THOMPSON RIVERS UNIVERSITY

Conservation, Tourism and Sustainability at the Adams River Salmon Run in Tsútswecw Provincial Park, British Columbia

by

Carmen Dianne Massey

Bachelor of Commerce, concentration in Tourism Management, University of Calgary, 1997

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Courtney Mason (Ph.D.), Thesis Supervisor, Faculty of Adventure, Culinary Arts & Tourism
Robert Hood (Ph.D.), Committee Member, Faculty of Adventure, Culinary Arts & Tourism
Brian Heise (Ph.D.), Committee Member, Faculty of Science
Anna Carr (Ph.D.), External Reviewer, Department of Tourism, Otago University

ABSTRACT

Sockeye salmon have been returning to the Adams River in South Central British Columbia for thousands of years. They are an ecological and cultural keystone species and a significant contributor to the economy. However, salmon populations are in decline throughout the Pacific Northwest, putting communities, economies and ecosystems at risk. The Salute to the Sockeye is a nature-based tourism experience celebrating the return of wild salmon to the Adams River. This research examines how nature-based tourism can contribute to the sustainability of a species and be a driver for change. Using a community-based participatory research methodology and interviews, this research identifies the network of actors connected to the Adams River salmon run, examines actor relationships, and considers the impacts these relations have on socio-economic and environmental sustainability. There is strong evidence to suggest that collaboration among actors, guided by local experience and knowledge, is crucial to sustaining wild Pacific salmon.

Keywords: Wild salmon; Conservation; Actor networks; Nature-based tourism; Indigenous communities: Parks and protected areas.

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DEDICATION

I dedicate this research to my sons, Dayton and George Massey. You boys inspire me every day. May there be wild salmon for your grandchildren to visit in the Adams River.

CHAPTER 1: INTRODUCTION

Wild Pacific salmon have sustained communities and been an integral part of river and lake ecosystems of the Shuswap region of interior British Columbia (BC) for thousands of years (Ignace & Ignace, 2017). Salmon are deemed essential to life by Secwépemc Indigenous communities (Turner, 2008). Adams River sockeye are a significant contributor to the BC economy through their commercial harvest (Busch, 2000) and contribute to the wildlife viewing and sport fishing tourism sectors (Kruger et al., 2018). Many Indigenous communities continue to rely on salmon as an important food source (Ignace & Ignace, 2017). Despite the importance of salmon to the province, populations are in decline throughout the Pacific Northwest (Price et al., 2017). In 2018, 46 independent researchers from across Canada, members of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (see Appendix A, List of Acronyms), recommended Species at Risk Act (SARA) protection for multiple wild Pacific salmon populations in the BC interior (Government of Canada, Species at Risk Act, 2018). However, little is known about what and who is having the most impact on salmon populations nor which actions could have the most significance in salmon conservation (Cohen, 2012, Walsh et al., 2020).

BC's communities, ecosystems and economies depend on salmon and it is critical that we understand the underlying causes of salmon decline. By investigating the actors[1] involved in the salmon life cycle we are able to identify how relationships within the salmon actor network are affecting salmon sustainability. Stakeholder relationships connected to wild Pacific salmon in BC are complex, involving numerous human and non-human actors. In this thesis, a combination of Stakeholder Theory and Actor Network Theory (ANT) are applied as a lens to understand the network of actors involved in the conservation and management of the Adams River salmon run. Semi-structured interviews and a community-based participatory methodology are used to identify the underlying tensions between actors and investigate the distinctive barriers and opportunities that either inhibit or facilitate successful conservation strategies for the Adams River salmon.

[1] For the purposes of this thesis the words actor and stakeholder are used interchangeably.

Located on the traditional territory of the Secwépemc nation of south-central BC and with spawning grounds in Tsútswecw Provincial Park, the Adams River salmon run lies at an intersection where multiple issues and actors converge around salmon conservation. Examining the Adams River salmon run actor network provides us with the opportunity to realize the role relationships play in the continued survival and protection of this critical species throughout the province. As we look to a future of uncertainty and change, we must understand that the sustainability of wild salmon must involve effective and collaborative relationships between actors throughout the vast salmon actor network.

Literature Review

Wild Pacific Salmon at the Adams River, BC

Wild Pacific salmon are a cultural and ecological keystone species in the province of BC (Garibaldi & Turner, 2004, Wilson & Halupka, 1995). Salmon are a charismatic fish attracting a high level of conservation attention (Quinn, 2005). Wild Pacific salmon spawn throughout BC, hatching out of redds in freshwater rivers and streams throughout most of the province, migrating out into the Pacific Ocean for the growth phase of their lives, and eventually returning to their natal streams to spawn and die and start the cycle anew (Busch, 2000, McGillivray, 2011, Malik et al., 2017, Quinn, 2005).

As an ecological keystone species salmon have been found to be integral to both terrestrial and aquatic environments. Salmon-derived nutrients feed invertebrates in rivers and streams (Verspoor et al., 2011). Salmonberry plants adjacent to high-density spawning streams are found to have higher nitrogen levels than in non-spawning areas (Bilby et al., 2003). The health of riparian plant communities can be related to the size of salmon runs (Hocking & Reynolds, 2011). Avian density and diversity in estuarine environments correlates to salmon nutrient load (Field & Reynolds, 2011). However, as consumption of salmon and industrial development have outpaced the ability of the land and water to support populations, serious concern has arisen around sustainability of both salmon and the ecosystems that depend upon them (Shepard & Argue, 2005).

Wild Pacific sockeye salmon, *Oncorhynchus nerka,* are an anadromous fish hatched in freshwater rivers and streams of the North Pacific, including Canada, the United States, Russia

and Japan (Malik et al., 2017). Juvenile fish rear in nursery lakes for approximately one year, after which they travel downstream to brackish estuary habitats. Following a period of salt water adaptation, sockeye salmon move out into the open ocean. For two years Adams River sockeye range far into the Pacific growing and feeding on rich ocean nutrients. At the end of the ocean phase of their life cycle the salmon school together with their natal group and return to the place where they were hatched to spawn the next generation (Quinn, 2005). Similar to most other Pacific salmon species, sockeye die after they spawn, contributing to critical ecosystem functions. Their decomposing body material feeds plants, mammals, birds, fish and the next generation of sockeye salmon hatching out of the gravel nursery beds and moving into nursery lakes to begin the cycle anew (Malik et al., 2017) (see Appendix B, Adams River Sockeye Salmon Life Cycle).

Wild salmon populations in the Pacific Northwest of North America are declining (Peterman & Dorner, 2012). Causes include visible issues such as dams, poor logging practices, over-grazed riparian vegetation, dewatered and polluted rivers, degraded ocean conditions, poor hatchery practices and overharvest (Lichatowich, 2013). How fish are governed, managed and exploited as a resource are what Lichatowich calls unseen or hidden components of the salmon decline. Climate change is another such invisible factor, increasingly seen to be impacting wild Pacific salmon. Rising ocean temperatures due to climate change may be interfering with the timing of salmon migration (Thomson & Hourston, 2010). Fluctuating water levels in rivers due to uneven snow melt hinders returning salmon from physically navigating up rivers (Schoen et al., 2017) and temperatures in some rivers are found to be increasing beyond optimal thermal range for adult salmon survival. Disease transfer from farmed salmon into wild stocks has been documented (Krkošek, 2017) and it has been found that diseased adult salmon may have reduced reproduction rates (Morton et al., 2017). Canada's Wild Salmon Policy has been found to be ineffective in addressing population decline (Price et al., 2017). Additionally, the management of highly migratory species is challenged by the inability of management systems to adapt to changing ecosystem conditions (Malik et al., 2017). In spite of the many challenges, Quinn (2005) provides an optimistic view of the resiliency of salmon, if their habitat is protected or enhanced. Walsh et al. (2020) propose a Priority Threat Management framework to prioritize fisheries management strategies and optimize Pacific salmon survival.

Besides being an ecological keystone species, salmon are a cultural keystone species essential to the communities and economies of BC. Salmon have been fundamental to human existence in the region since time immemorial (Turner & Clifton, 2009, Ignace & Ignace, 2017). For thousands of years, salmon have been returning to spawn in the Adams River, in the Thompson region of the Fraser River drainage system, where these fish are a food and cultural resource sustaining communities (Palmer, 2005, Ignace & Ignace, 2017). Despite the modern shift in food consumption away from wild to store-bought foods, many interior BC Indigenous communities still rely on wild salmon to supplement their diet, and for social and ceremonial purposes (Turner & Clifton, 2009; Palmer, 2005; Ignace & Ignace, 2017). Non-indigenous communities also rely on salmon as a food resource, and communities continue to fish for both sport and economic gain (Cooperman, 2017). Salmon wildlife tourism also brings economic benefit to interior BC communities (Androkovich, 2015).

Because salmon are anadromous and require freshwater spawning habitats, industrial activity such as logging of watersheds, damming of rivers, and contamination and depletion of water degrade critical habitat and put pressure on salmon populations. Protection of freshwater ecosystems in spawning grounds such as the Adams River is vital to the sustainability of salmon (Darimont et al., 2010). However, beyond DFO counting returning salmon (Fisheries and Oceans Canada, Stock Assessment 2018), and Little Shuswap Lake Band (LSLB) monitoring fish returns in nearby Scotch Creek (A. Arnouse, Interview, January 10, 2019) very little salmon research has been done at the Adams River. Three academic publications related to the Salute to the Sockeye festival at the Adams River present an economic perspective of the tourism experience (Kruger, 2014, Kruger et al., 2018, Androkovich, 2015). *Everything Shuswap*, a recent publication by Jim Cooperman (2017) provides history and insight into the Shuswap Watershed, its people and ecology. Matthew and Michel (2017) reveal Indigenous Secwépemc place names in the Shuswap region. Ignace & Ignace (2017) document the people, lands and laws of the original Indigenous inhabitants of the region, and dedicate a significant portion of the text to the role of salmon in the lives of the Secwépemc people. This thesis aims to add to this body of knowledge and to offer a different perspective, providing insight into salmon conservation specifically at the Adams River and revealing how the network of actors connected to this place affect socio-economic, cultural and environmental sustainability.

The State of Salmon Conservation in BC

BC wild salmon populations have been in decline for decades (Peterman & Dorner 2012, Price et al., 2017; Government of Canada, Wild Salmon Policy, 2005; Government of Canada, Wild Salmon 2018 to 2022 Implementation Plan, 2018; Government of Canada, COSEWIC Annual Report, 2018 to 2019). Concern is high among conservationists, scientists, academics, fisheries managers, Indigenous communities and the general public around the potential demise of wild Pacific salmon. All interview subjects for this research project expressed concern for the survival of wild salmon in BC (see Appendix C, List of Interview Participants). Although factors such as over fishing, predation, climate change and the effects of industrial activity have been identified as impacting salmon populations, researchers are still struggling to find the root causes of salmon population decline. Land use activities, such as resort and housing development along the shores of Shuswap Lake and Adams Lake; industrial activities on the land such as the Canadian Pacific rail line; deforestation in headwaters of the Adams Lake and Shuswap Lake drainage basins; and the Salute to the Sockeye tourism experience potentially impact salmon-spawning habitat at the Adams River.

Responding to concern around the possible causes of disappearing wild salmon in BC, the federal government ordered the Cohen Commission in 2009 (Government of Canada, Cohen Commission Enquiry, 2012). The commission was charged with examining the source of the decline of sockeye salmon in the Fraser River basin and making recommendations to prevent further loss. While many recommendations were made, no one factor was identified as to what Cohen called the "smoking gun". The Cohen Commission recommendations have never been fully implemented in Canada. In 2018 the Canadian Federal government through the Minister of Fisheries and Oceans and the Canadian Coast Guard (DFO) updated the Wild Salmon Policy Implementation Plan (WSP, Government of Canada, 2018), and the BC Provincial government passed legislation limiting fish farm operations in sockeye salmon migratory pathways (Government of British Columbia, 2018). These two policies demonstrate a commitment by the Canadian public to preserve wild salmon populations in the rivers and streams of BC. However, in spite of policy updates, commissions, recommendations and reports, salmon populations continue to decline. The most recent dominant run to the Adams River occurred in 2018 and was the lowest return of salmon on a dominant year in recorded history (Government of Canada, Stock Assessment, 2018; Watershed Watch, 2019). In 2017,

16 out of 24 Fraser River sockeye Conservation Units (CU[2]) were declared Special Concern (5), Threatened (2) or Endangered (9). Several were recommended for protection through Canada's Species at Risk Act (SARA) by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), a Federal arms-length body of scientists. Wild Pacific salmon have made a thousands of kilometer-long journey for millennia, but now seem to be on the brink of potential extirpation in several habitats throughout BC.

Getting to "Ground Zero": Contextualizing the Adams River Salmon Run

The wild Pacific salmon life cycle can be presented pictorially as a circle (see Appendix B, Adams River Sockeye Salmon Life Cycle). Pat Matthew, fisheries management coordinator for Secwépemc Fisheries Commission, explains the Adams River salmon run:

> … this is related to where the salmon do all of their four-year cycle. They're hatched up in the Adams River, and they take the first year in Shuswap Lake and they begin their voyage down the Adams River, big Shuswap Lake, Little River, Little Shuswap Lake, South Thompson River, meets the Thompson River, which joins up with the Fraser River system and all flows to Vancouver and then from that they start their journey to the ocean where the salmon dwell in the ocean until they begin their journey back on the fourth year… they're born and hatched and come back on the fourth year but every place that the sockeye salmon travel must be included into this conversation. (Interview, January 16, 2019)

Identifying where a circle begins or ends is challenging, but as a place of both hatching and spawning, the Adams River is often referred to as both the starting or ending place in the salmon life cycle. Jason Bellows, local guide outfitter and BC Sport Fishery Council Director, refers to the Adams River as "ground zero, where it all begins" (Interview, March 19, 2019).

The Adams River salmon run, described technically as a salmon spawning event in the Thompson area of the Fraser River system of BC, has evolved into a pattern of dominant returns every four years (Thomas & Hourston, 2010). During the dominant cycle, significantly larger numbers of fish return to spawn as compared to the three sub-dominant years. The dominant year Adams River salmon run is among the planet's significant migratory

[2] A Conservation Unit (CU) is a group of wild salmon sufficiently isolated from other groups that, if extirpated is very unlikely to recolonize naturally within an acceptable timeframe, such as a human lifetime or a specified number of salmon generations. (Government of Canada, Wild Pacific Salmon Policy 2018 to 2022)

phenomena. Wes DeArmond, BC Parks Area Manager including Tsútswecw Provincial Park, location of the spawning grounds for the Adams River salmon run, describes:

> …You'll see across the globe there's other areas that have massive wildlife migrations, and often you get a concentrations of humans at these sites during those events because they're so prolific and can be captured by photography or video, so you'll see things like the monarch butterfly migration, or the lemmings jumping off cliffs and I mean there's the penguins in Antarctica, the caribou in the Yukon. So I see the similarities here at the Adams River. People have come to understand that this is the place to go to see literally thousands, if not millions of salmon, coming back to spawn in one short section of river. (Interview, January 17, 2019)

Adams River salmon migrate up the Fraser River, a watershed draining one-third of the province of BC (Evenden, 2004) to reach Tsútswecw Provincial Park (see Appendix D, Adams River Salmon Run Migration Route). This is prime protected habitat for wild salmon, freshwater aquatic species and plants, and mammals and bird species that feast upon dead salmon carcasses left behind after spawning (DeArmond, Interview, January 17, 2019). Secwépemc peoples, the Indigenous peoples of the region, have long relied on salmon from this river for food, social, ceremonial and economic reasons (Ignace & Ignace, 2017).

In his personal interview (February 6, 2019), Brian Riddell, President of the Pacific Salmon Foundation, refers to the Adams River salmon run as: "one of the seven wonders of the world. It's not counted as number seven but it's probably number eight". He emphasizes the importance of the run:

> Fraser sockeye are the most valuable fish in North America… Adams River sockeye *are* the Fraser sockeye, that's what people outside our area equate it to. I talk to my family back east (*in Canada*) and they don't talk about the Fraser sockeye, they talk about the Adams River. Internationally, they talk about the Adams River.

The Adams River, clearly holds a special place in the minds of the people connected to the life cycle of salmon, as evidenced by the language used to describe the Adams. Expressions used include: "the womb" (DeArmond, Interview, January 17, 2019); "the jewel" (Riddell, Interview, February 6, 2019); and "an iconic important salmon run for British Columbia" (Hill, Interview, June 13, 2019). Sunny Lebourdais, Secwépemc woman and Qwelmínte-Secwépemc G2G, Director of Transformation describes the Adams River as a place that has "captured people's imagination" (Interview, July 9, 2019).

Indigenous and non-Indigenous people in the Shuswap region speak of salmon as key to their identity and bringing socio-economic benefit to their communities. Lebourdais (Interview, July 9, 2019) speaking as a Secwépemc Indigenous woman, says, "salmon are such a huge part of who I am." Darlene Koss (Interview, January 8, 2019) administrative coordinator for The Adams River Salmon Society (TARSS), a non-Indigenous woman, observes: "I think it (*the salmon run*) is central to all our lives". While salmon are no longer a primary food source in the Shuswap region, Indigenous communities continue to harvest salmon as a supplementary food source (Nordquist, Interview, June 6, 2019). Tourism opportunities such as sport fishing and wildlife viewing have arisen around the salmon run and many interviewees refer to the economic benefits salmon bring to the local economy (A. Arnouse, Interview, January 10, 2019; Bellows, Interview, March 19, 2019). During the dominant migration period, thousands of visitors attend the Salute to the Sockeye festival (Salute) at Tsútswecw Provincial Park to observe spawning salmon in the wild (Kruger, 2014; Kruger et al., 2018).

The life cycle of Pacific salmon is vast and the network of actors involved is correspondingly large and complex. The Adams River salmon run provides socio-economic and environmental value for British Columbians. Identifying and understanding the Adams River wild Pacific salmon actor network will provide insight into how relationships are affecting salmon conservation in this and other protected areas of the province.

Thesis Statement and Research Objectives

Relationships between actors in a network have an effect on sustainability (Gibson, 2012). This thesis contends that relationships are impacting the sustainability of the Adams River salmon run. Identification of the network of actors connected to the Adams River salmon run is a critical first step to revealing the underlying power dynamics and tensions between the actors connected to wild Pacific salmon conservation in BC. This thesis argues that stakeholders are subject to competing interests, overlapping jurisdictions and the vast life history of salmon themselves, resulting in complex relationships between network actors, contributing to a lack of socio-economic and environmental sustainability.

Six key questions guided this research to examine whether relationships between stakeholders are affecting socio-economic and environmental sustainability of the Adams River salmon run: 1) What is the current environmental and socio-economic state of

sustainability of the Adams River salmon run?; 2) Who are the actors who make up the network of relationships involved in conservation, management and use of the salmon from the Adams River, and what are their overlapping interests that bring complexity to these relationships?; 3) How is the complexity of wild salmon as a species reflected in the complexity of the human relationships involved?; 4) How do the relationships in the network impact the sustainability of the Adams River salmon run?; 5) What effect does a nature-based tourism event like the Salute to the Sockeye at the Adams River salmon run have on the sustainability of a species?; 6) Can a nature-based tourism event be a vehicle for sustainability and a driver for change?

Methodological Approach and Methods

In this study, a community-based participatory research (CBPR) methodology (Ashok et al., 2017) was used, which places participants at the center of the knowledge creation process. CBPR improves the potential for long-term benefits derived from the research, including capacity building and conflict resolution strategies (Jagosh et al., 2015). CBPR was used in this project because it involves diverse participants, including several Indigenous partners (Koster, 2012). Indigenous participation in the research process was critical, and using a participatory methodology fostered trust and ensured that sensitive cultural knowledge was appropriately protected (Kovach, 2009). Trust is built between researchers and participants when CBPR involves them in every stage of the research process. The guiding principles for conducting CBPR are to: promote active collaboration and participation at multiple stages of the research; foster co-learning; support projects that are participant-driven; disseminate results in useful and culturally appropriate terms (O'Fallon & Dearry, 2002). It is essential to recognize that Indigenous Chiefs and Councils often see themselves as equal to the federal government in land jurisdiction and rights with respect to their role in governance (Palmer, 2005) and resist being identified as stakeholders, preferring to be acknowledged as partners.

As CBPR focuses on the specific values and practices of participants and encourages identification of their key concerns (Frerichs et al., 2016), it can contribute to research that informs policy development that considers their needs and perspectives. In particular, CBPR can bridge the gap between academic research and community members by developing frameworks that privilege local knowledge (Jagosh et al., 2015). CBPR enables the building of meaningful recommendations for future actions and makes this research relevant to the

participants, stakeholders and partners involved. Relationships between the researcher and several local actors laid the groundwork for this study beginning in 2016. Based on these established relationships, this research involved consulting with participants over several months prior to data collection. This allowed an understanding of the main issues from the perspectives of actors and identified the most valuable methods of data collection. Involvement of stakeholders at the earliest stages of the research process informed both the direction of the project and shaped the questions that were developed in the interview guide.

Semi-structured interviews (Barriball,1994) were conducted from January 2019 to April 2021, mainly with actors in the Interior of BC (see Appendix E, Interview Guide). To reach a diverse sample of respondents, snowball sampling was used to recruit participants (Noy, 2008). Interviews were conducted with 31 actors involved in the Adams River salmon run, primarily in-person, with fisheries managers, commercial fishery operators, researchers, conservationists, local environmental organizations, government and Non-Governmental Organization (NGO) representatives and Indigenous leaders. Most participants were from the interior of the province, but eight were from the Lower Mainland, Metropolitan Vancouver, southern BC and throughout the Pacific Northwest. As salmon are found over such a vast geographic area, it is critical to show the geographic distribution of participants and to demonstrate that the sample represents actors from numerous regions. The average length of interviews was 1 hour and 15 minutes. Open-ended interview questions allowed for in-depth responses (Hillman & Radel, 2018). All interviews were recorded and transcribed verbatim. Guided by CBPR, interview questions were developed in collaboration with an initial group of local participants involved in the Adams River salmon run to confirm appropriate language and contexts, and to gain insight into the relationships between the actors. The interview questions focused on four main themes: perspectives and knowledge of salmon and the ecosystems that support them; relationships within and between the organizations that manage salmon as a resource; the economics of salmon industries, including related tourism; and the barrier to or opportunities for collaboration in broader salmon policy development and conservation. A key aspect of CBPR frameworks is the input from community members to inform the development of research tools. Network actors were central to frame the research questions and provide practical suggestions on how to approach other network actors. Opportunities for feedback were provided at all stages of the process.

Interview transcripts were coded and analyzed to look for shared and opposing opinions, and to uncover recurring themes. Data were analyzed to reveal commonalities and divergent patterns related to the participants' perspectives. This process of content analysis included reading through each transcript several times using open coding, then identifying relevant sub-themes. Trustworthiness in the data was assured through the collaborative nature of the data analysis and content validation. Direct quotations are also critical to demonstrate trustworthiness (Elo & Kyngas, 2008) and are presented throughout the following sections to present participants' voices and perspectives as clearly as possible. Participants were provided with their own verbatim interview transcripts to ensure reliability and accuracy, and to allow for edits before the research was consolidated into final themes.

Consent forms were distributed and anonymity was offered, but was unanimously declined by all participants. Therefore, participants' names are associated with the quotations used throughout this text. This demonstrated a clear desire by the actor group for transparency and open collaboration. In addition to being guided by CBPR, this project adhered to OCAP (ownership, control, access and possession) principles and followed Tri-Council policies on ethical research with Indigenous communities. Ethics approval was granted by a University Research Ethics Committee (#102002). Upon completion of the project, a summary of the research findings will be provided to all participants to disseminate to other stakeholders and community members. At the advisement of participants, these findings, driven by stakeholder perspectives, have been shared by the researchers at community-based symposiums and with relevant organizations such as TARSS and LSLB.

Researcher Positionality

My personal life experiences led to the development of this research project and contributed to the selection of the methodological approach used. I am a Canadian woman, of non-Indigenous descent. I initially visited the Shuswap region of BC as a tourist, and relocated permanently in 1998. I was attracted by the unique natural beauty of the area and access to recreational and cultural activities, such as the Salute. Over the years I experienced a deepening connection to diverse ecologies and communities of the area.

Shortly after moving to the Shuswap I experienced the excitement of the Adams River salmon run. Every fall the leaves change and the air cools and Shuswap residents begin to

anticipate salmon returning to the local rivers and streams. I joined the crowd of tourists at the Salute in 1998 and have visited the salmon run each fall since. Over the past 22 years I have participated in five dominant salmon runs at the Adams River. As my appreciation for wild salmon grew I began to appreciate the significance of salmon to local Indigenous communities. As a tourism professional, I recognized the benefit of the salmon run to the local economy. In 2015 until 2017, I participated on the TARSS board of directors. Through that role I built relationships with several local actors, such as BC Parks, DFO staff and environmental groups in the community. Through these relationships I began to realize the complexities of the Adams River salmon run and relationships involved in hosting the Salute tourism event. Watching salmon runs dwindle to the historically lowest return to the Adams in 2018 motivated me to understand more about the reasons behind the decline.

As a researcher embedded in the community, I am privileged to have existing relationships with many of the actors involved. Responses to interview questions were candid and led to open and in-depth dialogue. This research project is relevant and applicable to my community.

Thesis Overview

This thesis is divided into four distinct chapters. *Chapter 1* provides an introduction and overview, including a detailed description of the Adams River salmon run. This chapter contains a literature review contextualizing the notions of Pacific salmon conservation, and research related to wild Pacific salmon, the Adams River and the Shuswap Region. Research methodologies and methods are outlined and researcher positionality is acknowledged.

Based on representative actor group interviews, *Chapter 2* borrows from both Stakeholder and Actor Network Theory. This chapter reveals the human and non-human actors connected to the Adams River salmon run and explores relationships between actor groups. Literature related to Stakeholder and Actor Network theory are presented. Complex overlapping jurisdictional and resource management challenges are examined, and barriers to collaboration affecting sustainability are identified. Examples of successful programs and strategies that have improved collaboration and sustainability at the Adams River are presented. This chapter clarifies the unique role of the Adams River salmon run within the larger network of salmon ecology, conservation and management networks.

Building on the presentation of actors involved in the larger network, *Chapter 3* focuses on a subset of actors involved in the Salute festival. This chapter explores how the organization of the Salute, a nature-based tourism event at the Adams River, can enhance socio-economic sustainability and improve the survival of wild salmon. Literature related to nature-based tourism, sustainability, and parks and protected areas is examined. The recent name change at Tsútswecw Provincial Park, the impact of park visitation on the ecosystem, and the implications of hosting a nature-based tourism event within a provincial park are explored.

In the final chapter, *Chapter 4,* the complexity of relationships involving salmon conservation in British Columbia is reviewed and the power of political and public influence is acknowledged. This chapter includes a series of recommendations, many of which were highlighted by stakeholders during the interview process. Recommendations center on overcoming barriers to collaboration and supporting effective initiatives related to BC wild salmon conservation from an interior BC perspective. The conclusion considers how this research may be applied to the broader context of species conservation, and the role of nature-based tourism experiences in parks and protected areas in BC.

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CHAPTER 2: EXPLORING THE ACTOR NETWORK THAT SHAPES THE ADAMS RIVER SALMON RUN

Wild Pacific salmon are valuable to BC's ecosystems. communities, and economy but wild salmon populations throughout the province are in decline. This is also a time of alarming fluctuations in salmon populations reflected in the historically high return to the Adams River in 2010 followed by historically low return in 2018. However, little is known about what and who is having the most impact on salmon populations (Cohen, 2012, Bennett 2017). By understanding the network of actors involved in the Adams River salmon run, including those involved in the use, enjoyment, harvest, management, policy creation, monitoring and conservation of salmon, and the relationships between these actors, we are better able to consider the effect relationships are having on sustainability[3].

Before examining the network of actors involved it is important to understand how and why the people of the province value salmon and what is at stake with the potential loss of wild salmon. The Secwépemc believe salmon sustain them as people and in return, people have the responsibility to care for salmon (O. Arnouse, Interview, January 29, 2019; Lebourdais, Interview, July 9, 2019; Morrison, Interview, February 7, 2019; Thomas, Interview, February 12, 2019). Salmon are deemed essential to life by Secwépemc Indigenous communities (Garibaldi & Turner 2004, Palmer, 2005, Turner 2008). "Salmon were and are caught by Secwépemc as a vital and crucial part of who we are, our food and our connection with those who give themselves to us" (Ignace & Ignace, 2017, p.155). All Secwépemc interviewees expressed a personal responsibility to ensure salmon are sustained for future generations, referring to the seven-generation ethos (Clarkson et al., 1992). Paul Michel, former Kukpi7 (Chief) of the Adams Lake Indian Band (ALIB), reiterates the importance of salmon to the Secwépemc people:

> … salmon is our life and livelihood, and it is our traditional way of life. We've always lived alongside the sockeye salmon and the sockeye salmon brings our sustenance… You protect the salmon, that means you're protecting the water and water is the essence of life. You can't live without fresh water and so the sockeye salmon is a marker to us, if you protect the sockeye salmon you are protecting the waters, and if we have waters we can live and if we have the sockeye salmon we can live. (Interview, July 4, 2019)

[3] This research uses Elkington's (1998) triple-bottom line approach to sustainability, considering ecology, economy and community.

Little Shuswap Lake Band (LSLB) Kukpi7 (Chief) Oliver Arnouse speaks of importance to his community of the land, water and salmon of the Adams River watershed:

> …And so we are in the headwaters and the main caregivers of the sockeye… it's a thing that being in the headwaters where all these things come from that we are charged with that responsibility to look after it to ensure that as many as come back and more leave. The responsibility is to ensure that the sockeye have a good place to spawn, you know, the Adams and the Scotch Creek area…And they return every fall to spawn there and every four years they have a big run. We just had one (*in 2018*), right? But it wasn't as big as it should have been… we have not only the responsibility to this community but to other people who live down along the Thompson River, the Fraser River, and that whole area, to ensure the survival of those salmon. (Interview, January 29, 2019)

The Secwépemc people have been stewards of the traditional territory of the Adams River for thousands of years and continue to be caretakers of wild salmon, a species critical to Secwépemc cultural and spiritual well-being.

Neil Brooks, hatchery manager and education coordinator at the Kingfisher Interpretive Centre on the Shuswap River, describes the critical role of salmon to the people, plants and animals of interior BC:

> …salmon as a keystone species, as the (*emphasis*) keystone species here, are important. The fertilizer, the marine-derived nutrients that they bring here from the ocean. Tons and tons and tons and tons of those nutrients… (Interview, January 10, 2019)

In addition to their critical role as a keystone and culturally valuable species, Adams River salmon are a significant contributor to the BC economy. In the past 150 years, salmon have become integral to non-Indigenous economies and communities (Evenden, 2004, McGillivray, 2011). The economic contribution of Adams River sockeye salmon to the commercial fishery in BC is significant. Brian Riddell, President of the Pacific Salmon Foundation and Pacific Salmon Treaty Commissioner for Canada (Interview, February 6, 2019) states: "…if you look at value per fish, Fraser sockeye (*of which the Adams is a significant component*) is the most valuable Pacific salmon anywhere...in terms of value to people and to Canada and the economic value. Fraser sockeye is the gold standard." Wild salmon also contribute to BC's modern-day economy through the growing Canadian tourism industry's wildlife viewing and sport fishing sectors (Tourism Industry Association of Canada, 2020). The Adams River salmon run contributes to the economy of the Shuswap region, as described by Paul Demenok,

local area government representative and Shuswap Watershed Council chair: "From a tourism perspective, it (*the Adams River salmon run*) is welcomed. Because we have more people, spending more money here, so economically it helps the local economy" (Interview, June 8, 2019).

In this chapter I argue that in order to better understand the causes of salmon decline in BC we need to understand the actors and stakeholders involved in the salmon life history and the effect of these relationships between actors on salmon sustainability. Stakeholder relationships connected to wild Pacific salmon in BC are complex, involving numerous human and non-human actors, which inhibits collaboration and effective decision making. Identifying and examining the network of actors connected to the Adams River salmon run reveals the underlying power dynamics and tensions between actors, exposes the existing and emerging pressures on the network, identifies the distinctive barriers arising out of these relationships and collaborative opportunities emerging among actors in the network.

Three key questions guided this research to identify the network of actors involved in the Adams River salmon run and to reveal the barriers and opportunities existing within the network: 1) Who are the actors who make up the network of relationships involved in conservation, management and use of the salmon from the Adams River, and what are their overlapping interests that bring complexity to these relationships?; 2) How is the complexity of wild salmon as a species reflected in the complexity of the human relationships involved?; 3) How do relationships in the network impact the sustainability of the Adams River salmon run?.

Actor Perspectives of the Adams River Salmon Run

Regardless of geographic distance from the Adams River, interview participants involved in some aspect of salmon management, protection, enhancement, harvesting or monitoring unanimously identified the Adams River as a significant place for wild Pacific salmon in British Columbia. All interviewees reported a feeling of personal connection to the Adams River salmon run, citing the Adams as a place they have visited at least once outside their professional work capacity. Speaking to his personal interest in the Adams River, commercial salmon fisherman from the lower Fraser River, Ryan McEachern, explains:

> I was there (*at the Adams*) for the spawn in 2010 and 2014…I wanted to go see it because those were huge massive escapements… (Interview, June 12, 2019)

Riddell (Interview, February 6, 2019), considers the Adams to be "one of the most significant populations of wild salmon in the province". John Reynolds, COSEWIC Chair and salmon researcher at Simon Fraser University describes the Adams River salmon run as "one of our flagship populations" (Interview, June 12, 2019). Aaron Arnouse, LSLB Councilor and past fisheries manager for the community (Interview, January 10, 2019), describes the respect from other Indigenous communities down the Fraser for the spawning grounds of the Adams, stating that the Adams is often referred to among the communities as: "where the salmon come home to". Bellows (Interview, March 19, 2019) also speaks of the Adams as where the "salmon go home". LSLB Kukpi7 (Chief) O. Arnouse holds the traditional knowledge that his community is "the main caretakers of the salmon" (Interview, January 29, 2019). Lebourdais describes the recognition that other Indigenous communities have for LSLB as a "caretaker community" of the "home" of the salmon (Interview, July 9, 2019). Lummi, Washington Tribe member and filmmaker Darrell Hillaire, when researching Fraser River salmon for a film project in 2017, rediscovered the Adams as the place where "most of the fish (*from his coastal community*) go back" (Interview, June 13, 2019). Wes DeArmond, Area Manager for BC Parks says, "I work in Tsútswecw Park, at the headwaters, that is basically the womb of the spawning salmon habitat" (Interview, January 17, 2019). The interests of actors involved in wild salmon management and conservation in BC converge at the Adams River, making the Adams an ideal focus and starting point for this analysis.

Literature Review

Actor Network Theory and the Adams River Salmon Run

Using stakeholder analysis to study organizations and people can help manage relationships by identifying and grouping stakeholders. Social network analysis looks at aspects of relationships such as centrality (where power in a network lies and how actors are connected to others within the network), tie levels (the strength of the connection between actors in a network) and network density (the concentration of actors in the group) (Chung & Crawford, 2016). In addition to stakeholder analysis and as an extension of social network analysis, we use Actor Network Theory (ANT) as a lens for this research to enable

identification, categorization and analysis of the network of actors involved in the conservation of wild Pacific salmon. ANT is a type of social network analysis that treats social relations as network effects where all actors are important to understanding the fluidity of the network (Latour, 1987, Law, 1992). ANT can be used to describe the way that collectives and events are organized and interrelate with each other (Martins & Dias, 2017). In this way, ANT can reveal the complexity of relationships and enable a focus on the connections between network actors, rather than focusing on individuals. ANT is a dynamic model because it is based on relationships and helps reveal what is occurring between actors, rather than simply identifying who the actors are. ANT has been used to gain insight into both ecological and environmental contexts (Martins & Dias, 2017), and is increasingly being used as a tourism research methodology (Johannesson et al., 2014).

ANT is also a unique approach in that it can attribute agency to nonhumans, including animals, plants, minerals, and climates (Dwiartama & Rosin, 2014) and it recognizes that non-human actors can also play critical roles in a network (Cresswell, 2010). The theory is useful in the context of the Adams River salmon run because it allows us to place salmon at the centre of the network of relationships, rather than focusing solely on humans (Murdoch, 1997). In this paper, ANT is used to inform who is included in the analysis and to look at the relationships and tensions between actors. In this way, ANT recognizes the contributions of diverse actors in the network, rather than focusing on those players with the most power, or the strongest voices. ANT guides the results to focus on the interaction and the shifting relationships among actors. Relative to the salmon, the human actors include government employees, land managers, tourists, Indigenous and non-Indigenous communities, commercial fishery operators, advocacy groups and the general public. This also includes jurisdictional, legal and policy issues related to human institutions. Examples of non-human actors at the Adams River include climate change and of course salmon. ANT has been applied in research related to the interaction between humans and conservation ecology, such as wildlife viewing activities and nature-based tourism experiences (van der Duim et al., 2017, Rodger et al., 2009), environmental justice (Holifield, 2009), and resource governance (Bodin & Crona, 2009). Although no other examples of such an application were found in the literature, it was helpful to apply ANT in this research by representing actors geographically in alignment with the salmon life cycle (see Appendix B, Adams River Sockeye Salmon Life Cycle and Appendix

F, Key Actors in the Adams River Sockeye Salmon Network). This novel application could be useful to researchers who want to practically and theoretically map key actors involved in a species' life cycle and geographically represent them.

The Adams River salmon run is the return of Sockeye salmon from the Pacific Ocean in late September to the gravel spawning channels of the Adams River. However, it is described in many different ways, depending on the actor perspective. Quinn (2018) refers to the salmon run as "the total number of adults surviving the natural mortality agents and heading back to freshwater to spawn." In Haig-Brown's seminal work, *The Salmon* (1974), he describes each run as being "specialized to its own freshwater environment by thousands of years of adaptation." For reporting and monitoring purposes, Fisheries and Oceans Canada (DFO) identifies each unique salmon run as a Conservation Unit (CU). The Adams River is the primary natal spawning site of a CU called the Late Shuswap Conservation Unit (Government of Canada, Stock Assessment, 2018), which includes other rivers and streams in the Shuswap Lake drainage basin.

The Adams River is also the location of a nature-based festival attracting hundreds of thousands of visitors to Tsútswecw Provincial Park to celebrate the return of spawning salmon. The Salute to the Sockeye festival (Salute) is held during the month of October, every four years, in concurrence with the dominant Adams River salmon run. According to Darlene Koss, the Adams River Salmon Society (TARSS) administrative coordinator, the 2018 Salute saw approximately 80,000 visitors in one three-week period (Interview, January 8, 2019). The Salute is an event with the power to affect public opinion and educate people about salmon. Park interpreters, displays and signage help visitors understand the phenomenon they are witnessing and the importance of salmon to the ecosystem and communities of BC (Kruger et al., 2018). This tourism event, and those invested in it, involves a group of actors that relies on the Adams River sockeye.

There is a body of research that examines the complexities of salmon ecology, history and management (Lichatowich, 2013; Malick et al., 2017); the role of salmon in communities and economies (Shepard & Argue, 2005; Kruger et al., 2018); and stakeholder relationships in salmon management in the Pacific Northwest (Evenden, 2004). However, there is virtually no published research with regard to the relationships among Pacific salmon stakeholders in Western Canada, and no research on relationships among actors at the Adams River salmon

run, in Tsútswecw Provincial Park, BC, or other parks in Western Canada. Additionally, very little research exists that outlines the network of actors involved in the wild Pacific salmon life cycle or how these actors can contribute to improved management processes.

Actors, Salmon Migration and Conservation on the Adams River

Regardless of geographic distance from the Adams River, participants involved in salmon management, protection, enhancement, harvesting or monitoring unanimously identified the Adams River as a significant place for wild Pacific salmon in BC. In addition to those who live close to the Adams River, coastal communities throughout the Pacific northwest have long relied on schools of returning salmon to sustain their people. The Indigenous coastal community of Lummi, Washington is a distant actor in the network, located over 400 km from the Adams River. The Lummi Tribe has long harvested Adams River sockeye in the Strait of Juan de Fuca, which is now Washington State. Recently the Lummi Tribe revived its relationship with LSLB, as they sought to understand where the salmon caught in the Pacific were going to spawn. Kukpi7 O. Arnouse speaks of the connection between the two communities:

> …they've (*Lummi Tribe*) been here two or three times, just to visit sometimes, they bring their Elders up and we talk about the lack of return and they talk about all the boats they see out there harvesting and so we exchange things and try to talk about ideas. And you know it's something we might be able to get help in getting a moratorium on fishing someday. That would be a connection. (Interview, January 29, 2019)

Actors from throughout the network are connected through the large and complex life history of wild Pacific salmon.

In this thesis actors are presented in alignment with the Sockeye salmon life cycle (see Appendix B, Adams River Sockeye Salmon Life Cycle), beginning at the Adams River. Actors in the network are described following the flow of water from the spawning grounds at the Adams River toward the Pacific Ocean (key actors and their role in the network are presented in Appendix F).

Immediate Actors

The Adams River is located entirely within Tsútswecw Provincial Park (see Appendix D, Adams River Salmon Run Migration Route) and as such, activities that take place at the Adams are sanctioned, supported and managed by BC Parks staff and governed by provincial legislation (Government of British Columbia, Approved Tsútswecw Provincial Park Management Plan, 2002). All actors in this location are immediate actors. Immediate actors maintain the park, host the Salute to the Sockeye tourism festival and work on the protection of salmon habitat at the Adams River.

The Province of BC is connected to the immediate actor group through two ministries: Ministry of the Environment and Climate Change Strategy (BC MOECCS) includes BC Parks which has the legislative mandate to manage the land and resources of the park. "Basically, BC Parks tries to balance recreation with conservation values," says DeArmond (Interview, January 17, 2019). BC MOECCS also oversees fresh water in the province. The Ministry of Forests, Lands, Natural Resources and Rural Development (FLNRORD) oversees activity on Crown Land that does not impact salmon habitat and manages non-salmon fishing in the river and lake.

Blair Acton, TARSS vice-president and chairperson for the 2014 and 2018 Salutes, explains that TARSS has been granted permission by BC Parks to own and operate an interpretive cabin within the park. Society volunteers provide trail-based interpretive tours of the park to visiting public, corporate, and school tour groups between May and October (Interview, February 4, 2019). As the main organizer for the Salute, TARSS is looked to as a media spokesperson for the immediate actor group during the Adams River salmon run and is often called upon to provide in-season updates regarding salmon run returns and to provide post-season commentary on salmon populations and conservation concerns. The TARSS website is a key source of information for the general public related to salmon in BC. TARSS is increasingly playing an advocacy role for interior BC salmon issues within the province.

LSLB Elders and other Secwépemc community members provide interpretive Indigenous walks and canoe tours in Tsútswecw Park. The Secwépemc community is involved in developing content for park displays and incorporating the Secwépemc language into park signage. DeArmond is committed to any future Tsútswecw Provincial Park infrastructure development and interpretation initiatives being conducted in collaboration with LSLB, in

accordance with the recently provincially-adopted United Nations Declaration of the Rights of Indigenous People (UNDRIP) (Interview, January 17, 2019). The BC government's commitment to UNDRIP is reflected in the 2018 name change from Roderick Haig-Brown Provincial Park to Tsútswecw Provincial Park in recognition of Indigenous cultural and historical interest in the area. Although LSLB no longer fishes for food in the Adams River, the community benefits economically from salmon by charging for tours and ownership of nearby Quaaout Lodge where tourists often stay during their visit to the spawning grounds.

DFO enumerates salmon in the Adams River (capturing and counting fish on the spawning grounds to determine how many salmon returned) and monitors salmon habitat conditions in the Adams River. DFO staff are involved with the rest of the immediate actor group in planning for the Salute and providing staff volunteers during the Salute. Through their Salmon Enhancement Program, DFO supports ongoing public engagement and education opportunities in the region throughout the year. DFO's hands-on school program during the Salute has connected generations of young British Columbians with salmon ecology and biology. Several interviewees recalled childhood fieldtrips to the Adams where DFO staff conducted salmon dissections (Acton, Interview, February 4, 2019; Bellows, Interview, March 19, 2019; Jennings, Interview, July 5, 2019). Tom Nevin, DFO Community Advisor for the BC Interior, describes that during the 2018 Salute approximately 8,000 school children visited the salmon run through DFO programming supported by over 70 DFO volunteers from across British Columbia (Interview, January 17, 2019). In their personal interviews Nevin and Acton mentioned a recent DFO collaboration with TARSS and the Pacific Salmon Foundation (PSF). In 2018 the three organizations worked together to purchase and install an underwater camera to live-stream activity in the river to monitors in the park interpretive cabin. This collaboration makes the salmon run accessible to visitors unable to walk to the river's edge.

Another immediate actor, PSF provides funding to support infrastructure development and ongoing salmon conservation and education efforts in Tsútswecw Provincial Park. PSF hosts a display at the Salute, where they answer salmon ecology questions and provide information to the public about wild salmon conservation.

Local environmental groups including Shuswap Environmental Action Society (SEAS) and Shuswap Trail Alliance (STA) advocate for culturally and ecologically responsible development in the park. Economic development groups, including Shuswap Tourism, the

local Chambers of Commerce and municipal and regional governments work to maximize economic opportunities for businesses.

An immediate actor group is Secwépemc Indigenous peoples who visit the spawning channels of the Adams River to honour their connection to salmon and hold an ancient first-fish ceremony each fall (O. Arnouse, Interview, January 29, 2019; Morrison, Interview, February 7, 2019). Kukpi7 Michel describes how Indigenous communities from downstream were historically connected to the Adams:

> …we are stewards of the land, we are protectors of the land, and we had agreements all the way along the Fraser River system, Thompson River system who can take what, how much salmon is taken, who can take which run. (Interview, July 4, 2019)

To share their cultural and spiritual connection to salmon, Indigenous people attend the Salute to view the salmon and some share stories, songs and traditions with one another and the public.

Visitors to the salmon run are also immediate actors. Food vendors, artisans and musicians enhance the Salute visitor experience, while hundreds of community volunteers park thousands of cars and buses. Local contractors and community members build and maintain park infrastructure such as the interpretive cabin, the event stage and interpretive signs and trails. Local companies provide traffic control and waste disposal during the Salute. Immediate actors maintain the park, volunteer to plant trees in riparian areas, ensure salmon habitat is protected at the Adams River, and every four years this group of actors becomes intensely involved in hosting the Salute.

Near Actors

Actors involved in the network shift as salmon alevins emerge from redds and are swept downstream into Shuswap Lake. Fry spend up to one year in the nursery lake environment, growing large enough to survive the journey to the ocean via the South Thompson River and the Fraser River. Non-human actors begin to play a larger role as silt from forestry activities, road building, disturbance of beachfront recreation properties, water consumption from irrigation, leaching of septic sewer systems and churning of water from tourist activities on Shuswap Lake impact the growing salmon. Near actors have a significant impact on juvenile and adult salmon health as the salmon swim down-river toward the ocean, and on their return

journey to spawn. Salmon are affected by fishing, forestry, industry and advocates that they encounter along the way back up-river.

Kingfisher Interpretive Centre, a non-profit society operating on nearby Shuswap River, is a near actor. The Centre takes a community approach to salmon conservation (Brooks, Interview, January 10, 2019). Public are invited to participate in a hatch and release program to enhance threatened salmon populations in the upper reaches of the Shuswap watershed. Kingfisher volunteers and staff organize school trips and partner with DFO to bring salmon tanks into classrooms in local schools. Students release salmon fry into the river at the end of the project. Located in the same watershed approximately 80 km apart, there are synergies between the Kingfisher Interpretive Centre on the Shuswap River and TARSS in Tsútswecw Provincial Park on the Adams River. For example, funds collected by TARSS at the Salute are used to support interpretive activities at Kingfisher and both organizations encourage tourists to visit each other's locations.

Alongside the rivers, the national CP and CN rail lines become actors, as they run cars full of heavy crude oil, coal and grain directly alongside the salmon migration route, creating risk of contamination in the case of a derailment. Agriculture operations remove water from the Thompson River for irrigation. Dawn Morrison, local Secwépemc woman and curator of the Wild Salmon Caravan (Interview, February 7, 2019) observes that recent clearing of industrial agricultural land along the Thompson River will likely cause siltation and contamination of water quality for migrating salmon.

In the City of Kamloops, salmon swim past densely populated areas where bridges, highways, homes, pulp mills and industrial development impact salmon. In Kamloops Lake the Secwépemc Fisheries Commission (SFC) monitors smolt populations swimming downstream and harvests adult salmon swimming back upstream through an Indigenous commercial fishery. Salmon are sold to the community through a retail store in Kamloops called Riverfresh (Matthew, Interview, January 16, 2019). SFC represents the fisheries interests of seven Secwépemc communities to DFO, including LSLB. Kupki O. Arnouse describes SFC:

> We have what's called SFC, Secwépemc Fisheries Commission out of Kamloops. And it's all Indigenous, and we manage our creeks and rivers by doing counts and returns…and we meet later on once all those statistics are put together to see how the

> communities are faring, and if they're all within the depletion numbers we notify fisheries about our concern. And what's going on... (Interview, January 29, 2019)

The group of near actors has a significant impact on juvenile salmon health as they swim down-river toward the ocean, and on their return journey, adult salmon are affected by the fishermen, industry and advocates that they encounter along the way back to spawning grounds.

Middle Actors

Adams River salmon smolts leave the Thompson River and enter the Fraser River near the community of Lytton where they must survive increasing human population density and development pressures by middle actors before reaching the Pacific Ocean. Indigenous communities along the Fraser River are near actors due to their historic and current salmon fishery activities. Today, the Fraser Salmon Management Council (FSMC) represents the interests of approximately 80 Indigenous communities in the Fraser watershed. FSMC advocates for continued access and protection for wild salmon and is working toward a better relationship with DFO (A. Arnouse, Interview, January 10, 2019). A non-Indigenous group, the Mid-Fraser Sport Fishery Advisory Board, is a group advocating for sport fishery access to salmon on the middle section of the Fraser River. They work to protect the interests of the lucrative sport fishing industry (Jennings, Interview, July 5, 2019).

An example of how middle actors can affect Adams River salmon is a 1914 landslide on the Fraser River caused by the building of the CN rail line. The slide changed the salmon migration route by increasing hydraulic flow rates beyond which salmon could navigate back upstream. Emergency measures were taken to lift some salmon past the swift-moving water, and rocks were partially removed from the river. At the recommendation of the International Pacific Salmon Fisheries Commission (Roos, 1991) (now the Pacific Salmon Commission), an elaborate series of fish ladders was built in 1944. To date, migrating salmon use these ladders to navigate the narrow, turbulent Hell's Gate section of the Fraser river (Evenden, 2000).

The Fraser estuary is a key habitat for salmon as they school in protected waters and marshes during a period of physiological transformation where they change from freshwater into saltwater species, enabling them to live and grow in the salinity of the ocean environment (Quinn, 2005). The estuary habitat has been severely impacted by non-human actors such as urban and industrial development of the Metropolitan area of Vancouver. Redirection of water

for flood control, dredging to open up shipping lanes, pollution runoff into streams, loss of marshy habitat to housing and land development, and shipping and marine traffic in the Port of Vancouver combine to make the estuary a precarious environment for salmon (Haig-Brown, Interview, April 14, 2021). Looking out of his boat at the edge of the Fraser River and noticing the human caused changes to fish habitat, McEachern comments, "All those little creeks and tributaries, all those fish are gone now… fish and people don't live very well together" (Interview, June 12, 2019).

The City of Vancouver is home to the Western Region DFO office and staff that execute Pacific salmon management for the Canadian Federal government. The joint US and Canada Pacific Salmon Commission gathers here to determine Pacific salmon fisheries allocations. The collaborative salmon management approach employed in Canada has led to most lobby and special interest groups also being located close to DFO headquarters in the Lower Mainland.

Academic institutions are significant actors in the network as they seek to better understand the biology and ecology of salmon and salmon habitat. The University of British Columbia and Simon Fraser University have robust salmon research departments located in the vicinity of the Fraser estuary. Salmon conservation groups such as Rivershed Watch, Watershed Watch Salmon Society, the Fraser River Watershed Initiative, David Suzuki Foundation and Wild Salmon Forever have headquarters in this human-population dense zone. These groups work to affect the public opinion of the people of Vancouver (Hill, Interview, June 13, 2019) and have staff located in or near Vancouver.

Distant Actors

As they swim out into the Pacific Ocean, juvenile salmon access rich ocean nutrients, enabling them to grow and mature (Quinn, 2005). Adams River Sockeye are thought to migrate in large schools to the Bering Sea, but as discussed by Riddell, specific navigation patterns in the open ocean are not yet clearly understood (Interview, February 6, 2019).

Distant actors in the Pacific Ocean have a significant impact on the number of salmon that eventually make their way back up the Fraser and Thompson Rivers to spawn in the Adams. Ocean temperature fluctuations, acidification, and productivity influence salmon survival and size, and commercial and sport harvest prevent salmon from returning to spawn at the Adams

River (Bennett, 2017, Justice et al., 2017, Schoen et al., 2017). Open pen salmon farming on the wild salmon migration route through the Johnstone Strait[4] is the likely source of transmission of disease to wild populations (Morton et al., 2017, Cohen, 2012). Large-scale commercial salmon hatcheries are used by Pacific salmon-bearing nations to improve domestic salmon populations for harvest. Commercial salmon hatcheries may be compromising wild salmon population health (Naish et al., 2007, Nagata et al., 2011). This type of salmon enhancement has been called ocean ranching (Salvanes, 2010). Matt Jennings, Executive Director of BC Freshwater Resort and Outfitter Association, discusses the effect of hatchery-produced salmon:

> … if you look at the data of how many pounds, tons of enhanced salmon are being pumped out by Russia, Japan and Alaska right now… there is only so much food in that part of the ocean where all the wild fish are going…There's competition. …there's more salmon in the Bering Sea than there ever has been in history. People say the salmon are disappearing. Well, wild salmon are disappearing. There's more salmon now in that area, the problem is…it's called ranching. (Interview, July 5, 2019)

In addition to the pressure put on wild salmon from distant actors such as fish farms and hatcheries, international fishing agreements affect Adams River salmon populations. The Pacific Salmon Commission is the international decision-making body which manages the Pacific Salmon Treaty between Canada and the United States to determine the allowable commercial catch of Adams River salmon. The Pacific Salmon Treaty provides protection from open seas fishing of Adams River salmon, but no such ban exists in the Bering Sea where Adams River salmon are thought to migrate (Riddell, Interview, February 6, 2019).

Adams River Sockeye return to the mouth of the Fraser after one to two years spent growing in the ocean. As the Sockeye run the gauntlet of the Fraser River and move upstream and away from the effects of distant actors, such as commercial fisheries, they return to the realm of middle, near and eventually to the immediate actors and the Adams River.

[4] Sockeye migrate out through the Johnstone Strait but migrate back via two routes: the western side of Vancouver Island, or between Vancouver Island and the mainland of BC, back through the Johnstone Strait (Quinn, 2005). (see Appendix D, Map of Adams River Salmon Run Migration Route)

The Complexity of Salmon Habitat and Management Jurisdictions in Water and on Land

In Canada each level of government has unique jurisdiction over resources. For example, the federal government regulates salt water species and habitat through DFO and the federal Ministry of the Environment (MOE). The provincial governments in Canada have jurisdiction over fresh water habitat and species, unless a species becomes designated as a species at risk, at which time they become regulated under SARA legislation through the MOE. In the case of an anadromous species that spend part of their life in salt water, the federal government maintains jurisdiction over the species and the habitat that the species migrates through, including the fresh water habitat. As noted by DeArmond, this means that, although the Adams River is a freshwater river over 400 km from the Pacific Ocean, DFO has primary jurisdiction of the salmon that inhabit the river (Interview, January 17, 2019).

The BC provincial Ministry of the Environment and Climate Change Strategy (BC MOECCS) and Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) have jurisdictional roles in monitoring and managing the water and land adjacent to and including the Adams River in Tsútswecw Provincial Park. FLNRORD manages forestry interests and mitigates land-based activity impacts on the watershed. BC MOECCS has oversight of BC Parks, the primary decision maker and land manager directly at the Adams River. Fresh water in the river is largely governed through the BC Water Sustainability Act, overseen by BC MOECCS. Bellows describes the situation:

> … it (*jurisdiction*) is very complex. Because, the province gets to set the… Forest Practice Code (*now called Forest & Range Practices Act (FRPA)*) and set the mandate for logging and road building and all this sort of stuff is all provincial jurisdiction, and all the freshwater is provincial jurisdiction. Except for that anadromous water, anything that gets salmon in it, now, that is federal territory…DFO gets a say in what happens with that stuff, for any enhancement projects or anything, work near rivers or streams, if it's got a salmon in it, that's federal jurisdiction… (Interview, March 19, 2019)

Mel Arnold, Member of Parliament for the North Okanagan Shuswap and member of the bipartisan Standing Committee for Fisheries and Oceans Canada, suggests that the "silo system" of governance affects salmon management, as federal and provincial governments, and even agencies within the same government, don't necessarily share information (Interview, February 18, 2019). Overlapping jurisdictional governance and management of salmon and

salmon habitat through siloed government agencies may be preventing collaboration on issues impacting salmon conservation.

Intensive logging and agricultural activity in the Shuswap watershed, which are governed by the FLNRORD, have historically impacted the Adams River salmon habitat. President of SEAS, Jim Cooperman explains that silt, debris and minerals from logging activity, clear cuts, road building and soil disturbance wash into the rivers and streams and ultimately, into salmon spawning channels (Interview, January 31, 2019). McEachern recalls, "Yes, well of course the Adams built a lot of this fleet, but prior…they had a lot of fish in the upper Adams. Which was totally wiped out by logging" (Interview, June 12, 2019). Jennings adds: "The province should be going through all salmon sensitive watersheds, putting an instant moratorium on harvest until a plan has been developed with minimal impact" (Interview, July 5, 2019). DeArmond speaks about the importance of protecting the ecosystem of the park from the effects of the forest industry, which is managed through FLNRORD and operates out of the same physical space as his Ministry of the Environment office in Kamloops:

> …my job is to look specifically at the area of the park and if a (*forestry*) block is on the edge of the park, my job is reducing the impact of the (*forestry*) block on that park boundary and I have been successful in that, having roads closed and buffer zones placed along the edge of parks. But my concern is a buffer that's maybe one hundred metres wide, in these catastrophic events that we're starting to see with weather, it may not be enough to stop siltation, let's say, or landslides that start, you know, half a mile up the mountain or half a km up the mountain. (Interview, January 17, 2019)

Reynolds discusses how layers of overlapping jurisdiction between and among ministries and levels of government formulate an inherently complex environment and are contributing to problems around salmon conservation:

> … we are very good at drawing together and having meetings and forums and things where we all agree that we're all in this together and we all need to seize the moment and so on, turn the ship around. But then I think people go back to their jobs and government people...it seems like to them, they're not structured to take this overarching, coordinated approach to managing salmon…imagine when you're now trying to talk about the province and the municipalities, who have ten different departments trying to interact with ten different DFO departments, and then you have aboriginal governments, and communities and municipalities… (Interview, June 12, 2019)

LSLB, the local Indigenous government whose traditional territory includes the Adams River, has input at all levels of government with regard to decisions affecting the Adams River. For

example, SFC represents the fisheries interests of seven Secwépemc communities to DFO. When asked if the Indigenous regulations being considered for the watershed will supersede the federal and provincial laws, Kukpi7 O. Arnouse responds, "They will, they will. We're headed actually into self-government, and they have to come to us when that happens" (Interview, January 29, 2019). Morrison provides an example of how local Indigenous governments influenced a controversial land development in prime spawning habitat near the mouth of the Adams River:

> …there is a boat launch that was proposed a few years back…the chief of the ALIB at the time, Nelson Leon…he basically held the government to task, to say that's title and rights, that's not going to happen. He presented a good case, so the provincial government didn't give the license to that developer. (Interview, February 7, 2019)

Land and water jurisdiction are becoming increasingly complex in BC as Indigenous governments demand access to resources on unceded traditional territory and expect to be consulted on decisions. A concerted effort at collaboration between all levels of government and agencies involved in salmon management and conservation is essential to protecting salmon habitat in the Shuswap watershed.

While elected representatives are mandated to govern for the interests of constituents, including protection of species and habitats, lawmakers are under constant pressure to make choices between the environment or the economy. Reynolds provides an example of economic interests weighing against the protection of wild salmon:

> Well I would say that fish farming… they (*fish farm advocates*) have demonstrated time and time again, they don't have the interests of wild fish at heart. The fact that they always deny (*scientific*) results that are contrary to business interests proves that they don't. (Interview, June 12, 2019)

In 2018, COSEWIC recommended several wild Pacific salmon CU be listed as endangered or critically endangered under SARA legislation. This listing would provide enhanced protection for these salmon populations and their habitat. As part of the SARA process, an economic impact assessment must be undertaken to determine the effect on the economy of protecting a species. SARA protection would significantly curb economic interests related to salmon. However, a SARA listing has not yet been made from the COSEWIC recommendation. As a result, wild Pacific salmon populations continue to decline outside of federal protection.

The commitment to support wild salmon conservation and sustainable harvest objectives is being demonstrated by some initiatives that attempt to connect various actors and foster learning and collaboration. For example, when the Lummi Tribe was seeking to understand where the salmon they caught in the Pacific were going, they collaborated with a number of actors in the network. Tribe member Darrel Hillaire describes how his people followed the salmon up the Fraser to arrive at the Adams River salmon run and since have returned multiple times to visit the spawning grounds:

> … we geared up for 2018 (*sockeye salmon run*), we got to learn about the early runs, the late runs (*on the Fraser*) and what happens in the middle of the summer…we met with the Pacific Salmon Commission, with their chief biologist, talked to our biologist, talked to the fishermen, we started to break it down and realized that the Adams River run is the main run, where most of the fish go back. So we thought, we better head up stream and find out what to look for (Interview, June 13, 2019).

In addition to smaller groups of actors like members of the Lummi Tribe and LSLB working toward salmon conservation objectives, DFO's management structure is another example of collaboration among actors. Representatives from all interest groups are included in DFO dialogues relating to salmon allocation. These include the sport fishing advocates, conservation organizations, as well as commercial and Indigenous fisheries, all of whom get to participate in recommendations related to salmon. Unfortunately, it is this very collaborative process that creates one of the main issues in conserving the salmon. By giving each actor an opportunity to participate in discussions about how salmon should be allocated, how many salmon should be harvested, or even related policies, conservation objectives are often lost among the strong voices who advocate for their access to the resource. Shifting this focus away from some actors such as commercial fisheries, and refocusing on salmon conservation and environmental protection, is an essential step toward placing salmon at the centre of sustainable salmon conservation policies.

Wild salmon populations are at risk of being caught in a situation where jurisdiction and decision-making is passed back and forth between actors in an attempt to avoid the consequence of making an unpopular economic or political decision.

> We have to think how a watershed works, which gets I think at the heart of what you're asking. Which is all the different ways in which the upland upstream effects come downstream and affect the salmon and their migration. And link everything up together

> and avoid silos between different departments that have different jurisdiction and interests and so on. (Reynolds, Interview, June 12, 2019)

If any progress is to be made toward conservation of salmon, actors from the network must commit to working collaboratively across jurisdictional and organizational boundaries to make it a priority.

Salmon Allocation: Competing Demand and Stakeholder Dynamics

Tension between actors intensifies as salmon return from the ocean near the end of their four-year life cycle. Salmon continue to grow and mature right up to the point of reentry into the freshwater river environment. Individuals fishing in BC and Washington coastal communities have harvested salmon returning to the mouth of the Fraser River for generations. It is here that Indigenous communities, sport fishing guides, and commercial fisheries compete for access to harvest, while conservationists make the case for allowing salmon to return, or escape, unimpeded to spawning habitats. The government prioritizes access for environmental and Indigenous interests but there is disagreement about whether this prioritization is effective for many of the groups involved.

The Pacific Salmon Commission (PSC) is a joint salmon management body representing the fishing interests of the United States and Canada and enforces the Pacific Salmon Treaty (Shepard & Argue, 2005). Sixteen percent of Adams River Sockeye are allocated to the United States and 84% to Canada. Based on early-season test fisheries conducted by the commercial fishing fleet, PSC determines the total allowable harvest of each population of returning salmon to the Fraser. In-season population estimates fluctuate based on river monitoring equipment and in-season harvest allocations are adjusted weekly. After the PSC determines the allowable harvest, it is the mandate of DFO, in collaboration with the Fraser Panel, to allocate the Canadian share of the salmon. The Fraser Panel, comprised of representatives of stakeholder groups, meets regularly in-season, to adjust allocations based on changing conditions and salmon population fluctuations. Guided by the Wild Salmon Policy, DFO is mandated to consult with various stakeholder groups to allocate access fairly among these actors, with priority given to maintaining viable wild salmon populations. As salmon populations decline, it becomes more challenging for DFO to allocate a diminishing resource.

Fisheries management in Canada sets up a perennial tug-of-war between conservation, economic and cultural interests.

Arnold expresses the economic value of salmon to the Canadian economy and the importance of a non-partisan approach to effective fisheries management:

> I think all members there (*on the Standing Committee*) want to put fish first, and fishermen right beside them as far as priorities… we realize that without fish we can't have fishermen and without fishermen we can't have prosperity or sustenance in our coastal communities or our marine communities… the partisanship really gets left aside there…how do we catch that harvest and yet do it sustainably so it's there for perpetuity? That's the challenge of scientists and fisheries management and politicians that guide some of the policies and the enforcement part of it. (Interview, February 18, 2019)

Although each stakeholder group advocates to DFO for maximum access to salmon for their own interests, actors throughout the network have to submit to the collaborative process by which DFO prioritizes these divergent agendas or interests.

Among interviewees there was a high level of trust in the research conducted by DFO. However, in some interviews, actors questioned the transparency of DFO decision-making processes. Some interviewees also questioned if DFO is acting as mandated by the Wild Salmon Policy. There is concern that political and lobbying pressure from economic beneficiaries of the fishery seem to have disproportionate influence in allocation decisions (Hill, Interview, June 13, 2019; Jennings, Interview, July 5, 2019).

DFO works within the legal framework of the Federal Fisheries Act. The Wild Salmon Policy sets out priority allocation of Pacific salmon. For all species of salmon, the first priority is ensuring a minimum number of fish return to the spawning grounds to preserve the brood population for future sustainability of the CU. Indigenous food, social and ceremonial purposes are served next, where a certain number of fish are made available to Indigenous communities to support cultural uses and food security. Sport and recreation fisheries have the next priority, where access to salmon is required to support the fishing lodges and guide outfitters of the lucrative tourism industry, and to non-Indigenous recreational fishing. Finally, the commercial fishery receives lowest priority, but they advocate that access to salmon is important to keep the Canadian commercial fishing fleet and coastal communities employed. There is, however, a slightly different allocation for sockeye. After the environmental allocation, currently 95% of sockeye salmon are allocated to Indigenous communities and other commercial fisheries.

This is a trial policy that ends in 2021, and will be re-evaluated. Increasingly commercial fishing licenses are being granted to Indigenous communities. Allocation among the groups is a constant act of diplomacy where actor groups trade access to salmon, conducted mainly through the Fraser Panel and coordinated through DFO. Riddell presents the priority decisions that have to be made in an environment of increasing pressure of climate change on salmon survival:

> … (*with climate change*) you are basically going to have to respect that you're going to lose more of the fish in the river and so you would increase what the managers would call the environmental management adjustment…that is an estimate of how many fish you're going to lose because of the environment, so when you put fish into the river, after the fish leave the ocean, how many do you have to make sure that they get through the river? So all you can do is reduce the fishing enough so you allow for those fish that are going to die along the way, and still meet the escapement goal. (Interview, February 6, 2019)

Using an open-ocean test fishery and in-river modelling tools combined with brood year estimates from four years previous, DFO calculates the total harvest that will allow a sustainable percentage of the population to return as escapement[5] to maintain the next generation. Allowable harvest allocations are calculated by taking the difference between the early season estimate of total fish returning and the fish that must return as escapement.

McEachern goes on to describe the process from his perspective as a member of the Fraser Panel representing commercial fishing interests:

> They (DFO) know exactly how many fish they want on the spawning grounds, and then they work their way backwards…and they know how much the food fishing is supposed to get, how much they've allocated to First Nation sale fisheries and how much they're going to lose to en route mortality all the way back out to the fishermen and that is how much is left and that's how much you (*the commercial fishery*) get. …I mean, the Fraser panel manages the Fraser fisheries, and everybody's at the table there. Even the people who don't think anybody should be fishing, they have a seat at the table. So they get to say their piece…I think the commercial fishermen have been neutered by the process. (Interview, June 12, 2019)

Aaron Hill, Watershed Watch Salmon Society Executive Director, counters the perspective that commercial fishing interests are given last priority by DFO:

> …it's really problematic because the Fraser panel is totally dominated by fishing interests. You have DFO representatives for the Canadian side, and you have the

[5] Escapement is the number of fish that actually make it back (from the mouth of the river) to the spawning grounds and successfully spawn (Nevin, Interview, January 17, 2019).

> American government fishery representatives on the American side, but aside from a couple people from the management agencies, the rest is all commercial, Indigenous and sport fishermen…as conservationists, we only have observer status on the panel…but the numbers they actually adopt are decided on by this panel that's dominated by fishing interests, and they consistently adopt (*to use*) run sizes that are higher than the commission scientists recommend, and management adjustments that are lower…that creates more fish on paper which means more fishing opportunities. There is this consistent bias towards risk-prone decision making. (Interview, June 13, 2019)

Environmental groups, such as Watershed Watch Salmon Society use their legitimacy with the Canadian public to pressure DFO to apply the precautionary principles (González-Laxe, 2005) embedded in their own policies. Conservationists lobby for DFO to allow a higher percentage of fish to escape up the river than in the past (Knudsen, 2000). They argue that this will compensate for the detrimental impacts of climate change such as rising river water temperatures and fluctuating water levels that increase in-river mortality.

In spite of public pressure to protect salmon for environmental reasons, Indigenous communities throughout the Fraser watershed seek to exercise court-upheld rights to access resources on traditional lands, as supported by the Delgamuukw ruling (Delgamuukw v. British Columbia, 1997) and continue to conduct commercial, social and ceremonial fisheries. Lebourdais describes the critical importance for communities to have access to a traditional fishery:

> The food is great. The food is fantastic, and everybody knows how good it is for you. But that is probably a quarter of the value of what salmon brings to us…salmon is connection to your family, your connection to your land, your connection to that river. … (*the legend of how salmon came to the people through coyote*) talks about our relationship to salmon being founded…not as a resource, but as a duty and responsibility that they were given when they were transformed, to come and help us…So they have that responsibility to us, but we have that responsibility to them, to ensure that we respect and honour the gifts and the sacrifices that they are making. And that is part of the duty that was given to them by the Creator. (Interview, July 9, 2019)

Morrison expresses skepticism about whether DFO follows the Wild Salmon Policy of prioritization of ecological conservation and respect for Indigenous food, social and ceremonial relationships to salmon. She points out that the federal fisheries mandate, as stated on their website, is to manage fish stocks as a "global export for trade". She interprets this mandate as automatically prioritizing salmon as a resource to build GDP, above valuing salmon as a food source for Indigenous peoples (Interview, February 7, 2019).

McEachern disagrees that commercial interests are given higher priority than environmental or Indigenous interests. He describes how DFO has recently begun to "buy up" commercial fishing licenses attached to vessels in the marine mixed-stock commercial fishery in the ocean and has allocated the licenses to Indigenous commercial fishing of known-stocks in the Fraser River system. According to him, this shift has allowed interior Indigenous communities to increase their access to salmon for commercial trade at the expense of coastal communities (Interview, June 12, 2019). As Matthew indicates, this concept is viewed positively by many and he confirms one such recently reintroduced Secwépemc Indigenous commercial fishery on Kamloops Lake as an economic and cultural opportunity for Secwépemc communities of interior BC (Interview, January 16, 2019).

After the needs of the environment and the Indigenous communities are prioritized, the sport and commercial fisheries lobby for economic opportunities to fish. Jennings describes his role in the BC Fishing Lodge and Guide Outfitter Association, as "advocating for fishing tourism and making sure that any legislation doesn't unfairly target our stakeholders or impact their businesses" (Interview, July 5, 2019). Jennings makes the case that a fish caught and released through sport fishing can create significantly more revenue per fish than through commercial fishing for food consumption. However, DFO is often seen by the sport fishery sector as being biased toward the interests of commercial fishing (Interview, July 5, 2019). While the perception among network actors is that the commercial fishery has the most power to affect allocation decisions, recent salmon population declines have made the commercial fishery the prime target of reduced allocation.

Actor groups are often dissatisfied with DFO wild salmon management because of variation in forecasting which leads to over or under fishing the Fraser River system. When more fish appear at the spawning grounds than anticipated in the early season, as happened in 2010, those with commercial and recreational fishing interests are frustrated by not having access to the surplus of fish. Sometimes fewer fish return than is predicted by early season estimates, as in 2018, and conservationists and the public question DFO for allowing commercial fishing interests to harvest the returning population below sustainable limits (Hill, Interview, June 13, 2019). Post-season escapement numbers (salmon that arrive at the spawning grounds and are physically accounted for and reported by DFO at the end of the season), often vary widely from early-season run-size estimates, on which harvest allocation

decisions were made. However, by the time actual escapement is calculated it is too late to reverse harvesting decisions based on early-run estimates. With regards to the vulnerability felt by actors at the Adams, Bellows says:

> … it's a little frustrating, again, it's just that mindset that we need to fish the surplus and not put something into the savings account for the next time, it's just, let's hammer them up front, right, … and that's what they're doing here with our run. They have no idea how many are coming back. It's a guess. Well, they do pad it, they definitely do, but the whole escapement and how many are coming back, I mean, I could throw a dart at a dart board and give you those numbers, like it's ridiculous right? (Interview, March 19, 2019)

Agreeing with Bellows, Reynolds (Interview, June 12, 2019) compares predicting how many fish will actually arrive at the spawning grounds to "predicting the weather two years in advance". McEachern speaks to the DFO's seeming inability to adapt to in-season fluctuations:

> The department is basically too slow to react to problems. They never shut the fishery down fast enough, that's a chronic bureaucratic problem, and they also never ramp the fishery up fast enough to capture unexpected surpluses. So you're left with this big kind of slow moving bureaucratic monster. (Interview, June 12, 2019)

From an Indigenous perspective, Dave Nordquist, Title and Rights representative for Adams Lake Indian Band (ALIB) and a Secwépemc man with traditional ties to the Adams River, expresses the frustration of Indigenous peoples at the Adams River. Nordquist highlights the perceived power imbalance between conservation and commercial interests:

> Every decision they (*DFO*) make is to try and really ride the edge of conservation. I mean, the way they managed the fisheries this past fall (*in 2018*), they are the reason we had the lowest return on a dominant year to the Lower Adams. It was their decisions that eliminated that safety factor, to catch a few more fish. (Interview, June 6, 2019)

Fisheries-management models are struggling under cumulative impacts that are particularly relevant in historically low salmon returns. In its own Government of Canada, *State of Canadian Pacific Salmon* report (Grant et al., 2019), DFO recognizes that salmon management decision-making models from the past cannot be applied under the present climate-change conditions. DFO and its actor group partners must commit to making difficult and potentially politically and economically unpopular salmon allocation decisions to ensure adequate numbers of fish survive the journey back to spawn. With the stakes so high, a precautionary approach to fisheries management (González-Laxe, 2005) has never been so relevant, as the

actors involved decide whether or not they are truly committed to the survival of wild Pacific salmon.

Mounting Tension in the Network as Competition Increases for a Dwindling Resource

Beyond the jurisdictional complexities and fisheries challenges outlined above, as salmon populations decline and fish allocations become tighter, tensions are growing among actors. Cooperman expresses the frustration felt by immediate actors in the network as a result of impacts on salmon in the ocean environment:

> … the survival of salmon isn't up to us (*at the Adams*). It doesn't happen here. It happens in the ocean and the main problems for salmon are overfishing, climate change, and salmon farms...And those three issues, anybody living in the Shuswap can have no impact on them, other than writing letters or signing petitions. (Interview, January 31, 2019)

DeArmond describes pressures originating from actors downstream overpowering interior habitat protection efforts by BC Parks:

> I would say that there's a lot of variables and unknowns that are occurring downstream… that's what worries me the most…what's happening out at sea. Why are we seeing these tiny runs coming back in some areas or not at all in others? … And yet, we can say why, but we also know global ocean temperatures are rising. There are temperatures that are recorded that are higher than have ever been seen before. There are wildfires in BC for the last two years that have been two of the largest wildfire seasons for area destroyed… I mean, there's so many things going on and I don't know how to predict what's happening outside of the park. (Interview, January 17, 2019)

There is clearly a lack of communication between actors working in the oceans and forests, and those at the Adams River.

Tensions within immediate actors exist at the Adams as well. For example, people who fish for sport, conservationists and the Salute festival managers struggle to deal with the issue of recreational fly fishing in the Adams River during the salmon spawning season. Those fly fishing have waded into the Adams to catch trout during salmon spawning season for over one hundred years (Haig-Brown, 1974). Some see fly fishing in the Adams River as low risk to salmon populations (Reynolds Interview, June 12, 2019). Jennings argues that individuals fly fishing have knowledge of salmon habitat and believe they are able to step around redds responsibly (Interview, July 5, 2019). Others, like Don Paterson, past President of TARSS and Salmon Symposium Chair (2018) explain that visitors to Tsútswecw Park are confused by park

rules disallowing photographers or children entry to the water or disruption of the fish during spawning, while at the same time observing anglers wading directly among the salmon redds (Interview, January 8, 2019). In 2018, TARSS requested that BC Parks ban fly fishing in the river during spawning (Paterson, Interview, January 8, 2019). BC Parks is caught in the middle, with a mixed mandate to protect the ecology of the park, but also allow the public to enjoy and access it (DeArmond, Interview, January 17, 2019). This presents a challenge for BC Parks because they do not have jurisdiction in the water, which is the role of the BC MOECCS and the sport fishing regulatory body, FLNRORD. In addition, because this is salmon habitat, it technically should be the responsibility of DFO. The BC Fishing and Resort and Outfitters Association and local Fish and Game clubs seem to be lining up to defend fishing rights. Meanwhile conservation groups such as TARSS and local Indigenous communities are urging closures to protect salmon in the river (A. Arnouse, Interview, January 10, 2019). This situation is not yet resolved and will likely take significant collaborative efforts between sport fishing representatives, BC Parks, TARSS and DFO.

Rising tensions between upriver and downriver Indigenous communities are building around salmon conservation. LSLB is the Indigenous community at the Adams River spawning grounds. A. Arnouse describes how they try to use their voice as caretaker of the spawning grounds to appeal to fellow Indigenous communities in the lower river system to reduce fishing efforts and allow more salmon to "return home". He explains that their community has voluntarily chosen not to fish the past few runs at the instruction of Elders. But the LSLB community finds it difficult to watch their Indigenous neighbours downstream continue to catch fish for food, social and ceremonial reasons, and to see the terminal Indigenous commercial fishery on Kamloops Lake take thousands of fish from the system (Interview, January 10, 2019). Kukpi7 O. Arnouse thinks a four-year fishing moratorium is imperative to salmon conservation. He discusses the importance of collaboration among the Indigenous communities:

> I've sent that message that we ourselves are going to set the example, that we have to put a moratorium on fishing… but nobody's acting on it. Like, our band, we protect the sockeye, but Adams Lake has a commercial fishery that's only ten km down the road from us, so it's kind of hard to protect the sockeye when your neighbouring band is out there catching at least a thousand to three thousand sockeye on a run. And then you see a small number return, and it's kind of like, how do you fix that? And you have to fix that with the First Nations before you can fix it with DFO. So I think that's just the

> biggest barrier now is the communication not just with DFO but First Nations and First Nations bands in general too, have to be on the same page in order for it (*salmon conservation*) to go somewhere. (Interview, January 29, 2019)

However, other Secwépemc Indigenous community members, including Nordquist, defend Indigenous fisheries in their communities as necessary to the survival of their culture (Interview, June 6, 2019). SFC, which conducts a fishery on Kamloops Lake, insists the terminal fishery is the most sustainable form of fishing (Matthew, Interview, January 16, 2019) and supports the community members involved. While encouraged by conservationists as a way to reduce by-catch and ensure the harvest of known populations (Cooperman, Interview, January 31, 2019), many people see the terminal fishery as a gesture of reconciliation not conservation (Bellows, Interview, March 19, 2019; McEachern, Interview, June 12, 2019). The transfer of fishing licenses from the largely non-Indigenous, mixed-stock marine fishery in the ocean to the largely Indigenous, known-stock terminal fishery in the Fraser River system is seen as "coming at the expense of coastal communities" (McEachern, Interview, June 12, 2019). Creation of a terminal fishery, although intended to create a more sustainable known-stock fishery, is leading to increased tensions between communities such as LSLB and other Indigenous communities down the river and on the coast.

Wild salmon returns are dwindling in the Fraser River system (Grant et al., 2019). However, many regions, such as the state of Alaska, are currently witnessing record salmon returns because they add ever-increasing numbers of hatchery-reared fry into the ocean. Jennings points out the increase of hatchery-produced fish by international actors and the potential negative impact on the Adams River salmon (Interview, July 5, 2019). This is driving Canadian provincial and federal governments to consider large-scale enhancement projects to increase Canada's salmon productivity. However, Canadian conservation groups insist that increased enhancement of BC salmon will harm wild salmon habitat and communities in the interior of the province, since salmon will potentially return to hatcheries and not to native spawning grounds. Instead they advocate for natural habitat protection ahead of investments in hatchery programs. International governments, working through bodies such as the Northern Anadromous Fisheries Commission and the PSC, are grappling with the issue of access to shared ocean resources for growing fish from different countries. The challenges and controversy surrounding hatcheries and enhancement demonstrate the pervasiveness and

interconnectedness of salmon issues from local, provincial and international perspectives. Clearly there is a need for collaboration and compromise from all levels of government and between all actor groups to effectively protect and manage salmon for future generations.

Conclusion

As wild salmon populations decline, it is fundamental for the socio-economic and cultural sustainability of all impacted communities and the environments that sustain them, that we understand why. Relationships among actors have an effect on salmon sustainability. As this study demonstrates, to overcome barriers between actors and improve the sustainability of wild salmon we must understand the complexity of the diverse actors in the network. Using a geographic representation to categorizing the actors in this network in alignment with the salmon life cycle is an innovative way to identify and analyze relationships among the actors. Immediate actors at the Adams River collaborate to host the Salute to the Sockeye Festival which facilitates education of salmon conservation locally and internationally. However, these same actors struggle to agree on how or if they should implement a fly-fishing ban in the river during salmon spawning. Near actors often appreciate the economic benefit of the salmon returning to the Adams and Shuswap, but are less aware of the impact of their land-use choices on salmon conservation. Foreshore disruption, siltification and eutrophication from forestry and the turbidity of water from boats all affect salmon fry survival in the nursery lakes (Stockner & Ashley, 2003). Middle actors, as they pursue harvesting interests, directly influence the numbers of returning salmon to the Adams. Distant actors, such as international hatchery operations and warming oceans caused by human activity, have the largest impact on salmon returning to spawn, but have the least connection to the Adams River. Complex Pacific salmon management systems in Canada lead to power struggles among international actors seeking access to salmon for their own interests. A comprehensive understanding of the actors involved helps to uncover where overlapping jurisdiction and competing interests create confusion and a lack of responsibility or ownership over issues. Examining the factors that make these relationships complex to begin with provides an opportunity to recognize the significant role human and non-human actors play in the conservation of wild salmon.

Despite the best intentions of the various actor groups to protect and support salmon populations, salmon are not thriving in the wild in BC. It is known that bio complexity affects

fisheries sustainability (Hillborn et al., 2003). Reynolds concludes that the vast and complex salmon life cycle itself poses the greatest challenges to the network of actors seeking to manage and sustain wild Pacific salmon. He believes that the extensive life history of the salmon which live in freshwater and saltwater habitats, and the movement through diverse geographic regions and ecosystems makes it extremely challenging to develop effective conservation strategies (Interview, June 12, 2019). It is encouraging that this research indicates that actors throughout the network have demonstrated a willingness to collaborate to support wild salmon conservation and sustainable harvest objectives.

Based on the evidence presented in this research, one of the best approaches to mitigate issues facing salmon is to give local actors a stronger voice in decisions affecting the watersheds in which they live. Actors in the interior of BC like the LSLB, BC Parks and the Salmon Society have first-hand knowledge of the returning salmon population and know when returns are low or unhealthy. These local groups, that are present at the start, and the end, of the salmon life cycle and witness actual population returns, need more power in the decision-making processes relating to salmon allocation and habitat conservation. Prioritizing localized influence in fisheries management is imperative because local organizations "reinforce the circumstances that facilitate strong conservation incentives, and facilitate the allocation of resources for the acquisition of the information necessary to act upon those incentives" (Wilson, 2006). DFO needs to be aware of the interior actor groups and recognize the knowledge these groups possess with regard to local river and lake spawning habitats. Adaptive co-management would be an ideal approach to shift focus to privilege local knowledge, as its main driver is cooperative management and exchanging of property rights or regulatory benefits. This in turn delegates some of the management responsibilities to actors who have more practical knowledge than large scale managers or politicians (Bellanger et al., 2020) and fosters a collective ownership of the issues facing salmon through greater collaboration (Armitage et al., 2009).

On a practical level, a major change that will help mitigate salmon decline is the elimination of guess work in calculating numbers of returning salmon to the Adams River. DFO needs to ensure that spawning grounds receive adequate numbers before commercial fishing is permitted. Bellows refers to this as "loading the spawning grounds" (Interview, March 19, 2019). The salmon should be allowed to return to the Adams River and once enough

fish to maintain a healthy population have returned to the spawning grounds, people can fish the tail end of the return. This will support enough salmon getting back into the Adams River to maintain a healthy population in the future. We need to shift the focus from salmon in the open ocean and the mouth of the Fraser, to looking more at the interior of BC and the salmon spawning grounds. This involves more DFO presence in the interior and at the Adams River. Commitment from all actors across jurisdictions to engage with each other and work towards collective decision making and policy amendment is essential to secure a future for the renowned Adams River salmon run and the diverse peoples and ecosystems it supports.

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CHAPTER 3: THE SALUTE TO THE SOCKEYE: A CONVERGENCE OF PEOPLE AND SALMON AT THE ADAMS RIVER, TSÚTSWECW PROVINCIAL PARK, BRITISH COLUMBIA

For thousands of years Adams River salmon have been returning to spawn in the waters of Cstellanetkwe (Adams River Watershed), Secwépecm'uluw (Secwépemc traditional territory in south central BC, Canada), in Tsútswecw Provincial Park. The Salute to the Sockeye (Salute), a quadrennial nature-based tourism event held in conjunction with the dominant sockeye salmon migration cycle to the Adams River, is hosted in the park by immediate and near actors as described in Chapter Two. Tom Nevin, DFO Community Advisor for the BC Interior, describes the primary motivation for hosting the Salute as the desire to celebrate the Adams River wild Pacific salmon run (Interview, January 17, 2019). Increasing awareness of decreasing and unpredictable salmon returns, the assertion of Indigenous presence in traditional territories, and the need to manage the impact of visitation to Tsútswecw Provincial Park have led to a collaborative approach to hosting the Salute (DeArmond, Interview, January 17, 2019). This chapter examines how a network of relationships built around hosting a nature-based tourism event can enhance the socio-economic and ecological sustainability of the Adams River salmon run.

Hundreds of thousands of Canadian and international public have attended the Salute at Tsútswecw Provincial Park. Blair Acton, the TARSS Vice President and Salute committee chairperson in 2014 and 2018, explains that the group of actors organizing the Salute oversees the logistics of hosting thousands of visitors in one three-week period. They also provide interpretative experiences to educate and promote salmon conservation and provide an enjoyable and meaningful visitor experience (Interview, February 4, 2019). Kruger et al. (2018) provide a market segmentation analysis that reveals both push and pull visitor motivations to attend the Salute. In 2015, Androkovich performed an economic impact analysis on the 2014 Adams River salmon run, demonstrating a significant economic benefit to the community from the Salute. However, as Salute attendance and economic benefits increase so does concern about whether a nature-based tourism event can promote salmon sustainability without damaging the natural phenomenon and environment upon which it is based (Paterson, Interview, January 8, 2019).

Tourism visitation to natural areas can have negative impacts on ecosystems, communities and local economies (Marion et al., 2016). The Salute brings thousands of visitors to a relatively small 12 km stretch of river in a BC provincial park, within a short three-week period (Kruger et al., 2018). This concentrated visitation could potentially prove unsustainable for the ecosystem, economies and communities that support the experience. However, hosting the Salute collaboratively builds cooperation and trust between the actor group, enabling them to break down normally existing jurisdictional and socio-economic barriers.

Two key questions guided this chapter examining whether a tourism experience can provide a vehicle for actors to work collaboratively toward improving sustainability: 1) What effect does a nature-based tourism event like the Salute to the Sockeye at the Adams River salmon run have on the sustainability of a species, community and economy?; 2) Can a nature-based tourism event be a vehicle for sustainability? This research demonstrates that a nature-based tourism event held in a protected area, with a strong bridging organization at the core can contribute to sustainability of a species and be a driver for change. The Salute is an example of a tourism experience contributing to socio-economic and environmental sustainability.

Literature Review

Nature-based Tourism, Sustainability and Protected Areas

Although nature-oriented tourism is often seen to align with environmentalism (Stoddart & Nezhadhossein, 2016), the industry is increasingly under scrutiny for its socio-economic and environmental impacts (Buckley & Coghlan, 2012, Strickland-Munro et al., 2009). The United Nations Sustainable Development Knowledge Platform defines sustainable tourism as tourism that leads to the management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity essential ecological processes, biological diversity, and life support systems (n.d. retrieved March 01, 2021). Nature-based tourism has been defined as a form of tourism where nature is the primary attractant or setting (Buckley, 2009). Ecotourism is further segmented by The International Ecotourism Society (TIES) as responsible travel to natural areas that conserves the environment and improves the welfare of the local people (n.d. retrieved March 01, 2021). As a form of nature-based tourism that is widely considered a tool of biodiversity conservation, ecotourism often produces mixed results (Das & Chatterjee, 2015). Indigenous tourism is seen

as an aspect of sustainable tourism and is often a key part of community economic development strategies for Indigenous communities. Often natural and cultural resources are used as the basis of the Indigenous tourism experience (Hinch & Butler, 1996, Butler & Hinch, 2007). Indigenous tourism often emerges in parks and protected areas and frequently involves co-management of traditional territories on government owned land (Zeppel, 2007). The Salute is a nature-based tourism event in a BC Provincial park that has economic and social impacts on Indigenous and non-Indigenous communities in the region.

Nature-based tourism is one of the fastest growing tourism sectors in the world and is often viewed as a sustainable form of development for host communities (Stoddart & Nezhadhossein, 2016). Protected areas are found to be significant aspects of nature-based tourism systems and development of protected areas are increasingly being integrated with nature-based tourism (Elmahdy et al., 2017). However, as outlined by Ashok et al. (2017), the impacts of nature-based tourism on local communities and ecosystems can be severe. Scholars have explored the concept of community sustainability in tourism (Das & Chatterjee, 2015, Higgins-Desbiolles, 2004). Sonjai et al. (2018) present the concept of community-based ecotourism (CBE) as a way to balance socio-economic interests and the environment. Marion et al. (2016) assess the biophysical impacts related to visits to wilderness and other protected areas of the United States of America, and demonstrates the degradation of the environments supporting nature-based tourism.

Ecosystems constitute the main capital for nature-based tourism (Kuenzi & McNeely, 2008). The Salute is an example of a nature-based tourism experience relying on an ecosystem that supports wild salmon. The Adams River lies completely within Tsútswecw Provincial Park, which has a legislative mandate for protection of natural and cultural resources while allowing for enjoyment by the public (Government of British Columbia, Approved Tsútswecw Provincial Park Management Plan, 2002). Each fall people visit the park to view salmon spawning from platforms and shorelines. The Salute occurs every four years when visitors come in especially large numbers during the dominant sockeye salmon run (Kruger et al., 2018). Fisheries and Oceans Canada (DFO), BC Parks, Destination British Columbia (DBC) and other regional tourism organizations, such as Thompson Okanagan Tourism Association (TOTA) and Shuswap Tourism promote festival attendance. DBC markets the Salute as a nature-based tourism experience to both domestic and international visitors (Cyr, Interview,

May 27, 2019). In spite of concentrated visitation during the Salute, negative impacts to the ecosystem from tourism activity have not been researched. However, considering the body of evidence showing that nature-based tourism can have negative socio-economic and environmental impacts, it is important to consider ecological and cultural sustainability of the Salute.

Sustainability research has been applied to numerous fields of study using inconsistent definitions of the concept (Johnston et al., 2007). Studies have looked at the various definitions (Alhaddi, 2015, Missimer et al., Part 1, 2016) and frameworks to unify an operational definition (Missimer et al., 2016). The 1987 United Nations Brundtland Report, *Our Common Future* (World Commission on Environment and Development), provides the most widely accepted definition of sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The Triple Bottom Line approach, coined by Elkington in 1998, provides a framework for measuring sustainability using three lines: economic, social and environmental. It has been recommended that nature-based tourism studies focus as much on the social impacts as the natural sciences (Buckley, 2009). Many Indigenous communities approach sustainability from the perspective of "seven generations" (Clarkson et al., 1992). The lens of sustainability from socio-economic and environmental perspectives was applied to this research, integrating the Triple Bottom Line approach, and Indigenous Seven Generations perspective, which aligns with the participatory methodologies utilized.

Often management of protected areas requires tradeoffs between values of preservation and allowing visitors to enjoy those values. Thoughtfully engineering protected area tourism planning partnerships is important to develop and implement informed actions (McCool, 2009). Protected areas can be conceived as part of a complex social-ecological system, causing decision-making and management to be particularly complex (McCool et al., 2013). However, it has been demonstrated that bridging organizations can mediate between people or groups in complex relationships to achieve conservation goals (Rathwell & Peterson, 2012).

Provincial parks constitute 14.4% of the land base in BC (Government of BC, Protected Lands and Waters – Environmental Reporting BC, 2018) and understanding the role of parks in sustainability is critical to supporting future ecosystems, economies and communities throughout the province. While there is literature examining national parks in Canada in an

Indigenous context (Mason, 2014, Thomlinson & Crouch, 2012, Binnema & Neimi, 2006, Murray & King, 2012), there is minimal research published regarding tourism in BC Provincial Parks (Clayton et al., 2011, Eagles et al., 2013) and even less about Indigenous tourism in provincial parks. However, there are some important studies worth noting. For example, Darimont et al., (2010) speak of the critical role of parks and sanctuaries in salmon conservation, and Pfueller et al. (2011), provide evidence that improved biodiversity conservation is an outcome of partnerships between park managers and the tourism industry in Australia. This chapter will contribute to the body of literature related to parks and protected areas of western Canada through examining the effect of relationships between actors on socio-economic and environmental sustainability.

Contextualizing the Salute to the Sockeye

The Salute is a three-week celebration of wild salmon occurring every four years at Tsútswecw Provincial Park in the southern interior of BC. During the month of October, typically a shoulder season for the BC tourism industry, an influx of thousands of visitors from across Canada and around the world visit the park (Acton, Interview, February 4, 2019). Festival goers disembark from buses and cars at the main parking area and walk down well-marked trails to stand at viewing stations alongside spawning channels to observe salmon spawning in native spawning habitats. A recently installed wheelchair accessible trail, funded through the Pacific Salmon Foundation (PSF) makes it possible for nearly every visitor to see salmon from the main viewing platform (Riddel, Interview, February 6, 2019). Visitors may join a tour hosted by volunteers from the Adams River Salmon Society (TARSS) or DFO. After viewing the salmon, people walk back through the main festival grounds to visit local art displays, eat wild salmon and bannock burgers at a food truck, listen to live music, or read the park interpretive signage (Acton, Interview, February 4, 2019). Through stories, music and displays, Indigenous community members share the significance of salmon to the Secwépemc people. In 2014 and 2018, some Indigenous community members led interpretive walks (A. Arnouse, Interview, January 10, 2019). Inside the TARSS interpretive cabin volunteers explain the salmon life history to visitors and sell festival souvenirs which help fund other TARSS initiatives throughout the year (Acton, Interview, February 4, 2019). Under a large tented area, PSF and other conservation groups such as the Columbia Shuswap Invasive Species Society,

present displays about wild salmon ecology and the challenges of salmon conservation (Nevin, Interview, January 17, 2019). Shuswap Tourism provides local visitor information, involving volunteers and staff from local Chambers of Commerce (Cyr, Interview, May 27, 2019).

In 2018, approximately 80,000 visitors attended the Salute (Acton, Interview, February 4, 2019), approximately ten percent of whom were local students arriving on buses with their teachers. BC Parks rangers, and other provincial Ministry of the Environment and Climate Change Strategy (BC MOECSS) staff, partner to host the school groups on interpretive trail walks to explain the salmon spawning habitat and describe the role of salmon in the ecosystem (DeArmond, Interview, January 17, 2019).

Interviewees describe in detail the way people are affected by visiting the Salute. Don Paterson, President of TARSS during the 2018 Salute, recalls how protecting salmon becomes a "real issue" to visitors after attending the Salute (Interview, January 8, 2019). He describes how a sensory combination of physically seeing the salmon in their spawning environment, reading and listening to the interpretive displays and music, tasting the local food, exploring the art and experiencing the smells of decaying salmon is what makes attending the Salute so compelling as a nature-based tourism experience. However, it is the ability for people to stand physically proximate to the river that Paterson opines affects people the most. Paterson describes a personal interaction he had during the 2018 Salute:

> People walk away from it saying I'm different…one young woman was at the river with me with two little girls, probably five and seven, and we sat there together… I pointed to a male fish in the river and it wasn't long after that the fish simply rolled on its side and ceased to be. And she said to me that is so sad but so beautiful. That is going to commit her to the Shuswap for the rest of her life because the experience was transformational and that is the object of the experience with tourism, is to simply say, you're not there to provide a commodity like a cup of coffee, you are providing something that is a life-affirming or life-transforming experience. (Interview, January 8, 2019)

Phil McIntyre-Paul, local trail advocate and tourism specialist, reinforces Paterson's impression of a transformational visitor experience. He describes hosting clients on a contemplative hiking program at the Adams River during the 1990s:

> …to come to know a pair of fish that are spawning and go back over a five or six-day period. And actually see them spawn and see what kind of transformational experience that was in people's lives…it really was profound…you're actually in the stench of it

> and starting to really get it that these fish that are getting dragged up (*by animals*) and then chewing them and dropping them and then realizing that those nitrogen molecules are being found in trees three hundred feet into the forest and the forest wouldn't even be there, that whole trophic movement… You're just realizing how this all connects. (Interview, February 5, 2019)

Wes DeArmond, BC Parks Area Manager, describes the Salute as a place of social connection:

> … people go, "we're going. We're going to the Adams and we're going to meet" and you get all sorts meeting, and we see it all the time when we have the Salute. We have loggers, fishermen, miners, you name it, car salesmen, teachers, doctors, dentists, I mean you get the whole gamut, you get the whole perspective of individuals coming, people with intellectual disabilities, people with physical disabilities, and challenges and I mean it goes from every country, from every walk of life, so whatever it does it brings people, attracts people to come. (Interview, January 17, 2019)

Ryan McEachern, a commercial fisherman from the Lower Fraser River, explains why he travels 400 km to attend the Salute, far from the mouth of the Fraser River where his family fishing fleet has been harvesting these same salmon for generations:

> … I was there for the spawn in 2010 and 2014 because I wanted to go see it because those were huge massive escapements. And it was neat… The fish belong to all the people of Canada, so if that's how they want to spend them (*at the festival verses being harvested*), that's ok with me. (Interview, June 12, 2019)

Although it is organized by a small group of actors, the Salute is a significant event for actors from throughout the network. Thirty of the thirty-one interviewees, some living over 500 km from the Adams River, reported attending at least one Salute. Twenty-one interviewees reported attending the festival in 2018 and thirteen have attended more than one festival in their lifetime.

The Salute has power to affect the general public toward caring about salmon conservation. Sunny Lebourdais, Director of Transformation, Quelmente-Secwépemc, a Government to Government initiative in the region, explains her perspective of the power of the Salute and the Adams River salmon run:

> …it's (*the Adams River salmon run*) obviously hugely contributing to the overall sockeye runs in the Fraser, but I think it has become more than just numbers. It's a symbol of what used to be or what could be. And in a way it has become a bit of a litmus test or an indicator in a lot of people's minds. You know, they may not know a lot about the Raft River and some of the salmon runs there that happen on the North Thompson or other areas. But the Adams has got a lot of recognition publicly so I think

> it has a special role to play in what it can teach us because it has captured people's imagination. (Interview, July 9, 2019)

Local fishing guide and outfitter, Jason Bellows, adds to what Lebourdais says, explaining the importance of the Salute in educating actors throughout the network to realize the importance of spawning habitat in the interior to the overall salmon ecosystem:

> … a lot of those people at the coast have never seen the spawning grounds, they have no idea. They fish the fish at the coast, they fish them in the Fraser, they fish them in the marine environment, they have no idea where their home is, they have no idea what it takes for them… It's an education thing, right, so everybody wants to take advantage of the resource but they have no idea where the resource comes from, or what it takes for them to be happy here at home. (Interview, March 19, 2019)

Aaron Arnouse, band councilor for Little Shuswap Lake Band (LSLB) contends that from the perspective of the local Indigenous community there is value in the Salute event to influence the public and others in the network to understand the importance of salmon to the local Indigenous peoples (Interview, January 10, 2019). Kukpi7 O. Arnouse, speaking about why LSLB is involved in the Salute and what he sees as the future of the Salute for his community:

> …I see it going further. I see it as more people coming together to better understand what the Tsútswecw actually means and their part in it and their grandfathers' part in it and their grandmothers' and why we had that place you know, and today it's for everybody, not just us, so the memory I guess of the ancestors and the songs they sang and the ceremonies they did and the way they just walked on the earth, bringing those people different generations back together again to show people that it's still here. The salmon song the salmon dance. (Interview, January 29, 2019)

The Salute creates an opportunity for Indigenous people to share with non-Indigenous people the value of salmon to their culture. It is also a way for Indigenous peoples to maintain their own cultural and spiritual connection to salmon.

Reiterating the perspective that the Salute holds a unique role in influencing people toward concern for salmon sustainability, Brian Riddell, President of PSF, summarizes the reason his organization is supportive of the event:

> … but because it's a particularly famous run and has lots of values for British Columbia and First Nations peoples we do put a priority on that making sure we support them when they come (*for support*) …it's (*the Adams River Salmon Run*) been referred to as one of the seven wonders of the world. It's not counted as number seven but it's probably number eight. In people's minds… it's a unique place and it's wild Pacific salmon. (Interview, February 6, 2019)

As a celebration of wild salmon, the Salute clearly has an important role in influencing the Canadian public. The actor groups facilitating the event are critical in promoting wild salmon conservation in BC.

Although the Salute plays an important role in the community now, Colin Speikerman, President (2019) of TARSS and Food and Beverage Manager at the LSLB-owned Quaaout Lodge, in his interview raises that the Indigenous community has been celebrating and welcoming salmon back to the spawning grounds long before the Salute's existence:

> …this is the head of one of the largest salmon runs in the world, so it's a natural gathering place for people and has been for thousands of years…the story a thousand years ago would have been harvesting, catching, trading, eating and celebrating the salmon coming back, now it's…teaching people the importance of conservation on a larger scale, getting other people involved. (Interview, January 17, 2019)

Secwépemc interviewees affirm that they continue to welcome salmon back to the spawning grounds each fall, as they have since time immemorial (A. Arnouse, Interview, January 10, 2019; O. Arnouse, Interview, January 29, 2019; Michel, Interview, July 4, 2019). LSLB Kukpi7 O. Arnouse, explains, "… we have a First Salmon Ceremony…when the first salmon (*of the season*) comes we have a ceremony" (Interview, January 29, 2019). A. Arnouse also refers to the ceremony honouring returning salmon as significant to the Secwépemc community:

> …our Elders, they do the First Fish ceremony every year the sockeye return. And that's one of the bigger cultural things that we do for our community, when the sockeye come home. And it's probably the most important one. (Interview, January 10, 2019)

Salmon are a cultural keystone species for the Indigenous peoples of BC (Turner, 2008). Welcoming salmon back to the spawning grounds is a critical part of the local Indigenous peoples' culture. As the quadrennial Salute continues, involvement of the Indigenous communities in the organizing and hosting of the Salute reflects the spirit of the ancient First Fish ceremony. This respects and honours the returning fish, first and foremost. The existence of a salmon celebration event at the Adams River is a continuation of an enduring legacy long established by Indigenous people of the region.

Since European settlers have come to the region over the past 150 years, salmon celebrations involving Indigenous and non-Indigenous people have been hosted at various locations near the Adams River. Kathie Cooperman, a non-Indigenous long-time resident and

agriculturalist in Lee Creek, on the north shore of Shuswap Lake, recalls attending a salmon festival as a child. She describes a carnival-like celebration held beside Little River on LSLB land, adjacent to the current-day Tsútswecw Provincial Park:

> I think the first Salute was in the 50s…yes, when I was five years old. That was 1953. … seemed like it was tourism or something like that. They had people cooking on the spot, and bringing in salmon cooked in various ways, they had presentations and they had a movie about the salmon run and the return of the salmon…it was in these big circus tents along the Little River. They used to get great crowds and it was all lined seating. It was fun. I remember being so impressed by the jellied salmon…it was moulded into a big salmon on a huge platter and brought around for people to try… they (*Indigenous community members*) were in regalia. It was great. I think the whole of Kamloops came out, for the event, as they did every weekend anyway, to go swimming. It was bumper to bumper traffic to come out to Shuswap Lake, Little Shuswap Lake. The good old days, you know! (laughs) (Interview, January 31, 2019)

It was not until 1993 that the Salute to the Sockeye was celebrated on BC Parks' land (DeArmond, Interview, January 17, 2019), which is within the traditional territory of the LSLB. DeArmond reflects on his involvement as part of the community hosting the event:

> … the Salute's been going on since 56 but the reality is that the First Nations have been celebrating it for millennia…it's one of those things where you think oh yeah, I'm going to be there and help put the Salute on but … it's almost like it's part of the Shuswap, people start to smell it in the air, they start to hear about it in Mission and Chilliwack and Agassiz, and what's coming? Well, millions of millions of salmon are coming back…it actually starts to affect people in different ways even before you have the Salute, actually. It's quite something, really. So, part of that you start to build off that energy, the salmon are coming back, they're coming home, so it's fun too. So that's what helps me put it (*the Salute*) together. (Interview, January 17, 2019)

It is critical that the actors at the Adams River continue to collaborate with Indigenous and non-Indigenous partners to support the sustainability of wild Pacific salmon for future generations.

Since the 1980's, increased visitation to the Salute has intensified pressures on the surrounding community. People visiting the Salute by bus or car caused long lines of traffic, backing up onto the local roads at the height of the salmon run (Cooperman, Interview, January 31, 2019). Trails were eroded and braided by walkers and people encroached on the riparian habitat as they sought to stand closer to the water to see the salmon spawning (McIntyre-Paul, Interview, February 5, 2019). With hundreds of visitors arriving at the park using limited outhouse facilities, long queues developed at the toilets (Acton, Interview, February 4, 2019).

To alleviate the pressure, local residents volunteered to park cars and host visitors, but were left exhausted and frustrated that they were not able to provide better facilities or programming. Responding to the challenges presented by increasingly larger numbers of visitors to the Salute, in 1993 BC Parks, DFO, and other local community volunteers collaborated to create TARSS which would act as an organization to coordinate the Salute and help manage the flow of visitors to Tsútswecw Provincial Park during the Salute (DeArmond, Interview, January 17, 2019). Because TARSS was a not-for-profit organization working at arm's length from government, the organization was able to apply for grants. They were given permission to charge an entrance fee during the Salute festival and funds collected were used to improve facilities in the park. Pressures from traffic control issues, waste management, visitor services, and physical impacts from people trampling in the forest and spawning beds were alleviated by the formation of TARSS and the collaborative approach between TARSS, BC Parks and DFO to manage the Salute event. Paterson describes the original purpose of the formation of TARSS:

> The whole purpose initially was to help the ministries of Parks and Department of Fisheries and Oceans manage the movements and activities of large numbers of people during specific time period…The whole thing on the (*TARSS*) group was to facilitate the arrival and departure of large numbers of people who are coming to see the fish and to say… put on a number of different things, like the art show or the souvenirs or the teaching or the pamphlets or the tours or what have you…(Interview, January 8, 2019)

The creation of the society was also as a way to channel money back into salmon conservation. Acton explains:

> BC Parks and DFO were very instrumental in forming the society, they were the ones that chose the fact that the society was needed so the admission money coming into the event stays local. If it was put on by the government it would have to go into the general coffers of the government and not back into the area, so the society was created by them and encouraged local people to form the society and really helped guide the society in the first few years. (Interview, February 4, 2019)

Initially LSLB was not included in the TARSS board of directors or in the organizing and hosting of the Salute. However, in recent years LSLB has filled a permanent seat at the TARSS board and LSLB and other Indigenous community involvement on the board has increasingly influenced the event toward Indigenous community inclusion. Paterson speaks of this evolution within the TARSS organization:

> I think that it was probably 2016, maybe a bit before, that we recognized that with changing conditions…we (*TARSS*) had to be doing more than just be involved in helping Fisheries and Oceans and BC Parks to put on ostensibly, what's a big party. And so we became more involved in education, public awareness, interaction with government, and building relationships with First Nations communities. I think that was the essential transition from, initially being involved solely with putting on a celebration or a party, to beginning to meet a wider need (Interview, January 8, 2019).

The continued evolution of TARSS's priorities and focus as an organization is evidenced in their lobbying the BC Government in 2016 to change the name of Roderick Haig-Brown Provincial Park to Tsútswecw Provincial Park, the historical place name given by the LSLB leadership and Elders (O. Arnouse, Interview, January 29, 2019). The actor group hosting the Salute has demonstrated a willingness to adapt and change to support sustainability at the Adams River salmon run.

Examining the Actor Group Involved in Hosting the Salute to the Sockeye

The main actors involved in the organization of the Salute have been previously identified in Chapter Two as immediate actors in the Adams River salmon run actor network. As outlined in the previous chapter, actors in the wild Pacific salmon network are often siloed and do not regularly interact with one another in spite of their common interest in wild salmon conservation and management. However, several of the key actors from the network come together to collaboratively host the Salute festival. Including an overall desire to protect spawning habitat and promote salmon conservation, actors involved in the Salute report diverse secondary motivations for their involvement in hosting the event. Nevin sees DFO's involvement as a way to connect a large federal bureaucracy with the public. He further recognizes that bringing DFO volunteers to the Salute from places throughout the province is a way to build internal camaraderie within the organization (Interview, January 17, 2019). PSF hosts a display at the Salute where staff can share wild Pacific salmon information with a hard-to-reach public, which Riddell speaks of as a valuable way to build awareness of salmon conservation issues (Interview, February 6, 2019). In the Indigenous context, A. Arnouse explains that LSLB community members participated in trail interpretive tours and displays as a way to communicate the cultural value of salmon to their people (Interview, January 10,

2019). The actors collaborating to host the Salute have salmon conservation as a primary motivation, but also use the event to promote their individual organizational interests.

Planning for the Salute continues over the entire four-year salmon cycle and culminates in conjunction with the arrival of the dominant sockeye return to the Adams every four years. TARSS board of directors and volunteers meet regularly over the entire four-year cycle to plan for the Salute, to raise funds and to coordinate event logistics. The board of directors of TARSS includes DFO, BC Parks, LSLB, Adams Lake Indian Band (ALIB), the Village of Chase, Columbia Shuswap Regional District (CSRD), and local residents. In this way, TARSS acts as a bridging organization between the various actors involved in the Salute and the wild salmon network at large. Although they do not have a seat at the TARSS board table, in-kind and financial support is contributed to the Salute by many other actors. For example, PSF provided the funding to upgrade and maintain viewing platforms, trail infrastructure and a stage in 2014 and 2018, significantly enhancing salmon viewing opportunities and overall visitor experience (Riddell, Interview, February 6, 2019).

Involvement by the local Indigenous communities is increasingly important to the actor group organizing the Salute. A. Arnouse comments on the willingness of the LSLB community to engage with TARSS to organize the Salute:

> …preparing for the Salute runs, just the management of the park and working together and everyone, there's been a lot of changes in the past few years, with a couple of past presidents (*of TARSS*), in developing better relationships with Little Shuswap, and that being they've created a First Nations policy… And since that's been done it's been a lot better and a lot easier working with the groups on it. (Interview, January 10, 2019)

He further discusses his community's involvement with BC Parks and other non-Indigenous community members:

> …BC parks has been a good partner with Little Shuswap in the past…six years or so in working with us, and Wes DeArmond (*BC Parks Area Manager*) works closely with us from BC Parks. He's usually the first person to phone or send an email if something's going on with the park. He runs a lot of things by the Little Shuswap, before anything happens. We're usually the first people he calls. And our other partnership is with the Adams River Salmon Society…we've been part of that group for a long time, ten years maybe. We work together and we attend meetings with them monthly. (Interview, January 17, 2019)

The regular, ongoing meeting of actors involved in organizing the Salute, through the facilitation of TARSS as a bridging organization, creates a central point of connection between

the actors. However, this means that a relatively small, financially vulnerable not-for-profit organization plays a critical role in the entire wild salmon actor network (Acton, February 4, 2019). Actors should recognize that TARSS plays a key role in supporting Adams River salmon conservation and must be supported to continue this vital work.

At varying times throughout the four-year planning cycle, the immediate actor network at the Adams River broadens to include several other local and regional supporting organizations. McIntyre-Paul speaks to the motivation of the STA to work closely with TARSS at the Adams River:

> …consistently they (*Secwépemc leadership*) point us (*the Shuswap Trail Alliance*) to the water and to the salmon. Saying it must be in this framework, in this context, because ultimately water and salmon are such an important indicator of whether we're doing that well or not in this place. (Interview, February 5, 2019)

McIntyre-Paul further describes how the STA worked closely with the actors at the Adams River in preparation for the 2014 Salute to design functional and culturally representative trails that would effectively move visitors through the park while minimizing impact on the environment.

> …BC Parks asked us to come in and …(*we*) did a whole inventory of the Adams River Trail System, Roderick Haig-Brown (*now Tsútswecw*) Park trail system with an eye towards the planning that they were doing with the Little Shuswap Band, the Adams River Salmon Society and the wider community leadership… so they asked us to do an inventory, with a thought toward sustainable trails… there was opportunity to redesign and it needed to be more resilient and more responsive to the shaping of the river…part of our redesign was to use social direction to move people where parks (*BC Parks*) wanted them to go, and away from areas they wanted them to stay away from. (Interview, February 5, 2019)

Other community partners also describe working collaboratively with the actor group at the Adams. Robyn Cyr, Manager of Shuswap Tourism explains how she works with TARSS, BC Parks, the Chamber of Commerce, the STA, and other community groups to promote the Salute tourism experience and to create additional economic opportunities for local businesses. For example, she works with partners to host media tours to the park, and promotes surrounding amenities at an information tent during the three-week event (Interview, May 27, 2019). Riddell explains how PSF funds infrastructure upgrades to the Provincial park (Interview, February 6, 2019). Darlene Koss, administrator for TARSS, describes how schools from Kamloops and the North Okanagan bring their students to the park even in non-Salute years,

to learn about salmon ecology in partnership with DFO, TARSS volunteers and BC Parks staff (Interview, January 8, 2019).

Although DFO is a significant actor throughout the entire wild Pacific salmon network, Nevin describes the importance of DFO's collaboration with actors directly at the Adams River:

> …The Salute to Sockeye has four partner groups that make the event so successful. They are...the Adams River Salmon Society, the Little Shuswap Lake Band, BC Parks and DFO. In recent years DFO has taken on the educational portion of the event for the organized school fieldtrips, as well as helped by having staff walk throughout the park educating people on Salmon, answering questions and assisting in enforcing the rules of the park. The educational school sessions involve a Salmon dissection (*by DFO staff*) as well as an ecology lesson led by the Ministry of Forests, Lands, Natural Resources Operations and Rural Development staff volunteers. About 8,000 students participated in our educational sessions for the 2018 Salute. (Interview, January 17, 2019)

Not only does the Salute build collaboration between organizations, Nevin observes that participation in the event by DFO staff from across the province draws the DFO organization together as a team:

> …For the actual Salute event itself I think we had about 70 DFO (*paid*) volunteers come to run the interpretive stations and walk the park trail system to interact with the visitors…The DFO volunteers came from all over the Pacific region…Terrace, Prince Rupert, Vancouver, Vancouver Island, the Fraser Valley, wherever there are DFO offices in BC, really… DFO rents a large house in Scotch Creek (*adjacent to the provincial park*) and the out-of-towners get put up there. Some DFO staff were fairly new to DFO and wanted to increase their experiences while other staff make it out for every Salute because they enjoy it so much… I think they find it inspiring… (*Personally*) I enjoyed chatting with visitors that were really excited to see the miracle of the salmon coming up to spawn. I saw tourists that were in tears because they were so moved by the experience. I think that the DFO volunteers that came up enjoy the interaction with the visitors and they also enjoy meeting other DFO employees. We save money booking a house but we purposely book a house so DFO staff can have their evening time getting to know other DFO employees. I've met many DFO staff people from the Island that I wouldn't normally have met. (Interview, January 17, 2019)

Further, Nevin describes the importance of the Salute to draw the attention of the Federal Fisheries Minister and the Canadian public to the effects of fisheries management and policy decisions by DFO on wild Pacific salmon populations:

> …(*In 2018*) the Honourable Jonathan Wilkinson attended. He came and met all the partners involved and spoke with many people. He rafted the Adams River with the DFO Stock Assessment crew and tagged sockeye salmon as part of our enumeration

> program (*counting returning salmon)*. I met him again recently and he said his day at the Salute to the Sockeye has been his favourite work experience so far on this job. (Interview, January 17, 2019)

For various reasons, the immediate actor group at the Adams River comes together to organize and host the Salute, a nature-based tourism event. TARSS is the bridging organization facilitating collaboration between actors not normally connected, in spite of their mutual interest in salmon conservation and management. The Salute provides opportunities for actors to connect with others in the network through the common goal of the conservation of wild Pacific salmon at the centre of the experience.

The Sustainability Dilemma of the Salute to the Sockeye

Salmon run returns and visitation to the Salute festival have both been unpredictable over the past three dominant Adams River salmon run years (2010, 2014, 2018). These runs were characterized by large spikes in numbers followed by extreme lows. Acton explains how Salute organizers were overwhelmed when the largest recorded return of Adams River sockeye salmon occurred in 2010 (Interview, February 4, 2019). Over 3.8 million fish returned to spawn attracting over 100,000 visitors to Tsútswecw Provincial park. However, in 2018 only 80,000 people attended the festival to witness approximately 500,000 sockeye spawning (Cooperman, n.d.), one of the lowest returns of sockeye on a dominant run to the Adams River since the Hell's Gate slide completely blocked the return in 1913. The potentially high concentrations of visitors during a short period of time to witness unpredictable salmon returns led several interviewees to question the potential effect the festival may be having on salmon, salmon habitat and the communities and economies surrounding the Adams River. Because of the volatility of both salmon and visitors, at least two interviewees raised concern about the sustainability of Salute festival and the TARSS organization itself (Acton, Interview, February 4, 2019; Paterson, 2019). The Salute being held every four years was identified as a challenge in creating economic opportunities for the surrounding communities. Although they appreciate the potential revenue from the large influx of visitors to the Salute, businesses are hesitant to expand based on an intermittently occurring festival (Cyr, Interview, May 27, 2019; Demenok, Interview, June 8, 2019). Indigenous community members are very concerned that unpredictable salmon returns are affecting the sustainability of their culture and communities

(Lebourdais, Interview, July 9, 2019; Morrison, Interview, February 7, 2019; Nordquist, Interview, June 6, 2019).

At times, people visiting the salmon run trample and destroy the critical wild salmon spawning ecosystem or interfere with salmon spawning activity while enjoying the tourism experience (Paterson, Interview, January 8, 2019; Cooperman, Interview, January 31, 2019; McIntyre-Paul, Interview, February 5, 2019). Seven out of 31 of the interviewees expressed concern about the impact of Salute visitation on the salmon. These concerns are validated by research published by Marion et al., (2016) who found inevitable degradation of environments supporting nature-based tourism. However, most interviewees felt the benefits outweighed the impacts of the Salute. Increased public awareness leading to greater political will to protect wild salmon; the positive impact on the local economy; and the opportunity to share the local Indigenous culture far outweighed any concerns they had. It was expressed that negative impacts by visitors on the salmon were not well measured or documented and were likely outweighed by the positive outcomes of the Salute (DeArmond, Interview, January 17, 2019; Nevin, Interview, January 17, 2019). Jim Cooperman, president of Shuswap Environmental Action Society (SEAS), and one of the founding members of TARSS, observes:

> …salmon are definitely aware of people….from trying to get photos of them if you get up close they move away, they feel threatened. If you stay there long enough then, if you don't move, they forget you're there and they'll go on doing what they're doing. So certainly having so many people all around them could have an impact but I don't know how you could measure it or how large of an impact. (Interview, January 31, 2019)

McIntyre-Paul describes the irony of hosting the Salute, a nature-based tourism event, to enhance salmon sustainability:

> … there's this crazy migration and then this weird migration of people because they're compelled to come and see it…and how that has to be managed. Otherwise in our pure human curiosity and amazement you could see how we would just run amuck and destroy the whole thing. It's had ten thousand years for the salmon to come back and make this place super cool again, after the ice age. And now in an instant we've got so excited about it that we're going to obliterate it. All of that (*is*) in the irony… (Interview, February 5, 2019)

Paterson gives serious consideration to the impacts of tourism on the Adams River salmon run:

> … that's the crux of it, isn't it? You know… I remember in November I took a few people to the river and walked on the rocks and they didn't move and hundreds of thousands of feet have packed them down into the ground so it was like I was walking

> on cobblestones, which means to me that if the water level rises in the future no bloody way those eggs are going into the gravel. But people will argue that the speed of the river water will be enough to turn the rocks so the spawning can continue, but that is under normal conditions. A few thousand or so feet are not normal conditions. So to what extent this is sustainable, that is the ultimate question. And I think that's what's coming out of the universities these days. They are looking at this question. What do we do about over tourism? It's a huge question. (Interview, January 8, 2019)

John Reynolds, COSEWIC chair and salmon researcher at Simon Fraser University, speaks about the tradeoff of tourism and its impact on the Adams River:

> …Well, in principle I'm a big fan (*of tourism*) as long as it can be done protecting the thing that we love. And what I see at the Adams celebration looks pretty harmless to me. At least from the standpoint of the fish in the river. They aren't paying any attention as far as I could tell, to most of the people who are looking at them from the viewing platforms and things. And I love the food trucks and the displays and all the rest of it. So, I think it's great… I go every four years, usually for a day, just to salute the salmon and I haven't personally seen, I'm sure there's the odd abuse, of dogs running in the stream or kids throwing rocks at the salmon, or whatever else might happen, but to me this is the… it looks good to me. (Interview, June 12, 2019)

However, Darrel Hillaire, from the Lummi Tribe in Washington State, currently developing a film tracing the salmons' journey up the Fraser River from the Lummi ancestral home in the Salish Sea to the spawning grounds in the LSLB traditional territory, speaks cautiously about the impacts of tourism on both ecosystems and communities:

> …I think about some things that are off limits to tourism. Our spiritual practices, our spiritual connection to the land and the water. And it's typically off-limits. Now, I think there would be some places where we would have an opportunity to share out on the water, but you know, I think we would do more damage than good if we brought too many people. You know…they have the same problem with orcas, and I don't think we'd (*Lummi Tribe*) get into the orca-watching business because it disturbs them. So if it's disturbing to the environment or disturbing to the salmon's life, I don't think we'd want to do that. They're there for one purpose and that's to extend the cycle of life and the miracle of life. And the salmon is so integral to everybody's lifeline, the humans, animals, trees, the soil, and why would you want to interrupt that? So if that's happening then I would think we would want to stop doing that. (Interview, June 13, 2019)

Nevin feels reassured by what he witnessed at the 2018 Salute:

> I think the benefits are much greater than any kind of negative impact. The people that experience the Salute learn so much about our Pacific Salmon, the watershed and environmental issues… It's also much better for these visitors to witness the salmon spawning in a supervised setting rather than 80 thousand people heading out into the

> wilderness on their own to see it. That would be extremely damaging. This was the first Salute that I've worked at, I was really impressed with how it went down. The day after the Salute everything is gone, the venders, the tents, the porta johns are gone, a week later and you can't even tell it happened. I was really impressed by that. Even during the Salute, we walked downstream 500 meters and there was nobody around, and you couldn't even tell that a large event was going on until you walked to the parking area. (Interview, January 17, 2019)

Generally, the interviewees acknowledged the potential impact of tourism visitation on the spawning grounds. However, many of them went on to explain how they are attempting to mitigate the potential negative impacts of the event on the ecosystem and culture. DeArmond, as the BC Parks Area Manager, is responsible for balancing the ecological integrity at Tsútswecw Provincial Park while allowing for visitor enjoyment. He takes the responsibility seriously as BC Parks manages the impact of thousands of visitors. DeArmond describes the benefit of the Salute being a quadrennial festival, which provides four years of recovery time between events. He also discusses the strategies BC Parks employ to minimize impacts and maximize the benefits of the festival:

> … over the years we've started to see an improvement in the way we run the Salutes. We know a lot of people are coming, and we're starting plan years in advance… BC Parks in their management planning looks at other areas we can send people to enjoy the parks to displace some of the impact, mostly just foot traffic, moving them to different locations… Improving trails, signage, hardening facilities in the terms of can they stand the test of a hundred thousand people walking on them, and… …we want to make sure that the facilities and such are robust and hardened so that, for instance, if you had a lot of people walking on a certain trail, that it was a good hard surface that didn't cause erosion or mucking and that sort of thing, so little species of invertebrates and reptiles and different species could walk across the trail quickly and get to the other side without having any impairment to their life cycle. So that's what we try to do, we always look at it from the standpoint, of the birth of the species, right up into its adulthood and into its old age and decay, back into the cycle again. (Interview, January 17, 2019)

Sustainability concerns are not confined to the ecosystem of the park. For the surrounding community, the Salute festival is often touted as an economic opportunity upon which local businesses can capitalize. However, Cyr points to the challenge of businesses investing in growth on the basis of an event held every four years:

> … there's going to have to be money, not funneled every four years, there's going to have to be money that's put into that every year to make it (*business investment*) sustainable. And again, does it have to be a big fancy event? No. it needs to happen every year in October when the salmon are returning to spawn, every year, it needs that

> educational piece. … it needs to be a constant reminder to people about how important that this is to the sustainability of our environment. (Interview, May 27, 2019)

The TARSS organization also struggles with the dilemma of an event that runs every four years (Paterson, Interview January 8, 2019; Acton, Interview, February 4, 2019). TARSS was set up to support the Salute tourism event, but stable funding and human resource capacity based on a quadrennial event can be challenging for the organization. The impact of unpredictable or diminishing salmon returns could directly affect the survival of the organization. Koss says:

> … the main reason for the Salmon Society is to help educate and put on the event …so if there are no salmon it would be difficult to have the event… (Interview, January 8, 2019).

The wide variation in salmon returns from the largest return in recorded history in 2010 to the lowest return during a dominant run in recent history in 2018 has also created a challenging situation for the organizers of the Salute. Visitor expectations of being able to see millions of fish, as media reports and photographs from the 2010 run portrayed, led to disappointment in 2018 when people only saw a few hundred in the water. Acton explains how expenses are incurred in advance of knowing exact visitation levels, which determine revenue levels necessary to cover event expenses. Planning for visitors has to be done well in advance. Visitors follow the fish, but by the time the fish arrive and the visitors follow, it is too late to adjust expenses to match the revenue. If fewer salmon return than expected, potentially fewer visitors may be attracted to the event, revenues could be lower and the organization may be put in financial jeopardy. The main source of funding for TARSS is based on revenues generated during the Salute. As the Salute is a quadrennial event, with a large revenue infusion only every four years and ongoing expenses throughout each subsequent four years, financial sustainability for TARSS is a constant challenge. Human resource commitment in the TARSS organization is also a concern, since TARSS is mainly run by a group of highly committed volunteers with minimal paid support staff. Volunteer burnout is high following a Salute festival. This leads to a constant search for new volunteer energy to support the society and the next event (Interview, February 4, 2019). Actor network support for TARSS will be important to the future of the Salute and wild salmon sustainability efforts in BC. Although relatively small in size and influence, TARSS plays a critical role in the Adams River salmon run network

that draws together the wider actor network through collaboratively hosting a nature-based tourism event.

Some TARSS members expressed that the Salute provides a platform to address salmon sustainability issues in a more meaningful way than "just hosting a party" (Paterson, Interview, January 8, 2019). To respond to this concern, in 2018 Immediate actors incorporated a Salmon Symposium into the activities of the Salute. TARSS and LSLB partnered to invite stakeholders and actors from throughout the network to participate in a conversation about salmon conservation from an interior perspective. Ninety delegates attended the symposium and they were all invited to witness the renaming ceremony at Tsútswecw Park. Delegates also received on-the-land Indigenous tours from local community members. Panel discussions, art installations and keynote presentations represented Indigenous and non-Indigenous ways of knowing about salmon conservation. The Shuswap Salmon Symposium is one example of a process to extend the influence of the Immediate actor group down the river to engage the entire actor network in a meaningful way.

The Renaming of Tsútswecw Provincial Park

In 2016 the TARSS board of directors approved a motion to "give the name back" (of Roderick Haig-Brown Provincial Park) to the Secwépemc people. Following the motion LSLB made a formal request to BC Parks to rename Roderick Haig-Brown Provincial Park that culminated in the BC government granting approval in 2018 to officially recognize the name Tsútswecw (in place of Roderick Haig-Brown) Provincial Park. The Secwépemc name Tsútswecw means "place of many waters" (O. Arnouse, Interview, January 29, 2019). All on-site signage and website language was updated in time for the Salute in 2018. The official name change ceremony, held on-site during the official opening of the 2018 Salute, was led by LSLB and involved other local Secwépemc communities.

A. Arnouse describes working through the process with BC Parks toward the name change:

> …one of the groups we have a good relationship with is BC Parks, because the Adams River park, formerly Roderick Haig Brown Park, now Tsútswecw Park, we worked with BC Parks for a year and a half on that name change and BC Parks was a big help throughput that whole process…with all the paperwork and it took a while for us ourselves to find the proper name for the park. We had to find the proper maps from the proper Elders to make sure we had the right name… (Interview, January 10, 2019)

Tsútswecw Provincial Park was among three Provincial Parks to receive name change approval from the provincial government in 2018, a step toward fulfilling UNDRIP commitments (DeArmond, Interview, January 17, 2019). DeArmond describes when he realized it was important to support LSLB in their request:

> You know what, I tried to see it from the side of the Indigenous people and I tried to look at it right from the get-go, when somebody said, that was never called Roderick Haig Brown park, for thousands of years we knew it as this name, and it just sort of, we were going through the changes with UNDRIP and Reconciliation agreements, where we were looking at things differently and not so much settler-centric, realizing that if we want to move forward together we have to look beyond our own biases and say "wow, you had your own language here that said there was a word for this place that was here for the last nine thousand years before the last hundred years, and we didn't even ask (*what the name had been*)…(Interview, January 17, 2019)

As an advocate of the process, DeArmond describes how the name change transpired:

> … the conversation started to morph into what was it called? Well, ok, it was called Tsútswecw. What does that mean...and it was really at that point in saying how can we move forward with something as simple as a name, without any due course, without any corroboration with the local people, just go in and name it something that was not in their language. And to me it just didn't fit. It really needed to be looked at more closely. So through the next year there was a lot of conversations, a lot of them happening behind the scenes, in the back channels, saying is this something government has considered? Repatriating a name? Well, let's talk about it. So there was a lot of conversations that happened in government saying, well, why wouldn't we? You know, we've done it in other places, it's not happening every month or even every year, but this is an area that is supported by myself, by the First Nations that live there, by the entire communities that lay between Kamloops and Salmon Arm, saying we don't fundamentally have a problem with this. (Interview, January 17, 2019)

DeArmond further reflects on how the name change contributes to social sustainability in the wild salmon network:

> Many of these people that this name is very important to, are friends of ours, and why would we not change a name? (Interview, January 17, 2019)

In his personal interview, Kukpi7 O. Arnouse reiterates the significance of the renaming to his people and his appreciation for recognizing the Indigenous name of the park:

> … the name being revived back, which is Tsútswecw… it's important to have that name because that's what the Elders called it, that's what we knew it as children, so it was always hard to say (*Roderick Haig-Brown*) … Yeah, my grandparents called it that (*Tsútswecw*), right, so that was an area where people would go. (Interview, January 29, 2019)

Greg Hopf, former Indigenous Tourism Specialist for TOTA and member of the Dene Nation of Northwest Territories, describes the significance of the name change for Indigenous peoples, and the implication for Indigenous communities outside the Shuswap:

> I think it definitely shows where we are moving as a country around reconciliation. There are a lot of places all over our country where our Indigenous groups are taking a stand and saying no, no, no, that's not the name of this place, what we used to call it. This is the name of the area that we used to call it. And I think that we as a country as a whole are starting to finally listen to the history, the stories of the area and the significance of that area, and so to rename it and give it back to the local Indigenous nations that have occupied that area since time immemorial, it definitely is the right thing to do…I think we need to do more of that. (Interview, January 11, 2019)

Dawn Morrison, local Secwépemc woman from the Neskonlith community and curator of the Wild Salmon Caravan, is cautiously optimistic about the name change:

> …it was interesting to see this year the renaming of the Roderick Haig-Brown Park which I thought was a step in the right direction to say yeah, the Secwépemc have been here for a long time. And there is wisdom and knowledge in the place name…I think it was an accomplishment to have it acknowledged that we have our own place names. But the history of provincial parks and federal parks has been contentious. (Interview, February 7, 2019)

DeArmond describes the renaming ceremony and the effect he feels the name repatriation will have on community sustainability.

> …and I know that some of the elders, just seeing their faces at the renaming ceremony, it was just, it was pretty profound, to see people going wow! I'm standing here with all of these settlers, immigrants, and they're actually supporting us and hear them saying you were here a long time before us, this is the right thing to do…And so that was really exciting for me, and it was a real vindication to see that people really do support this and they are, people don't have a problem with it. Change can be scary at times, but in this particular case I think it was just a real huge success. (Interview, January 17, 2019)

Repatriating the name of Tsútswecw Provincial Park was accomplished through collaboration between actors involved in the Adams River salmon run. For Indigenous peoples, official recognition by colonial governments of place names in their traditional territory are important and reestablishing these names on signs and maps are a step toward retaining Indigenous cultural and spiritual ties to the land and animals (O. Arnouse, Interview, January 29, 2019). As he shares the story of salmon returning to the traditional territory of the Secwépemc, story teller Kenthen Thomas speaks of the importance of historical ties to salmon that still sustain

his people (Interview, February 12, 2019). Secwepemc people strongly identify with salmon and feel ties to the land and water in which salmon live. By identifying the park by its Secwépemc name, cultural and spiritual connections to salmon are strengthened.

Tsútswecw Provincial Park was established in 1977 for its ecological value as a spawning grounds for wild Pacific salmon (Government of British Columbia, Approved Tsútswecw Provincial Park Management Plan). The park also preserves evidence of thousands of years of Secwépemc history (Paquet, 1990). Advocates for protection of salmon habitat, including Roderick Haig-Brown, secured protection for the Adams River sockeye salmon spawning habitat by involving the Nature Trust of British Columbia in the purchase and protection of land adjacent to the Adams River. The Nature Trust continues to hold title to the land with BC MOE. Roderick Haig-Brown felt so strongly that salmon needed protection that in his book *The Salmon* he states: "if there is ever a time when the salmon no longer return, man will know he has failed again and moved one step nearer to his own final disappearance" (1974, p. 79). Alan Haig-Brown, son of Roderick Haig-Brown, explains how his father, an early board member of the Pacific Salmon Commission, became involved in establishing a provincial park at the Adams River:

> …he was also on a fund, a group that bought lands and set them aside for conservation reasons... it's a land conservation thing. Wealthy people put up money and my father said the Adams River is protected but we've done nothing to protect the uplands, the land around it. And without the land around it being protected the spawning grounds can easily be damaged… there was a big ranch coming up for sale…he urged them to put together the money and buy that land. So that is the land that became the park. So then it evolved when they had a park, they named it after him because he harangued them forever to do it. (Interview, April 14, 2021)

Roderick Haig-Brown's daughter was delighted when she heard the park might be changed to a Secwépemc name. In an interview with a local newspaper she says: "I know that there are existing traditional names for many spots in the area and feel it would be great if the name chosen reflected this long-standing relationship of people, salmon, land and rivers. I feel strongly that my father, who had deep respect for Indigenous peoples, would also be delighted to hear about this change" (Kamloops This Week, May 8, 2017).

Cooperman disagrees with renaming the park with an Indigenous place name. He points out the irony of a provincial park, which is a construct of a Euro-Canadian government, being given an Indigenous name:

> …basically am very sad to see the Roderick Haig-Brown name gone because as far as I'm concerned it wouldn't be a park if it wasn't for Roderick Haig-Brown. So I think it deserved that name. Whereas I would be strongly in favour of renaming place names with Secwépemc names, like I'd sooner see the river itself renamed, or Scotch Creek renamed. The Secwépemc names we have now is one of the things that makes the Shuswap so unique. Like Squilax, and Quaaout, Sicamous, the list goes on and on. But the park wasn't developed with the First Nations at all. (Interview, January 31, 2019)

Although some community members pointed out that removing the Haig-Brown name may cause hurt to the Haig-Brown family, that concern was nullified when the Haig-Brown family stated their support of the name change publicly during the renaming ceremony. DeArmond shares his experience discussing the name change with the Haig-Brown family and how the family saw renaming of the park as an appropriate step:

> I found that in my discussions with them that … it was almost like a rock had been lifted off of them, that they had been wearing this, they'd used this name for so long and they knew it wasn't their father's intent, that he didn't protect the area because of having his name on it. Fact is, I think it was named after he had passed. So I think that they were very, very thankful that it (*the renaming*) was done in a manner that was very respectful and done in a way that gave the family time to understand that there was a name, and this is the name that the area was before it was named after their father and by all accounts they were more than gracious when the opportunity came at the Salute to the Sockeye festival to receive a blanket of appreciation from the (*LSLB*) band, thanking the Roderick Haig-Brown family for what they did to…to let's say, in the settler's paradigm, to protect what we call fee simple lands that were within First Nations territory but also identified on maps as being private in-holdings… (Interview, January 17, 2019)

Alan Haig-Brown further reinforces the Haig-Brown family support for the name change:

> … when the idea came up to give it an Indigenous name, of course my family were unanimous in saying great, go for it. So that's good. It's simple. It's just a wink in the time of the Adams River. (Interview, April 14, 2021)

The name change was specifically mentioned by 12 interviewees as being positive for the entire community. The experience has strengthened relationships between Indigenous and non-Indigenous community members and between LSLB and the Province. The renaming of Tsútswecw Provincial Park has set precedence for similar conversations to be conducted in other communities throughout the province. Tsútswecw Provincial Park became one of the first provincial parks in the province to receive name change recognition and this movement toward reconciliation, promoted and facilitated through the efforts of the actor group at the

Adams River, is evidence of community sustainability being driven through collaborative relationships developed around the Salute festival.

Repatriating the name at Tsútswecw Park has affected park managers, Indigenous political leadership, Indigenous and non-Indigenous community members. The name change has encouraged actors in the network to be more thoughtful about the original inhabitants of the land. There is a growing awareness of the responsibility the Secwépemc people still carry for the salmon who spawn here. Paterson reflects, "I think if people identify with Tsútswecw being ancient then I think people will take a more restorative view of the river and its environment" (Interview, January 8, 2019). The collaborative act of repatriating the name of Tsútswecw park has clearly improved the socio-cultural sustainability of the Adams River salmon run.

Conclusion

Hosting the Salute at Tsútswecw Provincial Park provides opportunity for the Adams River wild salmon actor network to collaborate. The Salute is an example of a nature-based tourism event that is improving environmental and socio-cultural sustainability. During the Salute the actors work together to provide a visitor experience. During the Salute some actors focus on counting fish in the river, and others build and maintain trails. Some provide interpretive tours, others create and install interpretive signage. A few actors rarely visit the Adams but they financially support the building of visitor amenities. The local economy benefits by local artisans selling art, visitors sleeping and eating in local establishments and purchasing guided tours. Actors from throughout the network not normally associated with one another gather at the Adams. This event is a vehicle to transcend the silo effect that so often prevents actors from working together toward sustainability.

Some representatives from local Indigenous communities are optimistic about their involvement in the Salute enhancing cultural sustainability. There is an appreciation for the name repatriation at Tsútswecw Park and efforts to incorporate more Indigenous culture and content into park interpretation. The Salute is a way for the Indigenous communities to share their ancient connection to salmon and bring awareness to declining salmon populations. Kukpi7 O. Arnouse reflects on the experience of visitors to the Salute:

> I see it as an educational type of thing for the sockeye. People come over from Taiwan or whatever, and they see the salmon and they are amazed… (Interview, January 29, 2019)

The Salute provides opportunity for the local Indigenous peoples to share their cultural and spiritual connection to the land, water and salmon. A continued commitment by the actor network to collaborate with Indigenous communities involved in the Salute will be key to sustaining the culturally meaningful work begun during the last two Salutes.

While the potential for damage to the critical spawning grounds is real and acknowledged, actors involved in hosting the Salute feel the benefits of the Salute outweigh negative impacts. However, future studies should be conducted to independently verify the impact of visitation on the spawning grounds of one of BC's most important salmon runs. The continued effort of TARSS, the key bridging organization at the Adams, will be important to the sustainability of the Salute event. A commitment by the actors in the network to support this organization is critical for the continuation of the Salute and the benefits it brings to the entire network. TARSS creates both a space and a mechanism for the various actors in the network to collaboratively support the return of wild salmon to the region. Addressing the challenges that face the TARSS organization and the Salute festival itself will be important to the long-term health of the Adams River salmon run.

The Salute nature-based tourism experience enhances environmental and socio-economic sustainability by placing wild salmon at the centre of the network. TARSS acts as a bridging organization, bringing together the actor network at the spawning grounds, the place of both the beginning and ending of the salmon life cycle. The Salute is both a celebration of wild salmon and an opportunity to educate the public on conservation issues. Involvement in the event provides Indigenous communities opportunity to share their cultural and spiritual connection to salmon and reinforces their role in caring for critical salmon habitat. The Salute serves as a model for sustainable nature-based tourism development in provincial parks throughout the province.

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CHAPTER 4: SALMON FOR SEVEN GENERATIONS

> I had the opportunity to be in Tofino one time and I watched a grey whale and it swam along the beach there, and it flapped its tail like that (*waves arm*) and you could see the fish and the clams coming up and the thing turned around and opened up its mouth and phewww (*mimics sound of blowhole*) and that's how it feeds, right, and I was totally amazed at that and I was thinking…my god! You know, we are all part of that, the salmon that come from around here (*the Adams River*) are down there and we're all like a rock in the Adams River, we're just all one part of the entirety of the sockeye salmon…that being…just that one part, before I leave I have to contribute one more thing to the survival of the sockeye salmon… (Kukpi7 (Chief) Oliver Arnouse, Little Shuswap Lake Band, Interview, January 29, 2019.)

BC has several wild salmon runs that remain. However, wild salmon populations are under stress throughout the province. Serious challenges are confronting salmon from multiple fronts. Climate change has introduced unpredictable water levels and sub-optimal physiological conditions in rivers and spawning channels that may prevent salmon from physically returning to spawning habitats. Rising ocean temperatures and declining ocean productivity are resulting in smaller, less robust, salmon returning to spawn. Mass-production of salmon through industrial hatcheries are out-competing wild salmon for ocean resources. Diseases are likely being transferred to wild salmon populations from fish farms in the ocean. Harvesting of wild salmon is potentially reducing salmon population numbers below sustainable limits. Degradation of spawning habitats and nursery lakes resulting from industrial and commercial activities in watersheds is creating inhospitable conditions for salmon spawning success and natal survival rates. These are not minor issues to overcome even if all stakeholders share consensus viewpoints in key decision-making processes. This research demonstrates that actors in the network are not aligned in their perspective of how to maintain access to salmon as a resource while preserving salmon for future generations.

Using a combination of Actor Network Theory (Latour, 1987) and Stakeholder Theory (Walker et al., 2008) as a lens, this research identifies the actors in the Adams River salmon network through geographic representation of actors in alignment with the salmon life cycle, and examines the complexity of the relationships involved. This research reveals the role relationships have in the environmental and socio-economic sustainability of wild salmon in BC. Understanding the actors involved and the effects of their actions and interactions on salmon sustainability is crucial. Wild Pacific salmon are a cultural and ecological keystone

species in BC. The Adams River salmon run contributes to the food supply and economy of BC Indigenous peoples who harvested salmon from the ocean, coast, rivers and streams of the province long before a colonial presence was established (Ignace & Ignace, 2017). Riddell points out that with the economic importance of the Adams River salmon run and the mounting threats to salmon sustainability throughout the network, "each successful spawn at the Adams is even more critical than before" (Interview, February 6, 2019). The Adams River salmon run remains one of the most productive wild salmon systems in the world (Evendan, 2004), but it is apparent that collaboration between actors in the network is essential to the future survival of the run.

Key Challenges to Wild Pacific Salmon Conservation in BC

The vast life history of wild Pacific salmon has a correspondingly large and complex network of actors motivated by diverse priorities. Economic and cultural interests motivate commercial and sport fisheries to compete for salmon harvest allocation. In the face of increasing climate change pressures and declining salmon populations, urgent recommendations have been made for meaningful implementation of Canada's Wild Salmon Policy Implementation Plan, including higher numbers of fish to escape harvest to ensure sufficient populations arrive at the spawning grounds (Price et al., 2017) (See Appendix G, Summary of Key Issues, Recommendations and Further Research). Meanwhile, many Indigenous communities uphold their right to harvest salmon for food, social, and ceremonial reasons while some other Indigenous communities call for a complete salmon fishing moratorium. Decisions affecting salmon habitat on land and in water are the responsibility of multiple levels of various government agencies with unclear jurisdictions. Silos in government and overlapping jurisdiction often prevent clear and decisive action to protect wild salmon. Wild salmon protection policies are recommended, formulated and funded as a result of the Canadian public's will to see the survival of wild salmon. However, most of the Canada's population remains unaware of the issues and challenges facing wild Pacific salmon populations. Often layers of Federal and Provincial policies and legislation created to protect salmon and salmon habitat are overlaid again by international agreements and fishing activity that complicate the effective protection of wild salmon populations in Canada.

Adams River salmon travel over 4,000 km throughout their life history, from spawning grounds in south central BC into the Pacific Ocean, and back over 4 years. During their lifetime the salmon cross multiple geographic, jurisdictional and political boundaries. As each actor in the network asserts their own interests or jurisdictions, the power dynamics and relationships between actors shift, affecting the sustainability of salmon. The Adams River salmon actor network is interconnected from the Adams River to the far reaches of the Pacific Ocean. Actors include multiple levels of government, policy makers, communities, general public, scientific bodies, sector groups, natural ecosystems, geographic boundaries, management policies and plans and international agreements. At the heart of the network are salmon. Morrison summarizes how the complex salmon life history impacts the lives of Indigenous peoples, plants and animals in the interior of BC:

> It's (*salmon*) a major part of the food web in Salish territory, and so as a result there's a lot of complexity that we have to learn how to live with because they migrate 4,000 miles, in some cases far up to Alaska, and then it comes all the way back, so there's all those relationships all the way down and all those people and trees and parts of the ecosystem that it feeds… (Interview, February 7, 2019)

McIntyre-Paul reinforces the idea that the entire salmon network is interconnected:

> … the health of the Adams River and the health of the salmon, which is inextricably tied to the health of our entire region, is completely tied to what happens in Lytton, and what happens in the Fraser delta, and what happens in the Pacific. (Interview, February 5, 2019)

Bellows emphasizes how the interconnectedness of the network creates an urgency of collaboration to protect salmon:

> I think that we're all going to have to curtail our part in this for the greater good of the fish so they can return. … It's going to be stream by stream but it's time to listen to the biologists and take what they say and make some changes…and we're running out of time, really. Or we'll be watching this on the Discovery Channel. (Interview, March 19, 2019)

Wild Pacific salmon stocks are facing what Dave Nordquist, Adams Lake Indian Band (ALIB) member and Title and Rights manager, identifies as a Tragedy of the Commons (Interview, June 6, 2019), describing salmon being over-exploited as a resource of interest to the entire network. He points to cumulative effects piling up against the survival of wild Pacific salmon. Salmon survival demands that the actors accept the complexity involved and put the interests

of salmon at the centre of their decision-making. It is key that the entire network prioritizes the interests of salmon over their own.

LSLB Kukpi7 (Chief) Oliver Arnouse points out the risk of not preserving the Adams River salmon run and the effect on the spawning grounds that are considered by the Secwépemc people as the "home" of the salmon. He sees Tsútswecw as a place where people will still come to connect to salmon in the future, but he is concerned about what the experience will be for future generations. He states that his people have observed a "pattern of depletion" of salmon in the local rivers over recent decades, but he is optimistic that Tsútswecw Provincial Park is a place where salmon habitat can still be preserved (Interview, January 29, 2019).

Recommendations for Sustainability of the Adams River Salmon Run

Policy-makers, environmental groups, commercial fishermen and fisheries managers monitor populations, allocate Adams River salmon, enforce regulations and harvest the salmon. However, directly at the Adams River, a subset of immediate actors focuses on using tourism as a way to enhance salmon sustainability through hosting the Salute festival at Tsútswecw Provincial Park. The Salute promotes salmon conservation, advocacy and education. An event accessible to people from all walks of life, people are welcomed to celebrate and learn about wild salmon. Tsútswecw Park is accepted among the actor network as a place of significance in the salmon life cycle. The Adams River is imperative salmon spawning habitat that holds an important place in the socio-economic and environmental sustainability of wild Pacific salmon. Bellows speaks to the importance of the immediate actors working together to protect the spawning grounds at the Adams:

> We start here in the river systems and the lake systems. If it's not good here it doesn't matter because all the fry come out of the gravel here and they spend that first year, or sockeye specifically, spend the first year in this lake to rear. Before they head to the coast. (Interview, March 19, 2019)

Sustainability efforts by immediate actors at the Adams have an effect on the entire network. Due to the work of the immediate actor group to collaborate and host the Salute festival, the Adams River has become a place where actors from across the network can feel connected to the salmon and to one another. More importantly, witnessing the Adams river salmon spawning at Tsútswecw Park captures the imagination of people who often express wonder at the salmon migration phenomenon. Organizing the Salute is an opportunity for network actors to practice

collaboration. The group of immediate actors at the Adams should be supported to continue hosting the Salute and share the profound message of salmon conservation with the Canadian public. This will in turn influence decision makers in government who set policy and fund conservation initiatives. Reynolds addresses the power of influencing public opinion:

> Society could decide that they don't care about wild fish anymore. Could decide to do away with these wild populations and we could do better. We could decide as a society that we'll do away with wild fish and we'll produce them all with hatcheries and fish farms. But, and it's a very large but…Canadians so far have made it extremely clear that that's not what they're all about. And that's why we have the Wild Salmon Policy that codifies that. And I've never heard any change of heart among the Canadian populace that suggests that they want to give up on wild fish. (Interview, June 12, 2019)

The Salute provides the opportunity to focus on a healthy salmon spawning habitat and the importance of returning salmon populations. LSLB has been raising alarm bells about diminishing salmon populations returning to the spawning grounds. The Salute amplifies the voice of immediate actors calling for enhanced protection of habitat and reduction of commercial and sport fishery at the coast in order to ensure a viable salmon population for the future.

Even as climate change pressures are leading to smaller, often unpredictable returns, actors continue to seek access to salmon harvest for economic benefit and as a critical food source for Indigenous and non-Indigenous communities. However, unharvested salmon have value to the ecosystem as an ecological keystone species, and to the economy for sport fishermen and wildlife viewing tourism operators. Reynolds (Interview, June 12, 2019) points out that many British Columbians see the continued existence of wild salmon as important to their identity. As salmon populations continue to decline, pressure is mounting on decision-makers to protect salmon for current and future generations. The collaborative fisheries management approach of DFO should genuinely incorporate a precautionary approach and truly prejudice conservation over harvest allocation. DFO should ensure sufficient salmon return to spawn prior to allowing commercial or sport fishery activity.

Overlapping jurisdiction brings complexity to decision-making at the Adams River. Various departments in the Federal and Provincial governments are unclear about who is responsible to, for example, restrict fly fishing in the river during spawning season. BC Parks is unable to effectively curtail forestry activity in the watershed which is bringing silt down into spawning beds. Agricultural operations withdraw water from rivers and streams and apply

chemicals to fields which leach into aquifers, damaging salmon habitat. However, DFO is unable to effectively monitor and regulate agricultural activity. DFO should enhance collaboration with provincial agencies to identify necessary policy to protect salmon and enforce regulations of land-based activities negatively impacting salmon habitat.

Declining salmon populations increase the pressure on decision-makers to weigh conservation interests over access to salmon for harvest. Shifting the focus of the network from harvesting interests to prioritize interior habitat concerns will create more effective salmon conservation decision-making. Depending on localized knowledge to guide priorities and focus policy efforts will enable the actor network to respond more appropriately to issues facing salmon populations. As climate change challenges increase, each salmon arriving successfully back to spawn is increasingly important for salmon survival and must be given full priority.

Future Research at the Adams River Salmon Run

Salmon research in BC has largely been conducted in coastal environments. Very little salmon research is undertaken at the other end of the salmon life cycle, in the interior of the province. The majority of research on salmon conservation in BC is predominantly from ecological and biological perspectives (Quinn, 2005, Hocking & Reynolds, 2011, Krkošek, 2017, Lichatowich, 2013, Thomson & Hourston, 2010). While Evenden (2004) and Cooperman (2017) present historical perspectives of wild salmon runs, Ignace & Ignace (2017) and Turner (2008) reveal the rich Indigenous relationship with salmon, and Androkovich (2015) and Kruger et al. (2018) examine the Salute from an economic perspective, significant gaps remain in socio-cultural analysis. Studies that investigate nature-based tourism in BC Parks and other protected areas of the province are limited and very little research has been published related to the Shuswap region in general. This research addresses these gaps and deepens our understanding of the role of actor relationships in salmon sustainability. Through this research I identified the network of actors involved in the Adams River salmon run using a geographic representation of the actor network in alignment with the salmon life cycle. This enabled me to expose existing and emerging pressures on the network of actors involved in salmon sustainability in BC. Despite numerous barriers, there are examples where actors are working collaboratively toward sustainability within the network. These include, but are not limited to, the newly revised federal Wild Salmon Policy, the BC Provincial Wild Salmon

Strategy, and the ongoing Salute to the Sockeye festival. As climate change, natural resource development, and increased industrial activity further complicate the unpredictable future of wild pacific salmon populations in the province, it is essential that the network commits to further collaborative approaches to salmon sustainability.

While this project does not use a specific theoretical lens to analyze colonial power relations, the voices of participants reveal the power dynamics and inequities in the Adams River salmon run network. This research also explores some of the reasons behind the complexity of the network and the actor relationships. However, further work needs to be done to pinpoint the levers which are most significantly affecting collaboration within the network. An application of network analysis to identify the most critical relations and to develop recommendations for key relationships to be strengthened or supported will be fundamental next steps. In future research it will be important to recognize the barriers to effective decision making toward salmon sustainability. Building on the participatory approach of this research, further work could examine how Indigenous knowledge and experiences of salmon ecosystems could support conservation efforts. Collecting traditional knowledge and observations about the effects of climate change on salmon populations from Indigenous perspectives could help understand how communities have addressed these challenges in the past to inform current conservation initiatives. An innovative aspect of this research is the application of ANT using a geographic representation of the network actors in alignment with the salmon life cycle. Future researchers should consider using this novel approach to reveal the network of actors involved in other species' life cycles. Having a geographical and theoretical map could be useful to reveal relationship complexities and barriers to effective conservation efforts in other contexts.

Conclusion

Sockeye salmon have been returning to the Adams River in Tsútswecw Park for thousands of years and Secwépemc peoples consider salmon essential to life. They are an ecological and cultural keystone species and a significant contributor to the BC economy. However, salmon populations continue to decline throughout BC's watersheds, putting communities, economies and ecosystems at risk. This research further demonstrated how a nature-based tourism event, collaboratively organized by a committed group of actors with a

strong bridging organization at the core, can contribute to sustainability of a species and be a driver for change. There is evidence to suggest that collaboration between actors, guided by local experiences and knowledge, is critical to the sustainability of wild Pacific salmon populations.

Sustaining the Adams River salmon run is crucial to survival of wild Pacific salmon in BC. Economically and culturally significant, the Adams River salmon run sustains communities and ecosystems throughout the province. The Adams River lies at an intersection where multiple issues and actors converge around salmon conservation. The Salute provides a unique opportunity to connect people to salmon, and actors to one another. As the network strives to sustain the remaining wild salmon populations in BC, addressing the complexity of salmon conservation lies in the acceptance that salmon is a resource in common to the entire network, and the protection of salmon is a responsibility we must all embrace. For successful salmon conservation, salmon must be the centre of a collaborative actor network. Morrison provides a reminder:

> …we've learned that wild salmon are not constrained by the arbitrary political boundaries…and that in order to be able to manage our relationships to salmon in a better way we need to be working with their systems…with their boundaries, the naturally occurring boundaries of the watershed. (Interview, February 7, 2019)

To more effectively manage our relationship with salmon, all actors must work together, including various levels of government, Indigenous councils and governing bodies, fisheries managers, environmental advocates and conservationists, forestry and fisheries license holders and communities from one end of the network to the other. Conservation efforts supported by effective policy, enforcement, and decision-making that aligns with a commitment to species and habitat protection, above the interests of resource extraction, will sustain salmon populations for the future. Putting wild salmon at the centre of the Adams River salmon run network will ensure the continuance of the communities, economies and ecosystem dependent on salmon for generations to come.

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APPENDICES

Appendix A: List of Acronyms

ALIB – Adams Lake Indian Band

BC - British Columbia

BC MOECCS - British Columbia Ministry of the Environment and Climate Change Strategy

BCFROA – BC Freshwater Resort and Outfitter Association

COSEWIC – Committee on the Status of Endangered Wildlife in Canada

DBC - Destination British Columbia

DFO - Department of Fisheries and Oceans Canada and the Canadian Coastguard

FLNRORD - British Columbia Ministry of Forests, Lands, Natural Resources Operations and Rural Development

FRPA – BC Forest & Range Practices Act

FSMC - Fraser Salmon Management Council

G2G – Government to Government

LSLB – Little Shuswap Lake Band

MOE - Canadian Ministry of the Environment

NIB – Neskonlith Indian Band

NGO – Non-Governmental Organization

PSF - Pacific Salmon Foundation

PSC – Pacific Salmon Commission

SARA – Species at Risk Act

SEAS - Shuswap Environmental Action Society

SFC – Secwépemc Fisheries Commission

ST – Shuswap Tourism

STA - Shuswap Trail Alliance

TARSS - The Adams River Salmon Society

TIES - The International Ecotourism Society

TOTA - Thompson Okanagan Tourism Association

UNDRIP – United Nations Declaration on the Rights of Indigenous Peoples

Appendix B: Adams River Sockeye Salmon Life Cycle

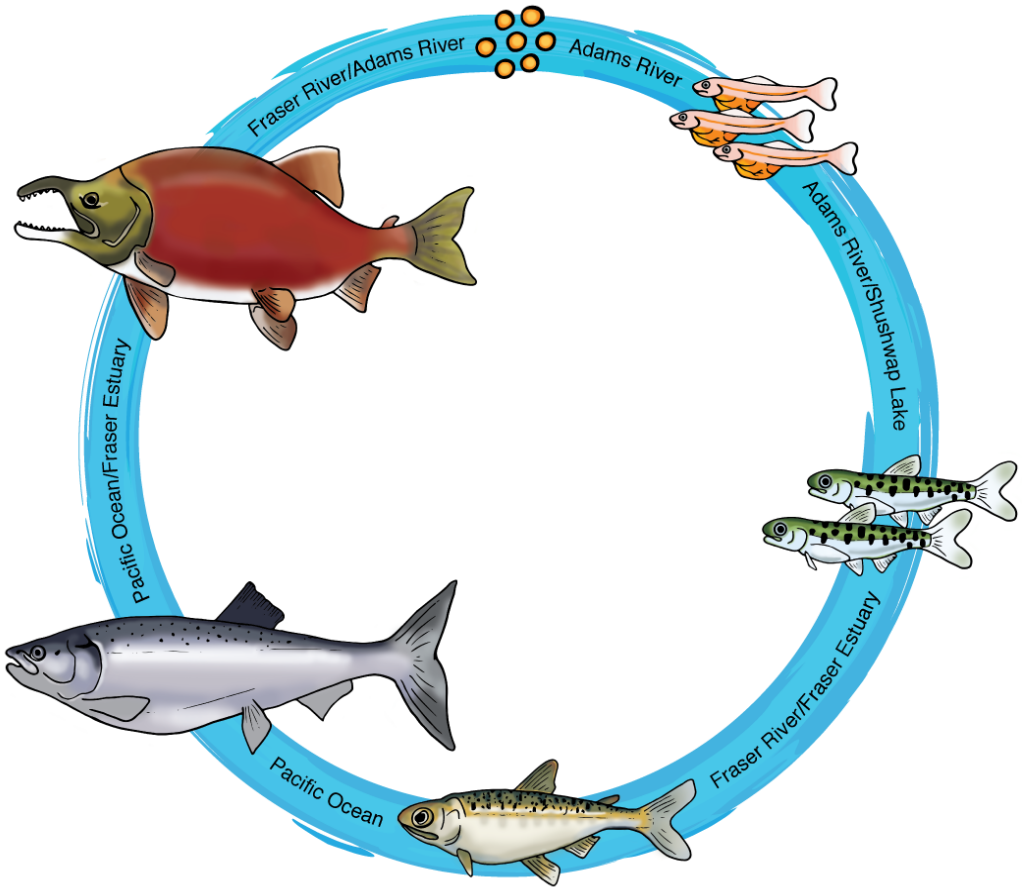

Figure 1 - Adams River Sockeye Salmon Life Cycle and corresponding location along the migratory route. The salmon begin as eggs in gravel redds in the Adams River. They emerge as alevins and are flushed by the spring freshet downriver into Shuswap Lake where they live as fry in the lake for one, sometimes two, years. While in the lake they develop the vertical bars (parr marks) that hide them from predators. Before they leave the lake they change into smolts, losing their parr marks, and turn silver in colour. They swim down the South Thompson, Thompson and Fraser Rivers to the Fraser Estuary. They then swim into the Johnstone Strait and out into the open ocean, where they grow and mature. After two to three years, they return as mature salmon to the mouth of the Fraser River and swim approximately 400 km back upstream through the Fraser, Thompson and South Thompson Rivers to the Adams River to spawn. After spawning the adults die and their bodies become the nutrition that sustains the alevins and fry of the next generation. Illustration by Alexis Shuffler (2020).

Appendix C: List of Interview Participants

Interviewee	Role	Date	Location
Don Paterson	The Adams River Salmon Society (TARSS), Past President 2016-2018, Salmon Symposium Chair 2018	08-Jan-19	Sorrento, BC
Darlene Koss	TARSS, Administrative Coordinator	08-Jan-19	Sorrento, BC
Aaron Arnouse	Little Shuswap Lake Band (LSLB), Councilor	10-Jan-19	Squilax, BC
Neil Brooks	Kingfisher Interpretive Centre, Executive Director, 35 year volunteer, hatchery manager	10-Jan-19	Enderby, BC
Greg Hopf	Thompson Okanagan Tourism Association (TOTA) - Indigenous Tourism Specialist	11-Jan-19	Kelowna, BC
Pat Matthew	Secwépemc Fisheries Commission (SFC), Fisheries Management Coordinator	16-Jan-19	Kamloops, BC
Wes DeArmond	BC Parks, Area Supervisor, Thompson Eastern Lakes	17-Jan-19	Kamloops, BC
Tom Nevin	Fisheries and Oceans Canada and the Canadian Coast Guard (DFO), Community Advisor, BC Interior	17-Jan-19	Kamloops, BC
Colin Speikerman	TARSS – President, 2018-2019; Quaaout Lodge, Food & Beverage Manager	17-Jan-19	Squilax, BC
Oliver Arnouse	Kupki 7 (Chief) Little Shuswap Lake Band (LSLB)	29-Jan-19	Squilax, BC
Jim Cooperman	Shuswap Environmental Action Society (SEAS), President; Author, Everything Shuswap	31-Jan-19	St Ives, BC

Kathie Cooperman	Long-time North Shuswap area resident, agriculturalist	31-Jan-19	St. Ives, BC
Blair Acton	TARSS, Vice President, Salute to the Sockeye Committee Chair, 2014-18	04-Feb-19	Squilax, BC
Phil McIntyre-Paul	Shuswap Trail Alliance (STA), Executive Director, tourism consultant	05-Feb-19	Salmon Arm, BC
Brian Riddell	Pacific Salmon Foundation (PSF), Past-President; Pacific Salmon Treaty, Environment Commissioner for Canada	06-Feb-19	Vancouver, BC
Dawn Morrison	Neskonlith Indian Band (NIB) member; Curator, Wild Salmon Caravan	07-Feb-19	Vancouver, BC
Justine Nelson	Fraser Watershed Initiative, Coordinator	08-Feb-19	Richmond, BC
Kenthen Thomas	Neskonlith Indian Band (NIB), Story teller; School District 73, educator	12-Feb-19	White Lake, BC
Mel Arnold	Member of Parliament, North Okanagan Shuswap; Standing Committee member, DFO.	18-Feb-19	Salmon Arm, BC
Jason Bellows	Westside Stores/Bucktail Adventures, owner; BC Sport Fishery Council, Director	19-Mar-19	Salmon Arm, BC
Robyn Cyr	Shuswap Tourism (ST), Regional DMO Manager	27-May-19	White Lake, BC
Dave Nordquist	Adams Lake Indian Band (ALIB), Title and Rights department; TARSS, Director	06-Jun-19	Chase, BC
Paul Demenok	Shuswap Watershed Council (SWC), Chair; Columbia Shuswap Regional District (CSRD), Director.	08-Jun-19	White Lake, BC

John Reynolds	Full Associate Professor, Simon Fraser University (SFU), Tom Buell Chair. Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Chair	12-Jun-19	Burnaby, BC
Ryan McEachern	Commercial Fisherman, Commercial Salmon Advisory Board, D, Fisheries and Oceans Canada; Owner, Bruce's Country Market, Maple Ridge, BC	12-Jun-19	Maple Ridge, BC
Darrel Hillaire	Lummi Tribe, Past Tribal Councilor; Children of the Setting Sun Productions, Executive Director and Founder	13-Jun-19	Lummi, WA
Aaron Hill	Watershed Watch Salmon Society, Executive Director	13-Jun-19	Tsawwassen, BC
Paul Michel	Thompson Rivers University, Executive Director, Office of Indigenous Education; Past Kukpi7 (Chief) Adams Lake Indian Band (ALIB)	04-Jul-19	Kamloops t'Secwépemc
Matt Jennings	BC Freshwater Resort and Outfitter Association, (BCFROA), Executive Director	05-Jul-19	Kamloops, BC
Sunny Lebourdais	Qwelmínte-Secwépemc G2G, Director of Operations; Whispering Pines/Clinton Indian Band member	09-Jul-19	Kamloops t'Secwépemc
Alan Haig-Brown	Freelance commercial fisheries journalist, son of Roderick Haig-Brown	14-Apr-21	Via telephone, from New Westminster, BC

Appendix D: Map of Adams River Salmon Run Migration Route

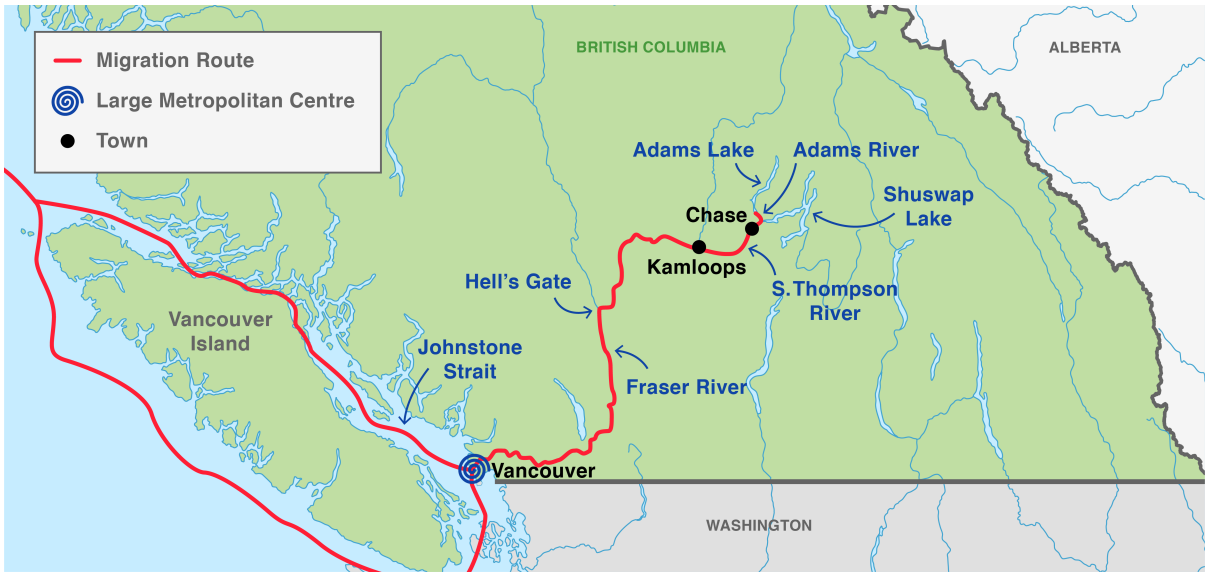

Figure 2 - Map of Southern British Columbia and the four-year migratory route of the Adams River sockeye salmon. Beginning at the Adams River in the interior of British Columbia, salmon move downstream through to the Thompson and Fraser Rivers and out into the Pacific Ocean. They return via the Johnstone Straight or outer Vancouver Island, to the mouth of the Fraser River and back upstream through the Fraser and Thompson Rivers to the Adams River (Quinn, 2005). Illustration by Alexis Shuffler (2020).

Appendix E: Interview Guide

ORGANIZATION:

1. What is your role in the organization/community/group (insert appropriate word)?

2. What are the principal involvements your organization brings to the Adams River Salmon Run?

3. What are the principal issues for your organization with relation to supporting the continuation of the Adams River salmon run?

4. Has your organization established any concrete goals concerning salmon conservation in the Adams River? If yes, how successful do you feel your organization has been in achieving these goals?

SALMON:

5. What is the state of salmon conservation in the province of BC in your opinion? In the Adams River? What do you think is the largest factor/s affecting the survival of wild salmon in BC?

6. Do you feel decisions are made for salmon that compromise the survival of wild salmon in favour of the interests of actors?

RELATIONSHIPS:

7. Do your organization's activities involve following rules and regulations related to conservation of salmon or its habitat in the Adams River watershed?

8. Do your organization's activities involve benefiting economically or socio-culturally from salmon in the Adams River?

9. In your organization do the people who work on the conservation of salmon in the Adams River integrate with people who work on extracting economic or social/community benefit from the salmon?

10. Do you integrate with other organizations concerning salmon conservation in the Adams River watershed, if so, who?

11. Describe your organization's interactions with the Provincial, Federal and Indigenous Governments on the subject of protection of salmon at the Adams River salmon run. Have these actions contributed to improving or inhibiting your organization's goals in salmon conservation?

12. What factors either encourage, or are barriers, to communication or collaboration?

TOURISM:

13. What is your actor group's involvement in the Adams River salmon run Salute to the Sockeye tourism experience?

14. Does the Salute to the Sockeye tourism experience encourage or discourage salmon conservation? If possible, please provide some examples.

Appendix F: Key Actors in the Adams River Sockeye Salmon Network

Type of Actor	Corresponding Salmon Life Cycle stage	Location	Name of Actor	Role
Immediate Actors	Alevins and returning spawning adults	Adams River Watershed, Tsútswecw Provincial Park	Government of BC	BC Parks (Ministry of the Environment) and Ministry of Forests, Lands, Natural Resource Operations and Rural Development. Have legislative mandate to manage park land, water, forestry and natural resources
			The Adams River Salmon Society	Own and operate interpretive cabin within the park and main organizing body for quadrennial Sockeye Salute Festival; provide ongoing trail-based interpretive tours of the park
			Secwépemc communities	Provide interpretive Indigenous walks and canoe tours in Tsútswecw Park; develop content for park displays and incorporate Secwépemc language into park signage; visit spawning channels to honor their connection to salmon and hold a first-fish ceremony each fall.
			Department of Fisheries and Oceans	Count fish and assess habitat conditions in Adams River during spawning season; involved in planning for the Salute and mobilizing volunteers to the Adams during the quadrennial festival period
			Local Community Organizations	Support activities in the park, mainly related to salmon and conservation
			Sport fishery	Fly fishing for trout in spawning beds
Near Actors	Fry and smolts (and returning spawning adults)	Shuswap Lake, the Thompson River, Kamloops Lake	Industrial and agriculture operations	Railway cars with heavy crude oil, coal and grain run alongside salmon migration route; remove water from the Thompson river for irrigation and add contaminates to the water

Near Actors (continued)			City of Kamloops	Densely populated areas containing bridges, highways, pulp mills and industrial development
			Secwépemc Fisheries Commission	Represents the fisheries interests of seven Secwépemc communities to DFO; monitors fry populations swimming downstream and catches adult salmon swimming upstream through an Indigenous commercial fishery; sell to community through a retail store in Kamloops
			Fraser Salmon Management Council	Represents the interests of approximately 80 Indigenous communities in salmon fishery activities in the Fraser watershed
Middle Actors	Smolts (and returning spawning adults)	The Fraser River, The Fraser Estuary	Metropolitan area of Vancouver	Urban and industrial development; redirection of water for flood control; dredging to open up shipping lanes; pollution runoff into streams; loss of marsh habitat to housing and land development; shipping and marine traffic in the Port of Vancouver
			Western Region DFO	Manages Pacific salmon for the Canadian Federal Government.
			US and Canada Pacific Salmon Commission	Determine Pacific salmon fisheries allocations. Headquartered in Vancouver
			Lobby and salmon conservation groups	E.g., The David Suzuki Foundation, Wild Salmon Forever., Watershed Watch Salmon Society. Work to affect the public opinion of British Columbians to preserve and enhance salmon populations. Located close to DFO headquarters in the Lower Mainland because of the collaborative salmon management approach employed in Canada.

Middle Actors (continued)			Academic Institutions	E.g., University of British Columbia, Simon Fraser University. Conduct salmon research and education.
			Pacific Salmon Foundation	Conducts research and supports conservation and advocacy for wild salmon in BC
			Sport and food fisheries	Indigenous and non-Indigenous fisheries; catch salmon in the Fraser and Thompson River for sport and food fisheries
			Pacific Salmon Treaty	Provide protection from open seas fishing of Adams River salmon and determine the allowable catch of returning salmon. Managed through the Pacific Salmon Commission
Distant Actors	Adults	The Pacific Ocean	Climate change	Changing ocean conditions precipitated by climate change require salmon adaptation; ocean temperature fluctuations and acidification affect salmon survival and size
			Open-pen salmon farming	Source of the transmission of disease to wild populations
			Commercial salmon hatcheries	Enhance domestic salmon populations for harvest; compromise wild salmon population health
			Coastal communities of the Pacific northwest	Rely on salmon to sustain their people
			Fraser River fishing fleets	Commercially harvest the bulk of Adams River Sockeye

Table 1 - Key actors in the Adams River sockeye salmon actor network. Actors are presented in alignment with the corresponding stage of Sockeye salmon life cycle, the geographic region in which they occur and their main role in the network.

Appendix G: Summary of Key Issues, Recommendations and Further Research

KEY ISSUES:
1. Lack of focus: individual actors put their own interests vs. the interests of salmon at the centre of decision-making.
2. Climate change: changing river volumes and rising ocean and river temperatures prevent salmon from returning to spawning grounds and lead to suboptimal physiological conditions for spawning.
3. Over harvest: harvest competition for a dwindling resource reducing salmon numbers below replacement levels.
4. Reduced ocean resources: large-scale industrial hatchery-produced salmon in the open ocean outcompete wild species. Process is known as ocean ranching.
5. Disease transfer: salmon farms located in migratory path of wild Pacific salmon allowing disease transmission to wild populations.
6. Degradation of salmon spawning habitats: land-based industrial activities bring siltification and disruption to spawning channels and nursery lakes.
7. Complexity of wild Pacific salmon life history: habitat crosses jurisdictional and geographic boundaries inevitably bringing complexity to salmon management.
8. Lack of collaboration: overlapping jurisdiction prevents actors from taking action in the overall interests of salmon conservation.
9. Ineffectual policies guiding decision-making: Wild Salmon Policy is not effective in guiding DFO decision-making to prevent wild Pacific salmon population decline; Cohen Commission recommendations not implemented.
RECOMMENDATIONS:
1. Increase collaboration among actors: policy development and enforcement, reduction of silos between government organizations through collaborative policy implementation.
2. Increase pressure from Canadian public on government to enhance salmon conservation policy and enforcement
3. Frame salmon as a resource in common: the protection of salmon as a responsibility in common. Salmon at the centre of the network, prioritize interests of salmon over their own interests
4. Implement recommendations from independent sources such as COSEWIC recommendations for SARA protection of wild Pacific salmon populations and Cohen Commission. Demonstrate commitment to species and habitat protection above the interests of land-based industrial network.
5. Localized approach to salmon conservation: engage localized perspectives through informing the conversation and learning from localized contexts. Connect to local peoples, especially Indigenous communities, and get their perspectives, value their perspectives. Employ adaptive management techniques to favour local knowledge and build local buy-in to salmon conservation.
6. Further acts of reconciliation, such as name change at Tsútswecw Provincial Park and involvement of Indigenous governance models in fishery decisions.

7. Favour an interior salmon habitat perspective when making harvest allocation decisions; load the spawning grounds before allowing harvest.
8. Salmon viewing tourism experiences in parks and protected areas hosted by a committed group of actors to strengthen network relationships to overcome organizational silos and build awareness of salmon conservation issues among the Canadian public.
FURTHER RESEARCH:
1. Using Indigenous Methodologies, examine how Indigenous knowledge and experiences of salmon ecosystems could support conservation efforts, particularly from an Interior BC perspective.
2. Using Network Theory, identify the most critical relationships in the salmon actor network. Developing recommendations for key relationships to be strengthened or supported will be fundamental next steps to strengthen the actor network.
3. Using Case Study Analysis, identify the barriers and facilitators of effective resource management in other watersheds and with other species. Identify best practices from other places that can inform the salmon network. Look broader than what is happening in BC to learn how watershed and protection is working in other contexts.
4. Further studies: Nature-based tourism in BC Parks and other protected areas of the province, related to salmon conservation; Indigenous relationship with salmon; Research from localized perspectives, including socio-cultural research; More community based qualitative perspectives related to salmon conservation, to capture additional bodies of knowledge which can be applied in localized context; Apply the technique of geographically representing network actors in alignment with species' life cycle to different land/marine migratory species.