arises from the fact of historic occupation and use of lands and are derived from traditional practises of Aboriginal peoples in relation to their territories prior to contact with European settlers. Aboriginal right or title is established by proving continuous historic ties to land, waters and cultural practises. Treaty rights arise from negotiated formal agreements between Aboriginal peoples and settlers, either historically or under the modern day treaty negotiation process. Treaty rights are established from interpretation of formal treaty texts (Harris and Millerd 2010, 85).

regard, the Supreme Court of Canada's (SCC) rulings on the following cases merit a brief discussion: *R v. Sparrow* (1990), the *Van der Peet* trilogy (1996), the *R. v. Gladstone* (1996), the *R v. Marshall* (1999) and the landmark *Ahousaht* (2009) case. *R. v. Sparrow* was monumental in establishing a priority right to fish for FSC purposes, on the grounds that the right to fish for subsistence was an integral part of Aboriginal cultures and had therefore never been extinguished. This decision was critical for two reasons: one, because it stated that the FSC fishery had priority over all other fisheries, once the conservation priority had been met; and second, because it established a very high standard of justification for the Federal government to infringe on this priority right (Harris and Millerd 2010, 86). However, Harris (2008) argues that the food fishery originally emerged in the Canadian legal framework as the equivalent to the reserve system for land: it relegated access to the resource for First Nations to a small, subsistence amount while opening up the rest of the resource for settlers.

In British Columbia, the category of Indian food fishing performed the same function in the fisheries as did the Indian reserve on land: the reserve and the food fishery were the legal categories through which the state consigned the Aboriginal presence on the land and in the fisheries to the margins. As a result, the characterization of the right in terms of food fishing is part of a colonial history of dispossession. (Harris and Millerd 2010, 99; Harris 2008)

Harris and Millerd argue that the limit on the designation of a priority right to fish only for FSC purposes is an example of the continuing dominance of the Federal government over Aboriginal peoples. They argue that a true Nation-to-Nation relationship, fulfilling the Federal government's responsibility towards Aboriginal communities, would be better served by transferring access without regulating use of the fish. However, how the Federal government has gone about allocating fishery access to Aboriginal communities is much more complex, and evidence of continuing colonial control (2010).

The *Van der Peet* trilogy was a set of three cases in 1996 establishing that in order for Aboriginal peoples to have a right to a commercial fishery, they would have to prove that they carried out commercial fishing activities prior to contact with Europeans, and that these commercial fishing activities were "integral to the distinctive culture" of the community in question (Harris and Millerd 2010; *Van der Peet* 1996 para 46). This standard has proven difficult to meet, not least because Canadian and Indigenous legal traditions are difficult to reconcile (Borrows 1996; White 2016).

R. v. Gladstone (1996) was the first case to establish an Aboriginal right to a commercial fishery, in which the Heiltsuk Nation won the right to a commercial fishery – limited to spawn-on-kelp. However, the court left the power to limit the right to an Aboriginal commercial fishery in the hands of DFO, stating that "pursuit of economic and regional fairness, and the recognition of the historical reliance upon, and participation in, the fishery by non-aboriginal groups" were justifiable reasons to limit Aboriginal commercial fisheries (*Gladstone* 1996 para. 75). The *R. v. Marshall* (1999) case created a third category for Aboriginal commercial fisheries, where the court ruled that, based on historical treaty records, Aboriginal Peoples had a right to fish for a 'moderate livelihood' (*Marshall* 1999 para. 7). This is a more expansive right than the right for an FSC fishery, but still more restrictive than a full commercial fishery as decided in the *Gladstone* case. More recently, the *Ahousaht* case established the right of nine Nuu-chah-nulth Nations on Vancouver Island to establish a commercial fishery – although with the caveat that the right "is not an unlimited right to fish on an industrial scale, but it does encompass a right to sell fish in the commercial marketplace," (*Ahousaht* 2009, para. 489).

Many of these SCC decisions sparked resistance from non-aboriginal fishermen, in the form of court challenges⁴¹ as well as protests against DFO⁴² to mitigate the impacts of these changes on existing fishery participants. Some situations have resulted in violence and property damage, such as destruction of Mi'kmaq fishing gear, vehicles and an empty cottage in the aftermath of the *Marshall* decision (Johansen 2004, 5-6; see notes 41 and 42 below for other examples). Conflicts between Aboriginal and non-aboriginal fishermen reported from across Canada were mirrored by stories of tensions between fishery user groups mentioned by interviewees. One participant mentioned conflict on the west coast from the previous year:

It's getting to the point where the policies are – eventually, if they don't do something pretty quick it's going to erupt in violence. There was an example last year down in the central coast where an area was open and a white fishermen was fishing there, and First Nations were protesting and threatening to shoot, destroy gear. (Interviewee 9, 2019)

Conflict between competing users of a common-pool resource are to be expected – and the goal of an effective co-management process is to mitigate such conflict through open dialogue and transparency. A key factor necessary to the success of co-management systems, especially in the context of multiple user groups with different interests, is to build a sense of fairness into the decision-making process (Pinkerton et al. 2018). This is done most effectively through involving all stakeholders to participate in the creation of rules. Research suggests that the perception of fairness of a rule system and the user's willingness to comply with a decision, even if it is against the interests of said user, is directly linked to the user's perception of fairness

⁴¹ The *Marshall* case sparked an attempt at a re-hearing by the commercial fishing fleet; the SCC denied the request. (*R. v. Marshall* 1999; *Marshall II - R. v. Marshall*, [1999] 3 S.C.R. 533 [*Marshall II*].)

⁴² DFO's Aboriginal Fisheries Strategy originally created a pilot project to allow First Nations fishermen to fish salmon, without restrictions on the use of the fish for FSC, in exclusive openings ahead of the commercial fishery; this sparked a protest from the commercial fleet that eventually led to charges being filed by DFO against protesters. Appeal of these charges to the SCC was dismissed and the charges were upheld as justified by the need to "ameliorate a historic disadvantage" in *R. v. Kapp*, 2008 SCC 41. (Harris and Millerd 2010, pg. 97)

of the system that created the rules being enforced (Jentoft and Kristoffersen 1989, 362). It is clear from the tensions discussed by interviewees, as well as evidence of conflict over fisheries from across Canada that this sense of fairness is absent among fishery participants.

4.2.3 DFO Pacific Region's Priorities with regard to First Nations

Since the 1990 Supreme Court decision in the *Sparrow* case, DFO has introduced a series of program and policy changes in order to accommodate the new legal obligations between the Federal government and First Nations. The first such policy was introduced in 1992, as a direct response to the *Sparrow* decision, called the Aboriginal Fisheries Strategy⁴³ (AFS). The AFS aimed to fulfill the Federal government's obligation to make fish available for the priority FSC fishery. This was done through the negotiation of annual agreements between DFO and the Nation in question (DFO 2012). In addition, the Allocation Transfer Program (ATP) was initiated as part of the AFS, which aimed to transfer access for commercial fishing opportunities to First Nations through a voluntary buy-back program from the commercial fleet (DFO 2015). Commercial licenses retired from the commercial fleet were allocated to First Nations as communal commercial licenses – they were not tied to vessels as the non-aboriginal licenses are; however they are subject to the same regulations as the non-Aboriginal commercial fleet (Harris and Millerd 2010).

In 2002 DFO engaged in a consultation process with Aboriginal communities across Canada who have agreements with DFO under the AFS. Responses from participants suggested

⁴³ The AFS only applies to First Nations that do *not* have a land claims agreement in place (also known as modern day treaty agreements). Once a treaty is signed, the fishery sharing arrangements set out in those agreements take precedence, as treaties are protected under section 35 of the *Constitution Act (1985)*. Currently, four modern day treaties have been signed between First Nations in BC, the Provincial and Federal governments; the details of these treaties are outside the scope of this research paper, so I focus mainly on DFO co-management arrangements with First Nations that do not currently have a land claims agreement in place.

that there was much room for improvement in the DFO relationship with Aboriginal peoples. In a report of the consultation published in 2003, (summarised) comments included:

"5. The AFS needs to provide a greater management role for Aboriginal groups in the fisheries."

"7. DFO does not sufficiently take into account Aboriginal stock assessment and traditional knowledge into its decision-making processes."

"14. Some skepticism was expressed about the purpose of the 2002 engagement process, itself, with many Aboriginal groups noting that DFO did not make significant changes following the 1996 AFS review. Similarly, many expressed the belief that DFO would ignore the results of the 2002 meetings, as many Aboriginal groups believed the department had with respect to the National Aboriginal Guardian Program Review."

(DFO 2003b)

Following the 2002 consultation process, DFO made changes to the AFS that included lengthening the time frame of agreements to beyond annual agreements, shortening and reducing the amount of jargon in the agreements, streamlining reporting requirements that were burdensome, and creating the Aboriginal Aquatic Resource and Oceans Management (AAROM) program. AAROM was created to support Aboriginal communities who were pooling funding from AFS and other avenues to enable fishery, habitat and ocean research. The goal of AAROM was to provide capacity building for these initiatives, so that Aboriginal communities could create oceans departments that would be responsible for science, collaboration with other Nations in a watershed or region, and co-management with DFO (DFO 2018a).

Another initiative to transfer fishery access to First Nations on the west coast comes in the form of the Pacific Integrated Commercial Fisheries Initiative (PICFI), which launched in 2007. The goal of PICFI is to continue to transfer retired commercial licenses to First Nations in the Pacific region; the difference from the previous ATP is that PICFI funding and programming comes with the requirement for First Nations to create Commercial Fishing Enterprises (CFE)

with a strong business plan before a Nation is selected to participate in the program. Capacity building for the business planning phase is also provided for through the PICFI program, notably through the deployment of a DFO 'Business Development Team' (DFO 2017b). The most recent DFO policy on Aboriginal fisheries initiatives is the 'Integrated Aboriginal Policy Framework' (2006-2010). This framework aimed to pull together all the different policies relevant to Aboriginal fisheries across Canada and modernise them, to include new changes such as DFO's move towards Ecosystem-Based Management and Integrated Ocean Management (DFO 2007).

Despite the fact that AAROM began as a program to help supplement initiatives already being undertaken by Aboriginal communities, evaluations of the program in 2009 and 2017 revealed mixed results. The 2009 review was undertaken by DFO, whereas the 2017 review was undertaken by the National Indigenous Fisheries Institute (NIFI); this was a broad review of DFO fisheries policy as related to Aboriginal peoples across Canada. Both reviews reported that the funding provided to communities was a valuable support for significant research programming, and recommended that the program be renewed. However, both reports also indicated that participants did not believe that AAROM had resulted in true co-management. 'What we heard' reports from the NIFI consultations, which included both the AAROM program and PICFI, revealed frustration that DFO still retained all the decision-making power in these so-called co-management initiatives:

Participants are unanimous that they lack a true voice in decision-making. "We can no longer invest in the Integrated Fisheries Management Planning process; we have to develop our own process." (NIFI 'What we heard' AAROM Program Workshop, Kamloops, BC. October 2017a, 3)

A few participants felt the Department and/or the business development team pushed them into using program funding for purposes other than what was

intended. (NIFI 'What we heard' PICFI Workshop, Nanaimo, BC. October 2017b, 3)

The wording of both AAROM and PICFI reveal that DFO still holds all the decision-making power; moreover, since DFO controls a limited pot of funding, First Nations looking to be included in these programs must change their practises to align with a DFO vision of 'sound business practises':

AAROM text states: "Preference would be given to Aboriginal communities with sound business and resource management planning and practices, a record of complying with DFO reporting requirements, and a commitment to the core principles of conservation and sustainable development." (DFO 2003b)

PICFI text states: "Obtaining commercial fisheries access through PICFI will depend on a First Nation having or developing the capacity to fish; and to operate modern business systems, including a clear way for community members to participate in, and benefit from, commercial fishing activities." (DFO 2017b)

These issues aligned with a comment made by an interview participant regarding the role of PICFI in setting up First Nations to compete against each other for funding and licenses, and the role of the Business Development Team that was sent in by DFO to help First Nations prepare for the PICFI program:

First Nations had to compete for [PICFI] allocations, so there wasn't any 'we're just going to work together as a nation or as communities' – what happened was that 'I have to get more than you' and they all had to create a business plan and... the business plan had to be accepted by the Department, and the plan had to show how it was going to benefit, not fishermen, but benefit the band, and then they sent their own approved people around to help First Nations build a business plan... that said that 'you're going to be just like

white guys, you're going to own this quota, and you're going to lease this quota to the highest bidder so that the band can make the money.'
(Interviewee 10, 2019)

The result of Pacific licensing and quota policy combining with the PICFI program has been that despite First Nations communities now owning quota and commercial fishing licenses, First Nations fishermen still do not have access to fish. Instead, Commercial Fishing Enterprises, which are not free to make their own choices regarding business planning, lease band-owned licenses and quota to the highest bidder, so that the quota is rarely ever leased to members of that Nation to fish. Comments such as the above are reflective of most conversations around the PICFI program in Prince Rupert that I heard; it is clear to most fishery participants that although the goal was positive – to transfer commercial fishing access to First Nations through communal licenses so that First Nations fishermen could be given access to fishing opportunities – the practical implementation has been poor, dependent on DFO priorities, and resulted in continuing inequity for small-scale First Nations fishermen.

It is clear from the comments of different user groups that all three are operating under a different idea of what co-management means, and what the relationship between user groups should look like. It appears that commercial fishermen believe that all user groups should be collaborating at the same table, in a citizen-to-citizen arrangement. First Nations, on the other hand, have been fighting to be recognised in Nation to Nation relationships with Provincial and Federal governments. The Nation to Nation relationship is complicated, even from a legal perspective, because although Aboriginal rights and title has been affirmed through SCC decisions, those same SCC decisions also grant the Federal government discretionary power to infringe on Aboriginal rights and title when the Federal government believes it is necessary for other high-priority objectives such as conservation or 'regional stability' in the case of DFO

(Harris and Millerd 2010). Therefore, even from a legal perspective, although the Nation to Nation relationship may privilege First Nations and DFO communications, it does not result in meaningful transfer of power in decision-making. From the perspective of DFO, it seems they are attempting to cultivate two separate co-management arrangements with the commercial fleet and First Nations respectively, which has resulted in DFO retaining decision-making power, an unequal transfer of the cost burden of co-management to one group (commercial fishermen), continuing marginalization of First Nations fishermen and significant conflict and tension between fishing communities on the ground. Castro and Nielsen (2001) discuss this kind of ill-defined co-management as arising out of the pressure faced by national governments to decentralise and liberalise, without updating legal and policy frameworks to enable a transfer of authority or funding. The result is that "communities and local authorities may be asked to bear the work and costs of resource management without any meaningful transfer of authority or decision making," (Castro and Nielsen 2001, 231). This certainly appears to be the case in the Canadian Pacific context.

It is understandable how recognition by the courts of Aboriginal title and treaty rights, in combination with a reduction in the overall TAC over a short period of time has left the different user groups in the west coast fishery distrustful and resentful of other groups. However, education and transparency are needed to mitigate these tensions, because in practise the SCC's decisions are not nearly as favourable towards Aboriginal fisheries as other groups may believe. As an example, besides the priority FSC fishery, (and many reports suggest that the amount of fish allocated towards FSC is not nearly enough to meet the needs of communities – for examples, see Ecotrust Canada 2018, 28-29; Fong 2018) Aboriginal commercial fisheries are required to establish a high standard of proof in order to obtain permission for a commercial

fishery where DFO does not control use of the fish. This is hardly in the spirit of a Nation to Nation relationship, and in practice leaves little opportunity for the development of privileged First Nations commercial fisheries. Education and transparency are also needed around the nature of Canada's relationship with Aboriginal peoples. The uniqueness of Aboriginal peoples' legal relationship with the rest of Canada and therefore access to land and resources must be emphasised. Furthermore, much work is needed to reverse the devastating effects of over a century of colonial dispossession and violence.

The existence of conflict between user groups is not necessarily a sign of failing co-management, however. Castro and Nielson (2001) argue that many co-management arrangements tend to arise out of intense conflict between user groups and between users and governments. They note that conflict is a natural part of dynamic systems. As the common-pool resource of the fisheries and the budding co-management arrangements are both evolving, dynamic systems, conflict is to be expected, and may even serve as a catalyst for improved collaboration. In order for this to take place however, alliances must be formed and honest, open dialogue needs to take place on the roles and interests of each user group. Time, resources and social capital are necessary investments to transform conflict into productive collaboration (Castro and Nielsen 2001).

Research from multi-party co-management initiatives suggests that the kinds of tensions present in the Canadian Pacific context between First Nations and commercial fishermen are not insurmountable. Pinkerton's (1994) extensive studies of co-management on watershed planning and collaborative habitat protection planning in California and Washington State respectively imply that even in situations where there are vastly differing levels of investment and methods of using the resource, as well as in situations where native groups participated as governments,

collaboration and the creation of effective co-management systems were possible. Pinkerton argues that factors critical to the success of these multi-party arrangements were "public discussion and exploration of goals and possible strategies, [and] the support of government in facilitating the acquisition of key information about the status of the resources and the risks involved in various strategies," (Pinkerton 1994, 2369). Clear definition of mandates, boundaries and participant roles are also critical factors for success. Thus, present conflicts and competing interests need not hinder the creation of co-management agreements across differences. In the Canadian Pacific case, legitimate conflicts between user groups will need to be addressed, and fora created for open, transparent dialogue before legal or policy level attempts at access right allocations will be effective.

4.3 Disjoint in Conservation Paradigms

4.3.1 MSY Single-Stock Approach

It is clear from discussions with fisheries participants that everybody agrees on at least one thing: conservation of marine resources is deeply important to all. Most of my interview participants who were fishermen made a point to highlight the fact that although the prevailing public perception is that fishermen don't care about what happens to the marine environment, they all believed strongly that conservation and sustainable use of the fishery resource was necessary: that their own livelihoods depended on it. Where there is divergence however, is in understandings of what sustainable conservation looks like.

A few telling conversations with fishermen and fishery participants illustrate that fishermen are operating under a conservation model that can be called Maximum Sustainable

Yield (MSY) under an isolated stock⁴⁴-recruitment model⁴⁵ – a prevailing theory about how human-nature relationships function in marine ecosystems that was initially questioned in the late 1970s (Larkin 1977), although it is still widely used by organizations such as the Food and Agriculture Association of the United Nations (FAO) today (2018, 39)⁴⁶. This isolated stock-recruitment model uses the principle of MSY, which is the theory that there exists a discoverable level at which young fish of a particular species can reasonably replace older fish, and that once this level is determined, any surplus mature fish can and *should* be harvested, because it is assumed that above this optimal replacement rate, competition for food will naturally reduce the fish population (see Appendix D for a more detailed explanation of the stock-recruitment model) (Ricker 1954; Finley and Oreskes 2013). This is considered to be a 'wasted opportunity' from the perspective of harvesters and managers trying to maximise the amount of fish that can be taken out of the marine ecosystem (Dunklin 2005, 3). That this model was commonly used by DFO in the past is evidenced by an interviewee's comment on the change from then to now: "Before DFO used to try to maximise the fishing resource out here. Now it seems like they're trying to minimise it. They used to make us harvest – now they don't anymore. We're just not allowed to," (Interviewee 2, 2019).

Comments from interviewees reflected the logic of the MSY concept closely as they explained why, from their perspective, fish was being wasted:

⁴⁴ Fish *stock* here is defined as: "the living resources in the community or population from which catches are taken in a fishery. Use of the term **fish stock** usually implies that the particular population is more or less isolated from other stocks of the same species and hence self-sustaining. In a particular fishery, the fish stock may be one or several species of fish." (FAO 1997)

⁴⁵ *Recruitment* refers to the number of fish that survive to maturity; this model is explained in further detail in Appendix D

⁴⁶ Although the FAO does continue to use the MSY concept, and in some cases does encourage maximum utilisation of the resource (ex. when food security is an issue), in recent years the discourse has changed from viewing MSY as a target to viewing it as an upper limit (Mace 2001).

We don't want to take all the fish, we need these fish to spawn. But we also want to – the fish population is here (indicates high point) but it should only be down here (indicates low point) so we want to knock this down every year, and if you do that, and keep it at a sustainable – which we did in the 80s, because we had a fishing fleet that could do it... you were allowed to go right into every creek and fish every last fish, because they wanted them caught so they wouldn't ruin the spawn. Why did that work then, and not now? Why did that mentality work then, but now it doesn't seem to work? (Interviewee 2, 2019)

The Skeena last year they got 2 days and then they let them [salmon] all go up, and then every year they got too much up in Babine Lake, and they truck them out for dog food... Every year they've got too much [fish] up there, where they should have given more openings. (Interviewee 5, 2019)

This model is typically applied to most fisheries, as one interviewee noted his experience with the prawn fishery: "here we hammer the prawn fishery, and guess what, they're back every year. So we found out in any kind of wildlife – the more you push an animal, the more you harvest an animal, the more they reproduce." (Interviewee 2, 2019)

The idea that too much fish surviving could ruin the spawn is known as 'over-escapement'; where salmon is concerned, this idea deserves more attention, because salmon spawn in freshwater riverbeds where there is an argument to be made for limited food supply. In addition, all species of Pacific salmon typically die right after spawning, so there is no imperative to protect old-growth stock, as there is with other species (Hixon, Johnson and Sogard 2014). In a 2003 report by the House of Commons Standing Committee on Fisheries and Oceans (FOPO), the issue of over-escapement and over-spawning was brought up by fishermen who

believed that the large escapements⁴⁷ that DFO had been allowing was causing damage to the salmon stock overall. Their concerns were summarised by the following quote:

There's a high correlation between over-escapement and poor return, particularly for sockeye. Every major over-escapement event since 1956 has resulted in a near collapse in the Skeena, in Rivers Inlet, and in the Fraser River. But our managers go on dumping more and more fish on the spawning grounds. (Sutcliffe, UFAWU, quoted in Canada 2003a, 32)⁴⁸

This is a sentiment that I heard from participants as well – the idea that too much salmon being allowed to go up the river to spawn in their natal riverbeds could actually be detrimental to the health of the stock overall:

What has happened recently in my mind is over-escapement – over-escapement everywhere – we have nobody to monitor the creeks, to say 'this creek's had enough', bring the boats in to – see, the fishing fleet, which was really big at one time, 750 seiners, 3000 trollers, 3000 gillnetters were used as a conservation tool... we were only allowed to fish on abundance, if there wasn't enough fish we weren't allowed to set the net... when the test net says there's too much fish here, they would have us fish harder to slow the run down. (Interviewee 2, 2019)

This was due to the belief that too many spawners would overcrowd the riverbeds and compete for food. Another interviewee referred to this issue when he spoke of the existing fleet being 'ineffective' on the west coast – presumably, ineffective at preventing over-escapement.

MSY, and specifically in the salmon fishery, ideas about over-escapement, reflect what Acheson and Wilson (1996) call Numeric Management in fisheries: the use of mathematical modelling with simplified, single-species stock sizes and life cycles that are assumed to be

⁴⁷ Escapement refers to the amount of fish that are allowed to 'escape' fishing predation and make it to the spawning grounds – this is a key concept in the MSY theory, which tries to determine the optimum level of escapement for maximum harvest. See Appendix D for details.

⁴⁸ Quote from John Sutcliffe, Vice-President, United Fishermen and Allied Workers Union; quoted in the House of Commons Standing Committee on Fisheries and Oceans report on the 2001 Fraser River Salmon Fishery, June 2003 (Canada 2003a).

predictable and tend towards equilibrium. Thus, the way that this management system aims to protect fish stocks while 'producing' fish for food and profit is to manage the "exploitative effort" on that particular stock (Acheson and Wilson 1996, 680). The human-nature relationship characterised by this management model sees managers and fishermen as existing outside the system, using science to control and exploit the resource for human benefit.

Although the single-stock MSY model has been a long-standing and compelling theory that is traced back to the 1930s by some scholars (Mesnil 2012, 473), there are several catastrophic flaws with this ideology. For one, as Finley and Carmel have shown, the emergence and subsequent popularity of this theory was not based on the science of the day, but rather a political agenda in which the United States was aiming to protect the right of its distant water fleets to foreign waters (2013, 248). Besides its somewhat dubious emergence, there are several important criticisms of the isolated stock MSY ideal. Larkin outlined these issues in his famous 'Epitaph for the Concept of Maximum Sustained Yield' (1977): weaker, less commercially valuable stocks are not protected; maximising yield from all species simultaneously is impossible; use of accurate data and precise regulation of fishermen is necessary for MSY to function well, a condition not satisfied in practice; ecosystem relationships beyond fish populations are ignored⁴⁹.

To address the question of over-escapements, and salmon over-escapements specifically, two papers, Walters et al. (2004) and Dunklin (2005), examined this issue in detail and concluded that although over-escapement does lead to reduced *efficiency* of spawners, there is no evidence to suggest that it harms the overall stock. In fact, Walters et al. (2004) found that over-escapement leads to greater biodiversity amongst the fish population, which is important for

⁴⁹ For more details on Larkin's criticisms, see Appendix E

long-term adaptive capability of a species, and in the case of salmon, may also help in the colonization of new spawning beds – which is again important for evolutionary success of the species, especially in the face of climate change and threats to habitat from human activity. This study was based on an assessment of data for 21 salmon runs spanning 50 years. In a white paper published by the Wild Salmon Center in Portland, Oregon, Dunklin (2005) notes the importance of understanding the perspective from which questions on over-escapement are posed. In the case of fishermen or fisheries managers, over-escapement can legitimately be seen as an undesirable scenario, because their goals are to maximise the fish that can be harvested. However, from the perspective of a biologist or ecologist, the importance of maintaining biodiversity and replenishing nutrients to inland riparian zones means that over-escapement is not possible – any (high) level of escapement is considered beneficial.

4.3.2 Ecosystem-Based Management and the Precautionary Approach

Both of these ideas, single-stock MSY and the theory of over-escapement, are challenged within a precautionary approach (PA) and ecosystem-based fisheries management (EBM) perspective – the system that DFO is now attempting to move towards (Shelton and Sinclair 2008). This is evidenced by comments from an interview participant who is a staff member at DFO: "Part of it is a Canada-wide commitment to move more towards ecosystem based management, which basically means that you have to know a lot more than we currently do about the ecosystem," (Interviewee 6, 2019) The move towards adoption of the precautionary approach and ecosystem-based management is also evident in several DFO policy documents, as well as the *Oceans Act (1996)*, which is one of the key pieces of legislation that guides the DFO. The *Oceans Act* states that "*conservation, based on an ecosystem approach, is of fundamental importance to maintaining biological diversity and productivity in the marine environment.*"

This applies broadly to Integrated Ocean Management, of which fishing is a part. DFO has also explicitly pledged to move towards a precautionary, ecosystem-based management approach through the adoption of the Sustainable Fisheries Framework in 2009, which encompasses a suite of policies and planning tools, including the "Fishery Decision-Making Framework Incorporating the Precautionary Approach"⁵⁰, "Policy on New Fisheries for Forage Species"⁵¹ and "Policy on Managing the Impacts of Fishing on Sensitive Benthic Areas."⁵² At the national level, the Canadian government has also committed to incorporate the PA into its practises; the Privy Council Office published "A Framework for the Application of Precaution in Science Based Decision-Making About Risk" to facilitate this transition (Canada 2003b).

The Precautionary Approach (PA) is a concept that requires that "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." (UNCED 1992, Principle 15)⁵³ The PA is both a complementary principle to EBM, and a key principle of EBM (FAO 2002). Ecosystem-Based Management is considered by some to be a return to more traditional forms of natural resource management, such as the "commonsense knowledge of hunters and farmers in different parts of the world." (Bazukis 1969); to be sure, EBM is more in

⁵⁰ Framework to develop a harvest strategy, including harvest control rules and a risk management system that is applicable to all commercially fished species, and may be applicable to other species as needed. For example, this framework will be used to set the Total Allowable Catch (TAC) for each species (DFO 2009a).

⁵¹ Policy to incorporate the PA and EBM into opportunities for new commercial fisheries focused on forage species, which are species below the top of the food chain in an aquatic system, and so are an important food source for other species (DFO 2009b).

⁵² Policy that sets out requirements for science and data collection as well as the incorporation of PA and EBM into decision-making on fisheries management to protect benthic (ocean floor) habitats. Enshrines the principle of risk-aversion into management of these areas (DFO 2009c).

⁵³ Both the PA and Ecosystem-Based Management have been incorporated into international agreements on environmental protection, especially concerning fisheries, such as the 1992 *United Nations Convention on Biological Diversity* (United Nations 1992) and the 1995 United Nations Agreement on Straddling and Highly Migratory Fish Stocks (which came into effect in 2001) (United Nations 1995).

line with traditional holistic ideas of natural relationships than the reductionist and single-stock focus of 20th century science. EBM is a complicated concept with many definitions; for the purposes of this paper, I use the definition provided by DFO:

An **ecosystem approach** requires that fisheries management decisions consider the impact of the fishery not only on the target species, but also on non-target species, seafloor habitats, and the ecosystems of which these species are a part. This approach also requires that management decisions take into account changes in the ecosystem which may affect the species being fished. This includes the effects of weather and climate, and the interactions of target fish stocks with predators, competitors, and prey species. (DFO 2009d)

Ecosystem approaches aim to incorporate complexity and an understanding of the system's stability and resiliency into decision-making – stability and equilibrium cannot be assumed, as it is with single-stock models. Significantly, EBM can include humans as a part of the ecosystem, so that the human-nature relationship shifts from one of a controller to one of a participant in a much larger and more complex system (Larkin 1996).

It is important to note that although DFO has pledged to incorporate the PA and EBM into its management activities, there is a large gap between policy statements and implementation. In practise, management activities sit somewhere between these two approaches – the older, single-stock method and the newer, more complex perspective on marine ecosystems. This has resulted in management decisions that incorporate the ideals of the PA and EBM strategy in the absence of any significant improvement to data collection and science, to the frustration of many fisheries participants. For example, the PA leads managers to shut down fisheries and areas more often than in the past, because now a lack of scientific data requires that those areas be treated with caution. The following quote from a DFO staff person illustrates this policy with regards to the crab fishery in Area A. The sampling program referred to is a co-

science initiative between DFO and the Area A Crab Association: the Association sponsors a charter to collect data on the crab moult, which allows Area A to stay open longer during the off-season when it is determined that the crab are not in their softshell phase.

DFO wouldn't really be upset if the sampling program didn't happen, because it just means shutting it down and it's either way, you're working towards conservation, either by having a big closure to protect any possible moult, or to study it closer so you can narrow it down to when the moult actually happens. (Interviewee 6, 2019)

The PA and EBM have also led to what many fisheries participants referred to as 'risk-averse' management and 'weak stock' management (BurrIDGE, February 4, 2019)⁵⁴. These terms refer to the fact that DFO, in attempting to apply an ecosystem approach, aims to set harvest limits that take into account the strength of the weakest stocks which results in stronger stocks swimming by while fishermen are banned from fishing them. For example, if a particular stock of Chinook salmon is determined to be a weak stock, then due to concern that there may be Chinook salmon mixed in with the stronger runs of Pink salmon, the harvest limits for Pinks will be set at a low level, on the chance that the weaker Chinook stocks may become overfished if more Pinks are taken. This is how both the PA and the EBM are currently applied in practise. From the perspective of fishermen though, this seems like a waste of fish – and this frustration is only exacerbated by the fact that DFO has reduced its data collection and stock assessments, so there is the perception that DFO is restricting fishing without an accurate idea of how many fish are actually out there and how many stocks or species are in trouble.

⁵⁴ Christina BurrIDGE, Executive Director, BC Seafood Alliance, FOPO West Coast Policy Review, [Evidence](#), February 4th, 2019.

A criticism of the PA is important to highlight here. Referring back to the question of salmon over-escapement, one of my interviewees recommended that I look into the debate and particularly the views of Dr. Carl Walters:

DFO's golden haired scientist was a fellow at UBC, Carl Walters, he's the one that came up with this risk-averse management – even Carl Walters says it doesn't work – they even gave him an award in 2009, and now they don't want to listen to him because he says you have to fish harder when the big runs come, you have to change your interception rate to slow them down. (Interviewee 2, 2019)

In a 2010 presentation titled "Where have all the Sockeye gone?" Walters questions DFO's precautionary approach – an approach that he himself once endorsed (Perry, Walters and Boutillier 1999, 133). Although the presentation still maintains that over-escapement in salmon fisheries promotes biodiversity, in line with his 2004 technical paper cited previously, he questions whether the trade-off between fishermen's livelihoods and biodiversity is acceptable, especially in light of data that suggests that: first, salmon stocks can be generally protected at significantly higher rates of exploitation than has been allowed since the DFO's 2005 Wild Salmon Policy; and secondly that weaker stocks of salmon are unlikely to ever become strong enough to replace stronger stocks, so he poses the question: "are small stocks really worth saving, when they have no potential for significant contribution to future fisheries?" (Walters, 2010, 51). In light of data that suggests salmon population levels in the 1990s were similar to what they were in the 1800s, and that the PA has done little to improve the status of weak salmon stocks, Walters asks: "Is it wise or just for people who will not pay the bill to demand that fishermen give up 50% of their income as an insurance policy for biodiversity?" (2010, 46). Clearly, there is still much that is unknown about salmon population health and fisheries ecosystem functioning more broadly. Data is difficult and expensive to collect, and poorly

understood even when it exists. However, what Walters is questioning here is who has the power to make decisions on fisheries use and preservation tradeoffs – and whether it is fair for DFO to advocate the PA without having the information required to apply the PA adequately. Beyond the question of fairness lies the question of effectiveness, too – is a system in which users do not trust the data behind management decisions, do not feel empowered to influence those management decisions, and believe that opportunities to harvest the resource and improve their livelihoods are passing them by, likely to be effective at controlling exploitation of the resource? Theory on common-pool resource management suggests that this type of scenario, in which rules are imposed from an external authority and that are viewed as illegitimate by participants results in a high incentive to 'cheat' – harvest more than the allowable amount of fish (Baerlein, Kasymov, and Zikos 2015).

The erosion of trust evident between managers and users, coupled with the disparity between what DFO pledges to do in policy and what actually happens on the ground has reduced users' confidence in DFO's management. The PA and EBM approaches require a significant increase in data collection and science-based decision-making, but with DFO's reduced capacity, fishermen are left skeptical of DFO's effectiveness, and frustrated at the cut-backs to their livelihoods. It is unclear whether fishermen accept that the old theories of natural resource management that they operated under during the heyday of fishing are no longer acceptable from a scientific perspective – in fact, that those theories are now considered responsible for fishery collapses around the world (Bavington 2010, Finley and Carmel 2013). Further, it is unclear whether effective communication takes place between DFO and user groups; DFO claims that the move towards PA and EBM was made through consultation with user groups (DFO 2018b), but the resistance and frustration of these users suggests otherwise. What is clear however, is that

users and managers are operating under different conservation paradigms, which naturally leads to conflict and a loss of confidence, because each believes that the other is not 'playing by the rules of the game,' so to speak.

The lack of open, transparent access to scientific data, as well as the lack of a common understanding on how to sustainably manage the fishery resource are major barriers to effective co-management. Co-management systems can only be successful when all participants develop a common understanding of the working of the resource, typically developed over long periods of time living closely with the resource (Pinkerton 1994). Local knowledge is highly valuable in effective co-management systems – but in this situation where government and users are evaluating the fishery from two different conservation paradigms, local knowledge has become under-valued, while government priorities are enforced, at the expense of users' cooperation. Effective education and translation of scientific information is needed in order to have all user groups come to a common understanding on the most effective methods to manage the fishery – and managers will have to accept that local knowledge, operating at a small-scale and developed over long periods of time living with the resource, is a valuable perspective to incorporate (Berkes 2009). Co-management systems must be adaptive and allow users to learn together; in the case of Canadian Pacific fisheries, the critical process of learning and adapting collaboratively is missing.

Chapter 05: Looking to the Future of Fisheries Co-Management in B.C

The findings of this paper show that one thing is absolutely clear: we are moving towards an era of co-management and overall greater user participation in natural resource management. This is especially true of fisheries, and the Canadian government has accepted this imperative, due in part to a recognition that the capacity needed for effective central management simply does not exist within the government. For fishery participants, despite the complicated and historically layered policy and planning process that has led the fishery to where it is today, most fishermen are also willing to engage in meaningful co-management. Having lived and worked in or around the fishery for decades, often within multi-generational fishing families, fisheries participants have a host of ideas on how to improve the fishery, and, in turn, how the revitalization of the fishery could transform small coastal communities into healthy, attractive, and thriving places to live for residents. Thus, co-management is now seen as a necessary element of future fisheries management. For managers, co-management represents an opportunity to improve management effectiveness by incorporating users as stewards of the resource. For users, co-management represents an opportunity to improve fairness and equitable distribution of benefits from the resource, to both improve fish harvester livelihoods and increase benefits from the fishery to coastal communities. Certain areas need special attention as complex co-management arrangements continue to emerge between multiple competing user groups on Canada's west coast: issues of power and scale, developing a common understanding of the legal and historical rights to the fishery resource, and balancing different knowledge systems. This chapter offers some insights on resolving these challenges. The chapter closes with some recommendations, informed by interview participants and research findings, on how to move

towards community-based co-management in Prince Rupert, and the BC coast more generally, and suggests areas for future research.

5.1 Co-Management for whom?

A critical question that emerged through the research is: Co-Management for whom? It is clear that co-management can be applied to an array of management arrangements, from top-down hierarchies to industry self-management. Due to the wide applicability of the term, co-management is used by DFO currently to describe its management relationship with the fishing sector, despite DFO retaining most of the decision-making power in the relationship. Meanwhile, co-management is also used within a narrative that seeks to further the privatization of the fishery for the benefit of narrow corporate interests. Both these configurations of co-management have shifted the balance of power towards actors who privilege the economic outcomes of the fishery at the expense of social concerns, especially within small coastal communities. Small-scale fishermen and the communities they were once embedded within are quickly losing access and independence within the fishery. If the aim of co-management is to empower those whose livelihoods are most directly affected by management decisions (Berkes 2009), simply undertaking co-management with any group that has the time, resources and incentive to participate in a government-prescribed process is not enough. Prior to undertaking a change in management process and calling it co-management, DFO must engage in open dialogue and collaboration on what exactly co-management should look like; *who* is engaged in this conversation is of critical importance.

Co-management as it currently exists hinders the development of a fishery management system that is effective and just. The current system is increasingly inequitable and, as participants become disillusioned, marred by inter-group conflict. As concern for livelihoods and

access to food increase, care for the resource takes a backseat. In the literature, the benefits of co-management in increasing effectiveness are predicated on an open and accessible incorporation of all participants into critical decision-making conversations (Pinkerton 1994; Quimby and Levine 2018). Presently, significant barriers prevent certain participants, especially small-scale fishermen and young entrants from participating meaningfully.

If "getting to co-management involves institution building, the development of trust and social capital," as Berkes posits, (2009, 1694), then Canada's west coast fishery is a long way off from anything resembling functional co-management. Co-management institutions as they currently exist are only open to a select few participants, do not provide an effective forum for discussion and genuine power-sharing, and exist on a single, geographically large scale that is not accessible for most small-scale participants. The DFO-created advisory process engages in consultation more than any kind of power-sharing, and therefore can only be classified as co-management in a vague sense (Berkes 2009; Castro and Nielson 2001). Furthermore, Pinkerton et al. (2018) and Berkes (2009) all argue that local leadership or 'bridging organizations' between the co-management partners are necessary for successful collaboration: currently, there are no organizations with the capacity or mandate to fulfill this role in the west coast fishery. These are key challenges that must be addressed.

Co-management and fishery relationships at small scales will yield a much different kind of fishery and coastal community landscape, whereas at larger scales, the fishery may still be economically viable, but the benefits are spread and measured at too large a scale (such as at the fishery-wide or provincial scale) to support small coastal communities. Thus, there is a choice to be made about what kinds of benefits are valued from the fishery, and who these benefits should flow to. Multi-scalar governance – otherwise known as polycentric governance – can distribute

power throughout the management system (Quimby and Levine 2018); therefore, a well-designed co-management system that actively prioritizes fishery access and benefits for small coastal communities has a much greater chance of delivering fishery benefits to coastal communities. The key is that issues of power and scale must be decided deliberately, and cannot be left up to the market to determine. As Mansfield has shown, simply devolving power and responsibility without attention to who benefits can lead to 'capture' of power by neoliberal rhetoric, which also benefits from devolution (2004a). This is currently the case in B.C., as discussed in chapter 4.

5.2 Multi-party conflict resolution

The Canadian west coast fishery is characterised by a high level of heterogeneity – in fish species, fishing methods and perhaps most importantly, user groups with competing interests. As the amount of fish that can be harvested from the fishery continues to shrink, conflicts between user groups is to be expected. Examples from multi-party co-management in other contexts offer important lessons, such as the necessity for clear mandates, roles and boundaries between user groups, and the critical importance of both government support and clear inter-group dialogue (Pinkerton 1994). Open dialogue and information sharing across groups, however, requires a convenor.

Currently, the Federal government's handling of the relationship between commercial fisheries participants and First Nations communities in BC has resulted in conflict. However, the research suggests that these conflicts could be mitigated through a DFO-facilitated dialogue. Small-scale commercial fishery participants interviewed for this paper accept that a portion of fishery access will necessarily be transferred to other groups, especially due to the legal imperative created by recent Supreme Court of Canada decisions (chapter 4). Fishery

participants also understand that the relationship is in a state of conflict largely due to how it has been managed by the Canadian government. Small-scale commercial fishermen and First Nations fishermen do also share certain grievances with DFO: both groups believe their knowledge is not valued in DFO decision-making, and both believe that benefits from the fishery should primarily flow to communities, which they are currently not. Therefore, the groundwork does exist to start turning this conflict into collaboration.

The question of power is also important here, in the relationship between DFO, commercial fishermen and First Nations communities. DFO is attempting to engage in co-management without any transfer of power – and this extends beyond decision-making power to the primacy of western scientific knowledge used to make those decisions. Co-management without power-sharing is common in many government attempts to fulfill legal and political obligations without giving up control. This represents a continuation of colonial practises in the relationship between government and First Nations (Harris and Millerd 2010), and results in weak co-management.

5.3 Conservation science and local knowledge

A critical factor necessary to the success of functional co-management is an environment of open and transparent information sharing (Pinkerton 1994). Knowledge about the resource must be freely shared and collaboratively produced for it to have lasting legitimacy (Berkes 2009). Reciprocally, co-production of knowledge is a dynamic process that can only work in a context of open, transparent dialogue and the development of trust and respect of alternate knowledge systems (Berkes 2009). This is clearly a point of friction in the Canadian west coast context, between the scientific paradigm employed by DFO and the local and indigenous knowledge systems employed by user groups – which can also be quite distinct from one

another. In practise, co-production of knowledge is difficult, as difficult as attempting to reconcile divergent worldviews (Berkes 2009). However, co-production of knowledge is both a process that needs to take place for effective co-management in a multi-party context, and also as an end in itself, as a mechanism to reduce conflict and improve ecosystem health outcomes (Berkes 2009; Eamer 2004). Despite the difficulty, it can be attempted in the Canadian west coast context both through the inclusion of user groups in 'co-science' initiatives, for which users are both willing and optimistic, and through a shift in DFO's belief in the primacy of its own knowledge paradigm – admittedly, the more challenging side of the equation.

Knowledge production in the Canadian west coast fishery currently is one-directional and top-down. Capacity changes within DFO have reduced active, visible on-the-ground data collection. Coupled with recent changes in conservation science and international policy pressures, which are rapidly changing the scientific models used to understand fisheries, capacity reductions have resulted in a disconnect between local and state understandings of the status of the fishery. This has led to a situation in which management decisions are viewed with suspicion – eroding users' faith in the rules they feel forced to follow. In order to have conservation paradigms align amongst user groups and for everyone to speak the same language, users will need to engage in multi-party knowledge production and learning. As DFO currently holds all the power in decision-making, as well as in enforcing the knowledge system that informs those decisions, DFO buy-in to alternate and collaborative processes of knowledge production is necessary.

5.4 A future for fish as food

The main question underlying this research project was how a change in the management system of the fisheries would affect seafood access for small coastal community residents, and

more broadly, how a change in the management of food production and harvesting resources could serve to re-localise food access. Ultimately, this is a question of whether empowering local communities and active food producers and harvesters might change the commoditized, globalized, export-oriented nature of food systems in small, remote communities. Ideally, implementation of a meaningful, functional, community-based co-management system to manage the fishery resource will help to empower small-scale, independent fish harvesters. The research does support this conclusion, at least: that meaningful co-management with active users of the resource is likely to improve the livelihood of active harvesters, through improving their position within the fish supply chain. However, whether co-management can change the export-orientation of the fish supply chain is a question requiring further research.

It is unclear whether empowering active fish harvesters and improving harvester livelihoods necessarily increases the circulation of seafood within coastal communities. As illustrated in chapter 3, even small-scale active harvesters view fish within a market-oriented paradigm, and although the level of commoditization may not equal that of large-scale processors or industrial operators, fish is still definitely viewed as a product to be sold into high-value markets. Active harvesters see themselves as small business owners trying to break free from corporate control. The primary benefit of the fishery is perceived as harvester livelihoods, not as a local food source.

Changing the export-orientation of the fishery will require a change in social relations within communities, away from a capitalist, exchange-value driven system (Polanyi 1957; St. Martin 2007). Alternate incentives that supersede the primacy of market-logic are required to reverse trends towards globalization, efficiency and consolidation in the food system.

Community-based co-management may very well be the mechanism through which these

changes are fostered – it certainly has a better chance than the current trend towards industry self-management; however, localising the food system will have to be an explicit objective of the co-management system in order to be useful. Once again, an attention to scale and power are critical here – co-management for whom, and with which participants? Co-management at what scale? Olson et al. (2014) argue that the inclusion of community members not related to the fishery is likely to strengthen the link between harvesters and communities, and lead to greater investment in the outcomes of the fishery by residents. Thus, improving food access from the fishery is more likely if food access is a stated objective of the co-management system, and if community members are at the co-management table to demand priority for local access.

5.5 Recommendations: moving towards community-based co-management

With these reflections, I offer the following recommendations for the future of co-management between west coast fishery participants and DFO; these recommendations emerged from both interviewee suggestions and research findings, and are informed by the literature on successful co-management. Recommendations are divided into two categories: the first focuses on short-term goals to improve co-management between DFO and fishery participants whereas the second focuses on longer-term objectives to include in functioning co-management systems to improve fish access for coastal communities.

5.5.1 Recommendations for co-management partners

1. Provincial labour⁵⁵ **legislation to create representative groups** that serve the interests of active fish harvesters is needed. A significant challenge to meaningful participation in the existing advisory process, or any other consultative or co-management process for active

⁵⁵ The necessity of this legislation coming from a labour perspective was emphasised by an interview participant. The reasoning is that active harvesters are classified as such from a labour perspective, rather than legislation that targets licenses or quota owners.

harvesters is that they are disorganised and do not have an organization that can speak for their interests. An organization such as this can become the co-management partner with DFO.

2. DFO must incorporate **social and scale-specific objectives** into its mandate in managing the fishery. As discussed above, attention to where fishery benefits flow and what scale of user and community participates in the co-management process is critical. Currently, DFO has left the use and distribution of fish up to the market, which has resulted in consolidation and concentration of processors in large urban centres or overseas. A singular focus on conservation is not enough.
3. Both DFO and fishery participants must engage in **collaborative science initiatives**. Restoring visible data collection can go a long way towards restoring faith in the information behind management decisions, and improving data collection for better decision-making. In addition, as Berkes (2009) argues, collaborative knowledge production can provide better information for all partners, and the process of engaging in co-science can help strengthen partnerships and build trust as well.
4. DFO should **restore volunteer stewardship programs** that incorporate non-fishery participants into the stewardship of resources, which strengthens the connection of community members with coastal ecosystems, provides opportunities for education and utilises volunteer capacity to increase data collection. Pinkerton has shown that local volunteer labour also helps to offset the cost of local management (1994).
5. Both the Federal and BC Provincial governments must engage in a study to **determine how to fairly but steadily de-commoditise licenses and quota** within the BC fishery. This can be done through changes in tax structure to de-incentivise passive ownership, legislation that

stipulates a divestment period for current investors, or a number of other policy innovations, many of which active harvesters in BC provided in detail to the FOPO Committee between January and February 2019.

6. While recommendation 5 is being designed, DFO should **create a database to make information on license and quota ownership public**. Investigations into beneficial ownership are necessary to get an accurate picture of who exactly owns access to fish adjacent to the Pacific coast. This was a key recommendation to the FOPO Committee (2019) by witnesses.
7. DFO must engage in an **open and transparent, on-going and accessible discussion with fishery participants and coastal communities** on visions for the future of the fishery. Particular attention must be paid to ensure inclusion of those marginalised by the current system: small-scale, active harvesters, new entrants and those tied into unfair profit-sharing agreements with current license and quota owners. This also signifies that co-management is an ongoing, adaptive process (Castro and Nielson 2001; Berkes 2009).
8. DFO must **confer formal decision-making power on co-management institutions** created through collaborative discussion in recommendation 7, again, with special attention paid to inclusion of marginalised fishery participants. Pinkerton (1994) argues that this is necessary to provide some assurance to participants that their participation will not go unheard.

5.5.2 Recommendations for a fish as food priority

1. Include **access to fish** for local community members as an **explicit objective** of the co-management system.
2. Include **representation from community members** who are not fishermen in the co-management system. This should be a goal for inclusive co-management generally, but as

community members are most likely to interact with the fishery as consumers, representatives for the community are most likely to push for local access. Olson et al. (2014) show that inclusion of non-fisher community members is important to generate investment from community builders that value local benefits from the fishery.

3. **Introduce catch use into management objectives;** for example, one interviewee recommended that a certain percentage of catch could be dedicated to be sold to the community closest to where it was caught, to ensure that coastal communities are benefiting from the fishery resource directly. Benefits to local communities must be designed intentionally.

5.6 Areas for future research

This major paper aimed to understand the state of co-management from the perspective of fisheries participants in Prince Rupert, BC and explore lessons for a future for the west coast fishery that is more effective, distributes benefits fairly, and ideally can contribute to the revitalization of small-scale coastal communities. Critical questions are raised by this research and deserve further attention. How can DFO devolve power to user groups in a way that ensures the empowerment of active fishermen and coastal communities? Is such a devolution of power desirable in a context in which significant experimentation will be necessary before effective co-management systems are likely to emerge?

An area of research that was brought up in this paper but needs further attention is that of the relationship between commercial fishermen and First Nations. This is a topic that is especially important as the Canadian government attempts to engage in reconciliation initiatives while at the same time, conflicts between communities on the ground threaten to escalate. How can power be shared equitably across user groups with different and competing legal and historic

rights to the fishery? What does sharing the fishery resource, and more broadly, sharing land and resources with Aboriginal communities look like in a true Nation-to-Nation relationship? How might disparate knowledge systems work together to inform relationships between people and nature?

Finally, the connection between fisheries co-management and improved local access to seafood needs further development, as this paper has offered preliminary observations on this question.

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Appendix A: [Sample] Questions for Active Fishermen

1. What fisheries do you participate in?
2. What avenues do you currently have to make your voice heard or take part in decision-making conversations on fisheries management? How often do you access these opportunities?
3. What type of participation would you ideally like to have in decision-making regarding fisheries management?
4. What do you think of the current Advisory Board process used for decision-making in west coast fisheries policy? How could this process be improved?
5. How do the Area Associations incorporate input from active harvesters, and how is that information used? How are decisions made within the Association, and how does DFO respond to this process/ the recommendations?
6. In your opinion, what would be some of the benefits if active fishermen had a say in decision-making? What would be some of the challenges?
7. Is improving access to seafood for local residents a priority for you as a fisherman? Why or why not?
8. What kinds of policy or regulatory changes would encourage you to sell locally? What kind of environment (non-policy related factors) would you need to be able to sell seafood locally?
9. The term food sovereignty came up a few times in the FOPO review. What does food sovereignty mean to you in the case of fisheries? What would food sovereignty look like if implemented in Prince Rupert/ on the west coast?

Appendix B: Overview of Pacific Fisheries Licensing and Regulations

The earliest method of controlling input/ effort in the fishery was limited entry licensing, which was implemented successfully for the first time in the salmon fishery in the 1960s, with other fisheries following suit (Reid, January 30, 2019)⁵⁶. There are several aspects to licensing that are used to control who has access to fish in the commercial sector: limited entry controls the growth of the fleet by controlling how many licenses are issued; vessel and party-based licenses determine whether the license is attached to the vessel or the fisherman (or company/ First Nation), which allow the DFO to keep a record of which licenses are being used and by whom; vessel length restrictions across different fisheries also attempt to control fishing capacity, by preventing vessels from expanding to be able to harvest more fish; rules to control the transferability of licenses across different fisheries are typically attached to resource conservation objectives and stipulations; and lastly, "stacking and splitting rules" allow multiple licenses to be stacked onto a single vessel, and prevent those licenses from then being sold individually, with the aim to decrease the number of boats on the water, by increasing the number of licenses tied to each vessel. Many of these rules have existed since or evolved to manage the overcapacity in the fleet created during the post-war period.

⁵⁶ Rebecca Reid, Regional Director General, Pacific Region, DFO, [Evidence](#), FOPO West Coast Fisheries Policy Review. 30 January 2019.

Appendix C: History of the Canadian Pacific Fishery

Prior to Confederation, fishing was primarily an activity that sustained First Nations along the coast of what is now British Columbia for thousands of years. Pacific Coast First Nations incorporated fishing into their social and food practises, participated in trading with local First Nations, and maintained practises such as the *potlatch*, which ensured a balance between human consumption of fish and what the ocean could provide sustainably. Trospen (2009) argues that the *potlatch*, a traditional feast in which the Chief gave away material goods and food to those in attendance, was one method of managing the 'tragedy of the commons' of Pacific fisheries. Despite archaeological evidence of significant population pressure on key Salmon fishing grounds such as the Skeena and the Fraser rivers in present-day British Columbia, social structures internal to and between First Nations along the coast allowed thousands of years of sustainable access to key food fish species, such as salmon, halibut, shellfish and eulachon (Trospen 2009). Unfortunately, the story of fish harvesting and conservation since Confederation is not nearly as promising; a century of industrialization, population pressure and fisheries management have resulted in severe overfishing and corresponding stock declines in the last 150 years.

European conceptions of fisheries as common property are typically traced back to the Magna Carta, which declared that the right to fish was universal. Hugo Grotius, a Dutch jurist, added to this in 1609 that the 'high seas were open to all,' due primarily to the impossibility of delineating and enforcing property rights on the open ocean (Swenerton 1994, 10-11). When colonial governments began to assert control over coastal regions around the world, these were the principles that informed how early fisheries policy would be ordered.

The Department of Marine and Fisheries was created on July 1st, 1867 with authority over the sea, coastline and fisheries of what was claimed as Canada during Confederation. Upon British Columbia's joining Confederation in 1871, the Department's jurisdiction and that of the *Fisheries Act* was extended to include the Pacific coast by 1876 (Swenerton 1994, 11). In 1979 the Department of Fisheries and Oceans was established as a result of *The Government Organization Act* to replace the Department of Marine and Fisheries (Library and Archives Canada, 2010).

The Federal government's attempt to regulate fishing along the BC coast began in 1876, once the *Fisheries Act* could be applied to the west coast. Much of the early attempts to manage fish stocks and equitably allocate the benefits from the fisheries, which were considered a public resource, focused on managing effort by fishermen. 'Equitably,' that is, between European settlers; Indigenous rights to fish in their traditional territories were continually restricted (Harris 2001). Harris (2008) argues that the European conception of the fisheries as 'common property' contributed to the legal argument for dispossession of coastal First Nations. As common property, the Canadian government was justified in opening the fishery up to settler interests and a burgeoning canning industry, as there was no basis to exclude newcomers from the resource (Harris 2008, 13). However, early attempts at control of the resource by the government, such as limiting entry into the fishery through licensing, failed constantly. This was due both to a lack of enforcement capacity and because "it was politically difficult to deny access to what was considered a public resource," (Swenerton 1994, 15).

The industry and government's interests aligned to the benefit of the fishing industry during the world wars, when government subsidies to modernize and increase the capacity of both fishing and processing eventually resulted in an over-expanded fleet. This was accompanied

by a reduced concern for conservation of fish stocks, as the government focused on encouraging the production of canned salmon for export to feed allied troops (Swenerton 1994, 33).

Between the Canadian government's investments into the fishing industry during wartime and the open-access nature of the oceans prior to 1977, significant overfishing took place. Global expansion of the fishing industry quickly led to massive overexploitation fueled by the continuing industrialization of fishing following World War II. A rising global population with an increased demand for protein and the technological advances that accompanied post-war industrialization together resulted in a swift rise in the amount of fish being taken out of the oceans: from approximately 21.9 million tonnes annually harvested just after World War II to 68.8 million tonnes harvested annually by the 1970s (Cushing 1988, 235).

Declining fish stocks were detected as early as the 1930s, with Cod in the North Atlantic and Halibut in the Pacific (Finley and Oreskes 2013, 246). In 1943, the Chief Fisheries Scientist for Britain, Michael Graham, asserted the 'Great Law of Fishing', which stated that "Fisheries that are unlimited become unprofitable." (Graham 1943, quoted in Finley and Oreskes 2013, 246). However, the concept of Maximum Sustainable Yield (MSY) served to allay those fears, despite having very little scientific basis (Finley and Oreskes 2013). Gordon (1954) contributed that overfishing was the result of too much effort being exerted by individual fishermen. The solution, then, was to reduce effort through policy, to meet a pre-determined MSY. Finley and Oreskes blame MSY for the decline in world fisheries, as a key policy driver that facilitated overfishing (2013). Although embedding MSY within a more comprehensive management context, Bavington (2010) also locates the destruction of global marine resources in science used in the service of economic development and management tools, of which MSY is a prime example. MSY was introduced in 1949 by Wilbert M. Chapman, newly appointed

Undersecretary of State for Fisheries within the United States State Department. The concept was simple and intuitively appealing, and so has endured in fisheries management policy and popular understandings of the fishery resource, despite having little scientific evidence to back the theory (Finley and Oreskes 2013). Essentially, MSY asserts that there is a level at which fish can be removed from the ocean without harming the reproductive potential of the remaining population – in, fact, helping the remaining population, since the younger fish that remain have better access to food sources once older fish were harvested⁵⁷. From a policy perspective, this means that fish can continue to be harvested up to the point that the stock starts to show decline. MSY is grounded in several premises that do not hold up to scrutiny – such as the assumption that fishery managers will be able to recognise and effectively stop fishing activity once the point of decline is detected (Finley and Oreskes 2013, 247; Larkin 1977). Despite the fact that this policy tool has clearly been ineffective, even destructive, it continues to be a powerful concept in fisheries management around the world; the use of the MSY concept among Prince Rupert's fishing community is discussed in detail in chapter 4.

Industrialization also created an imbalance in *who* accessed the oceans and marine resources. Industrialized fishing operations shifted the balance of power from small-scale fishermen embedded within coastal communities and local food systems towards capital intensive and technologically advanced fishing operations. These technologically advanced fishing fleets had the capacity to travel long distances and store fish on board for long periods of time (Bavington 2010; Rogers 1995). They also typically used methods that were (and continue to be) much more destructive to the marine environment, such as bottom-trawling, which essentially uses large nets to scrape the ocean floor and bring up anything large enough to get

⁵⁷ See chapter 4, section 3 for a discussion on the concept and current use of MSY.

caught in the net – including a large proportion (20%) of unusable by-catch (Driscoll, Robb and Bodtker 2009, 5). Globally, industrialised nations had the advantage in supporting long-distance fleets and exploiting fish stocks in regions adjacent to under-developed countries; nations such as Spain, Poland, Germany, Britain, Portugal, Russia, Japan, Canada, and the United States of America invested in advanced trawlers with onboard freezers, filleting machines and sonar fish finders, among other innovations (Roger 1995, 32). Due to their capacity to travel long distances and stay at sea for months at a time, combined with open-access to the oceans, these industrial fishing operations were able to travel to the most fertile fishing grounds and exploit highly productive stocks until they were depleted before moving on to new fishing grounds (Pauly, Watson and Alder 2005). The fish caught by these operations went into capital intensive frozen fish and fish meal markets around the world, inevitably separating the geography of where the fish was caught from where it was ultimately consumed (Rogers 1995).

This industrialized system of fishing also shifts who has the opportunity to eat fish – whereas fish was previously most abundantly available to those who lived close to coastal areas and fished it for food, the product that comes out of the catch and processing of the industrial fishery is only available to those who can afford what has become an expensive protein option (Kent 2003). In addition, fish caught for fish meal simply by-passes any opportunity for human consumption and goes directly to industrialised agriculture and aquaculture operations that require a high-protein diet for land animals and farmed fish raised for human consumption (Rogers 1995, 32-33).

As Rogers argues in his book *The Oceans are Emptying* (1995), the industrialization of the fishery post-World War II provided the capacity and the incentive to overexploit healthy fish stocks into decline or outright collapse (34). He argues that although the international agreement

to extend an Exclusive Economic Zone to 200 miles from national borders helped to deter distant-water fleets from continuing to exploit fish stocks and leave them depleted, it has not addressed the effects of industrial capacity and motivation, which continue to overexploit vulnerable fish stocks by their very nature.

The third United Nations Conference on the Law of the Sea, which took place between 1973 and 1982, was called partly to protect fish stocks from exploitation by distant water fleets (Rogers 1995). By 1977, when a general consensus had been reached, several nations started to declare Exclusive Economic Zones that gave them sovereign rights up to 200 nautical miles off the coastal baseline (Ladan 1996, 259). Sovereign rights gave the nation in question the authority to exploit and protect all the natural resources under the surface of the water, but leave the surface of the waters accessible for navigation purposes by foreign fleets (UN 1982, articles 55-58).

This reduced the exploitation of certain fish stocks by distant-water fleets. However, as the fishery became nationalised in Canada, the Federal government invested heavily in increasing the capacity of Canadian operations to exploit fish stocks within the 200 mile economic zone. The Canadian government poured significant investments in to the fishing sector, in both processing and the fishing fleet, once the international fleets had receded and Canada found its own fishing sector to be incapable of generating the kinds of revenues that international trawlers had been generating (Swenerton 1994, 34; Rogers 1995, 42). Bavington provides more detail on this period, explaining the particular social and economic needs that arose in small, remote coastal communities as they expanded, especially on the East Coast; the Federal government attempted to prop up rural poverty and unsteady employment with unemployment insurance and subsidies for the fishing sector (2010, 16). However, the majority

of government investment went into strengthening the capacity of the offshore industrialized fleet.

Alongside investment in the economic potential of the newly nationalised fisheries came the development of a regulation and management regime by the Federal Department of Fisheries and Oceans (DFO) that was considered state of the art until the early 1990s, when the collapse of Atlantic Cod was declared and a moratorium placed on any further fishing (Bavington 2010, Rogers 1995). Rogers and Bavington both explore this question – how did arguably one of the best fisheries management systems in the world lead to such a catastrophic fishery collapse? Both authors argue that the problem lies with the ideas of 'natural resource management' and 'sustainable conservation', and the human-nature relationships these ideas employ, ultimately in the service of a capitalist, commoditized market logic.

Appendix D: Overview of Maximum Sustainable Yield

The principle of MSY assumes that if the maximum harvest level can be discovered by scientists, then the fishery can go on producing fish for harvest indefinitely (Finley and Oreskes 2013). Although MSY has been modified over the years, I am specifically referring to the isolated stock-recruitment model because, first, it assumes that each population of fish can be managed as an independent stock and does not take into account interactions in a mixed-species or mixed-stock context; and second, because it assumes a steady and predictable relationship between the stock (the population of a given species that is isolated from other populations of the same species; stocks may also include more than one species⁵⁸) and the recruitment rate (the number of fish in a given population that reach maturity) (Subbey et al. 2014). Perhaps the most influential model used to explain this relationship between stock size and recruitment is the Ricker Curve, introduced by a Canadian fisheries biologist in 1954 (Figure A). This is a theoretical model that attempts to explain the relationship between salmon, in this case, that make it to the spawning grounds, and those salmon spawns that will survive to maturity and attempt to come back to the spawning grounds. The 'replacement line' is the number of spawners (mature fish) needed to replace the spawning stock, one-to-one, for the next cycle; the dome-shaped curve represents the number of recruits that can be produced from a given spawning stock. Point A is the number of recruits produced for a given number of spawners at point C; point B is the number of salmon that need to reach the spawning ground to replace the spawning stock. Therefore, the recruits from point A to point B are considered 'surplus' and can be harvested without harming the future spawning potential of the stock (Ricker 1954). This

⁵⁸ 'Fish stock here is defined as: "the living resources in the community or population from which catches are taken in a fishery. Use of the term **fish stock** usually implies that the particular population is more or less isolated from other stocks of the same species and hence self-sustaining. In a particular fishery, the fish stock may be one or several species of fish." (FAO 1997)

theoretical curve is also used to determine the level of 'escapement', which is the number of spawners that need to return to the spawning grounds in order to maintain the stock population level – spawners above the necessary escapement level are considered an 'over-escapement' (as indicated in figure A) (Dunklin 2005).

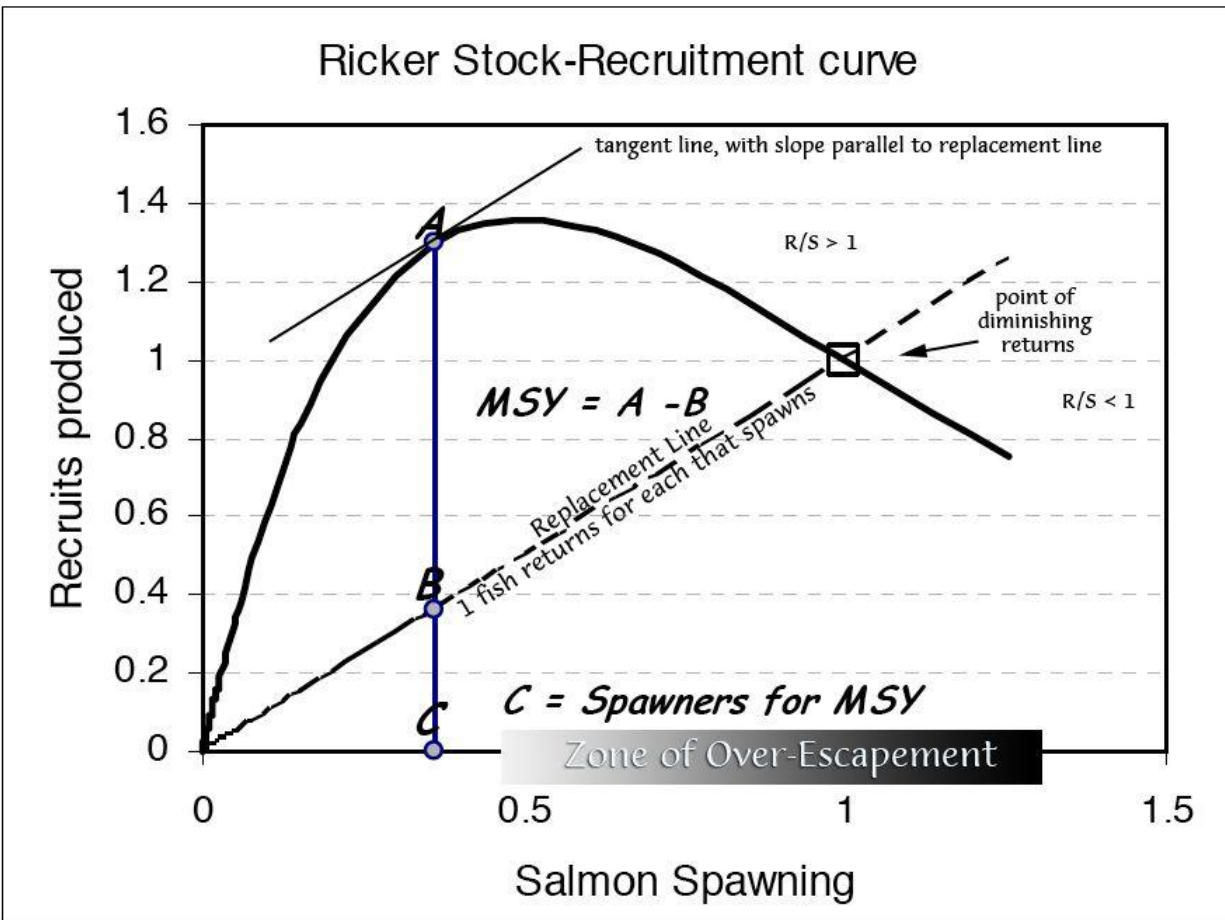


Figure A: Ricker Stock-Recruitment Curve (1954) sourced from <http://www.oceanecology.ca/fisheries.htm>

Appendix E: Larkin's Criticisms of MSY

From Larkin's "An Epitaph for the Concept of Maximum Sustained Yield" (1977)

- MSY focuses too exclusively on large, commercially significant stocks at the expense of weaker substocks (of the same species) and less commercially viable species that are fished alongside stronger stocks – this can result in overfishing of non-target substocks and species
- MSY oriented fisheries only focus on population size as a whole, and do not protect older individuals, who are typically stronger spawners – over time, this leads the quality of spawners to degrade, reducing biodiversity and leaving the entire stock vulnerable to catastrophe
- It is difficult to know and respond appropriately once the MSY has been taken, and since most fisheries management regimes globally are imperfect at best, this can quickly lead to overfishing and stock depletion
- MSY does not take into account complex ecosystem relationships between fish, food sources, and marine habitat, all of which are affected by commercial fishing
- And finally, MSY calculations are based on highly inconsistent and inaccurate data, and data that is difficult to obtain, and therefore most MSY calculations and models are simplifications and estimations at best.