LUND
UNIVERSITY

The Past, Present and Future of Collective-Action to Address Water Related Issues in the Fraser Basin

Degree of Master of Science (Two Years) in Human Ecology: Culture, Power and Sustainability

Human Ecology Division
Department of Human Geography
Faculty of Social Sciences

Author: James Joshua Young
Supervisor: Rikard Warlenius
Term: Fall 2018

Abstract:

The enactment of the Water Sustainability Act by the province of British Columbia, Canada, in 2016 signals a shift towards a more decentralized and localized approach to water governance in the province. In this context, this thesis explores the history of development in the socio-ecologically significant Fraser Basin and identifies that a unique and successful form of collective-action to address water related issues exists. The Fraser Basin Council is identified as a unique organization that has emerged as the only decentralized water governance organization in the province's history. Given its history, this thesis argues that the Fraser Basin Council is in a unique position to support both the provincial government and local communities to develop effective and long-lasting water governance entities in their local watersheds.

Acknowledgments:

I owe a great deal of gratitude to everyone in the Human Ecology programme for constantly pushing me to challenge my ideas and perceptions of the world. Specifically, I'd like to thank Joe and Thies for the wine fueled evenings discussing everything and nothing at all, my partner Louise for giving me motivation to work on this thesis when I needed it most, and to my thesis advisor Rikard Warlenius for providing me with invaluable feedback throughout the writing process.

Contents

Table of Figures

List of Tables

Appendix

1. Introduction

It is summer 2018 and the province of British Columbia is in the midst of yet another extreme fire season. Eerie images of dark orange skies blotting out the sun in the middle of the afternoon are playing out on news outlets across the country, videos of people fleeing by car on winding roads through forests completely ingulfed in flames have gone viral, and the second state of emergency in as many years has been declared by the province to access the resources of the Canadian Armed Forces (Vomiero, 2018). To you, the reader, this might seem quite dramatic, but to your average Canadian living in western Canada, this is starting to become the new norm. In 2017, the province experienced its second worse fire season in history, second only to this year, and during the summer of 2015, a severe drought shrank reservoirs and completely depleted multiple streams and aquifers of water (Brandes & Morris, 2016). It is quite clear that summers in B.C. are getting hotter and dryer, and this is putting a significant strain on freshwater resource systems in the province. Fortunately, the experience of the drought of 2015 thrusted water issues to the forefront of the minds of politicians, academics, NGOs and civil society as a whole, and has highlighted the need for a more modern and efficient approach to water resource management in British Columbia (Brandes & Morris, 2016). In 2016, the *Water Sustainability Act*, a much-needed replacement for the century old *Water Act* of 1909, was brought into force to respond to current and future pressures on water resource systems, and several of the key provisions in the Act are seen as providing the legal foundation on which more local and collaborative forms of governance could be developed at the watershed scale (Brandes & Morris, 2016; Brandes & O'Riordan, 2014; Brandes, et al., 2018; British Columbia, 2016).

Historically, the province of British Columbia has relied upon a centralized and government-led approach to water resource governance (Brandes & Morris, 2016). In so doing, the province blankets all the communities within its territory with the same set of rules dictating the range of water management activities available to water users, leaving little room for the development of local rules that consider the socio-ecological characteristics of watersheds (Ostrom, 1990). The enactment of the Water Sustainability Act signals a shift towards a more decentralized and localized approach. In this context, this thesis explores the history of development in the socio-ecologically significant Fraser Basin and identifies that a unique and successful form of collective-action to address water related issues exists. The Fraser Basin Council is identified as a unique

organization in the British Columbian context, that has emerged as the only decentralized water governance organization in the province's history and is responsible for the coordination of the activities of a variety of water users in the Fraser Basin. Given that communities across the province are expressing interest in taking on more responsibility over water resource management, and that the provincial government is exploring the possibility of developing a more decentralized approach to water governance, it will be argued that the Fraser Basin Council is in a unique position to support both the provincial government and local communities to develop effective and long-lasting water governance entities in their local watershed. Following a presentation of the aim and purpose of this study and the research questions that guided this inquiry, a summary covering the geographical area, demographics, relevant stakeholders and the socio-ecological importance of the Fraser Basin will be provided. A justification for the use of a case study research methodology, and the data gathering strategies and methods employed will follow. The subsequent section will be dedicated to the theoretical framework that has been used to guide the research and interpret the research findings, and will specifically discuss collaborative governance, the theory of collective-action, and will highlight the design principles that tend to characterize sustainable and long-lasting common-pool resource institutions. The case of collective-action to address water related issues in the Fraser Basin will then be presented and followed by a brief discussion and a presentation of the conclusions drawn throughout the research. Finally, a list of references will be provided.

2. Aim and Purpose

The aim of this study is to highlight the challenges and opportunities of developing effective collaborative institutions for the management of water resources in the province of British Columbia.

3. Research Questions

- *Is there a successful history of collective-action to address water related issues in the Fraser Basin? If so, how has it evolved?*
- *Given the traditional centralized and government-led approach to water governance in the province of British Columbia, how are individuals able to influence the decision-making process over water resource management?*

- *How can the Fraser Basin Council support collective-action initiatives to address water related issues in the Fraser Basin and the Province of British Columbia?*

4. Background

4.1 Geographical Area

The Fraser River is located in Canada's westernmost province of British Columbia. Its headwaters originate from the snowmelt and rainwater that run down the mountain peaks of mountains in Mount Robson Provincial Park on British Columbia's eastern border with the province of Alberta. As these waters descend they mix with ground water to form the mainstem of the Fraser River, which meanders south-west through the heart of British Columbia, fed through a network of tributaries that spread across the province. These waters flow 1375 kilometers before being discharged into the Strait of Georgia and forming the Fraser River Delta and the Fraser River Estuary (Renzetti & Dupon, 2017).

The Fraser Basin is made up of several smaller watersheds, all of which drain into the Fraser River. The term watershed refers to a defined area of land that drains surface water into a body of water, which in this case is the Fraser River (Brandes & O'Riordan, 2014; Milwaukee Riverkeeper, 2015). The watersheds that drain into the Fraser River are: The Upper Fraser, Stuart, Nechako, Quesnel, West Road-Blackwater, Chilcotin, North Thompson, South Thompson, Thompson, Lillooet and the Lower Fraser watersheds (Fraser Basin Council – "Fraser Basin Watersheds", 2018). In total, the Fraser Basin drains 240,000 square kilometers of land and could fit all of Great Britain within its geographical footprint (Fraser Basin Council – "About the Basin", 2018).

The Fraser River Estuary, located at the mouth of the Fraser River, is of significant ecological importance as it plays host to the largest concentrations of wintering water-birds and raptors in Canada and is a key spot for migrating birds to rest and refuel during their international journeys. The Fraser River is also the largest salmon producing river along the Pacific Coast of North America, and juvenile salmon rely upon the abundance of food and protection in the Fraser River Estuary in the early phases of their development (Relief Bird Sanctuary – "The Fraser River Estuary", 2018).

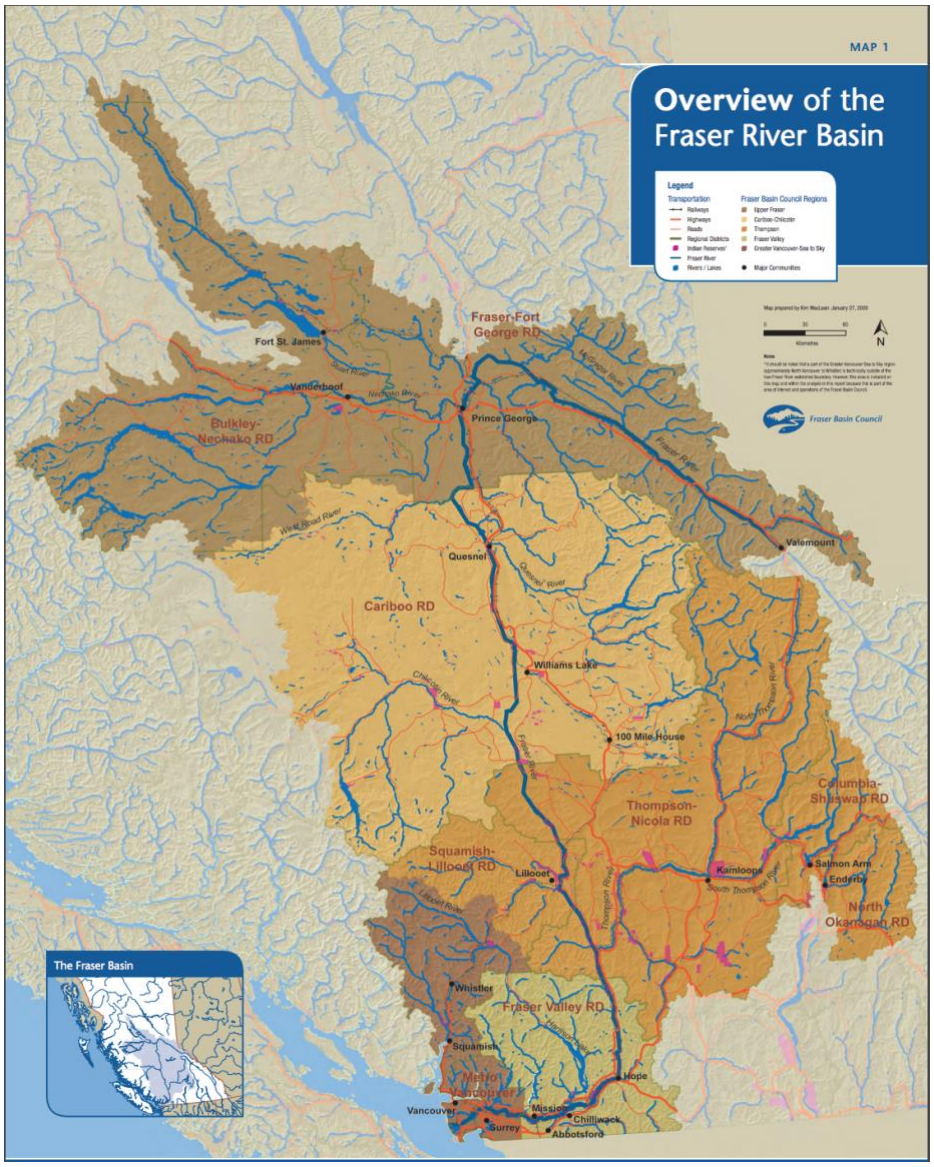

Figure 1. Overview of the Fraser Basin (Fraser Basin Council – "Maps", 2018)

4.2 Demographics and Stakeholders

The Fraser Basin is the largest river basin in British Columbia, the fifth largest in Canada, and is one of the few large rivers in the world whose mainstem has not been obstructed by hydroelectric dam development (Renzetti & Dupon, 2017). The Basin is home to over 2.7 million residents and to multiple different industries whose economic activities account for 80% of British Columbia's economy and 10% of the national economy (Renzetti & Dupon, 2017).

Eight major First Nations language groups reside within the Basin; Halq'emeylem; Hul'q'umi'num; Secwepemctsín; St át imcets; Nlaka'pamux; Nsyilxcen; Tsilhqot'in; and Dakelh, and Carbon dating has situated some of the settlements that dot the banks of the Fraser River as being over 10'000 years old (Fraser Basin Council – "Our History", 2018). First Nations communities have developed a strong spiritual relationship with this territory over time, and wild Pacific Salmon is of particular cultural and spiritual significance to Indigenous groups as they have historically relied upon the abundant salmon runs to sustain their livelihoods (Demers, 2017; Renzetti & Dupon, 2017).

4.3 Socio-Ecological Pressures

Over the years the Fraser River has been subjected to degradation by a wide variety of different factors, such as; pollutants from sawmills, pulp and paper production, mining and other heavy industries; municipal sewage; and agricultural and urban runoffs (Renzetti & Dupon, 2017). Although the Fraser River has been subjected to environmental stress by the activities of multiple industries, and of the wider community in general, it is important to note that there are several sections of the Fraser River, especially in the upper-basin, that are relatively underdeveloped and still boast pristine water quality conditions. This is especially true when you compare the Fraser with other major bodies of water in Canada like the St. Lawrence River and the Great Lakes. It is not, however, because of a stronger sense of stewardship over the environment in northern communities, but rather that the vast majority of industrial development has been concentrated in the sub-basin (Renzetti & Dupon, 2017). Along with rapid industrialization, the sub-basin has experienced rapid urbanization, which is expected to continue well into the future, and is more than likely to lead to the increase of socio-ecological pressures on the Fraser River and the integral Fraser River Estuary (Demers, 2017). Fortunately, NGOs, First Nations and civil society groups have called for action to curb the effects of human development in the sub-basin, as residents look to the Fraser as a source of relief to the urban sprawl, and for spiritual and recreational purposes (Demers, 2017).

5. Methodology

This section outlines the ontological perspective, methodology and methods used while conducting the research for this thesis. The research was qualitative in nature and employed an embedded

single-case study design. The specific methods used to gather data were semi-structured expert interviews and a document review. The method of triangulation was used as a means to validate the data. An outline of ethical consideration and the limitations of the study follows.

5.1 Ontological Perspective

The research for this thesis has been approached from a Critical Realist perspective. Critical Realism emerged as a critique of positivism and constructivism, and its central concept is that there exists a world that is populated by material things which acts independently of our knowledge of it (Sayer, 2000).

5.2 Embedded Single-Case Research Design

Hartley (2004) describes case study research as a detailed investigation of a phenomenon within its context, with the aim of analyzing the contextual characteristics and processes that inform the theoretical issue that is being studied (Hartley, 2004). In an effort to analyze the complex socio-ecological conditions that have led to the supply of common-pool resource institutions throughout the history of development in the Fraser Basin, and the institutional processes that have contributed to the evolution of the Fraser Basin Council into the organization that it is today, the research conducted during this thesis has been approached through an embedded single-case study design. The benefit of using a case study research design is that it has allowed for an in-depth and holistic investigation of the relevant contextual conditions while gathering multiple sources of data for analysis (Yin 1994, pp. 38).

The research has been approached from a single-case research design, as opposed to a multiple-case study design, because the history of collective-action to address water related issues in the Fraser Basin represents a unique case of how diverse groups of individuals have come together to supply common-pool resource institutions in the province of British Columbia (Calbick et al., 2004). The term embedded single-case study implies that the research is approached from more than one level of analysis (Yin, 1994).

Data collection is one of the most significant activities in case study research, because the richness and depth of the knowledge produced will be contingent on the successfulness of the data

collection strategy in unearthing interesting and relevant details about the case (Njie & Asimiran, 2014). The majority of case studies rely on one or more of the following six sources: interviews, documents, archival records, participant observation, physical artifacts and direct observations (Njie & Asimiran 2014, pp. 37; Stake, 1995; Yin, 1994). This thesis relies upon two of the six, interviews and documents. The data gathering processes and the strategies employed are outlined in the document review section of this paper.

5.3 Methods

5.3.1 Qualitative Semi-Structured Expert Interviews

Two semi-structured expert interviews were conducted via Skype with respondents who regularly interact with the Fraser Basin Council and are involved in water governance in the province of British Columbia. The choice to conduct interviews via Skype was out of necessity rather than out of any type of preference for the method. British Columbia is both a trans-Atlantic and cross-country flight away from Sweden, and interviews via Skype presented itself as a suitable way to enter into dialogue with experts who work on issues of water resource governance and management in the province.

As Bryman (2012) points out in his book *Social Research Methods*, there is not a significant difference between the responses of interviewees during face-to-face interviews, when compared to those conducted over the phone (Bryman 2012, pp. 488). However, Bryman also notes that there are some limitations to this method: (1) it is easier for a respondent to terminate the interview when it is conducted over the phone; (2) it is not possible to observe body language and (3) telephone interviews may not be well-suited for those who do not have access to telephones, or in this case a computer and reliable internet connection (Bryman 2012, pp. 488). The only limitation out of the three that was experienced during the interview process, was the inability to read the respondents body language; however, this is not believed to be a significant limitation in the context of this research.

Qualitative semi-structured interviews were chosen as an interview style because of the flexibility they allow for, while still providing enough structure that respondents discuss the same general topics (Bryman 2012, pp. 493). The ability to depart from the interview guide by asking follow-

up questions when respondents brought up interesting and significant issues allowed for a more holistic understanding of the issues that stakeholders face as they attempt to influence the decision-making process over water resource management in the Basin. However, one of the obvious limitations of this style of interview is that by deviating from the interview structure respondents may not consistently answer the same question in the same way (Turner, D.W., 2010). The free-flowing conversational style of the interviews and the different professional backgrounds of the experts did make connecting the ideas discussed somewhat challenging, however, their insights were invaluable in guiding the research.

Prior to conducting the interviews, respondents were informed about the nature of the research, and the type of data that was being collected and how it would be used. Respondents were also asked if the interview could be recorded and both agreed. The respondents were purposefully selected based on their experiences with the Fraser Basin Council and water governance in general. Cold-emails were sent out to several experts, however, very few replied, and even fewer had the time for an interview. Therefore, the data gathered through the interviews is not used to support any definite claims, but rather to guide the research and to get a more detailed understanding of the types of processes involved in water management in the Fraser Basin.

Respondents

Name	Organization	Position	Description of Duties
Rosie Simms	POLIS Project on Ecological Governance: Water Sustainability Project	Project Manager & Researcher	Rosie's work includes research and outreach on legal/policy options to advance freshwater protection; convening B.C. water leaders; and managing project activities.
Lina Azeez	Watershed Watch	Fraser Voice Organizer	Lina works to understand citizens perceptions and engage with people in the Fraser Basin on issues that affect salmon and salmon habitats.

Table 1. Expert Respondents

5.3.2 Document Review

Robert Stake (1995), states that almost every case study must rely on the examination of reports, correspondences, newspaper clippings or other documents, and argues that documents can be thought of as "substitutes for records of activity that the researcher could not observe directly" (Stake 1995, pp. 68). Stake goes on to suggest that when gathering data from documents the researcher should have a clearly defined strategy. Some documents may be more relevant than others and an estimation of the perceived usefulness of documents should be conducted prior to beginning the data gathering process (Stake, 1995). Individual data gathering strategies were designed with each research question in mind and the strategies employed during the document gathering process and the type of documents that were collected is outlined below:

Document Gathering Strategies:

Research Question 1: *Is there a history of successful collective-action initiatives that have addressed water related issues in the Fraser Basin? If so, how have they evolved?*

Document Gathering Strategy	
Strategy	Focus on publications covering the history of development in the Fraser Basin
Type of Documents	Books, Articles, Reports and Newspaper Articles.
Justification	Developing knowledge on the history of development in the Fraser Basin allows for a more holistic understanding of the case by analyzing the socio-ecological conditions that might have led to the emergence of collective-action initiatives that address water related issues in the Fraser Basin, and how they have evolved over time.

Table 2. Data Gathering Strategy for Research Question 1

Research Question 2: *Given the traditional centralized and government-led approach to water governance in the province of British Columbia, how are individuals able to influence the decision-making process over water resource management?*

Document Gathering Strategy	
Strategy	Focus on the relevant provincial legislation governing water resource in the province, the constitutional division of power, the government agencies involved and the arenas available to individuals to influence the decision-making process.
Type of Documents	Legislation, reports, books, newspaper articles.
Justification	By analyzing federal and provincial legislation over water governance, knowledge regarding how the government either inhibits or supports the ability for individuals to influence the decision-making process over water resource management in their local setting will be produced.

Table 3. Data Gathering Strategy for Research Question 2

Research Question 3: *How can an organization like the Fraser Basin Council support collective-action initiatives to address common-pool resource problems?*

Document Gathering Strategy	
Strategy	Gather the relevant documents that have already been accumulated during the research process on the Fraser Basin Council and government legislation. Supplement if needed.
Type of Documents	Reports, Legislation, and publications on the activities of the Fraser Basin Council since inception.
Justification	In order to access (1) if the Fraser Basin Council is a suitable organization to support collective-action initiatives and (2) how the Fraser Basin Council can support collective-action initiatives in British Columbia, the research must produce in-depth knowledge of the activities of the Fraser Basin Council and how they fit within the greater political context.

Table 4. Data Gathering Strategy for Research Question 3

Sources

Primary Sources:

- The Water Sustainability Act (2016): "The WSA is the principal law for managing the diversion and use of water resources" (British Columbia – "Water Sustainability Act", 2016). The WSA is provincial legislation brought into force on February 29, 2016.
- The Constitution Act (1867): An Act for the Union of Canada. In the context of this thesis, it outlines the constitutional division of power over water resources.
- The Water Act (1909): Prior to the Water Sustainability Act, the Water Act was the principal law for managing the diversion and use of provincial water resources.

Perceived Biases: There are no perceived biases in any of the pieces of legislation relied upon in this thesis. They simply outline the laws governing water resources in the province of British Columbia.

- Pages and reports from the Fraser Basin Council website

Perceived Biases: The Fraser Basin Council is not likely to present itself in a negative light, therefore the information from the Fraser Basin Council website is inherently biased. The information has been validated through a process of triangulation.

- Expert Interviews

Perceived Biases: Since the respondents are representatives of their respective organizations, they often promoted the work that they were doing in the Fraser Basin, and also discussed their personal experiences in water governance.

Secondary Sources:

- Reports from the POLIS Project on Ecological Governance. POLIS is a transdisciplinary research-based organization that investigates and promotes sustainability in British Columbia located at the University of Victoria (POLIS – "Welcome", 2018). They work together with Senior Crown Governments, NGOs and local communities to support the

implementation of the Water Sustainability Act, and work to build capacity at the local scale (Interview with Rosie, 2018).

Perceived biases: the organization is trying to advance better water governance in the province of British Columbia and they have an idea of what good water governance looks like to them. However, since POLIS is a trusted organization in the province working on issues of water sustainability with the federal and provincial governments, NGOs and local communities, the reports are relied upon with confidence in this thesis.

The reports included: Illumination: Insights and Perspectives for Building Effective Watershed Governance in B.C. (Brandes & Morris, 2016); A Blueprint for Watershed Governance in British Columbia (Brandes & O'Riordan, 2014); Collaborative Consent and Water in British Columbia: Towards Watershed Co-Governance (Brandes et al., 2018); and Collaborative Consent: Pathways towards watershed co-governance in B.C. and beyond (Simms et al., 2018)

- Reports from the World Bank that describe and analyze the Fraser Basin Council's approach to river basin management. Studies were conducted by Calbick et al. and Blomquist et al. in 2004 and 2005 respectively, well before the enactment of the Water Sustainability Act in 2016, which makes them slightly dated; however, the information regarding the Fraser Basin Council as an institution is extremely valuable.

Perceived Biases: The authors paint the Fraser Basin Council in a very good light and do not spend much time critically analyzing the organization.

The reports included: Institutional and policy analysis of river basin management: the Fraser River Basin, Canada (Blomquist et al., 2005) and the Fraser River Basin Case Study: British Columbia, Canada (Calbick et al., 2004)

5.3.3 Triangulation

The verification method of Triangulation has been used to increase the validity of the research findings. Triangulation refers to "the combination of two or more theories, data sources, methods

or investigators in one study of a single phenomenon to converge on a single construct" (Yeasmin & Rahman 2012, pp. 156).

5.4 Ethics

A certain degree of intrusiveness inevitably accompanies any qualitative research (Creswell, 2014). Above all, it is important that research is approached with an open-mind and in a respectful manner. While conducting the two expert interviews, both respondents were informed of the nature of the research, what type of data was being collected and how it would be used in the research. Permission was granted by both respondents to record the interviews and a verbatim transcript of the interview was provided to the respondents so that they had the opportunity to clarify any misunderstandings. At no point throughout the research process were respondents intentionally deceived and when respondents asked for certain statements to be removed from the body of research those statements were deleted from analysis. Upon completion of the research project, a summary of the research findings will be made accessible to both respondents as they were both curious about what sort of conclusions would be reached.

5.5 Positionality

When conducting research, it is of great importance to reflect on one's positionality as a researcher. As a Canadian who once worked in the reforestation industry in British Columbia and often within the Fraser Basin, I have developed a special relationship with this area, the wilderness, the animals and the people. When you spend months on end living in remote camps and all you see day in and day out is hundreds of square kilometers of forestry cut blocks and the effects that these activities have had on the land, the water, the wildlife habitat and the communities, you tend to internalize certain biases. I chose to pursue this research out of a deep concern for the way in which natural resources are being managed in British Columbia and in Canada in general, which constitutes a bias in itself. The choice to focus on water issues instead of land management was for two reasons: (1) to reduce the likelihood that my biases would cloud my judgement during the research process by exploring a topic with which I've had very little exposure to prior to the research and (2) the growing relevance of water issues around the world as a result of climate change.

When conducting research, it is important to acknowledge our own power and privilege as researchers (Creswell, 2014). I acknowledge that the Fraser Basin is the traditional territory of 8 First Nations language groups who have habited this area for thousands of years, and I try my best not to misrepresent the culture, beliefs, ideas or perspectives of First Nation groups.

5.6 Limitations

The most obvious limitation is of course the number of interviews that were conducted and that neither respondent was affiliated with the Fraser Basin Council itself. Due to the difficulty in (1) getting in contact with potential respondents and (2) arranging Skype interviews that fit in the busy schedules of potential respondents, the number of interviews conducted was much less than anticipated. In the end, the choice to include the data from the expert interviews in the thesis is due to the fact that by recounting their experiences, respondents were able to provide insights into the different avenues through which stakeholders attempt to influence the decision-making process, and the challenges that they experience in doing so, that simply would not have been possible to gather from a report or other document on its own. The data gathered from the interviews, however, is not used to make any definite claims, but rather served as a research guide to inquire about certain things that were not previously considered and to demystify certain bureaucratic procedural processes.

A second limitation to this study is that it has been conducted from Sweden, rather than *in situ*. If the opportunity to conduct field research would have arisen, it undoubtedly would have had significant impacts on the research design, the data sources collected, and the methods used. In an effort to address the limitations on the type of data sources that were able to be collected from abroad, a variety of different types of documents were gathered during the document gathering process. This allowed for a better understanding of the issues being covered by approaching issues from multiple perspectives. However, since the majority of data sources relied upon to analyze the Fraser Basin Council are secondary data sources, it limits the ability of this thesis to make any definite claims.

The following section of this paper is dedicated to the presentation of the theoretical framework used throughout the thesis.

6. Theoretical Framework

Before proceeding much further, it is important to establish some working definitions of the terms frequently used throughout this paper.

Key Definitions	
Common-Pool Resource	A natural or man-made resource system that is large enough to make it costly to exclude individuals from accessing the benefits of its use (Gardner et al., 1990; Ostrom, 1990)
Resource System	The stock of a resource, examples include a ground-water basin, a stream or a lake (Ostrom, 1990)
Resource Units	What individuals withdraw from a resource system, such as the number of cubic meters of water withdrawn from a lake (Ostrom, 1990).
Appropriators	Individuals who withdraw resource units from a resource system. It is important to note that the withdrawal of resource units is usually undertaken by multiple appropriators simultaneously often leading to conflict among resource users. (Gardner et al., 1990; Ostrom, 1990)
Institution	"Systems of established and prevalent social rules that structure social interaction" (Hodgson 2006, pp. 2). In a CPR setting, institutions are the sets of working rules that determine who is eligible to make decisions, what actions are allowed, what procedures must be followed, what information must be made available, and what payoffs are given to individuals based on their behaviour (Ostrom, 1990).

Table 5. Key Definitions

6.1 *Collaborative Governance*

Collaborative governance is a governance strategy that has emerged over the past couple of decades, which involves relevant stakeholders coming together with public agencies to engage in consensus-oriented decision-making (Ansell & Gash, 2007). It is a strategy that is widely seen as providing a more effective approach to the management of common-pool resources, such as water, because of the simple fact that no single actor can possibly hold all the relevant knowledge and/or resources to properly manage these complex socio-ecological systems by themselves (Ansell, 2015; Ansell & Gash, 2007; Conrad et al. 2018; Doberstein, 2016; Eckberg et al. 2015; Fliervoet et al. 2015).

Historically, the province of British Columbia has relied upon a centralized and government-led approach to water resource governance, with the state usually holding the bulk of the authority over the decision-making process. However, in recent years, more decentralized decision-making processes have emerged, in which appropriators and various other relevant stakeholders have been able to exercise more influence over the decision-making process. This shift in governance strategy is not exclusive to British Columbia, it is occurring around the globe in various settings, and the reason for this shift has to do with the interplay of several different factors. Chief among them is the failure of traditional governance structures to implement policies downstream and to effectively manage CPRs (Ansell & Gash, 2007). A second factor is that either due to budget cuts, a lack of interest, or the redirection of resources towards addressing other critical issues, governments around the globe have retreated from their management roles, and as a result have limited human and financial resources dedicated to monitoring and enforcement activities (Ansell & Gash, 2007; Fliervoet et al. 2015). And finally, individuals and communities as a whole have expressed a genuine desire to have more influence over the decision-making process (Brandes et al., 2018; Conrad et al. 2018; Simms et al., 2018).

Various definitions of collaborative governance exist throughout the literature. Ansell and Gash (2007) define collaborative governance as "a type of governance in which public and private actors work collectively in distinctive ways, using particular processes, to establish laws and rules for the provision of public goods" (Ansell & Gash 2007, pp. 543). This definition touches upon two important aspects of collaborative governance. Firstly, it highlights the cooperation between public and private actors in the establishment of laws and rules. Secondly, it acknowledges that there is an agreed upon process for the establishment of rules, that involves collaboration between the private and public sphere. A second definition of collaborative governance is that used by Jonston et al. (2011). They define collaborative governance as "a method of collective decision-making where public agencies and non-state stakeholders engage each other in a consensus-oriented deliberative process for inventing and implementing public policies and procedures for managing public resources" (Jonston et al. 2011, pp. 699). Here the authors highlight another important aspect of collaborative governance, that of consensus-oriented decision-making. Consensus-oriented decision-making allows for stakeholders to strive for consensus, but when a diverse group

of stakeholders cannot reach consensus, after a predetermined period of time has elapsed a decision is still ultimately made (Jonston et al., 2011).

To summarize, collaborative governance is widely seen as a more effective approach to the management of common-pool resources, because no single actor has all the relevant knowledge or resources to effectively manage CPRs by themselves (Ansell, 2015; Ansell & Gash, 2007; Conrad et al. 2018; Doberstein, 2016; Eckberg et al. 2015; Fliervoet et al. 2015). The term collaboration implies that there is a dialogue between the relevant stakeholders and government agencies during the decision-making process over the management of the CPR, and that decisions are made through consensus-oriented decision-making (Ansell & Gash, 2007; Jonston et al., 2011).

6.2 Theory of Collective-Action

> At the most general level, the problem facing CPR appropriators is one of organizing: how to change the situation from one in which appropriators act independently to one in which they adopt coordinated strategies to obtain higher joint benefits or reduce their joint harm.
>
> - Elinor Ostrom (Ostrom 1990, pp. 39)

Making the switch from independent action to coordinated or collective action is not a simple process. Much of the theory concerning collective action is pessimistic about the ability for individuals to overcome three main challenges; (1) supply their own institutions, (2) make credible commitments to follow the established rules, and (3) develop mutual monitoring mechanisms (Bates, 1988; Elster, 1989; Ostrom, 1990).

Supplying Institutions

In an article titled *Contra Contractarianism: Some Reflection on the New Institutionalism,* Robert Bates (1988) argues that even if individuals favour the development of new institutional arrangements facilitating the coordination of their activities, they are not likely to succeed in supplying them, because the "incentives to free-ride will undermine the incentives to organize a solution to the collective dilemma" (Bates 1988, pp. 395). However, Bates concedes that building trust and a sense of community between individuals may act as a mechanism to reduce individual

incentives to free-ride, and if the incentives to free-ride are sufficiently reduced, it could lead to collective action in the supply of new institutional arrangements (Bates, 1988).

Successfully organizing collective action to supply new institutional arrangements to coordinate the activities of appropriators is the first of many challenges when developing a successful CPR institution. The next challenge is to ensure that appropriators are making credible commitments to follow the rules.

Credible Commitments, Mutual Monitoring and Enforcement of the Rules

Establishing a set of rules is one thing but ensuring that those rules are being followed is another. When appropriators organize themselves to solve CPR problems, they establish a set of rules that limit the range of activities available to them in order to ensure the long-term viability of the resource system. But, how does the rule abiding appropriator know that he is not the only "sucker" following the rules while everyone else is going about their business as usual? The simple answer is that he cannot, until the issue of how rules are to be monitored and enforced is addressed, and when it comes to this issue, most theorists argue that even if individuals have played a part in the crafting of the rules, they will not monitor or enforce them (Elster, 1989). However, most of the successful common-pool resource institutions identified by Ostrom during her field research relied upon appropriators to monitor and sanction each other's behaviour (Ostrom, 1990)

Many individuals fail to overcome these collective-action challenges when attempting to supply CPR institutions, however there are a few individuals who have found success (Ostrom, 1990). Ostrom argues that most theorists have been led to pessimistic conclusions about the ability of individuals to achieve collective action, and that based on her own empirical observations, the theory of collective action should be adjusted (Ostrom, 1990). Therefore, Ostrom developed an alternative set of initial presumptions from which to approach the analysis of CPR situations:

- "Appropriators in CPR situations face a variety of appropriation and provision problems whose structures vary from one setting to another, depending on the values of underlying parameters." (Ostrom 1990, pp. 46)

- "Appropriators must switch back and forth across arenas and levels of analysis" (Ostrom 1990, pp. 46)

Overcoming a Variety of Problems

In an article titled, *The Nature of Common-Pool Resource Problems*, Roy Gardner et al. (1990), suggest that when approaching the analysis of CPR situations, we ought to recognize that appropriators are facing several different CPR problems (Gardner et al., 1990). The authors cluster these problems into two classes; appropriation problems and provision problems.

Appropriation Problems

Appropriation problems are those that concern the allocation of resource units and the access to the resource system. In a limited-access CPR situation, appropriators are governed by an established set of rules determining the quantity, timing, location and technology of appropriators. Since the spatial and temporal distribution of common-pool resources are often varied and uncertain, the allocation of spatial and temporal access to the resource system is an important factor to consider when addressing appropriation problems (Gardner et al., 1990; Ostrom, 1990).

Provision Problems

Provision problems are those that concern the productive nature of investments in the resource system itself and can occur on both the supply and demand side. On the supply side of provision problems are issues like the construction or maintenance of infrastructure to maintain the health of the resource system (Gardner et al., 1990; Ostrom, 1990). On the demand side, there is the issue of how best to regulate withdrawal rates to ensure the sustained health of the resource system while also being acceptable to appropriators (Gardner et al., 1990; Ostrom, 1990).

Behind any particular appropriation or provision problem, there are likely several different factors at play. These factors are often context specific and can include the physical structure of a resource system, the economic environment that appropriators face, the type of technology available to appropriators, and the set of rules that affect the incentives for appropriators to participate or free-ride (Ostrom, 1990). Furthermore, when appropriators believe that the rules in place or the assignment of access right and provision duties are unfair, uneconomic, uncertain, or inappropriately enforced, the likelihood that they will continue to conform to the established rules, or invest in provision activities, diminishes (Gardner et a., 1990; Ostrom, 1990).

Levels of Analysis: Operational-Choice, Collective-Choice and Constitutional-Choice Rules

According to Ostrom, when individuals attempt to collectively solve appropriation and provision problems, they must move back and forth between operational-, collective-, and constitutional-choice levels in order to find an appropriate solution (Gardner et al., 1990; Ostrom, 1990).

> Individuals who have self-organizing capabilities switch back and forth between operational-, collective-, and constitutional-choice arenas, just as managers of production firms introducing new technology, and investing resources in technology development.
>
> - Elinor Ostrom (Ostrom 1990, pp. 50)

Rules at the *Operational-choice* level govern the range of acceptable day-to-day appropriation, provision, and monitoring and enforcement activities available to appropriators (Ostrom, 1990). The rules at the *Collective-choice* level directly influence the operational rules and determine how appropriators or external authorities are able to make decisions regarding the management of the resource system. Collective-choice agreements are primarily concerned with policy-making and resource management. The *Constitutional-choice* level is concerned with formulation and governance and determines how collective-choice agreements are to be crafted by appropriators and/or external authorities (Ibid).

Based on socio-ecological conditions, appropriators may feel the need to adjust their appropriation strategies. In order to do so, they would have to revisit collective-choice agreements, and if there is to be a change to the collective-choice agreement, rules at the constitutional-choice level govern how these agreements are to be crafted. Each set of rules is nested within a higher-order set of rules, providing a certain degree of predictability and reducing levels of uncertainty among appropriators (Ibid). The time and costs of making changes to the rules also ensures that rules are relatively stable; however, the mechanisms that allow for appropriators to influence, alter or establish their own sets of rules must be effective if the CPR institution is to be sustainable in the long-run (Ibid).

Following Ostrom's approach, this thesis acknowledges that water appropriators are likely facing a multiplicity of context specific appropriation and provision problems, and must move between

the operational-, collective- and constitutional-choice levels of the governance structures present in the Fraser Basin if they are to effectively influence water management policy to overcome these problems.

6.3 *Design Principles for Robust Common-Pool Resource Institutions*

When comparing the CPR institutions that she encountered during her field research, Ostrom identified eight design principles that were present in all or most of the long-lasting and robust CPR institutions:

1. *Clearly Defined Boundaries:* individuals or households who have rights to withdraw resource units from the CPR must be clearly defined, as must the boundaries of the CPR itself.

2. *Congruence between appropriation and provision rules and local conditions:* Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions and to provisional rules requiring labour, material, and/or money.

3. *Collective-choice arrangements*: Most individuals affected by the operational rules can participate in modifying the operational rules.

4. *Monitoring:* Monitors, who actively audit CPR conditions and appropriator behaviour, are accountable to the appropriators or are the appropriators.

5. *Graduated Sanctions*: Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and context of the offense) by other appropriators, by officials accountable to these appropriators, or by both.

6. *Conflict-resolution mechanisms:* Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials.

7. *Minimal recognition of rights to organize:* The rights of appropriators to devise their own institutions are not challenged by external government authorities.

8. *Nested Enterprises*: Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.

(Ostrom 1990, pp. 90)

Design Principle 1: Clearly Defined Boundaries

Defining the boundaries of the common-pool resource and determining who is authorized to use it is the first step in organizing collective action. Without defining who is able to draw upon the resource system, appropriators run the risk of outsiders reaping the benefits of their provision activities without contributing, and/or negatively impacting the resource system by not conforming to the operational rules that have been agreed upon by authorized appropriators (Ostrom 1990, pp. 91). Both of which have the potential of increasing the incentives to freeride or to break the established rules.

Design Principle 2: Congruence between appropriation and provision rules and local conditions

Rule systems that are well-tailored to the local socio-ecological conditions help to preserve the common-pool resource system and create a situation wherein appropriators are more likely to conform to the rules that determine specific appropriation and provision activities (Ostrom, 1990, pp 92). If the rules are perceived to be unfair, uncertain or uneconomic, conformance rates will suffer.

Design Principle 3: Collective-choice arrangements

Common-pool resource institutions that allow for individuals who rely upon the CPR to participate in the modification of the rules are better able to tailor rule systems to local conditions. This is because as appropriators interact with one another and the resource system over time, they produce knowledge on the behaviours of others and on the resource system itself (Ostrom, 1990, pp. 93).

Design Principle 4: Monitoring

In order to ensure that appropriators are conforming to the established rules, the resource system and the behaviours of appropriators must be monitored. If there is no one monitoring the activities of the appropriators, how are appropriators who are abiding by the rules to know that they are not the only sucker following the rules? Ostrom has found that although most theorists suggest that appropriators will not monitor the behaviour of others, in successful examples of common-pool resource institutions, the appropriators are incentivized to monitor each other's behaviour in one way or another, such as receiving some form of reward for catching someone breaking the rules (Ostrom, 1990).

Design Principle 5: Graduated Sanctions

Appropriators who infringe on the rules are likely to be assessed a graduated sanction that depends on the severity of the offense. If an appropriator-monitor discovers that an offender who normally follows the rules has slipped up, the authorities might want to impose only a modest sanction. However, the sanctions for someone who breaks the rules repeatedly ought to escalate in an effort to halt future rule breaking. Graduated punishment can range from an insignificant fine all the way to banishment (Ostrom 1990, pp. 98).

Design Principle 6: Conflict-resolution mechanisms

Most theoretical models position an external and all-knowing official as the enforcer of unambiguous rules; however, Ostrom argues that applying the rules in field settings is never unambiguous (Ostrom 1990, pg. 100). If individuals are to follow a set of rules for a prolonged period of time, mechanisms that allow them to discuss and resolve what constitutes an infraction must exist. If individuals do not have access to mechanisms that allow them to make up for occasionally breaking a rule, the rules might come to be viewed as unfair and conformance rates might suffer (Ibid). The presence of conflict-resolution mechanisms does not guarantee success, but it would be hard to imagine how a common-pool resource institution could be successful without them.

In the context of this paper, the next two design principles are of particular importance and are explained in more detail. This is due to the constitutional division of power over water resources in Canada and the costs associated with the supply of common-pool resource institutions.

Design Principle 7: Minimal Recognition of Rights to Organize

The activities and policies of external political regimes have profound effects on the level and type of self-organization available to appropriators when attempting to produce collective benefits (Ostrom 1990, pp. 111). If external governments fail to recognize the rights of appropriators to device and organize their own rule systems, it can become very difficult for appropriators to sustain a rule-governed CPR. To provide an example of how the policies of external governments can undermine successful CPR institutions, we have to look no further than in Atlantic Canada. On the Atlantic Coast of Canada, small and relatively isolated fishing communities had devised, maintained and enforced local rules that governed the appropriation activities of fishermen for

decades (Barnett & Anderies, 2014). However, in 1996 the authority over the fisheries shifted from the provinces to the federal government (Barnett & Anderies, 2014). Believing that the rules devised by the local fishing communities left the oceans open to overexploitation, the Department of Fisheries and Oceans (DFO) refused to recognize the local rule systems and instead opted to manage the fisheries from a centralized approach by imposing a blanket set of rules to govern all the Atlantic fisheries. By doing so, the DFO weakened the ability of local fishermen to enforce their own local rules when outsiders and industrial fishing fleets entered their traditional fishing grounds, as under federal law, the outsiders were acting within their rights (Barnett & Anderies, 2014).

This illustrates that the activities and strategies of external actors in the greater political system must be considered when analyzing CPR situations (Ostrom, 1990). In the context of water resource management in the province of British Columbia, the provincial government has also historically relied upon a centralized approach, which likely has had, and continues to have an effect on the ability for water resource appropriators to establish, alter or influence rules dictating the range of actions available to them. It is therefore integral to identify how constitutional-choice level decisions made by external governments have influenced the working operational rules in the Fraser Basin.

Design Principle 8: Nested Enterprises

The importance of nested enterprises cannot be stressed enough. Each successful CPR institution that Ostrom encountered during her field research was characterized as having nested enterprises and as having larger organizational units built upon smaller and previously organized units (Ostrom, 1990). This paper has already discussed the importance of nested enterprises in providing a certain degree of predictability to appropriators about the costs and procedures associated with altering institutional rules. However, in addition to this, nested enterprises can also reduce the costs associated with the supply of CPR institutions (Ibid). When a group of individuals comes together and successfully establishes a small-scale institution, they recognize that they have the ability to achieve collection action and build social capital. As this group attempts to tackle larger issues, the costs of building the larger and more complex institutional arrangements needed to do so is significantly reduced if they are built on the organizational base that already exists (Ibid). The

social capital built between the individuals may also enable them to overcome some of the more complex collective dilemmas in supplying institutions. Therefore, an analysis of a CPR situation must consider the incremental institutional self-transformations of a CPR institution (if they exist) to adequately analyze and evaluate the outcomes of collective action in a CPR.

Although not all successful CPR institutions are characterized as having all of the design principles listed above, there is a good chance that a CPR institution is successfully managing a common-pool resource if most of the design principles are present. For this reason, this paper will utilize Ostrom's institutional design framework to evaluate the Fraser Basin Council and to provide recommendations on how the Fraser Basin Council can support the provincial government and local communities to develop collaborative watershed governance initiatives.

Section Summary

This section of the paper has hopefully provided you with a general overview of the theoretical framework relied upon during the research and analysis of the collaborative water governance institutions that have been supplied through collective-action in the Fraser Basin in order to address water related issues. Three main challenges in achieving collective action have been identified, so to have eight institutional design principles that tend to characterize successful CPR institutions. In the next section of this paper, we dive into the case of collective-action to address water related issued in the Fraser Basin.

7. Case Study: Collective-Action to Address Water Related Issues in the Fraser Basin

The case being explored in this thesis is the evolution of collective-action to address water resource management issues in the Fraser Basin. Given the size of the Fraser River and the considerable effort that would be required to exclude individuals from accessing the benefits of this resource system, the Fraser River is considered to be a common-pool resource. Throughout its history, several examples of individuals organizing to achieve collective-action to address common-pool resource problems exist. The case will be organized as follows. First, a historical overview of the Fraser Basin will be provided, followed by a description of the first known example of how a group

of individuals achieved collective-action to influence water management policy in the Basin. Having identified a unique form of collective-action in the Canadian context, the case will describe how the Fraser Basin Council emerged as a similar, albeit much more complex common-pool resource institution. Shifting the analysis to the present day, after a brief discussion of the activities and programs of the Fraser Basin Council, the paper will situate water resource management in the current political context. Focusing specifically on the new Water Sustainability Act of 2016, the paper will discuss the potential for the establishment of new decentralized and collaborative governance structures at the local scale to address water management issues in the province of British Columbia. In addition, the paper also discusses the potential emergence of a new role for a province-wide capacity building organization and argues that the Fraser Basin Council is well-suited to fill this role.

7.1 A Short History of the Fraser Basin

> In Canada, rivers became routes for an unfolding nation in an earlier historiography; today they appear more frequently in our writing as sites of pollution. Romantic highways have become sewers.
>
> - Matthew D. Evenden 2007, pp. 4

The importance of rivers in Canadian history and culture simply cannot be overstated. During the colonial era, rivers were used as a means of transportation to shuttle colonial settlers deep into the wilderness and later became bustling trade hubs between settlers and First Nation groups (Blomquist et al., 2005; Evenden, 2007; Renzetti & Dupont, 2017). Prior to this, rivers were relied upon by First Nations for food and medicines, and still to this day play a central role in various spiritual and cultural ceremonies (Renzetti & Dupont, 2017; Yates et al., 2017). In general, our use of rivers has not changed too drastically in the present day, we still rely upon them for nourishment, transportation and commerce, and strong spiritual and cultural connections between communities and their rivers remain. However, the impacts of rapid urbanization and industrialization have had significant impacts on the health of these vital bodies of water (Brandes & Morris, 2016; Brandes et al., 2014; Brandes & O'Riordan, 2014; Calbick et al., 2004; Evenden, 2007; Renzetti & Dupont, 2007).

Originating on the slopes of the Rocky Mountains in northeastern British Columbia, the Fraser River curves 1375 kilometers southwest in a massive *S*-like arc across the province before discharging into the Strait of Georgia (Blomquist et al., 2005; Evenden, 2007). As the waters of the Fraser flow east to west, they pass through a variety of ecological zones: lush evergreen forests in the Rockies, dry sagebrush in the southern interior, and dense rainforests on the west coast. The ecological diversity offers pristine habitat for a large variety of wildlife, and to five species of Pacific salmon who spawn in the Fraser and its tributaries, and whit whom First Nations have developed a complex cultural history (Blomquist et al., 2005; Evenden, 2007; Renzetti & Dupont, 2017; Yates et al., 2017). Prior to European contact, the abundance of salmon and a diverse marine environment in the lower sections of the Fraser supported the largest First Nation communities in Canada (Evenden, 2007). Coastal contacts between Europeans and First Nations in the lower Fraser were not realized until the late 18th century, roughly 200 years after encounters in eastern Canada, and even as the fur-trade developed, and trading-posts were established, European settlers initially did not attempt to displace or colonize First Nations in the Basin (Evenden, 2007). It wasn't until the gold rush in 1858 that the British Empire created the colony of British Columbia and began to resettle First Nations communities to the fringes of their traditional territories (Evenden, 2007). Although the Fraser River quickly became colonized the difficult terrain and its relatively isolated location kept it on the margins of the British Empire.

This all changed when British Columbia entered into Canadian Confederation in 1871 and the Canadian Pacific Railway was completed in 1887. Upon entering Confederation, the federal government assumed control of a rail belt that encompassed a significant portion of the Fraser Basin, and under its control, the belt became a vital artery that fueled resource development in the Basin (Evenden, 2007). By the turn of the century, Canada's new Pacific metropolis, Vancouver, with a population of roughly 30'000, had established several prominent lumber mills and fish canneries and shipped timber and canned fish east on the rails to external markets (Evenden, 2007).

Oh, how things can change in a matter of decades. Today, Vancouver is one of Canada's largest and most internationally recognized cities and the Fraser Basin is home to over 2.7 million residents. With exception to Vancouver, the economic activities that take place within the Basin are still heavily dependent on resource extraction and development (Blomquist et al., 2005;

Renzetti & Dupont, 2017). The industries active in the Fraser Basin include: forestry, pulp and paper mills, oil and gas, mining, agriculture and the Pacific Salmon fisheries. The economic activities that occur within its boundaries account for roughly 80% of British Columbia's economy and 10% of the national economy (Renzetti & Dupont, 2017). Needless to say, the Fraser Basin no longer finds itself relegated to the margins. There has, however, been a significant ecological cost to this rapid development, and the Fraser River in particular has been degraded by several different factors over the last decades, including: pollutants from sawmills, pulp and paper production, mining and other heavy industries; and municipal sewage and agricultural waste (Renzetti & Dupont, 2017).

Not unlike most large bodies of water in Canada, the socio-ecological pressures on the Fraser River are numerous and have serious impacts on the health of the riverine ecosystem. Where the Fraser River does differ from most large rivers in Canada, and most large rivers in the world for that matter, is that its main-stem has not been obstructed by hydroelectric dam development. How the Fraser escaped this fate is a perfect introduction to the case as it demonstrates that there is a unique history of collective-action in the Fraser Basin (Evenden, 2007).

7.1.1 The Fisheries Protection Coalition

Prior to 1945, hydroelectric dam development in the Fraser Basin was mostly focused on the tributaries to supply the electricity needed to power resource extraction activities in the mining and forestry industries (Evenden, 2007). The utility companies, being privately owned, were weary of risky development, and damming the main-stem of the Fraser River posed significant technical and practical difficulties. Without strong demand for electricity there was simply no way to justify such an investment (Ibid). It wasn't until after 1945 that damming the Fraser became appealing as the demand for electricity in the Basin sky rocketed, and flood control became an important aspect of public policy after a devastating flood in 1948 (Ibid). All of a sudden, a wide variety of voices were promoting the numerous benefits of damming the Fraser, and for a time it looked as if the Fraser would end up like most of the large rivers in the world: obstructed.

By 1948, Alcan, a major Canadian mining company and aluminum producer set its sights on either the Nechako River or Chilko Lake to develop a hydroelectric dam to power their rapid economic

growth. With their exports to the United States well above peak war-time exports, Alcan had significant public, economic and political support for the project; however, they were met with strong opposition from a fisheries protection coalition (Evenden, 2007). Several decades prior to the proposed development, a series of landslides were triggered by railway construction crews in a narrow river passage called "Hells Gate", which created a virtual dam that blocked migrating salmon from entering the upper Fraser Basin (Ibid). The impact of the Hells Gate incident on salmon runs have been profound, resulting in an unimaginable drop in salmon catches that is still felt today (Ibid). The Hells Gate incident and the effects on the Canadian Pacific salmon fishery were not soon forgotten, and as both the Nechako River and Chilko Lake offered pristine salmon spawning habitat, fish scientists, having learned from the consequences of obstructing the flow of salmon, warned fishermen and the canneries of the potentially devastating effects on salmon stocks if the proposed dam development were to go through (Evenden, 2007). Thus, the fisheries protection coalition was born, and together they organized an opposition to the hydroelectric development on the vital Chilko Lake, while compromising and accepting dam development on the less ecologically significant Nechako river (Ibid). From this point on, whenever dam development was proposed on the main-stem of the Fraser, developers were met with considerable resistance from a well-organized coalition who succeeded in their efforts to keep the main-stem unobstructed.

Figure 2. Picture of landslides in "Hell's Gate" March 2, 1914
(Photographer Unknown. Source: (Evenden 2007, pp. 27))

In the Canadian context, the formation of the Fisheries Protection Coalition is a unique example of how successful collective-action can lead to collectively produced benefits. One must consider that this was also in an era when hydroelectric dams fueled Canada's post-war economic development and were widely seen as symbols of progress and of man's dominion over nature (Loo, 2016). At the time, Alcan had a significant amount of political support at both the provincial and federal levels of government, as well as among the general public, as they were one of the major companies fueling economic development in the Fraser Basin and in other regions of Canada. In this context, for a fisheries coalition to have mounted a successful opposition to their proposed development is a massive success. A key to their success was that they justified conservation efforts as a means to protect the salmon fisheries and the livelihoods of fishermen, canners and First Nations. Furthermore, the composition of the coalition likely had a significant impact on their ability to mount a successful opposition. With the support of the Department of Fisheries (now the Department of Fisheries and Oceans) the coalition was able to mount a political and bureaucratic defense, and the Canadian fish scientists provided the empirical data necessary to back up their claims (Evenden, 2007). This public-private-civil collaboration constitutes a truly unique partnership in this period of Canadian history, and the knowledge shared between a diverse group of actors working collaboratively is arguably what allowed them to find success. As we will see, although this was the first known example of how a diverse group of stakeholders came together to achieve collective-action to address water management issues in the Fraser Basin, it was not the last.

7.1.2 The Evolution of the Fraser Basin Council: A Collaborative Governance Institution

The Fraser Basin Council is the second example of successful collective-action to address water management issues in the Fraser Basin that will be discussed in this thesis. When the Fraser experienced a devastating flood in 1948, the Dominion-Provincial Board of British Columbia initiated the first serious attempt to develop a comprehensive plan for water resource management and sustainability in the Basin (Renzetti & Dupont, 2007). Given the size and the ecological diversity in the Basin, and the challenges that surveyors must have experienced while navigating deep into the wilderness, this was a wildly ambitious project for its time, and it should come as no surprise that they ultimately failed to generate enough knowledge about the natural resources within the Basin to create the comprehensive plan that was envisioned. Instead, the Dominion-

Provincial Board of British Columbia refocused on the issue of flood control (Renzetti & Dupont, 2007). Although unsuccessful, this marks the first time in the Fraser Basin's history that the provincial government attempted to take stock of the resources in the province with the aim of creating a plan to effectively manage natural resources. The desire to create such a plan later lead to the establishment of the Fraser Basin Council a few decades later.

The Fraser River Estuary Management Program

In the early 1970s, a second attempt to develop a comprehensive plan for the Basin was initiated by the province. *The Fraser River Estuary Management Program* (FREMP) was announced in response to deteriorating water quality conditions and water-use conflicts occurring between a variety of water appropriators in the tributary systems of the Fraser River, and the ecologically significant Fraser River Estuary during the Gold Rush (Blomquist et al., 2005; Calbick et al., 2004; Renzetti & Dupont, 2017). At this time the Fraser River Estuary was the most polluted and industrially developed estuary on the west coast of Canada, and the levels of pollution were so significant that even the general public had become concerned about the deteriorating water quality conditions and the effects they might have on salmon stocks and their habitats (Renzetti & Dupont, 2017).

To tackle the issue, the province developed FREMP, which brought together coastal zone management and river basin planning for the first time in the province's history, and a series of regulatory efforts to protect fish and wildlife habitat were developed in a multi-agency and multi-governmental agreement (Blomquist et al., 2005; Renzetti & Dupont, 2017). The Fraser River Estuary Management Program represented a clear attempt to develop a unified vision on issues related to sustainable development in the Fraser Basin by approaching the management of water resources in a holistic way, from its headwaters to the estuary. FREMP also represented an attempt to manage water resources in a more coordinated way by improving cooperation between the federal and provincial levels of government on issues related to water resource management. Unfortunately, due to its heavy focus on salmon, FREMP also failed to develop a comprehensive plan for water resource management in the Basin (Calbick et al., 2004; Renzetti & Dupont, 2017).

Fraser River Basin Action Plan

In the 1990s the *Fraser River Basin Action Plan* (FRAP) was announced as the third attempt to develop a long sought-after comprehensive plan for the Basin. The Fraser River System was identified by the Government of Canada as one of three major freshwater systems in need of priority action under the national *Green Plan* ("Fraser Basin Council – Our History", 2018). The primary focus of FRAP was to restore the environmental health of ecosystems within the Basin by encouraging cooperative partnerships and collective stewardship. The program also engaged with the general public to inform them about how their actions impact the health of the watershed in which they reside ("Fraser Basin Council – Our History", 2018). Some of the successes stemming from FRAP include curtailing the release of toxic wood preservatives into the Fraser and its tributaries, and introducing better management and pollution prevention plans for the industries operating within the Basin ("Fraser Basin Council – Our History", 2018).

Fraser Basin Management Board

A second outcome of Canada's Green Plan, the *Fraser Basin Management Board* (FBMB) was established in May 1992. The FBMB represented the first basin-wide organization to exist in the Fraser Basin and included representatives from the Federal, Provincial, Municipal and First Nations governments, as well as, seven other representatives from NGOs, industry and civil society (Blomquist et al., 2005; Calbick et al., 2004; Fraser Basin Council – "Our History", 2018; Renzetti & Dupont, 2017).

The FBMB was given three main objectives in its mandate: (1) develop a locally based governance structure to address issues of sustainability in the Fraser River Basin, (2) check up on the overall health of the Basin, and (3) produce a constitution for the Fraser Basin Council.

(1) The FBMB was to develop a locally based governance structure in the Fraser River Basin in a period of five years through a process of consensus-based decision-making. After a significant amount of negotiations between the different levels of governments and consultations with the general public, they achieved this goal in June of 1997 by establishing the Fraser Basin Council (Calbick et al., 2004; Fraser Basin Council – "Our History", 2018; Renzetti & Dupont, 2017).

(2) Through a process of continuously monitoring important socio-ecological vital signs, the board attempted to measure the success of the work being done to improve the sustainability of the Basin. This represents the first time in the province's history that an adaptive governance approach to water resource management was pursued. In adaptive governance, socio-ecological metrics are monitored in order to establish whether management activities are having any measurable effect and based on that information officials adapt their management activities if needed (Folke et al., 2005). Three years after the FBMB had been formed, it published the first *State of the Fraser Basin* report in 1995, and also released *Report Cards* in 1995 and 1996, which graded the overall progress being made on the most critical issues affecting the Basin (Renzetti & Dupont, 2017).

(3) In February 1997, the Fraser Basin Management Board also published the *Charter of Sustainability.* The Charter acts as the long term-vision for sustainability within the Basin and is the guiding set of principles for the range of management activities of the Fraser Basin Council (Calbick et al., 2004; Fraser Basin Council – "Our History", 2018; Renzetti & Dupont, 2017). The Charter was developed collaboratively with First Nations groups residing within the Basin, and the 11th principle of the Charter recognizes the right of First Nations to assert right and title over land and water. It became the first document in British Columbia to be signed by two senior provincial government officials that explicitly recognizes the importance of Aboriginal rights and title in the decision-making process, preceding the formal and legal recognition by the Supreme Court of Canada in 2014 by 17 years (Renzetti & Dupont, 2017).

The Fraser Basin Management Board also launched eight "demonstration projects" to demonstrate the value of leaders working together to address the complex issues inherent in multi-interest watershed management (Fraser Basin Council – "Our History", 2018). These projects focused on smaller geographical areas within the Fraser Basin and aimed to restore the health of the watershed while providing an arena for a variety of water-users to address CPR problems. Later in this paper, it will be argued that certain provisions within the Water Sustainability Act offer the potential to reintroduce and build upon these watershed governance structures and allow local water appropriators to exert more influence over water resource management in their watersheds.

Fraser Basin Council Society & the Fraser Basin Council

As has been mentioned above, the Fraser Basin Council (FBC) was established in 1997 and is the operational arm of the Fraser Basin Council Society. The FBC is a multi-organizational and multi-interest planning body made up of a diverse group of stakeholders who discuss and decide upon management priorities and activities in the Basin (Blomquist et al., 2005; Calbick et al., 2004). Sticking with a winning model, the governance structure of the FBC is made up of representatives from all three levels of government, the private industry and civil society. There are 38 directors in total: three from the federal and provincial governments, and one representative from each regional district; representatives from each of the eight First Nations language groups; ten representatives from NGOs or civil society; four representatives that provide environmental, social and economic perspectives; one limited term Youth director; and a second limited term director representing BC's financial communities (Blomquist et al., 2005; Fraser Basin Council – "Our History", 2018; Renzetti & Dupont, 2017).

The activities of the FBC are governed by what Ostrom (1990) would refer to as a Constitutional-choice level document in the Charter for Sustainability. The Charter extends far beyond issues of water and also focuses on other aspects of social, economic and ecological sustainability.

FRASER BASIN PRINCIPLE FOR SUSTAINABILITY

Mutual Dependence
Land,water, air and all living organisms including humans are integral parts of the ecosystem. Biodiversity must be conserved.

Accountability
Each of us is responsible for the social, economic and environmental consequences of our decisions and accountable for our actions.

Equity
All communities and regions must have equal opportunities to provide for the social, economic and environmental needs of residents.

Integration
Consideration of social, economic and environmental costs and benefits must be an integral part of all decision-making.

Adaptive Approaches
Plans and activities must be adaptable and able to respond to external pressures and changing social values.

Coordinated and Cooperative Efforts
Coordinated and cooperative efforts are needed among all government and non-government interests.

Open and Informed Decision-Making
Open decision-making depends on the best available information.

Exercising Caution
Caution must be exercised when shaping decisions to avoid making irreversible mistakes.

Managing Uncertainty
A lack of certainty should not prevent decisive actions for sustainability.

Recognition
There must be recognition of existing rights, agreements and obligations in all decision-making.

Aboriginal Rights and Title
We recognize that Aboriginal nations within the Fraser Basin assert Aboriginal rights and title. These rights and title, now being defined, must be acknowledged and reconciled in a just and fair manner.

Transition Takes Time
Sustainability is a journey that requires constant feedback, learning and adjustment. In the short-term, the elements of sustainability may not always be in balance.

- Table 6. Fraser Basin Charter of Sustainability (2013)

As outlined in the first principle, the Fraser Basin Council promotes the perspective that everyone who lives or does business within the Basin is interdependent (Fraser Basin Council - "Charter for Sustainability, 2013), and that given the nature of water, the actions of individuals can have far reaching impacts downstream. This interdependence among a wide variety of water users is indicative of a common-pool resource situation (Ostrom, 1990), and the Fraser Basin Council, as an organization facilitating the coordination of their activities, can be thought of as a very large common-pool resource institution.

Prior to 2009, the Fraser Basin Council's activities were solely concerned with the Fraser Basin, and they fell within two categories: basin-wide or regional programs (Fraser Basin Council – "Programs & Services", 2018). The basin-wide programs dealt with broader issues such as; flood management, sustainable fishing and improving relationships with First Nations. The regional programs were more specific and geared towards the socio-ecological conditions of smaller geographical areas within the Basin, they included; the Chilako Watershed Council, Britannia Mine Reclamation and Remediation and the Nechako River Environmental Enhancement, among others (Calbick et al., 2004; Fraser Basin Council – "Programs & Services", 2018). The FBC has also continued public outreach programs and the monitoring and reporting activities that were initiated by the Fraser Basin Management Board.

Although the Fraser Basin Council has not been delegated any federal or provincial authority over water resource management in the Basin, one of its greatest strengths is that it brings a diverse group of key stakeholders from all levels of government, the private industry and civil society together to engage in consensus-based decision-making on issues of water resource management (Interviews with Rosie and Lina). The FBC provides an arena for water appropriators and other relevant stakeholders to influence the decision-making process over water resource management by sitting at the table with government officials who do have the authority to make decisions. The idea is that each representative will return to their respective agencies or communities and independently implement the management programs that have been agreed upon at the table (Interviews with Rosie and Lina). Government officials at both the federal and provincial levels also benefit from participation in the FBC, as it allows for them to better coordinate their activities and responsibilities over water resource management in the Basin and fulfill their duty to consult

the public. However, the need to hand water management programs off to other governmental agencies to be implemented is an inherent weakness of the FBC, and sometimes means that programs are not implemented exactly as has been agreed upon. Furthermore, the Fraser Basin Council can sometimes allow for provincial and government officials to "rubber stamp" their way through obligations to consult First Nations, private interests and civil society when implementing management programs.

Up until 2009, the activities of the FBC focused solely on the Fraser River system, but it has since expanded its mandate to become a province-wide governance entity with a special focus on the Fraser Basin (Renzetti & Dupont, 2017). This shift of focus has been met with mixed reviews and by becoming a province-wide institution, calls into question whether it can still be considered a common-pool resource institution. However, the FBC argued that their work on issues of climate change, air quality, water resources and watershed management, and sustainable and resilient communities is needed on the provincial scale (Brandes & Morris, 2016).

7.2 Water Governance and Water Resource Management – Current Political Context

This sub-section of the case study will further elaborate on the challenges in achieving good water governance in the Canadian context and will provide a general overview of the current legislation that governs the management activities of water resources in the province of British Columbia.

7.2.1 Constitutional Division of Power and Intergovernmental Coordination

Canada has a federal political system and grants the provinces the bulk of the authority over the natural resources that fall within their territory. However, in the case of water, things become slightly more confusing as the federal government has retained authority over certain aspects of water, including: authority over the fisheries and oceans; navigation; water on federal or First Nation land; and transboundary waters (Blomquist et al., 2005; Renzetti & Dupont, 2007). Therefore, the authority over water resources is not entirely in the hands of the provincial government, but rather shared by both the federal and provincial governments, with a wide variety

of different governmental agencies at both levels of government holding jurisdiction over different aspects of water.

> The fish in the water are federal fish and the boats in the water are federal boats but the water is provincial water.
>
> - Anonymous Respondent (Blomquist et al. 2005, pp. 12)

At the federal level, the Department of Fisheries and Oceans and Environment Canada are the agencies that most often deal with water related issues (Blomquist et al., 2005; Calbick et al., 2004). At the provincial level, there are three ministries that play a significant part in the management and protection of water resources in British Columbia: The Ministry of Water, Land and Air Protection; The Ministry of Sustainable Resource Management; and the Ministry of Health Services. British Columbia's provincial government also delegates responsibilities over drinking water and wastewater to municipal governments, so at the end of the day, each level of government is involved in water resource management in the province (Blomquist et al., 2005; Calbick et al., 2004). This can cause a significant amount of confusion when attempting to coordinate the activities of several different government agencies at all three levels of government.

The lack of coordination and communication between the different agencies responsible for water resources has often led to fragmented governance, unorganized management activities and failures to implement policies downstream (Ansell & Gash, 2007; Fliervoet et al., 2015; Renzetti & Dupont, 2007). As a result, some of the management policies have had adverse effects on riverine ecosystems and there is sense of overall dissatisfaction among both citizens and private interests with how water resources are being managed in the province (Brandes & Morris, 2016; Brandes et al., 2018; Simms et al., 2018; Interviews with Rosie and Lina). It is often suggested in the literature that the high costs associated with coordinating the activities of a variety of government agencies is the main reason the province has had suboptimal management outcomes (Blomquist et al., 2005; Calbick et al., 2004; Renzetti & Dupont, 2007; Watson, 2004); however, researchers often fail to acknowledge that the legislation that governed water resource in the province up until 2016, was the century old *Water Act* of 1909. In this context, it should come as no surprise as to why management activities were producing sub-optimal socio-ecological outcomes. How could

one expect a century old piece of legislation to effectively govern water resources in the modern world? That is not to say that the constitutional division of power over water resources in Canada does not pose a challenge in coordinating the activities of the various government agencies involved, but the provincial government also neglected to develop modern freshwater legislation for over a century. In 2016, the province finally enacted the *Water Sustainability Act*; however, they have still yet to develop the full range of regulations that outline how it will actually go about protecting water resources in the province (Brandes et al., 2018; Brandes & Morris, 2016; Fresh Water Alliance, 2017).

7.2.2 Water Sustainability Act

The Water Sustainability Act (WSA) came into force in February 2016 and is a much-needed modernization to freshwater legislation in the province of British Columbia. Some of the elements included in the WSA have water advocates very excited, and the main highlights include; regulation of ground-water for the first time in provincial history; enhanced legal protections for ecological water flows; improved ecosystem monitoring and reporting mechanisms; and most importantly in the context of this paper, a new comprehensive planning regime that enables the creation of localized water sustainability plans and the potential for delegated decision-making (Brandes et al., 2018).

Historically, the province of British Columbia has relied upon a centralized and government-led approach to water governance (Brandes & Morris, 2016; Renzetti & Dupont, 2007). What this means is that instead of crafting water management policies to reflect the socio-ecological conditions of local watersheds, provincial authorities blanket the entire province with the same set of rules and regulations (Folke et al., 2005; Ostrom, 1990). After an extensive consultation process when developing the WSA, provincial authorities came to recognize that the general public and private interests were deeply dissatisfied with how the province had been managing water resources and found that communities wanted to have more influence over water resource management in their watershed (Brandes & Morris, 2016). In an effort to shift away from the traditional top-down approach, provincial legislators included certain legal mechanisms in the WSA that allow for the creation of new forms of governance structures such as, watershed roundtables or advisory bodies (British Columbia, 2016).

The following is a list of some of the most relevant sections of the WSA that allow for water appropriators to either self-organize to supply their own institutions, or influence the decision-making process in their watershed:

- Sections 64-85: Outlines how water appropriators can develop Water Sustainability Plans to prevent or address conflicts between appropriators at the watershed scale (British Columbia, 2016).

- Section 115: Outlines how Ministers or individuals can request the establishment of Advisory Boards that provide advice on different aspects of water governance, such as, establishing water objectives and best practice for ecological monitoring and reporting (British Columbia, 2016).

- Section 124: Outlines how area-based regulations can be established to govern water resource management activities within a designated area (British Columbia, 2016).

- Section 126: Outlines how certain decisions relating to water management can be made by entities other than government decision-makers (Brandes et al., 2018; British Columbia, 2016).

Sections 64-85 of the Water Sustainability Act provide the legal foundation on which water appropriators can self-organize to supply their own CPR institutions. While, sections 124 and 126 provide the legal foundation on which water appropriators are then able to establish the sets of operational- and collective-choice rules that govern the range of appropriation and provision activities available to them within their local watershed. Unfortunately, the provincial government has still yet to develop the critical details that determine how individuals are actually to go about establishing water sustainability plans and area-based regulations, and to have decision-making authority delegated to their watershed governance structures.

8. Discussion

While exploring the history of development in the Fraser Basin, this thesis has successfully identified a unique history of collective-action to address water related issues. One in which public, private and civil stakeholders mutually dependent on water resources successfully organized to collectively produce common-pool resource institutions that protected their livelihoods and enhanced the overall sustainability of the Fraser Basin. What each of these successful CPR institutions have in common is the makeup of their membership structure. Each had the support of senior crown governments, private interests and civil society. The Fishery Protection Coalition was supported by the Department of Fisheries, Canadian fish scientists and capitalist salmon canners (Evenden, 2007), and the Fraser Basin Management Board, which later supplied the Fraser Basin Council, was also established as a public-private-civil partnership (Blomquist et al., 2005; Calbick et al., 2004; Renzetti & Dupont, 2007).

One of Elinor Ostrom's (1990) eight design principles for robust common-pool resource institutions is that individuals must have the minimal recognition of external government authorities to organize (Design Principle 7). In each example, representatives from different levels of government play an important part in the membership structure, and in the context of the Canadian constitutional division of power over water resources, this certainly contributed to their successes in achieving collectively produced socio-ecological benefits. By including senior crown governments in the membership structure, water-users and other relevant stakeholders are able to sit at the decision-making table with government representatives who have the authority to make decisions over water resource management in the Basin, and thus are themselves able to exert some degree of influence over the decision-making process by negotiating their positions with decision-makers. However, in every example, senior crown governments retained final authority over water resource management and did not delegate any authority to these organizations to implement their own management programmes (Blomquist et al., 2005). In the case of the Fisheries Protection Coalition, this is not a significant weakness, as the coalition was formed with one driving purpose, to protect the Fraser salmon fisheries by blocking hydroelectric dam development on the main-stem of the Fraser River. Each member had a vested interest in preventing migrating salmon from being obstructed. The end goal was the same for every actor. If salmon were permanently

prevented from flowing upriver, it would have led to the collapse of the Fraser salmon fisheries (Evenden, 2007), putting the fish canneries out of business and entire communities out of work, and calling into question the ability of the Department of Fisheries and of Canadian fish scientists to preserve the long-term sustainability of Canadian fisheries. However, in the case of the Fraser Basin Council things aren't so simple. As a multi-stakeholder collaborative governance organization, a wide variety of stakeholders come together to negotiate their positions in an effort to influence the decision-making process over water resource management, and their interests do not necessarily always align. By having to rely on external government authorities to implement the management programmes that have been agreed upon through a long process of consensus-based decision-making, the FBC cannot be sure that the management programmes will be implemented in the way they have been devised at the decision-making table. This runs the risk of increasing the incentives among stakeholders to find other ways to influence the decision-making process and perhaps in less transparent ways. Therefore, for the Fraser Basin Council to be a considered a truly effective common-pool resource institution, they must be delegated the authority to implement their own management programmes in the Basin.

This is why the new Water Sustainability Act is such an interesting piece of legislation. It has the potential to completely change the way water governance is approached in the province of British Columbia. Certain provisions within the WSA provide the legal foundation on which communities can self-organize to supply their own common-pool resource institutions and be delegated authority to manage their local watersheds (Brandes & Morris, 2016). The desire among communities in British Columbia to do so is obvious as well. When the POLIS Project on Ecological Governance conducted a survey on watershed governance in British Columbia, they found that 83% of British Columbians agree that the current form of water governance and management is inefficient and must be modernized (Brandes & Morris 2016, pp. vii) and that 85% of British Columbians support the establishment of watershed entities to manage water resources (Brandes & Morris 2016, pp. viii).

The establishment of watershed entities under the WSA offers the potential to sustainably manage water resource in a more collaborative and democratic way by allowing for local water-users to craft operational- and collective-choice rules that reflect the socio-ecological conditions of their

local setting. However, it is critically important that the watershed entities who are delegated the authority to manage their own watersheds have the capacities needed to do so. To be successful, watershed entities will need to have strong leadership, strong relationships between a variety of different stakeholders, and access to expert advice, and to a broad range of tools and services to assist them to develop strong and long-lasting CPR institutions (Brandes & Morris, 2016; Ostrom, 1990). Given that communities wishing to supply their own watershed entities might not have all of these capacities from the onset, a potential role emerges for a province-wide capacity building organization to supports local communities as they attempt to develop strong CPR institutions in their local watersheds (Brandes & Morris, 2016). This thesis suggests that the Fraser Basin Council is well suited to fill that role, as the FBC has already expanded its mandate to focus on province-wide issues, and the role of capacity builder fits within the FBC's three key areas of focus: taking action on climate change and air quality, supporting healthy watersheds and water resources, and building sustainable, resilient regions and communities (Fraser Basin Council – "FBC Today", 2018). Supporting communities to develop their own watershed governance entities has the potential to make communities more sustainable and resilient by educating them about the biophysical dimensions of their watersheds and how their actions impact the water and the land, and also offers the potential for communities to act against climate change in their own backyard, while improving the health of their watershed. Furthermore, the Fraser Basin Council has already successfully supported the establishment of watershed entities in the past. The precursor to the FBC, the Fraser Basin Management Board, established watershed "demonstration projects" during the 1990's, and the current manifestation of the Fraser Basin Council supported the establishment of the Nechako Watershed Council in 1998, and the Nechako Watershed Roundtable in 2015 (Fraser Basin Council – "Accomplishments", 2018).

The Nechako Watershed Council is still operational today and has made significant strides in enhancing the long-term sustainability of the watershed. One of their major accomplishments is securing 50 million CAD in funding towards a Nechako Environmental Enhancement Fund from Alcan in compensation for the dam development on the Nechako that was discussed earlier in this paper (Fraser Basin Council – "Other Regional Work", 2018).

The Nechako Watershed Roundtable is a more recent collaborative initiative to improve the health of the watershed, and includes representation from First Nations, government, community groups, academic and research communities and the public (Fraser Basin Council – "Nechako Watershed Roundtable", 2018). It was originally established in 2012 as a forum for which a variety of different stakeholders in the watershed could share information and knowledge, and brainstorm on how they could collectively advance the health of the watershed. It later evolved into the Nechako Watershed Roundtable when in 2015, the group decided to create a strategic plan to "undertake and advise on water stewardship activities in the Nechako River Basin" (Fraser Basin Council – "Nechako Watershed Roundtable", 2018).

Given that the Fraser Basin Council was established as the first Basin-wide common-pool resource institution in British Columbia, and has supported the establishment of watershed entities throughout its history, from the "demonstration projects" launched by the Fraser Basin Management Board in the 1990's to the recently established Nechako Watershed Roundtable in 2015, the FBC is well aware of the challenges in developing robust watershed entities. It seems only natural for the FBC as an institution to evolve into a province-wide watershed capacity builder; however, it is unclear if the FBC is willing to take on this responsibility or if the provincial government has even considered such a role.

In terms of the watershed entities themselves, many of the critical details of the Water Sustainability Act have still yet to be worked out by provincial legislators, so it is unclear how communities will actually be able to go about: establishing Water Sustainability Plans (s.64-85), establishing area-based regulations (s.76-83 and s.124) or be delegated decision-making authority over certain water management decisions (s.126). As such, it is impossible to say with any certainty if the collaborative watershed governance entities envisioned by the province of British Columbia will be characterized by the eight design principles for robust common-pool resource institutions outlined by Elinor Ostrom. However, the sections of the WSA highlighted in this thesis do offer the potential for some of the design principles to be met, specifically design principles 1,2,3 and 7.

- Design Principle 1: **Clearly defined boundaries**

  Sections 65 and 71 of the Water Sustainability Act clearly define the boundaries of the common-pool resource by outlining how a Water Sustainability Plan can be developed in a *designated geographical area* (British Columbia 2016, s.65). Section 71 also defines who has the right to partake in the decision-making process over the CPR by requiring that any persons who might be affected by such a plan be notified and included in its development (British Columbia 2016, s.71).

- Design Principle 2: **The rules governing the common-pool resource should reflect local conditions**. Sections 76-83 of the WSA states that those who will be affected by the development of the Water Sustainability Plan have the right to partake in the development of the regulations governing the watershed (British Columbia 2016, s.76-83), and offers an opportunity for water-users to craft operational- and collective-choice rules to reflect the local socio-ecological conditions.

- Design Principle 3: **Collective-choice arrangements**

  Section 124 of the WSA outlines how regulations are to be crafted and/or altered by water-users and the authorities, while section 85 states that water-users and the authorities are able to review, amend or alter regulations in the Water Sustainability Plans in the future (British Columbia 2016, s. 85).

- Design Principle 7: **Minimal Recognition of rights to organize by external government authorities**. Sections 64-85 of the WSA outlines how communities are able to organize to supply their own collaborative watershed entities and thereby formally recognizing their rights to do so (British Columbia 2016, s. 64-85).

In this context, the Water Sustainability Act does offer the opportunity for communities to establish robust and effective collaborative watershed entities; however, they will face challenges in doing

so and will need a guiding hand from an experienced organization to build certain capacities, and of course, for the provincial government to roll out the final sets of regulations to do so.

9. Conclusions

This thesis has explored the history of development in the socio-ecologically significant Fraser Basin and identified that a unique and successful form of collective-action to address water related issues exists. The Fisheries Protection Coalition, The Fraser Basin Management Board and The Fraser Basin Council were identified as unique organizations in the British Columbian context, as stakeholders from the public, private and civil spheres of society collectively produced these organizations to successfully address water related issues in the Basin.

The membership structure of these organizations allowed for water appropriators to influence the decision-making process over water resource management by sitting at the decision-making table with government representatives who have the authority to make decisions. However, since these organizations have not been delegated any authority to implement their own water management programmes, they have to rely upon external government agencies to do, sometimes resulting in programmes not being implemented in the same way that had been agreed upon.

The enactment of the Water Sustainability Act signals a shift away from this centralized and government-led approach, towards a more decentralized and localized approach to water governance in the province of British Columbia. Given that communities across the province have expressed interest in taking on more responsibility over water resource management, and that certain sections of the Water Sustainability act provide the legal foundation upon which communities can develop collaborative watershed entities, this thesis has argued that the Fraser Basin Council is in a unique position to support both the provincial government and local communities to develop effective and long-lasting water governance entities at the local scale.

Whether or not the Fraser Basin Council is interested in this role is undetermined, but there is a critical need for an organization to develop the capacities at the local scale if communities are to effectively manage water resources in their watershed.

10. List of References

Ansell, Chris and Alison Gash. 2008. "Collaborative Governance in Theory and Practice." *Journal of Public Administration Research And Theory: J-PART* no. 4 (2008): 543. https://www.researchgate.net/publication/31311629_Collaborative_Governance_in_Theory

Ansell, Chris, and Jacob Toring. 2015. "How does collaborative governance scale?." *Policy & Politics*, Vol. 43, No. 3 (2015) pp. 315-329 http://ludwig.lub.lu.se/login?url=http://search.ebscohost.com.ludwig.lub.lu.se/login.aspx?direct=true&db=hlh&AN=108413617&site=eds-live&scope=site

Barnett, Allain and John Anderies. 2014. "Weak feedbacks, governance mismatches, and the robustness of social-ecological analysis of the Southwest Nova Scotia lobster fishery in comparison to Maine." *Ecology and Society*, Vol. 19, No. 4, Article 39. https://www.ecologyandsociety.org/vol19/iss4/art39/

Bates, Robert. 1988. "Contra Contractarianism: Some Reflections on the New Institutionalism." *Politics and* Society, Vol. 16, No. 2-3 (June 1, 1988), pp. 387-401. http://journals.sagepub.com/doi/pdf/10.1177/003232928801600207

Blomquist, William; Ken S. Calbick, and Ariel Dinar. 2005. "Institutional and Policy Analysis of River Basin Management: The Fraser River Basin, Canada." *Policy Research Working Paper*; No. 3525. World Bank, Washington, DC. © World Bank. http://siteresources.worldbank.org/INTSAREGTOPWATRES/Resources/Insti&Pol_Analysis_of_RBMDecent.pdf

Brandes, Oliver M., Merrell-Ann Phare, Rosie Simms, Micheal Miltenberger. 2018. "Collaborative Consent and Water in British Columbia: Towards Watershed Co-Governance." *POLIS Project on Ecological Governance & Center for Indigenous Environmental Resources*, January 2018. https://poliswaterproject.org/files/2017/09/POLIS-CC-6b-web.pdf

Brandes, Oliver and Jon O'Riordan. 2014. "A Blueprint for Watershed Governance in British Columbia." *POLIS Project on Ecological Governance*, University of Victoria. https://dspace.library.uvic.ca/bitstream/handle/1828/7930/A%20BLUEPRINT%20FOR%20WATERSHED%20GOVERNANCE%20IN%20BRITISH%20COLUMBIA.pdf?sequence=1&isAllowed=y

Brandes, M. Oliver and Time Morris. 2016. "Illumination: Insights and Perspective for Building Effective Watershed Governance in B.C." *POLIS Project on Ecological Governance*, University of Victoria, June 2016. https://poliswaterproject.org/files/2016/06/POLIS-Illumination-web.pdf

British Columbia. 2016. "British Columbia's *Water Sustainability Act* and Regulations" The Province of British Columbia, March 2016.

Calbick, K., Raymond McAllister, David Marshal and Steve Litke. 2004. “Fraser River Basin Case Study: British Columbia, Canada.” Fraser Basin Council, Vancouver. http://web.worldbank.org/archive/website01062/WEB/IMAGES/CANADA_F.PDF

Conrad, E, T. Moran, M. DuPraw, D. Ceppos, J. Martinez and W. Blomquist. 2018. “Diverse stakeholders create collaborative, multilevel basin governance for groundwater sustainability.” *California* Agriculture, Vol. 72, No. 1 (2018), pp. 44-53 https://doi.org/10.3733/ca.2018a0002

Creswell, J. W. 2014. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches.* (4th Edition). Thousand Oaks, CA: Sage.

Demers, Jocelyn. 2017. *The Watershed Guardians of The Fraser River*. Monde Films, Green Planet Stream.

Doberstein, Carey. 2016. "Designing Collaborative Governance Decision-Making in Search of a ‘Collaborative Advantage’." *Public Management Review*, Vol. 18, No. 6 (2016) pp. 819-841. http://ludwig.lub.lu.se/login?url=http://search.ebscohost.com.ludwig.lub.lu.se/login.aspx?direct=true&db=bth&AN=113944983&site=eds-live&scope=site

Eckerberg, Katrina, Therese Bjärstig, and Anna Zachrisson. 2015. "Incentives for Collaborative Governance: Top-Down and Bottom-Up Initiatives in the Swedish Mountain Region." *Mountain Research and Development,* Vol. 35, No.3 (2015) pp. 289-298 https://doaj.org/article/86e13a877e194742814c7f187067b87d?

Elder-Vass, Dave. 2010. *The Causal Power of Social Structures*. Cambridge University Press.

Elster, Jon. 1989. “Social Norms and Economic Theory.” *Journal of Economic Perspectives*, Vol. 3, No. 4 (Fall 1989), pp. 99-117. https://www.jstor.org/stable/pdf/1942912.pdf?refreqid=excelsior%3Ad0ffc8a62256324ad962ba080b785196

Evenden, Matthew D. 2007. *Fish versus Power: An Environmental History of the Fraser Basin*. Cambridge University Press.

Fliervoet, J., G. Geerling, E. Mostert, and A. Smits. 2016. "Analyzing Collaborative Governance Through Social Network Analysis: A Case Study of River Management Along the Waal River in The Netherlands." *Environmental Management* 57, no. 2: 355-367 http://ludwig.lub.lu.se/login?url=http://search.ebscohost.com.ludwig.lub.lu.se/login.aspx?direct=true&db=ccm&AN=112262272&site=eds-live&scope=site

Folke, Carl, Thomas Hahn, Per Olsson and Jon Norbeg. 2005. “Adaptive Governance of Social-Ecological Systems”. *Annual Review of Environment and Resources*, Vol. 30, No. 1. Pp, 441-473. http://www.carpediemwest.org/wp-content/uploads/Folke-et-al-2005.pdf

Fraser Basin Council. 2018. “About the Basin.” Fraser Basin Council. Vancouver. https://www.fraserbasin.bc.ca/about_fraser_basin.html

Fraser Basin Council. 2018. “Accomplishments.” Fraser Basin Council. Vancouver. https://www.fraserbasin.bc.ca/about_accomplishments.html

Fraser Basin Council. 2013. “Charter for Sustainability.” Fraser Basin Council. Vancouver. https://www.fraserbasin.bc.ca/_Library/Fraser_Basin_Council/charter_for_sustainability.pdf

Fraser Basin Council. 2018. “Maps.” Fraser Basin Council. Vancouver. https://www.fraserbasin.bc.ca/_Library/Maps/map_basin_overview_2009.pdf

Fraser Basin Council. 2018. “Nechako Watershed Roundtable.” Fraser Basin Council. Vancouver. https://www.fraserbasin.bc.ca/Nechako_Watershed_Roundtable.html

Fraser Basin Council. 2018. “Other Regional Work.” Fraser Basin Council. Vancouver. https://www.fraserbasin.bc.ca/ufr_other_work.html#nwc

Fraser Basin Council. 2018. “Our History.” Fraser Basin Council. Vancouver. https://www.fraserbasin.bc.ca/about_fbc_history.html

Fraser Basin Council. 2018. “Programs & Services.” Fraser Basin Council. Vancouver. https://www.fraserbasin.bc.ca/programs_services.html

Fraser Basin Council. 2018. “FBC Today.” Fraser Basin Council. Vancouver. https://www.fraserbasin.bc.ca/about_fbc_today.html

Fraser Bain Council. 2018. “Fraser Basin Watersheds.” Fraser Basin Council. Vancouver. https://www.fraserbasin.bc.ca/basin_watersheds.html

Fresh Water Alliance. 2017. “History of the Water Sustainability Act.” Resources Page on Fresh Water Alliance Website. https://www.freshwateralliance.ca/history_of_the_wsa

Gardner, Roy, Elinor Ostrom and James Walker. 1990. “The Nature of Common-Pool Resource Problems.” *Rationality and Society*, Vol. 2, No. 3 (July 1, 1990) pp. 335-358. http://journals.sagepub.com/doi/pdf/10.1177/1043463190002003005

Global Water Partnership. 2003. *Effective Water Governance: Action Through Partnership in Central and Eastern Europe.* GWP Secretariat. Stockholm, Sweden. https://www.gwp.org/globalassets/global/gwp-cee_files/regional/governance-2003.pdf

Hardin, Garrett. 1968. “The Tragedy of the Commons.” *Science*, Vol 162, No. 3859 (Dec. 13, 1968), pp. 1243-1248. http://pages.mtu.edu/~asmayer/rural_sustain/governance/Hardin%201968.pdf

Hartley, J. (2004). *Case study research*. In Catherine Cassell & Gillian Symon (Eds.), *Essential guide to qualitative methods in organizational research*. London: Sage (pp.323-333).

Hodgson, Geoffrey. 2006. "What Are Institutions?". *Journal of Economic Issues*, Vol. 40, No. 1 (March 2006), pp. 1 – 25. http://www.geoffrey-hodgson.info/user/bin/whatareinstitutions.pdf

Hurley, Terrance. 1998. "Rent Dissipation and Efficiency in a Contest with Asymmetric Valuations." *Public Choice*, Vol. 94, No. ¾ (1998), pp. 289-298 https://www.jstor.org/stable/30024345?seq=1#page_scan_tab_contents

Loo, Tina. 2016. "High Modernism, Conflict, and the Nature of Change in Canada: A Look at Seeing Like a State." *Canadian Historical Review*, Vol. 97, No. 1, pp. 34-58 https://www.utpjournals.press/doi/pdf/10.3138/chr.3035

McCully, Patrick. 2001. *Silenced Rivers: the ecology and politics of large dams*. Zed Books, London.

Njie, Baboucarr and Soaib Asimiran. 2014. "Case study as a Choice in Qualitative Methodology." *IOSR Journal of Research & Methods in Education*, Vol. 4, No. 3 (May-Jun 2014), pp. 35-40 http://www.iosrjournals.org/iosr-jrme/papers/Vol-4%20Issue-3/Version-1/E04313540.pdf

Olson, Mancur. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Harvard University Press, Cambridge, Massachusetts.

Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action.* Cambridge University Press.

Relief Bird Sanctuary. 2018. "The Fraser River Estuary." Delta. Canada. https://www.reifelbirdsanctuary.com/fraser.html

Renzetti, Steven, and Diane P. Dupont. 2017. *Water Policy and Governance in Canada*. n.p.: Cham: Springer International Publishing: Springer, 2017.

Sayer, Andrew. 2000. *Realism and Social Science*. Thousand Oaks, New Delhi: Sage.

Stake, Robert E. 1995. *The art of case study research*. Thousand Oaks, CA: Sage.

Vomiero, Jessica. 2018. "B.C. is in a state of emergency – here's what that means for fighting wildfires." Global News, Aug 15, 2018. https://globalnews.ca/news/4390622/bc-state-of-emergency-fighting-wildfires/

World Bank. 2006. "Good Governance for Good Water Management." *Environment Matters 2006*. The World Bank Group. https://siteresources.worldbank.org/INTENVMAT/64199955-1162240805462/21127276/8GoodGovernance.pdf

Yates, Julian S., Leila M. Harris, and Nicole J. Wilson. 2017. "Multiple ontologies of water: Politics, conflict and implications for governance." *Environment & Planning D: Society &Space*, Vol. 35, No. 5: 797-815.
http://journals.sagepub.com/doi/full/10.1177/0263775817700395

Yeasmin, Sabina & Khan Ferdousour Rahman. 2012. "Triangulation Research Method as the Tool of Social Science Research." *BUP Journal*, Vol. 1, No. 1: 154-163
http://bup.edu.bd/assets/uploads/journal_content_file/1511259502154-163.pdf

Yin, Robert K. 1994. *Case Study Research: Design and Methods*. Thousand Oaks, CA: Sage.

11. Appendix

List of Expert Respondents

Respondents			
Name	Organization	Position	Description of Duties
Rosie Simms	POLIS Project on Ecological Governance: Water Sustainability Project	Project Manager & Researcher	Rosie's work includes research and outreach on legal/policy options to advance freshwater protection; convening B.C. water leaders; and managing project activities.
Lina Azeez	Watershed Watch	Fraser Voice Organizer	Lina works to understand citizens perceptions and engage with people in the Fraser Basin on issues that affect salmon and salmon habitats.