

**SEEKING CERTAINTY: A POLITICAL ECOLOGY OF
SHELLFISH AQUACULTURE EXPANSION ON THE WEST
COAST OF VANCOUVER ISLAND, BRITISH COLUMBIA**

by

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APPROVAL

ABSTRACT

This dissertation documents the expansion of private access ocean tenures for shellfish aquaculture into the territory of the Nuu-chah-nulth First Nations on the West Coast of Vancouver Island, in British Columbia, Canada. The research illustrates how treaty making, promoted as a path to sovereignty for Aboriginal peoples, encouraged Nuu-chah-nulth participation in the nascent shellfish aquaculture industry and facilitated tenure expansion in Nuu-chah-nulth territory. The findings identify the potential that economic development programs in Aboriginal communities have to create uncertainties for non-industrial resource use, and to exacerbate vulnerability. The work also elaborates on the dynamics of politics and power in treaty making in British Columbia, and invites critical reflection on contemporary approaches to Aboriginal relations in the province.

Informed by literatures regarding governance and neoliberalism, the dissertation builds around a case study of a shellfish aquaculture venture owned and operated by one Nuu-chah-nulth First Nation, the *ka:'yu:'k't'h/che:k:tles7et'h'*. Facilitated by treaty mechanisms, the venture arose in the year 2000 and has faced difficulties in achieving profitability. In building and contextualizing the case, the dissertation: (1) highlights the diverse values that Nuu-chah-nulth peoples draw from the harvest of wild-growing shellfish; (2) presents a history of the shellfish aquaculture industry and the effort to place more ocean-based tenures in the province; (3) questions calculations regarding the economic potential of

shellfish aquaculture in BC; (4) conveys the role of treaty-related instruments and experts in the ka:'yu:'k't'h/che:k:tl̓es7et'h' venture; and, (5) identifies institutional change resulting from the 1998 Provincial Shellfish Development Initiative.

The research is qualitative and employs both structural and discursive analysis. Ethnographic data was collected in ka:'yu:'k't'h/che:k:tl̓es7et'h' territory during several field stays 2005-2008. Public discourse, testimonies to political committees, policy and treaty documents, and business plans are also central. I conclude that the equitable management of ocean space in British Columbia requires ongoing research regarding the allocation and retention of ocean-based tenures in Aboriginal communities, and the application of cost-benefit analysis that accurately accounts for local realities in decisions about the use of coastal resources.

Keywords: political ecology, aquaculture, British Columbia, Aboriginal peoples, treaty, governance, neoliberalism

For my elders,

~Ruth and Gordon & Margaret and Henry~

This work is also inspired by a wonderful network of family, friends and mentors. I am blessed that so many of you fit in to more than one of these categories, and I would not want it any other way.

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ACRONYMS

BC	British Columbia
BCSGA	BC Shellfish Growers Association
BCTC	BC Treaty Commission
BCAL	BC Assets and Lands, Inc.
CSR	Centre for Shellfish Research (of VIU)
DFO	The Federal Department of Fisheries and Oceans
FSC	Food, social and ceremonial harvests
INAC	Department of Indian and Northern Affairs Canada
KCFN	Kyuquot-Checlesheht First Nation
LWBC	Land and Water BC, Inc.
MAL	BC Ministry of Agriculture and Lands
MARR	BC Ministry of Aboriginal Relations and Reconciliation
MoU	Memorandum of Understanding
NAR	The New Aboriginal Relationship
NTC	Nuu-chah-nulth Tribal Council
NSDC	Nuu-chah-nulth Shellfish Development Corporation
SDI	British Columbia Shellfish Development Initiative
VIEDA	Vancouver Island Economic Developers Association
VIU	Vancouver Island University (formerly Malaspina College)

PREFACE

In the 1980s and 1990s, British Columbia was awash in social activism, environmental controversy and changing economic imperatives. The recession of the 1980s, the softwood trade wars with the United States in the 1990s, ongoing concern regarding environmental degradation, and broader changes in demand for primary goods were reshaping the way that resource-based industry operated in the province. Further, Aboriginal rights and environmental movements were just beginning to surge in their public popularity and political power. As one might imagine, the interests of industry (to find new, cheaper, and more flexible ways to operate) did not necessarily match with those of many Aboriginal people (to assert sovereignty and control over resource use in contested territory), or environmental groups (to ensure the protection of ecologically significant swaths of publicly managed Crown land).

Perhaps the most defining example of the tensions are the 1993 logging protests in Clayoquot Sound, on the West Coast of Vancouver Island. The protests saw a range of social and environmental activists strategically unite to block logging trucks from entering into cut blocks slated for harvest; the blocks fell within ecologically and culturally significant rainforest within Nuu-chah-nulth territory. The 10 000 plus participants were victorious on many fronts: they halted logging, conducted one of the largest successful acts of civil disobedience in

Canadian history, drew international media attention, and influenced a new series of environmentally oriented restrictions on the forestry industry.¹ The protests also sent a reminder to politicians and CEOs alike about the contemporary realities of doing resource-based business in BC. Indeed, a few years earlier, a now infamous 1990 report entitled, *Economic Value of Uncertainty Associated with Native Claims in British Columbia*, had quantified an estimate of the financial impacts of un-clarified Aboriginal rights and title on the provincial economy. It suggested that a potential of \$1 billion in sales and 1500 jobs per year in forestry and mining stood to be missed if tensions continued throughout the coming decade.²

This preface illustrates the precise genre of political-economic uncertainty that sent Provincial leaders in the public and private sectors scrambling to re-tool approaches to the environment and social issues in the 1990s. Policy shifts and new initiatives included the introduction of intensive and wide-spread public land-use planning, more inclusive approaches at ecosystem-based management, and requirements to consult, accommodate and compensate Aboriginal communities on neighbouring resource developments. Most central to the story of this dissertation is the revamped effort to achieve comprehensive land-claims treaties with Aboriginal groups in the province.

In 1992, the BC Treaty Commission, and its six-stage treaty making process was born. Interested groupings of affiliated Aboriginal people could now

¹ Arvai & Mascarenhas (2001).

² McCaulaugh for Price Waterhouse (1990)

formally file a claim to traditional territory. If accepted, negotiations regarding the terms of self-governance over a defined piece of territory would begin. However, almost twenty years later, completed agreements remain rare. Of approximately 50 negotiation tables, only three contemporary treaties have been formalized legislatively. Arrangements surrounding territory, resource access and citizenship are proving difficult to negotiate, particularly when the mandates of many political and business elites tended to resist recognizing Aboriginal rights or title to territory in the first place. Nonetheless, political manoeuvres to achieve 'certainty' carry on.

The New Aboriginal Relationship (NAR), which I discuss further in various chapters, is an emerging Provincial approach to Aboriginal relations that puts an overt entrepreneurial spin on treaty negotiations, and Aboriginal self-determination and sovereignty more broadly. Instead of waiting for completed agreements, it prioritizes immediately increasing access for Aboriginal communities to resources through private property arrangements and simultaneously directing funding for industrial development; under this logic, capitalist development equates with social improvement. Arguably, it takes a neoliberal approach to governing the relationship between Aboriginal people, their territory, and ultimately, their vision(s) for resource use.

The dissertation takes particular interest in how this political approach has influenced the expansion of private access tenures for shellfish aquaculture in the province. In exploring the simultaneous pursuit and promotion of shellfish aquaculture on the West Coast of Vancouver Island as an industry of priority for

seafood export *and* Aboriginal economic development, the research documents historical and structural context in the overt, yet inevitably incomplete, erasure of diverse shellfish meanings, uses and harvest arrangements on Vancouver Island's rugged west coast.

Jennifer Silver
Vancouver, British Columbia, June 2010

CHAPTER ONE - SEEKING CERTAINTY: OVER WHAT AND FOR WHOM?

For thousands of years shellfish farming has sustained the people of British Columbia's coast. Dependent upon pristine nutrient rich waters, shellfish farming is one of mankind's (*sic.*) most sustainable industries. British Columbia's shellfish farms provide jobs to local First Nations, who began the practice millennia ago, managing their own rock guarded clam gardens. Today, our challenge is to grow this socially and environmentally responsible shellfish industry whose brand is known the world over for exquisite taste and quality – wrapping it up in the mystique of British Columbia's spectacular rainforest coast (Passage as printed on the cover of a booklet advertising Vancouver Island University's Centre for Shellfish Research Deep Bay Field Station. Obtained in Spring 2009 and available in Appendix A).

I. Introduction

Read literally, the opening passage suggests that shellfish aquaculture as practiced in British Columbia (BC) today is not so far removed from the carefully managed 'rock guarded clam gardens' of the past. The literal reader might also assume that, in BC, shellfish aquaculture is embraced by Aboriginal people and communities, that it efficiently produces highly desired export commodities, and that with a bit of clever environmentally-focused marketing, it will continue to

expand and grow.³ When I first read the passage, I had been conducting my dissertation research for almost three years, and understood the situation to be somewhat more complicated.

Human intervention in coastal ecosystems for food production has certainly been occurring in the territory now known as BC for hundreds, if not thousands of years (Harper 1995; Parrish et al. 2006; Williams 2006; Rick & Erlandson 2009).⁴ It is also true that several species of shellfish have been harvested for commercial markets through a licensed fishery for much of the last century (Broadley et al. 1988; Mitchell 1995/6). The amount of shellfish produced in the province through aquaculture has also been growing steadily since at least the mid-1980s, and many Aboriginal communities have been experimenting with band-owned and operated aquaculture ventures (Howlett & Rayner 2004). However, as I will show, shellfish aquaculture as it is being pursued in BC by many political and industry leaders is diverging further from the way that coastal

³ In Canada, Aboriginal is the term that currently predominates in reference to an indigenous person, peoples or nation. Three sub-groupings of Aboriginal persons are recognized in the Canadian constitution: First Nations, Metis, and Inuit. In 2006, approximately 66% of indigenous peoples in BC identified as First Nations, 30% as Metis, and 4% as Inuit (Statistics Canada 2009). Under the Canadian constitution Nuu-chah-nulth peoples would be recognized as First Nations.

Throughout the dissertation, I use the term Aboriginal, particularly when referring broadly to the politics of relations between Aboriginal peoples/groups and the Provincial government. This is in an attempt to recognize that all indigenous peoples in BC face a common struggle in attempting to assert unique visions of self-determination and sovereignty within the context of the negotiation of modern treaties. Where appropriate, and/or when referring specifically to Nuu-cha-nulth or ka:'yu:'k't'h/che:k:tles7et'h' persons/communities/First Nation, I use these terms specifically.

⁴ Of particular relevance here are 'clam gardens', or sections of beach modified to increase habitat and support higher density clam growth. The extent and functionality of clam garden sites have only recently been documented through archaeological and paleo-ecological research (Harper 1995; Williams 2006; Rick & Erlandson 2009). Thus far, they seem most prominent in the Strait of Georgia and Broughton Archipelago (Williams 2006). The invocation of clam gardens in the opening passage can be seen as a strategy to connect present-day aquaculture practices to a longer lineage of socio-economic activity and cultural tradition.

resources have been regulated and allocated previously. Although they may not see their role as such, supportive politicians and industry advocates of the shellfish aquaculture industry thus face the dual task of enabling profitable levels of production *and* ensuring that society accepts, or even participates in, the practices necessary to achieve them. To achieve profitable productivity levels, contemporary shellfish aquaculture necessitates private access to ocean space, as well as a narrow set of conditions or behaviours from both nature and people.

Although the opening passage praises virtues of the industry as a whole, the booklet itself was actually fashioned to promote the new Deep Bay Field Station under construction by Vancouver Island University's Centre for Shellfish Research (CSR). Deep Bay is in Baynes Sound, which is the longstanding geographical and production core of the BC shellfish aquaculture industry (on the Strait of Georgia, see Appendix B⁵). However, by the mid 1990s the space available to new private access shellfish tenures was running short. Calls for expansion have been mounting in some industry circles for at least 15-20 years. In 1997, Coopers and Lybrand Consulting projected that the industry could grow from \$12 million wholesale to be worth \$100 million in ten years time, provided twice the space was provided to interested entrepreneurs, and productivity per hectare continued to grow (Coopers & Lybrand 1997).

Spurred strongly by the projected 'industry economic potential', concerted political effort to double the amount of ocean space under tenure for shellfish

⁵ Appendix B contains maps with the coastal locations and bodies of water referred to in the chapters to come. It should be referred to freely by the reader as a spatial guide to the research findings.

aquaculture officially commenced with the BC Shellfish Development Initiative of 1998. An array of claims regarding the virtues of shellfish aquaculture arose alongside the expansionary agenda. One of the most common was that it presents an ideal economic development activity for Aboriginal peoples and communities. In many prominent instances (e.g., Coopers & Lybrand 1997; Salmon & Kingzett 2002; Doyle 2002; Salmon 2006), it is promoted as a culturally amenable and more productive alternative to the existing commercial intertidal clam fishery, which features heavy Aboriginal participation.

The positive images the opening passage evokes on behalf of the wider industry present an alluring point of entry into this research because the dissertation exposes and grapples with some of the complications the passage leaves unarticulated. In particular, I consider the diverse Nuu-chah-nulth values extant in the harvest of wild-growing shellfish; present a social-ecological history of shellfish aquaculture in the province; question calculations regarding the economic potential of the industry in BC; convey the role of treaty-related instruments and experts in a ka:'yu:k't'h/che:k:tl̓es7et'h' owned and operated shellfish aquaculture venture; and, identify institutional change resulting from 1998 Provincial Shellfish Development Initiative.

Formally, this research documents the emergence of, and overlap between, efforts to strengthen shellfish aquaculture as a profitable export industry and as a strategy for Aboriginal economic development. The findings suggest that rather than offering an obvious market and/or conservation response to declining shellfish harvests, private access tenures to publicly accessible ocean

space for aquaculture became attractive in Nuu-chah-nulth territory through a combination of technological change, economic projections, treaty-related measures and interventions for Aboriginal participation in the industry, and an overarching institutional strengthening around industrial shellfish production. In a sense, the expansion of private access tenures into Nuu-chah-nulth territory *has been governed into existence*.

The remainder of this chapter lays some basic groundwork for the examination of shellfish aquaculture expansion that rests at the heart of the dissertation. First, I provide a brief overview of the key themes and some background information. I follow this with an initial description of the analytical framework that has guided the research. I conclude with research objectives and an outline of the chapters to come. Many of the topics and strands of literature I begin to engage with here will be further elaborated in Chapters Two and Three.

II. People, nature, certainty

Political-economic certainty exists so long as an individual or group experiences the luxury of assurance: assurance of a desired range of outcomes and their endurance over a given period of time. In this sense, it is particularly elusive in that techniques to govern for specific ecological, social, and economic outcomes (particularly over longer time periods) remain fallible and subject to change and acts of resistance (Rose 1996; Harvey 1999, 2005; Dean 2007). The late 20th and early 21st centuries have seen political and economic leaders move away from top-down, force-based techniques, towards manoeuvres that direct society through strategic social programming, negotiation, planning and outreach, and

market-based mechanisms. Observers identify this shift as characteristic of neoliberalism and/or the neoliberalization of governance (Foucault 1991; Rose 1996, 1999; Peck & Tickell 2002; Jessop 2002; Harvey 2005; Dean 2007).

Industrial resource development is also grounded in expectations of certainty (Merchant 1980, 1998; Rose 1996; Braun & Castree 1998; Escobar 1998; Smith 1998; Harvey 1999; Agrawal 2005; Heynen et al. 2007). Assured access to territory and/or specific amounts of a resource, predictable labour supply, and sustained productivity levels are pre-requisites for profitability (Boyd et al. 2001; Bridge & Jonas 2002; Heynen et al. 2007). In this sense, private property rights and their attendant social relations are fundamental to capitalist growth. However, to create private property, existing resource users must be dispossessed of territory or denied access to resources, which may in turn destabilize existing livelihood strategies. Contradictions in expectations of certainty are the basis upon which much critical literature regarding environmental management, including political ecology, is built (Blaikie & Brookfield 1987; Peluso 1992; Escobar 1999; McCarthy & Prudham 2004; McCarthy 2005a; Tsing 2005; Heynen et al. 2007).

In BC, resource development and Aboriginal relations are currently mired in various degrees of *uncertainty* (Woolford 2005; Penikett 2006; McKee 2009). Mineral extraction, energy production, forestry and fisheries face tight economic margins and are the focus of much public and regulatory scrutiny (Barnes & Hayter 1994; Blackburn 2005; Young 2008). In addition, the designation of rights and responsibilities regarding vast tracts of Aboriginal territory remain largely

incomplete; negotiations and litigations between the state and Aboriginal groups are frequent and often take years to conclude. The resulting confusion makes it difficult for both communities and industry to access resources. As a result, achieving certainty is currently central to both state and Aboriginal interests.

However, as articulated clearly in the 2009 BC Treaty Commission (BCTC) annual report, different notions of certainty have tended to exude from opposing sides of the negotiation table (BCTC 2009). The report explains,

(f)rom the Crown's perspective, certainty is the legal technique used in modern treaties to ensure there is a full and final settlement of the land question. From the First Nations' perspective, recognition is about acknowledging aboriginal title and ensuring the survival of First Nations' distinct cultures and societies, including their continued attachment to their traditional territories (BCTC 2009, p. 11).

Therein rests an overarching contradiction that I explore with the dissertation. For the state, certainty rests in achieving assurance that access to the land-base for development will proceed into the future. For many Aboriginal communities, maintaining certain ways of being within a specific area of territory are of central focus; this includes opportunities for diverse resource harvests (Turner et al. 2008). In the case of shellfish aquaculture expansion in BC, I document the processes by which a narrow vision of certainty proceeds, and the extent to which it does so to the detriment of diverse shellfish harvests and management arrangements.

III. State-Aboriginal relations in BC

Currently, only five treaty agreements are legally enshrined in BC; two historic (Douglas Treaties, 14 land purchases, 1850 -1854; Treaty 8, 1899), and three

present-day (Nisga'a, 1998; Tsawassen, 2007; Maa-nulth, 2007).⁶ Labrador and the Northern Territories notwithstanding, this is a departure from much of the rest of Canada where treaties with existing Aboriginal groups were concluded prior to, or during early confederation (although not always with the best of intentions or the most just outcomes, see Denis 1997; Walkem & Bruce 2001; Miller 2009). The small number of treaties in BC persists largely because upon entrance into the Canadian confederation in 1871, successive Provincial governments denied the responsibility to negotiate with, or provide compensation to, Aboriginal peoples (Tennant 1990; McKee 2009). Political denial continued until approximately 1990.

In 1992, the BC Treaty Commission, dubbed as the 'keeper of the treaty making process' (McKee 2009), was initiated. Its first commissioners were appointed in 1993 and Aboriginal claimant groups were thereafter encouraged to enter the six-stage negotiation framework.⁷ Both the Tsawassen and Maa-nulth treaties were concluded under the BCTC framework. Four additional treaties are in the final stages of the BCTC process and, as of January 2010, just over half of the nations in the province (representing approximately 60% of Aboriginal

⁶ A treaty is a negotiated agreement over an agreed upon piece of territory. It sets out rights and responsibilities for Aboriginal, Provincial, and Federal institutions. A comprehensive treaty articulates a wide range of issues including governance, taxation, land ownership, environmental allocation and management, education and health, and financial transfers and agreements (McKee 2009).

⁷ The stages provide 'stepping stones' towards treaty-ratification in that they dictate required procedures and objectives. The stages are: statement of intent to negotiate, readiness to negotiate, negotiation of a framework agreement, negotiation of an agreement in principle, negotiation to finalize a treaty, implementation of the treaty.

individuals) in the province are negotiating at BCTC sanctioned treaty tables (Ministry of Aboriginal Relations and Reconciliation 2010).⁸

At this time, however, few observers would claim that contemporary treaty making has lived up to the initial, optimistic expectations (Penikett 2006). Although the Provincial and Federal governments have injected upwards of \$2 billion into treaty making, much land, and associated resources, remains on the negotiation table, under requirements of consultation and accommodation, or stalled in litigation (Penikett 2006). Divergent rights and interests in the land base remain largely un-clarified (Christie 2006; Penikett 2006; BCTC 2009; McKee 2009). With a more general societal awakening to the reality of Aboriginal rights and title on the one hand, and the immense difficulties in realizing treaties on the other, pressure to find alternative avenues for reconciliation continues to intensify.

As I elaborate further in the following two chapters, palpable changes in the ways that the state, the Provincial government in particular, understands and approaches Aboriginal relations, treaty making, and resource development in un-treated territory have unfolded over the last decade.⁹ Treaty negotiations

⁸ The 2006 Canadian census recorded 196 075 individuals identifying as Aboriginal, and 3 878 310 individuals identifying as non-Aboriginal in BC (Statistics Canada 2009). Estimates suggest that, prior to European contact there were 2 to 5 million inhabitants in the area that is now BC (McKee 2009).

⁹ I recognize that reference to 'the state' invokes a broad set of institutions, including government agencies, courts, penal system, and in some instances, the media. In BC, all of these play a role in defining and articulating relations between Aboriginal and non-Aboriginal society. My analysis has focused mainly on changing approaches that emanate from the Provincial government (e.g., departments, political debate and posturing). Therefore, my use of the term 'State-Aboriginal relations' in the dissertation can be interpreted to be largely in reference to the ways that Provincial governments in BC have understood issues of Aboriginal rights and title, and have caused (re)organization by various other state apparatus as a result.

continue, but they do so alongside of the parallel 'New Aboriginal Relationship' approach initiated by the current Provincial government (2001-present), led by Premier Gordon Campbell. This emerging suite of approaches calls for careful examination in terms of their potential to exacerbate socio-economic inequalities, facilitate Aboriginal sovereignty, and create meaningful opportunities for self-determination.¹⁰ The expansion of shellfish aquaculture into Nuu-chah-nulth territory provides an interesting case through which to consider these issues.

IV. Advancing a blue revolution? Industrial aquaculture in Canada

Industrial aquaculture is the high density rearing of specific aquatic species through intentional human intervention in their life cycle for commercial purposes (Silver, in press). As with industrial agriculture, industrial aquaculture ventures are commercial enterprises operating under highly competitive economic imperatives (Muir 2005). A successful marine aquaculture business rests on the assurance of private access rights to ocean space and the ability of the entrepreneur to utilize and/or manipulate the productivity of a coastal ecological system for competitive advantage (Anderson 2002; Naylor et al. 2003; Bavington 2005; Joyce 2008).

In 2003, *The Economist Magazine* put the (financial) world on notice that a 'blue revolution' was under way, and that it had the potential to solve marine food

¹⁰ Sovereignty generally refers to the independent authority of a people over activity and citizenship within a defined territory. Similarly to Sullivan (2006), I understand sovereignty as "mutable and contingent" (p. 45), in that it ultimately boils down to ongoing exercises of power such as jurisdictional control, the maintenance of boundaries, and the allocation of finances and resources. I consider self-determination to be the degree to which these processes are pursued independently of undue and/or unsolicited influence.

production and conservation conundrums. Pointing to recent increases in shrimp and salmon production for global seafood markets, the article asserts that aquaculture stands to increase the productivity of coastal ecosystems. It proclaims confidently: “(n)ew technologies, new breeds and newly domesticated species of fish offer great hope for the future. They promise a blue revolution in this century to match the green revolution of the last” (p. 20).

The groundwork for an internationally competitive Canadian industrial aquaculture sector was initiated in the late 1970s and early 1980s. Interests formally coalesced for the first time in 1983 at meetings hosted in St. Andrews, New Brunswick by the Federal Department of Fisheries and Oceans (DFO). A brief search of articles from that period in a prominent national newspaper, *The Globe and Mail*, indicates that Canadian fisheries bureaucrats were particularly concerned by other countries with comparable coastline (e.g., Norway, Japan, and Scotland) pulling ahead in technological innovation and profit in salmon farming (Immen 1983; Porteous 1983; *Globe and Mail* 1983). In 1984, the Prime Minister named DFO as the lead Federal agency responsible for aquaculture governance. By 1988, agreements between the Federal government and the Provinces regarding roles and responsibilities had been negotiated. In most cases, the Provincial governments retained roles and responsibilities surrounding tenure allocation, siting, administration, and the mitigation of localized pollution

and habitat impacts. DFO retained an overarching, and somewhat contradicting, development-conservation mandate (VanderZwag & Chao 2006).¹¹

The Canadian industry has matured over the ensuing two and a half decades (on law/governance see VanderZwag & Chao 2006; on growth and political economy see Rayner & Howlett 2007). Efforts have bred some financial success. In 2007, the Canadian industry had a wholesale value of ~\$846 million (DFO 2008a). In context, this accounted for 1-2% of the world aquaculture production in the same year (UNFAO 2008), and was less than Canadian commercial fisheries, which had a wholesale value of \$1.951 billion (DFO 2008a). The current bulk (~91%) of the value of the Canadian aquaculture industry comes from four species: salmon, oysters, mussels, and trout (ibid, online). Nonetheless, DFO estimates that the Canadian aquaculture industry is poised to expand and could generate \$2-2.8 billion/year within the next 8-10 years (DFO 2008c). The financial projections also claim this growth would bring “year-round employment to more than 40,000 people in coastal, rural and aboriginal communities” (DFO 2008c, online).

The potential of aquaculture expansion for economic development in Aboriginal territory has already received some optimistic attention from the

¹¹ In the BC Supreme Court case, *Alexandra Morton et al vs. the A.G. of British Columbia and Marine Harvest Canada*, Justice Christopher E. Hinkson ruled in February 2009 that given its potential to impact other Federally managed fisheries, the BC government does not have the right to regulate salmon farms. A negotiated transfer of salmon farm regulation to DFO was mandated to occur one year later, but on January 26, 2010, Hinkson granted extension until Dec. 18, 2010. The BC Ministry of Agriculture and Lands announced its intention to also negotiate the transfer of shellfish aquaculture regulatory activities to DFO (not including the allocation of access rights), and placed a moratorium on any new aquaculture tenures or tenure expansions. However, the Government of Canada has also chosen to appeal the Hinkson decision. Given the newness of these decisions and the appeal, they have not been considered in this analysis.

Federal government and industry. This passage from the 2003 Report of the Canadian Commissioner for Aquaculture Development captures the 'win-win' attitude that proliferates. It reads:

(i)n many regions of Canada, First Nations have unique access to aquaculture development sites, when the primary constraint on industry growth in the area is, in fact, site availability. Aquaculture also fits well with the skills held by much of the potential work force in these communities (DFO 2003, p. 17).

It goes on to cite a 2001 Indian and Northern Affairs Canada (INAC) report that found approximately 130 First Nations have the potential to develop trout farms, 61 coastal First Nations have access to sites that could support salmon farms and 123 First Nations have access to sites with the potential for shellfish farming (DFO 2003).¹² As this dissertation reveals, similar assessments have been central to the expansionary mandate for shellfish aquaculture in BC.

Shellfish aquaculture in BC

Estimates suggest that the BC's intertidal and nearshore zones support up to 180 different species of bivalves; many of these are important food sources for local people¹³ (Parrish et al. 2006; Uu-a-thluk 2008; estimate by Neil Bourne in Broadley et al. 1988, p. 7). Some are exotic species that have colonized in the province and gained commercial significance through the intertidal clam fishery and/or the shellfish aquaculture industry (Gillespie 2007). However, when it

¹² It is unclear on how these assessments were made or what indicators were used. However, given the sheer number of communities assessed it is questionable as to whether in-depth, socio-cultural, ecological, and economic studies were undertaken within each community.

¹³ The intertidal is the area of coast between the low and high tide marks (i.e., exposed at low tide, covered at high tide). The nearshore is just below the low water mark, and is not exposed to the air. Bivalves are species of mollusc with shells consisting of two plates hinged together by a ligament. The word 'shellfish' is a less formal term, but for the purposes of the dissertation, is used interchangeably with bivalve.

comes to shellfish growth and culture, not all coastal habitat is equal; optimal conditions tend to occur in sheltered bays and estuaries, areas of low slope where the substrate is loose sand or cobble, and where adequate nutrients become available from currents and tidal fluxes (Joyce 2008).

Therefore, industrial shellfish aquaculture in BC utilizes a myriad of techniques to optimize the growth rates and density of shellfish within carefully located ocean-based tenures. Tenures usually occur in intertidal or nearshore areas, and currently, clams and oysters are the shellfish most voluminously produced through aquaculture.¹⁴ To achieve success, an aquaculturist (i.e., shellfish farmer) must ensure that the species grown and techniques employed are appropriate for the ecological conditions at their specific tenure site. Until the mid-1990s, productivity increases tended to evolve through on-farm experimentation and minor technological adaptations. However, advances in animal health and physiology, broodstock development, genetics, husbandry, anti-fouling and harvesting techniques increasingly drive industry competitiveness (Salmon & Kingzett 2002; Kingzett 2005). In other words, improvements in farm-level productivity increasingly rest with advances in

¹⁴ In BC, most nearshore and intertidal ocean space is considered 'crown land' and is managed by the Provincial government on behalf of British Columbians. Clams are planted and grown-out on modified sections of intertidal, while oysters tend to be cultured on rafts that float in nearshore waters. Thus, the Provincial government currently allocates tenures, while the Federal government participates in siting, evaluation, and enforcement activities. In exchange for lease fees paid to the Province, the tenure-holder gains private access to specific pieces of ocean space, usually for a 20-25 year period.

Further description of culture techniques, rights granted through tenure, as well as the allocation and regulatory process that oversees them will be considered further in the chapters to come. For a full delineation of the characteristics of ocean-based tenures and changing rights in shellfisheries in the province, see Joyce (2008).

scientific research and the farmer's ability to adapt and incorporate changing technology.¹⁵

The wholesale value of the BC shellfish aquaculture industry in 2008 was \$27 million (down from \$32.8 million in 2007). The production core is, and has always been, in the sheltered heart of the Strait of Georgia (see Appendix C). Estimates indicate that in 2002, 29% of the total ocean space under tenure for shellfish aquaculture (producing 52% of the wholesale value) rested in Baynes Sound (Centre for Shellfish Research 2002). However, in addition to supporting the shellfish aquaculture industry, the southern interior of Vancouver Island and the mainland Sunshine Coast are home to many permanent and seasonal residents as well as a significant ecotourism industry. Therefore, decreasing water quality and conflict over what constitutes ideal use of coastline has constrained the further allocation of tenures in the region since at least the early 1990s. Efforts to expand tenures into different regions and increase the overall productivity of the industry emerged formally in 1998.¹⁶

¹⁵ In BC, the capture and culture of shellfish has contributed to non-Aboriginal coastal livelihoods since at least the early 20th century. Quantitative characterization of the precise structure and socio-economic makeup of the present-day shellfish aquaculture industry are not readily available (e.g., size of firms, ownership, profit, changes over time). However, the industry is generally understood to currently be comprised of a mix of smaller producers and larger firms, and that it may be increasingly difficult for small producers to compete in terms of volume and range of products grown. Further discussion of the history and structure of the shellfish aquaculture industry in BC occurs in Chapters Five and Six.

¹⁶ As I will discuss, various commentaries (i.e., Salmon & Kingzett 2002; Kingzett 2005a; BCSGA 2009a) suggest that intensive or mechanized production and targeted marketing is required to ensure that BC shellfish products are competitive internationally. There are, of course, factions amongst industry participants regarding these goals. With this research, my focus has been on individuals and organizations that promote expansion, intensification, and brand marketing (i.e., industrial modernization). My corresponding short-hand use of the term 'industry' is not meant to characterize all shellfish aquaculturists as having common opinions, goals, or socio-economic backgrounds. Further research to characterize tenure-holders and/or aquaculture entrepreneurs would be informative.

V. A political ecology of shellfish aquaculture expansion

The analytical approach that guides this research is political ecology. Emerging in the 1970s and 80s (Wolf 1972; Blaikie 1985; Watts 1986), it assumes that environmental problems (source, definition, and solutions) are always politically charged.¹⁷ Initially, political ecologists sought structural explanations of environmental change and its impacts on local resource users. In this sense, research was pursued as a political economy of environmental degradation, almost entirely in developing countries (Wolf 1972; Blaikie 1985; Bryant & Goodman 2008). However, political ecologists influenced by the post-structural turn in the social sciences now also analyze discursive constructs of nature (Braun & Castree 1998; Escobar 1999; Castree 2004) environmental crisis (Taylor & Buttel 1992; Adger et al. 2001), and scale (Marston 2000; McCarthy 2005b). Recently, political ecology has also broadened its scope to consider environmental change and environmental injustice in industrialized nations (McCarthy 2002; Robbins 2002).

Political ecologists explore relationships that different groups of people have to resources and to each other (Peluso 1992; Ribot & Peluso 2003). Thus, how rights and access to resources are mediated over time between various groups, with various amounts of power, is a central point of departure for a

¹⁷ I recognize political ecology's roots in cultural ecology (Steward 1955; Wolf 1972) and concurrent growth in anthropology over roughly the same time period (Paulson et al. 2003). In particular, anthropology provides important contributions in understanding the relationship between culture and nature, adaptations to environmental change, and the dynamics of political power (Escobar 1995; Paulson et al. 2003; Zimmerer 2006, 2007; Li 2007). In its focus on space/scale/territory and market/political forces, this research is also strongly influenced by political ecology as taken up by the discipline of geography (Neumann 2005). The brief review here and its extension in Chapter Three reflect this focus.

political ecologist, and for this research (Escobar 1998). From this perspective, opportunities for a local community or group of resource users to benefit from an adjacent resource are impacted by larger socio-economic and political power dynamics at play (Ribot & Peluso 2003), as are opportunities to interpret, define and articulate the meaning and value of the environment itself (Taylor & Buttel 1992; Braun & Castree 1998). Analytically, this approach necessitates understanding resources and their social, political-economic and ecological contexts (Blaikie 1985), institutional and rights-based arrangements for their allocation and development (Ribot 1998; Ribot & Peluso 2003), as well as how both are represented, communicated, and reproduced through discourse, funding, and public policy (Braun & Castree 1998; Brown & Purcell 2005).

My methodological approach and analytical framework are informed by these strands of thought; I consider structural changes in the allocation and regulation of ocean space as well as discursive representations of the industry that present shellfish aquaculture as an ideal fit for Aboriginal community development. I see changes in shellfish harvest opportunities for coastal Aboriginal communities to be a result of this complex interaction of factors, as is the viability of shellfish aquaculture in any given location. Careful attention to the case of ka:'yu:'k't'h/che:k:tles7et'h' shellfish tenures illuminates dangers in the simultaneous pursuit of shellfish aquaculture as an industry of strategic priority and an Aboriginal economic development activity. I suggest that, while offering a new and potentially profitable economic opportunity to Aboriginal peoples and communities, the approach also generates the potential for the re-production and

proliferation of uneven power dynamics and the exacerbation of existing cultural, economic and ecological vulnerabilities (Blaser et al. 2004). Further, it sets into motion new pressure to assimilate territory and livelihood strategies by equating increased participation in entrepreneurial activity with sovereignty and social justice (Altamirano-Jiminez 2004; Alfred 2005). These outcomes have clear implications for the use of local resources and the rate of environmental change in Nuuchahnulth territory, which in turn reduce variety in livelihood options and opportunities for self-determination.

VI. Dissertation objectives and layout

Using the example of shellfish aquaculture expansion, this research explores how state-driven visions of political-economic certainty may limit alternative visions for territory, including subsistence activities and their corresponding role in Aboriginal culture and community economy. I explore the overarching question, *how do the contemporary politics of state-Aboriginal relations enable and/or constrain shellfish aquaculture expansion on the West Coast of Vancouver Island (WCVI), and to what extent do Provincial and industry visions for shellfish aquaculture expansion proceed to the detriment of diverse shellfish values and harvest arrangements?* The objectives of the dissertation are as follows:

- document the diverse values of shellfish harvest in Nuuchahnulth territory, and of the intertidal clam fishery to ka:'yu:k't'h/che:k:tles7et'h' harvesters;
- explore the emergence of the BC shellfish aquaculture industry. Present a detailed background and consideration of its prominent species;

- investigate the role of treaty related agreements in enabling the expansion of shellfish aquaculture tenures, and document ka:'yu:'k't'h/che:k:tles7et'h' (Kyuquot-Checlesheht) experiences with a band-owned and operated shellfish venture; and,
- consider how initiatives for expansion and Aboriginal participation have precipitated an uneven distribution of benefits and risks.

Policy and discourse analysis reveals how the initiation of the 1998 BC Shellfish Development Initiative implicated the WCVI and Nuuchahnulth territory as an ideal region for tenure expansion. This process began and continues through pre-treaty funding and agreements, was encouraged and promoted by industry leaders and consultants, and in some places has been institutionalized through stipulations in the 2007 Maa-nulth treaty. The ethnographic core of the work documents specific events and experiences of the Kyuquot-Checlesheht First Nation (KCFN) and ka:'yu:'k't'h/che:k:tles7et'h' peoples. I document varied Nuuchahnulth uses of shellfish, the multiple values derived by ka:'yu:'k't'h/che:k:tles7et'h' from participation in the DFO managed commercial intertidal clam fisheries, and the details of a foray into band-owned and operated shellfish aquaculture tenures. I conclude that although the \$100 million financial projection has not been achieved by the industry (recall that in 2007, the wholesale value of industry was \$32.8 million), institutional strengthening has nonetheless occurred to the clear benefit of some existing producers, wholesalers, and industry advocates. Recommendations for ongoing research and speaking to the politics of the New Aboriginal Relationship (NAR) are central to the discussion and conclusions that conclude the dissertation.

Chapters to come

In Chapter Two, I situate the research in broader literatures with a focus on neoliberalism and governance, and the role of the subsistence harvest of seafood in maintaining prospects for diverse community economies. I use Chapter Three to present the research background and methodology. It includes discussion of the New Aboriginal Relationship and its connection to the research, as well as consideration of the field site and data, my analytical approach, and personal reflections on my identity and motivations for the research. My overarching intent with these chapters is to ground the succeeding findings in current literature and provide a sense of the contemporary political-economic terrain in which the research has been conducted.

Chapters Four through Seven narrate changing practices in BC shellfish harvest, management and production, and explore how they rest on homogeneous assumptions regarding nature and Aboriginal participants. In Chapter Four, I discuss the various values in shellfish and shellfish harvest for Nuuchahnulth participants and illustrate how some of them are engaged through participation in the DFO managed commercial intertidal clam fishery. Chapter Five situates the present-day shellfish aquaculture industry in a longer regulatory and social-ecological background and illustrates the contingent nature of industrial shellfish production in the province. Next, with Chapter Six, I explore various prominent arguments for tenure expansion and increased per hectare productivity in the BC shellfish aquaculture industry that began in the late 1990s. Here I also focus in on specific initiatives for Aboriginal participation in the

industry, including treaty related measures. Finally, in Chapter Seven I present the case of the ka:'yu:'k't'h/che:k:tes7et'h' shellfish tenures that were put in place in 2000-2001 and explore the role that industry advocates and experts have played in identifying and defining the goals and objectives of initiatives for Aboriginal participation in shellfish aquaculture.

In Chapter Eight, I consider what the Shellfish Development Initiative has achieved in terms of its stated claims and actual outcomes. I also comment upon how the findings speak to the Province's unfolding NAR approach to Aboriginal relations and what it may imply for vulnerable Aboriginal identities, economies, and ecologies. Finally, with Chapter Nine, I review the findings, identify limitations, and outline recommendations for future complementary research that may answer questions the work has evoked.

As a whole, the dissertation presents a theoretically informed and ethnographically rich narrative of various paths pursued in search of certainty on the West Coast of Vancouver Island. Despite the high degree of optimism expressed by politicians and industry advocates, the data suggest the expansion of private access tenures for aquaculture are precipitating perverse outcomes, unmet projections, and localized resistances. Expansionary initiatives have not achieved their original goals, but have led to unanticipated institutional strengthening and the proliferation of uneven power relations. I believe these findings may speak to the wider NAR approach that is currently emerging in the province.

CHAPTER TWO - LITERATURE REVIEW

The most striking thing about resource production and consumption is that despite underlying tendency towards conflict, resource extraction activities are rendered reasonably coherent for significant periods of time. This is because potential conflicts are often negotiated through historically and geographically specific socio-political struggles that become codified as the institutions and social practise within which resource extraction activities are embedded (Bridge & Jonas 2002, p. 759-760).

I. Introduction

Mitchell Dean (2007) suggests that governing society is a distinctly “political project” (p. 1). On the surface, this statement seems obvious. As regularly understood, politics are a product of the rational regulation of domestic affairs through the formal institutions of the nation state (Dean 2007). However, particularly in contemporary liberal-democratic societies, individuals may act, vote, communicate, reproduce, consume, etc., generally without concern for persecution or other punitive response. According to Tania Li (2007), to govern requires overseeing “the actions of subjects who retain the capacity to act otherwise” (p. 17). Social scientists are therefore increasingly inclined to understand governance in relation to its overt regulatory, policy and disciplinary actions, as well as its reliance on discourse, directed programming for social and economic development, processes for public engagement, and market-based interactions to achieve desired outcomes (Foucault 1991; Rose 1999; Jessop 2002; Dean 2007).

As articulated by Bridge and Jonas (2002), the maintenance of sustained, profitable resource development requires the minimization or elimination of conflict and other uncertainties. Beginning with access, moving onto husbandry and business practice, and ending with consumption, a variety of behaviours, activities, and conditions must be aligned for sustained profitability to be achieved (Bridge & Jonas 2002; McCarthy 2005b; Heynen et al. 2007). In this sense, governance of the environment and resources unfolds over time, across multiple scales, and in the process, implicates people, markets, and ecosystems (Bridge & Jonas 2002; Bulkeley 2005; McCarthy 2005b; Agrawal & Lemos 2007; Walker et al. 2008). Consequently, research with the objective of documenting the contingencies and processes driving social-ecological change must also trace the power dynamics at play in governance (Liverman 2004; Bulkeley 2005; McCarthy 2005b). According to Paulson et al. (2003), power is “rooted in the asymmetrical distribution of resources and risks” and is reproduced through the social “processes that constitute people, places, and resources” (p. 205).

For example, for advocates of industrial aquaculture, a significant project in enabling shellfish aquaculture expansion is to encourage Aboriginal and other coastal communities that it is a beneficial activity to incorporate into economic development and livelihood strategies. This is a difficult and potentially controversial prospect because of existing shellfish uses, because access rights to intertidal territory must be redefined through the allocation of private access tenures (also see Joyce & Canessa 2009), and because changes in a mode of production inherently imply change in interrelations between people, as well as

with their physical surroundings (Neumann 2005). As the chapters to come will demonstrate, initiatives for Aboriginal participation in shellfish aquaculture implicitly seek the enclosure of and regulation of activity in ocean space, as well as a specific set of behaviours and outcomes from both society and nature. Further, dynamics of social and political power have facilitated initiatives on the WCVI, and thus, played a role in the expansion of private access tenures for shellfish aquaculture.

With this chapter, I situate the research relative to a growing literature on the contemporary politics of Aboriginal relations and resource use in BC. I suggest that outright denial of Aboriginal rights and forceful dispossession from territory has given way to various other power-laden processes. I also identify the theoretical foundations of the research within broader scholarship regarding neoliberal approaches to governance. Finally, I explore evidence of diverse seafood use in coastal Aboriginal communities, and comment on its role in sovereignty and self-determination.

II. State-Aboriginal relations: governing territory, resources, and identity

The title of the Indians in the fee of the public lands, or any portion thereof, is distinctly denied. In no case has any special agreement been made with any of the tribes of the Mainland for the extinction of their claims of possession; but these claims have been held to have been fully satisfied by securing to each tribe, as the progress of settlement of the country seemed to require, the use of sufficient tracts of land for their wants of agriculture and pastoral purposes (Joseph Trutch, Lieutenant Governor of British Columbia 1871-1887, from McKee 2009, p. 18).

British Columbia's economy is resource-based (Hayter & Barnes 1990; Hayter 2003; Young & Matthews 2007; Young 2008).¹⁸ For much of the last century, economic growth has been sought through the legitimization, allocation, and regulation of private access rights to bountiful public forest, fish, ocean space, energy and mineral resources (Bridge & McManus 2000; Hayter 2003; Prudham 2007; Reed 2007; Pinkerton & Edwards 2009). Once allocated by the state, through tenure, license, quota, lease, etc., the rights permit the holder to extract or alter the resource in question (Hayter 2003; Prudham 2007). In this context, 'economic development' tends to connote a very specific set of expectations regarding the use of natural resources: the production of surplus through wage labour, the export of raw resource commodities, and the maintenance and reproduction of amenable social relations (Warriner 1987; Barnes & Hayter 1994; Willems-Braun 1997; Rossiter & Wood 2005; Prudham 2007).

As reconfirmed in the words of Joseph Trutch, the ability of the Provincial government to allocate private access to resources rests in the initial rejection of Aboriginal rights, and subsequent resettlement of Aboriginal people onto state-selected reserve lands. Both of these occurred with the support of an enabling colonial legal system (Day & Sadik 2002; Hayter 2003; Rossiter 2007; D.C. Harris 2008; McKee 2009). Denial and dispossession also received ongoing legitimization through various versions of the *terra nullius* narrative, or what Day

¹⁸ In 2001 2/3, or about \$28.5 billion worth of BC's international export-based revenue came from goods and services produced in rural/periphery areas of the province, and similar trends continue (Baxter et al. 2005).

and Sadik (2002, p. 12) describe as the “fiction” of “vacant land uninhabited by ‘civilized’ societies” (also see Willems-Braun 1997; Day & Sadik 2002; C. Harris 2003, 2004). Indeed, to European newcomers, indigenous ways of knowing and using the environment were unfamiliar and often deemed inadequately productive or lacking in sophistication (Fisher 1992; C. Harris 1997, 2003; Willems-Braun 1997). Of course, *terra nullius* is a fiction: Aboriginal peoples have cultivated, managed and traded resources to achieve individual and community wealth and well-being for millennia (Harper 1995; Turner et al. 2000; Trospen 2003; Lepofsky et al. 2005; Williams 2006; Trusler & Johnson 2008).

Since initial contact, newcomer-native, and then state-Aboriginal relations have evolved continuously (Tennant 1990; Clayton 2000; Penikett 2006). To situate contemporary state-Aboriginal relations (in particular, the ‘New Aboriginal Relationship’ as further discussed in the next chapter), here I sketch some significant moments in political relations between natives and newcomers: strategic inter-reliance; dispossession, expropriation, and the enactment of colonial rule, and; changes in the late 20th century.¹⁹ The short descriptions confirm continuity in tensions between state interests and Aboriginal use of territory and resources.

¹⁹ These sketches condense almost three centuries of complicated colonial and legal history. My brevity should not be interpreted as a commentary on the significance of these moments to the politics and economy of present-day BC. Rather, they are an attempt to trace the genealogy governance and political power in state-Aboriginal relations (Foucault 1979). Tennant (1990), Fisher (1992), Culhane (1997), Braun (2000, 2002), Clayton (2000), C. Harris (2001, 2002, 2004), D.C. Harris (2001, 2008), Walkem and Bruce, eds. (2003), Christie (2006), and Miller (2009) are strong examples from the substantial historical and legal research that is available.

Strategic inter-reliance

When encountered in the 1770s by European maritime explorers, who were followed closely by traders and merchants, much of the coastline was found to be inhabited by peoples with different lifestyles, spiritual practices, institutions, and economic processes than their own (C. Harris 1997; Clayton 2000). In the decades between contact and BC's entrance as the sixth province in the Canadian confederation in 1871, native-newcomer relations based on extraction, trade, and export were forged. An economy grew around sea otter pelts, often hunted by Aboriginals, and unique geographies of encounter and resistance played out along the coast (see Clayton 2000). Fisher (1992) notes, "(n)ative traders were not gullible savages, but rather were rational and calculating in pursuit of their own self interest" (p. xiii-xiv).

In fact, when the first edition of Fisher's book was published in 1977, it flew in the face of the perception that a capitalist economy unravelled neatly and efficiently around native populations, who would have otherwise been disinclined to 'modernize' (Clayton 2000). The work spurred re-consideration of the interplay between natives and newcomers, and the dynamics of initial trading relationships. Clayton (2000) summarizes Fisher's findings as revealing that in some cases at least, the relations enabled "an efflorescence of Native material cultures, especially along the coast" (p. xvii). The literature now generally agrees that early political-economic relations between natives and newcomers were pursued strategically from both sides, and some Aboriginal economies successfully grew as a result (Fisher 1992; C. Harris 1997; Clayton 2000; D.C.

Harris 2001, 2008). McKee (2009) proposes that European engagement with Aboriginal tribes and nations was similar to what might occur between any two autonomous nations at the time: strategic relations where the threat of violence from either side simmered under the surface of many interactions.

Dispossession, expropriation, and enacting colonial rule

The literature also suggests that power dynamics shifted upon the arrival of subsequent waves of permanent British settlers (Tennant 1990; Fisher 1997; Braun 2000; C. Harris 1997, 2002, 2004; Rossiter 2004). From 1881 to 1899, the Canadian government's system of 'Indian Reserves' expanded into British Columbia, although treaties did not. Under the Federal *Indian Act* [1876], government agents were empowered to install elected Band Councils on reserves wherever possible, essentially working to dismantle existing indigenous systems of governance (Sullivan 2006).

Volumes have been written about the motives and methods of colonialism in Canada during this period (Culhane 1997; Denis 1997; Walkem & Bruce 2003; D.C. Harris 2001, 2008; C. Harris 2003). Dispossession of territory and expropriation of resources enabled through force and law figured prominently in ensuring favourable conditions for settler resource development, agricultural expansion, and residential settlements (Tennant 1990; Culhane 1997; C. Harris 2003; D.C. Harris 2008). Of course, many individual and collective acts of resistance occurred and forced colonial political response (Tennant 1990). However, assimilative actions and the spread of European disease worked in favour of the broad colonial vision (C. Harris 1997, 2003).

The late 20th century: denial to court-driven recognition

Despite incremental legal and social advances, Provincial denial of any responsibility to acknowledge or act on Aboriginal rights or claims to territory persisted into the 1970s (Tennant 1990).²⁰ Resource and land development boomed, yet consideration or compensation for Aboriginals whose territory was implicated remained unnecessary and largely ignored (Hayter 2003). However, as the opening preface to this dissertation captures, tensions grew between the 1970s and 1990s as social and environmental advocates and organizations gained political traction. To a degree, activists of various stripes organized around the issue of nature conservation (Roth 2002; Rossiter 2004).

The coalescence of civil society aside, broad legal and constitutional change also increased pressure felt by politicians and business leaders in the province (Blomley 1996; Dacks 2002; Roth 2002; Woolford 2005). Encouraged by the Canadian Supreme Court's *Calder* [1972] decision, the 1982 Canadian constitutional reform signalled the existence of underlying Aboriginal rights and title (see Walkem & Bruce 2003 for background). In section 35(1) of the revised Constitution, rights and title were enshrined as a distinctive and communal right

²⁰ For example, Aboriginal voting rights were extended in 1951 (Federal) and 1962 (Provincial) respectively, and the 1884 ban on potlatches and related indigenous ceremonies in BC was lifted in 1951.

to the exclusive use of specific territory.²¹ However, they had to be proven to the court and were alienable only to the Crown. Provincial and Federal Supreme Court decisions also continued to clarify requirements to consult and accommodate communities in whose territory developments occurred. The court decisions of *Sparrow* [1990], *Delgamuukw* [1997], *Haida* [2004], and *Taiku* [2004] are commonly identified as central (Dacks 2002; Christie 2006; McKee 2009).

In BC, the constitutional and legal change opened a proverbial can of worms regarding treaties, or more appropriately, the lack thereof. In the 1990s, hopes ran high that through the BCTC treaty making process, rights, roles and responsibilities over territory in much of the province would be clarified (Penikett 2006). As is now clear, this hope was naïvely optimistic. Nonetheless, the court-driven recognition of Aboriginal rights and title, and the reality that they must be addressed in land-use and planning, shifts a degree of power back to Aboriginal nations and leaders. Arguably, this shift has necessitated change in state-Aboriginal relations once again (Roth 2002; Penikett 2006; McKee 2009).

The politics of contemporary Aboriginal relations

This dissertation adds to a small but growing body of literature that documents the politics of the lagging treaty making process and explores contemporary state

²¹ Most broadly, rights include access to all that is necessary to ensure the continuity of a culture and society, such as rights to harvest, trade, self-identification, and governance (McKee 2009). Title refers to specific pieces of territory where a given group may enjoy their rights, as they have done since time immemorial (Christie 2006). Where they have not been previously extinguished through treaty or other agreement, Aboriginal rights and title are protected under section 35(1) of the Canadian constitution (McKee 2009). In BC, the Provincial government asserts legal title to most land. However, as McKee (2009, p. 10) states, “the rights of Aboriginal peoples, based on Aboriginal title, are such that the underlying title of the Crown is of limited value as long as the burden of Aboriginal title remains”.

approaches for neoliberal tendencies (Woolford 2001, 2004a,b, 2005; Roth 2002; Altamirano-Jiminez 2004; Blackburn 2005, 2007, 2009; Sullivan 2006). It contributes to critiques regarding the appropriateness of treaty making to address past injustices, and its implications for meaningful sovereignty and self-determination in the future (Alfred 2001; Woolford 2001, 2004a,b, 2005; Roth 2002; Blackburn 2005, 2007, 2009; Sullivan 2006; Penikett 2006). Finally, the findings provide further evidence that Aboriginal sovereignty and self-determination are being re-framed in terms of participation in the capitalist economy (Rossiter & Wood 2005; Blackburn 2009).

In his doctoral dissertation and a subsequent book, Andrew Woolford (2001, 2005) assesses the evolution and present-day status of the BC treaty making process from various sociological perspectives on reconciliation and justice. He concludes that in their limited legal and social mandates, treaties are more a mechanism to achieve economic, legal, and political certainty than to rectify injustices of the past. Woolford (2004b) suggests that prospects for meaningful Aboriginal self-determination will continue to remain limited as a result. He concluded that,

although a discussion is taking place between the parties on the question of certainty, it is clear that the current socio-economic context of the negotiations limits the possibilities for resolving this issue through any compromise that fully recognizes the alternative rationalities of Aboriginal lifeworlds (p. 439).

In other words, alternative aspirations for reconciliation and the utilization of resources in indigenous territory may not receive adequate space or consideration in negotiations, funding arrangements, or policy-making.

Carole Blackburn (2005, 2007, 2009) considers similar issues in her analysis of the 1998 Nisga'a Treaty, and the wider politics of treaty making. In the 2005 article, she contends that from the perspective of the state, certainty exists when tensions between the requirements of industrial resource development and the demands of Aboriginal social and environmental movements are eased, or 'reconciled'. She concludes that treaty making is pursued to help "regulate a population, mediate between Aboriginal-rights claims and the demands of global capital" (p. 586). She suggests that in doing so, negotiations work to re-produce the dominance of the state relative to the sovereignty of any given Aboriginal group. Ultimately, she identifies the desire for increased economic competitiveness as being behind the focused political attention to treaty agreements over the last decade (Blackburn 2005).

Finally, Rossiter and Wood (2005) highlight prevailing neoliberal tendencies in the current BC government's (BC Liberal Party) approach to treaties and Aboriginal relations. In particular, they focus on the context and contradictions in a provincial referendum held in 2002 to legitimize the mandate of Provincial negotiators, and therefore 'revitalize' treaty making. The topic and wording of the referenda questions were criticized for their apparent bias. For example, one of the eight 'yes/no' questions stated "treaties should include mechanisms for harmonizing land-use planning between Aboriginal governments and neighbouring local governments". Another asked "the terms and conditions of leases and licenses should be respected; fair compensation for unavoidable disruption of commercial interests should be ensured" (both from Rossiter &

Wood 2005, p. 360). Rossiter and Wood (2005) observe that the referendum questions were worded in such a way that they were difficult to disagree with. In this sense, they may have depoliticized and facilitated the acceptance of what were actually existing Provincial negotiation mandates.

That Premier Gordon Campbell even broached the treaty issue was surprising. In the years leading up to their election in 2001, Campbell and other Liberal officials opposed the negotiation or ratification of any treaties in the province, and went so far as to personally mount a legal challenge against the 1998 Nisga'a treaty. The case was dismissed by the courts and then appealed by Campbell. However, once the Liberals took office, the appeal was dropped (Rossiter & Wood 2005). Rossiter and Wood (2005) concluded that the Liberal government's about face on Aboriginal relations and treaty making more generally, are actually central to an attempt to re-frame "the terms of Aboriginal citizenship" (p. 352), and that the new approach

render(s) the historical geographies of colonialism that frame it irrelevant and to instead envision First Nation's full inclusion into BC society as centred on participation in the 'free' market economy (p. 353).

As becomes evident in later chapters, this sentiment is also evident in narratives that claim schemes based on private access for shellfish aquaculture are culturally amenable with Aboriginal communities and lifestyles.

These sketches illustrate that the connection among governance, territory, and political-economic certainty has long existed in British Columbia. Further, they suggest that contemporary approaches were necessitated by the tensions of the 1990s, the assertion of political power by Aboriginal groups/leaders, and by

the lagging treaty making process itself. Arguably, the emerging New Aboriginal Relationship is the latest in a long line of political manoeuvres to marginalize economic diversity in Aboriginal communities (i.e., mixed subsistence-capitalist) and aim to govern the relationship among Aboriginal peoples, territory and resources. I suggest that the NAR works in part through interventions for economic development that depoliticize or legitimize actions that reduce communal access to resources and territory. To build the theoretical background for this argument, I now move on to examine neoliberalism and neoliberal approaches to governance.

III. Neoliberalism and governance

Most broadly understood, neoliberalism is a political-economic philosophy. One of its core tenets is that sustained capitalist growth through free market interactions lead to a better life for *all* members of society (Larner 2000; Harvey 2005; Ong 2006; Heynen et al. 2007). Indeed, neoliberal programs for trade liberalization and the de-centralization of government are often rationalized with the conviction that 'a rising tide floats all boats' (Howells 2005). Scholarship regarding neoliberalism and its influence on contemporary approaches to governance are at the theoretical core of my analysis.

In the humanities and social sciences, neoliberalism is the subject of plentiful criticism. However, scholars simultaneously caution that 'actually existing' neoliberalism is extremely nebulous and locally variant (Larner 2003; Barnett 2005; Castree 2006). In the same way that the notion of globalization has received critical attention for its propensity to obscure what are actually diverse

and complex economic, political, and cultural processes, neoliberalism stands to confuse as much as it reveals about contemporary politics and governance (Larner 2003; Castree 2006). In an attempt to avoid declaring programs for shellfish aquaculture expansion as an example of neoliberalism writ large, here I will consider specific neoliberal characteristics that I understand to be at play in this case. I draw from scholarly critiques of neoliberalism and a dominant political-economic tendency to legitimize certain approaches to governance, development, and even nature itself. The characteristics I explore are enclosure for the creation of private property, and the depoliticization of interventions for economic development.

Private property and enclosure

Property or resources are private when rights of access and use are limited to a select individual, group, or firm (Ostrom 1990, 1992; Pinkerton 1992; Mansfield 2007). Enclosure refers to the political processes through which private property is produced (Heynen & Robins 2005; Heynen et al. 2007; Mansfield 2007; Reed 2007; Olson 2010). Continually creating and legitimizing private property is central to capitalism, and therefore from a neoliberal perspective, is necessary for widespread improvements to society (Harvey 1999, 2005; Hart 2004, 2006; Peck 2008; Smith 2008; Olson 2010).

For capital investment and business development to be attractive, a firm or individual must be assured of an ongoing set of rights to specific territory or resources. Privatization and enclosure are also increasingly popular in market-based schemes for conservation and environmental governance like quotas and

tradable permits (Mansfield 2003, 2007; Robertson 2004; Heynen & Robins 2005; Heynen et al. 2007; Reed 2007; Olson 2010). In both applications, the logic is similar: market mechanisms will encourage more innovative and efficient solutions to environmental problems than governmental regulation (Mansfield 2003; Robertson 2004). Calls for privatization rest on the supposition that territory and resources without defined rights will remain underutilized, or alternatively, will be over-exploited (Heynen et al., 2007).

Thus, common pool resources, or resources open to all for use, are frequently understood to be vulnerable to the *tragedy of the commons* (Hardin 1968). From the perspective of classical economics, the tragedy is inevitable until privatization or effective governmental regulation occurs: without rights, roles, and rules, the common pool resource will inevitably be over-exploited by individuals motivated by self-interest. Of course, institutional economists and common property theorists argue that this expectation fails to consider how groups might self-organize and create alternative arrangements and define access and use over time for the benefit of many (Pinkerton 1988; Ostrom 1990, McCay & Jentoft 1998). Further, in the same sense that private property advocates do not consider the potential for alternative institutional arrangements the tragedy scenario does not consider resource-use and harvest driven by values other than individual financial benefit.

In actuality, programs designed to extend or expand private property for broad social benefit present a paradox because to achieve enclosure, territory and resources must first be expropriated from people who regularly access them

communally (Li 2007; Heynen et al., 2007; Smith 2008). As Tania Li (2007) wrote:

(i)nterventions that set the conditions for growth simultaneously set the conditions for some sections of the population to be dispossessed. Winners and losers do not emerge naturally through the magic of the market; they are selected (p. 20).

Such is the “awkward embrace” (Li 2007, p. 21) between privatization for capitalism and schemes to improve the well-being of people on the socio-economic margins. The enclosure-dispossession-development intervention chain is arguably in perpetual motion, and is visible in later chapters.

Depoliticization

Philosopher Michel Foucault theorized that social relations are laden with power differentials, and that over time, interactions have the potential to direct or change the behaviours of the actors and institutions involved (Foucault 1979, 1991; Burchel et al. 1991; Lemke 2001). From this perspective, targeted programming, including schemes for economic development, has the potential to reconfigure perceptions, relationships, and even individual identity (Rose 1999; Lemke 2001; Valdivia 2005; Dean 2007). Analytically, this implies that social relations and identity may be traced for specific political influence at various scales (Larner 2000; Valdivia 2005; Ong 2006; Mansfield 2007; Heynen et al. 2007; Walker et al. 2008).

For example, geographer Jamie Peck (2008) writes that neoliberal policies often work to “construct a market(-like) order” to society, and that attempts, though always imperfect and locally specific, are “perpetually reconstructed through practice” (p. 4). Similarly, Ong (2006) suggests that neoliberalism moulds

“a new relationship between government and knowledge through which governing activities are recast as non-political and non-ideological problems that need technical solution” (p. 3). These words remind us that directed funding and neoliberal initiatives for training, capacity building, and/or economic development have the potential to alter social relations and individual interpretations of what is correct and productive behaviour. Over time, what was once political or contested, may come to be perceived as normal, apolitical, necessary, or even superior in some way (Ferguson 1990; Li 2007; Sturgeon 2007).

As I have suggested, initiatives to facilitate shellfish aquaculture expansion in BC are inherently political, especially given the nature of treaty making and unclarified rights and the diversity of shellfish use and values in coastal Aboriginal territory. Here, Gillian Hart’s (2004) understanding that neoliberalism is “predicated on interventions to create the organizational and subjective conditions for entrepreneurship”, and incite “individuals to become entrepreneurs themselves” (p. 92; also see Walker et al. 2008), speaks directly to my interpretation of interventions for Aboriginal participation in shellfish aquaculture in Nuu-chah-nulth territory. Although framed as the proactive pursuit of equitable access to shellfish tenures and industry participation, development initiatives fail to meet their broadest objectives unless they enclose common property, restructure social relations, and harness the productive capacity of nature. The interventions, initiated by the Province and undertaken with the help of industry-based experts, inherently aim to promote entrepreneurism, change social relations and alter social-ecological relationships.

IV. Of seafood and sovereignty: Aboriginal access to marine resources in BC

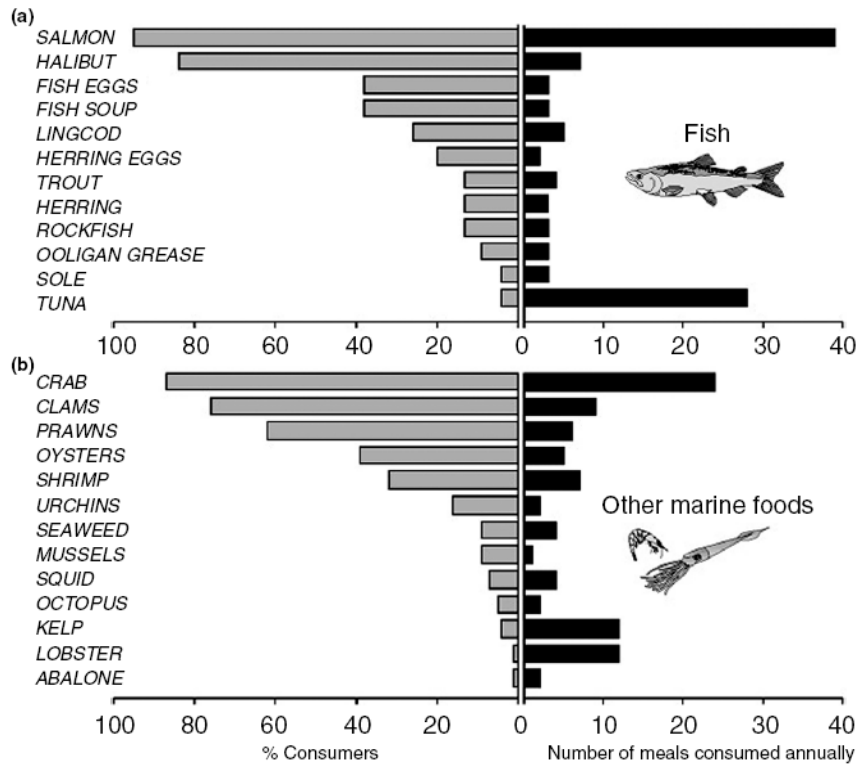
The marine waters and coastline of BC support over 418 species of marine fish and shellfish (Froese & Pauly 2010). Since approximately the 1960s, the allocation of private access rights to fisheries resources in the province has become the management norm, and in the major fisheries, licenses and quota have tended to consolidate with the largest producers, who are often tied to foreign firms (D.C. Harris 2001, 2008; Howlett & Rayner 2004; Parrish et al. 2006; Hoogensen 2007; Pinkerton & Edwards 2009). In the 1980s, the allocation of marine tenures for aquaculture in BC also began to increase rapidly. In that tenures grant private access and the use of natural resources like clean water and nutrients, they can be considered as the next wave in the privatization of BC's ocean space (see Joyce & Canessa 2009; Joyce & Satterfield 2010). Although they have reduced access to many coastal inhabitants, regimes for privatized access to fish and ocean space have made substantial contributions to the provincial economy. In 2008, commercially licensed marine fisheries in the province had a wholesale value of \$1.216 billion, while the aquaculture industry contributed \$529.9 million (Ministry of the Environment 2010).

Of course, harvesting resources from adjacent territory is central to the continuity of many Aboriginal communities in BC (Schreiber 2006; Turner et al. 2008). The value derived from harvests is more than economic: seafood also plays important subsistence, social, and cultural roles (Wiseman & Gobas 2002; George 2003; Atleo 2004; Mos et al. 2004; Richmond et al. 2005; Parrish et al. 2006; Uu-a-thluk 2008a). Even the act of harvesting itself provides opportunities

to transfer knowledge and reconstitute social-ecological relationships (Turner et al. 2000, 2008). In this sense, participation in the capitalist economy is but one *potential* contributor to individual and community well-being (Gibson-Graham 2005, 2006; Richmond et al. 2005; Parrish et al. 2006), and sovereignty rests in the maintenance of access to resources for a diverse array of self-determined uses (Alfred 2001, 2005; George 2003; Atleo 2004; Parrish et al. 2006; Sullivan 2006).

Mos et al. (2004) discuss the results of a traditional food survey in four separate villages of the Sencoten First Nation, who are Coast Salish Peoples from southern Vancouver Island (similar to Nuu-chah-nulth territory, Sencoten territory is largely coastal). The authors found that 46% of the respondents identified seafood harvest as a regular activity (22% said so for hunting or trapping), and 94% of the seafood consumed by all respondents was self-harvested or gifted to them by others. Figure 2.1 illustrates the diversity of marine food consumed in the Mos et al. (2004) study. Salmon and crabs were the two most popular species consumed. However, intertidal clams and oysters fell within the top four species of shellfish. Further, the authors also clarified that respondents primarily preferred the butter clam (*Saxidomus gigantean*) over other species of intertidal clams, including the non-native Manila clam (*Venerupis philippinarum*). Notably, the Sencoten are within close proximity (~30km) to the provincial capital of Victoria, making supermarkets and restaurants even more accessible than they would be for many in Nuu-chah-nulth territory.

Figure 2.1 - Results of a traditional food survey undertaken in the territory of the Sencoten people (Southern Vancouver Island). Illustrates the percentage of individuals who consume seafood, and the average number of seafood meals per year. *Adapted from Mos et al. (2004).*



In addition to reducing opportunities for self-determined resource use, Sullivan (2006) suggests that even if rights are extended to Aboriginal communities through tenures, licenses, quotas, etc., the privatization of resources works to reproduce state sovereignty. She argued that:

(I)aw, the court system, and treaty processes serve as vehicles for exercises of state sovereignty, as do resource management policies and regulations – including controls over licenses, permits, sea tenures, and enforcement (p. 45).

Thus, at the treaty table and through initiatives for economic development, varied resource use is vulnerable to dismissive attitudes, the prioritization of

industrialization, and ultimately, dispossession through enclosure (Sullivan 2006; Blackburn 2009).

The privatization of ocean space and the risks of aquaculture to the environment and subsistence harvests have caused growing concern in many Aboriginal communities (Schreiber 2006; Joyce & Satterfield 2010). In her 2008 quantitative mapping study of risks and opportunities in the BC shellfish aquaculture industry, Joyce noted that all 24 Aboriginal interviewees identified at least one of the following risks from increased shellfish aquaculture in their territory:

potential loss of existing rights to subsistence harvest or part-time income from wild shellfish harvests; loss of cultural identity and way of life, based on traditional relationships to wild resources; and risks to territorial sovereignty, pending resolution of land-claims settlements and rights and title cases (p. 105).

Joyce's work identifies many concerns regarding shellfish aquaculture expansion. Yet, how or why ocean-based tenures and initiatives for Aboriginal participation continue to advance remains unexplored.

V. Conclusions

In defining mandates, enforcing regulations, and punishing dissent, *government* clearly retains the ability to direct society through acts of regulation and authority. However, *governance*, or the pursuit of a certain, desirable range of outcomes, emerges through the reproduction of behaviour and norms through a diverse array of relationships and institutional arrangements. This may include the privatization of communal resources through depoliticized interventions for economic development. In this sense, Michael Watts' (2003) interpretation of

governance as the process of “securing rule through a multiplicity of authorities and agencies in and outside of the state at a variety of spatial levels” (p.9) aptly captures the way I theorize the relationship between the politics of treaty making and shellfish tenure expansion in Nuu-chah-nulth territory.

In BC, the political-economic luxuries of outright denial and forceful dispossession have largely disappeared. Resources are also more scarce and public demands for involvement in science and decision-making more common (Braun 2002; Bridge & Jonas 2002). Finally, legal precedence requires that industry must observe clear consultation and accommodation guidelines (which may include compensation) when doing business within the traditional territories of Aboriginal peoples (Rynard 2000; Christie 2006; Alcantara 2008). As a result, politicians and industry leaders must experiment with new ways to ensure the continuity of the resource-based economy (Woolford 2005; Rossiter & Wood 2005; Penikett 2006). The literature reviewed here suggests that, over the last decade, state approaches to Aboriginal relations in BC have come to display numerous neoliberal characteristics.

In the case of this research, I recognize neoliberal influence specifically in the prioritization of enclosure and de-politicization of this process through its framing as an ideal means to encourage Aboriginal economic development. As I will illustrate, *terra nullius*-esque narratives regarding productivity and culturally appropriate use of resources are well established (Willems-Braun 1997; Rossiter 2004). Indeed, as Kevin St. Martin (2007) conveyed:

the processes we associate with neoliberalism, including enclosure, garner their power and popularity via the elimination of any alternative (p. 528).

If this is the case on the WCVI, work that documents the existence and significance of varied shellfish values and alternative management arrangements in the face of enclosure may help to ensure that they receive due consideration. This objective is a core focus in Chapters Four and Seven in particular.

CHAPTER THREE - CONTEXT AND METHODOLOGY

I. Introduction

The dissertation is built around a case study of ka:'yu:'k't'h'/che:k:tes7et'h' experiences with changing shellfish management, including a band-owned and operated shellfish venture that began in 2001. Therefore, along with a deep, place-based understanding of shellfish values and responses to change in the intertidal clam fishery, the dissertation also identifies the convergence of broader structural and discursive dynamics mobilized through initiatives designed to increase the number of shellfish tenures in Nuuchahnulth territory. The 1998 Shellfish Development Initiative and treaty-related funding and agreements were central and, as I argue, their logic comparable with that of the New Aboriginal Relationship. With this chapter, I present some more specific information regarding the case study, and provide further context regarding the expansion of shellfish aquaculture onto the WCVI. I also offer methodological details, flesh out my analytical framework, and consider my position relative to the work and field site.

The chapter consists of four central sections. First, I build from the previous chapter to consider some wider political dynamics relevant to the research. Next, I discuss how the research emerged and evolved. Third, to provide a sense of the case, I present background on the Nuuchahnulth Tribal Council, the Kyuquot-Checlesheht First Nation, and the Maa-nulth treaty. I follow

this with details of the specific methodological decisions and activities that I have undertaken and a description of my analytical framework, which is informed by neo-Marxist and post-structuralist threads in political ecology and builds around the ethnographic case study with findings from historical, institutional, and discursive analysis. Finally, I pause for a reflexive consideration of my personal relationship to the research.

II. Political context

Without treaty, requirements to consult, accommodate and/or compensate neighbouring Aboriginal communities loom over virtually every resource-related decision in BC (Christie 2006). Industry remains tentative in its willingness to invest and Aboriginal groups remain restricted in their opportunities to access natural resources for any number of purposes (Penikett 2006). In response, the 'New Aboriginal Relationship' approach to state-Aboriginal relations has emerged (McKee 2009). Here, I outline some of its key characteristics and features; these are particularly relevant in the context of the literature reviewed previously.

Resource development and the New Aboriginal Relationship

The ongoing lack of political-economic certainty surrounding resource use and development is central to the current BC Liberal government's New Aboriginal Relationship. Since assuming leadership in 2001, the government has pursued this parallel, and very much 'work in progress' approach (see Woolford 2005, Penikett 2006, and McKee 2009 for detailed elaboration of the accompanying politics). At its core, the NAR is about finding new ways to confirm and reconcile

both Aboriginal and Crown rights to territory. Between 2005 to present, the notion of new (i.e., cooperative) relationships has become a central bureaucratic mantra (Penikett 2006; McKee 2009). Rhetoric intensified to a peak in the winter of 2009 when the government wished to introduce a 'Recognition and Reconciliation Act' into Provincial Legislature. If it had passed, the Act would have explicitly recognized a simultaneous Crown-Aboriginal title to most territory in the province. However, concerns from both industry and First Nations leadership have delayed the Act indefinitely. Nonetheless, the reconciliation approach remains central to the current mandate of Provincial leadership, and I consider it here to contextualize initiatives pursued to create the conditions for shellfish aquaculture expansion on the WCVI.

At the core of the NAR is the view that Aboriginal peoples, industry, and the province more broadly, stand to benefit if/when they coordinate development objectives within contested territory. In a 2006 statement on the New Relationship, Premier Gordon Campbell articulated the essence of the approach when he said:

(w)e are committed to building a constructive, new government-to-government relationship, based on mutual respect, recognition, and reconciliation. We are working to build a new, vital, modern British Columbia ... We are committed to pursuing new horizons of hope and opportunity, by moving beyond the barriers that have held us back for far too long. We are committed to opening up new dialogue, new understanding and new access to resources (Campbell 2006).

From this perspective, reconciliation in un-treated territory is just as well achieved away from negotiation tables as it is around them.

There should be little doubt that political and business elites also recognize the potential that the reconciliation of state and Aboriginal rights

presents. In a 2009 speech delivered to business and political leaders in Vancouver, the Honourable Chuck Strahl, Minister of Indian and Northern Affairs Canada, noted:

(a)n already sizeable aboriginal land base is growing significantly with the settlement of land claims. And this land base, if used for economic purposes, can make an important contribution to aboriginal communities, as well as to the national and regional economies. The non-aboriginal private sector is increasingly recognizing the economic potential of aboriginal people. In fact, a recent report from the Toronto-Dominion Bank highlighted the growing and important trend of partnerships with aboriginal businesses and communities (Strahl 2009).

With the words of Campbell and Strahl taken into consideration, the reality that the NAR approach aims to facilitate industrial resource development in Aboriginal territory becomes all the more apparent.

In 2007, the NAR was buttressed financially through legislation that allocated \$100 million to create the 'New Relationship Trust', and simultaneously establish a corporation for its distribution. The stated purpose of the fund is to enable training and skills development in Aboriginal communities so they may take full advantage of economic and resource development opportunities. In 2007, the Provincial government suggested that the funds would

help First Nations to build institutional and community capacity to engage with the Province on land and resource management processes and other matters affecting the economic, cultural and social well-being of their communities (Government of BC 2007).

Fundable projects must target one of three main project areas: economic development, governance capacity, and education, elders/youth, culture and language.

Particularly where treaties stall or litigation looms, the NAR advocates side agreements, alternative negotiations and early cash/land transfers. Rather than achieve final treaties, these processes are meant to attend to specific contentious issues and enable the continuation of resource development initiatives. Where *comprehensive* treaty agreements were the initial BCTC goal, the NAR has evolved to be purposefully *incremental* (Penikett 2006; McKee 2009). Certainly the incremental NAR approach moves further away from forceful dispossession and inadequate involvement in (or compensation for) resource development. Nonetheless, this research suggests that it is no less overt in terms of its intent to ensure certainty for industrial resource development, an objective that arguably favours some paths towards Aboriginal sovereignty and self-determination over others.

III. Research origins

The ka:'yu:'k't'h/che:k:tles7et'h' peoples graciously allowed me to spend time in their territory, and I am grateful for the opportunity that it has presented to conduct this research. The ka:'yu:'k't'h/che:k:tles7et'h' assert Nuu-chah-nulth ancestry and are politically affiliated with the Nuu-chah-nulth Tribal Council (NTC). ka:'yu:'k't'h/che:k:tles7et'h' territory falls approximately within the dark green shaded area in the inset of Figure 3.1. Kyuquot is the common name of the village and the location of the elected Band Council (administrative body) of the

Kyuquot-Checlesheht Indian Band, as designated under the *Indian Act* [1951].²²

Kyuquot is found on the northern tip of Kyuquot Sound, the second northern-most sound on the WCVI, and is accessible only by boat, or floatplane. Kyuquot is also the location of the Indian Reserve called Houpsitas.²³

Figure 3.1 - Map of Vancouver Island, with inset showing Kyuquot. The territory of the ka:’yu:’k’t’h/che:k:tes7et’h’ is shaded dark green in the box on the left. *Source: Public domain, wikimedia commons.*



²² Generally, the term First Nation is now used instead of ‘Indian Band’ (i.e., Kyuquot-Checlesheht First Nation). Indian Band, however, remains the legal nomenclature for nations registered under the Federal *Indian Act*. The Nuu-chah-nulth spelling for Kyuquot-Checlesheht is ka:’yu:’k’t’h/che:k:tes7et’h’ (usually not capitalized). I use it throughout the dissertation in reference to territory and peoples.

²³ Houpsitas is one of 26 reserve sites within the territory as identified by the *Indian Act*. It has been the main site of occupation for the KCFN since the mid 1970s (Kenyon 1980).

In the summer of 2005, I made the first of what would be several journeys to Kyuquot, and returned for a stay during the summer of 2006. During these trips, I was working for Dr. Evelyn Pinkerton on a project that aimed to document changes in the DFO managed intertidal clam fishery, understand community responses to these changes, and collaboratively formulate adaptive options (including ways to reconcile communal and private access arrangements for clam beaches). Through this work, I received my initial exposure to ecological and management challenges, and life on the WCVI more generally.

In response to what I had experienced during these visits, I first envisaged the research as an attempt to understand and offer practical solutions to the mounting challenges the KCFN faced in maintaining opportunities to harvest shellfish for personal and commercial use. Over the last decade, the fishery was having fewer openings per season, and the total area open to harvest was decreasing due to water quality issues and increasing numbers of private access shellfish tenures. Furthermore, harvesters felt increasingly vulnerable to arrangements with middle-person buyers who would travel in to the head of Kyuquot Sound to pick up product and take it for sale to processing companies located on southeastern Vancouver Island. I began by thinking of the research problem as a commodity chain analysis, and set out to document the steps in getting clams from beaches, and into local and international markets.

I knew Manila clams (*Venerupis philippinarum*) would be of central focus, as they had highest market demand and had been the species of choice in the commercial intertidal clam fishery for about 20 years. I wanted to understand the

barriers ka:'yu:'k't'h/che:k:tl̩es7et'h' harvesters faced in achieving a higher return for their manila clam product. For instance, could harvesters in the region undertake simple 'value added' activity that might produce a price premium, while also reducing pressure to meet the demands of middle-person buyers? At this point, I was not thinking explicitly about ecological histories and diverse values, or the tensions that concerted efforts to see aquaculture expand created in the wider system of shellfish production. I had also yet to consider the role that treaty making might be playing in expanding private access tenures.

However, as I proceeded with my studies and returned to Kyuquot for an extended stay in the fall of 2007 (this time alone), my focus moved towards tensions between the wild-growing and cultured shellfish harvests as well as programs for shellfish aquaculture expansion in Nuuchahnulth territory. In particular, I started to understand that pressure had been growing over the last decade for Aboriginal communities to 'get on board' with shellfish aquaculture in their territories, and that treaty-related initiatives had evolved to facilitate band-owned and operated shellfish aquaculture businesses. I became intrigued by, (a) the consistency of message in a wide array of discourse (consultant's reports, government documents, and public relations pieces) that shellfish aquaculture was an 'ideal fit' with Aboriginal livelihoods and culture; and, (b) the fact that many new shellfish tenures in Nuuchahnulth territory had been enabled through treaty-related agreements. Furthermore, there was ample evidence of focused attention and funding to encourage Nuuchahnulth participation, but less evidence that industrial shellfish aquaculture always offered a preferable

alternative to the existing DFO managed commercial and subsistence clam harvests, or to other activities like ecotourism. I began to wonder about the connection between programs that targeted Aboriginal communities for shellfish development, and wider interests in seeing private access tenures expand into more remote areas of the province.

What also coalesced for me was that clams and other shellfish species ecologically indigenous to BC embody a diverse array of values to many Nuu-chah-nulth people. These include, but are not restricted to, characters in stories and other pieces of oral history, ecological indicators, seasonal food sources, contributors to personal and/or socio-economic identity, or objects for the transmission of local ecological and/or cultural knowledge. If part of the research was to understand changes in the dominant mode of shellfish production from the perspective of the ka:'yu:'k't'h/che:k:tes7et'h', I was going to have to consider the ecological history of shellfish species, and the diversity of values that shellfish present in Nuu-chah-nulth territory. Finally, all of these issues had been, and stood to be further affected by the fact that the KCFN was about to sign to the Maa-nulth treaty. A case study of treaty-related resource development stood to provide some timely understanding of the issues bands may face immediately before treaty ratification and throughout implementation.

For all of these reasons, I moved away from the 'commodity chain' approach, to ask: *to what extent and how do the contemporary politics of treaty making enable and/or constrain shellfish aquaculture expansion on the WCVI?* The answers, which form the heart of this dissertation, ultimately stem from a

two-pronged analytical framework: an exploration into *why* the move towards shellfish aquaculture in BC is being sought by industry, the Province, and some Aboriginal communities, and second, *how* the expansion of private access aquaculture tenures has been pursued and experienced on the WCVI. This approach considers both structural and discursive influences and reveals how, despite unsatisfactory results, aquaculture is becoming further entrenched as the legitimate form of shellfish livelihood in ka:'yu:'k't'h/che:k:tl̓es7et'h' territory (following Li 2007). In the following two sections, I expand upon the data collection and analytical framework that has guided the work.

IV. Case context

The case study component of research is grounded in the experiences of the ka:'yu:'k't'h/che:k:tl̓es7et'h' peoples with various changes affecting the intertidal clam fishery, and the subsequent adoption of shellfish aquaculture as an economic development strategy. In order to frame the ethnographic details I present in later chapters, it is important to set out some details regarding the Nuu-chah-nulth Tribal Council and life in Kyuquot. In consideration of the case study relative to the wider politics of treaty making and shellfish aquaculture expansion, some background on the Maa-nulth treaty is also warranted here.

The Nuu-chah-nulth and the Nuu-chah-nulth Tribal Council

Nuu-chah-nulth traditional territory encompasses the majority of the WCVI and southwards into northern Washington State.²⁴ Nuu-chah-nulth oral histories and spiritual beliefs are grounded in the knowledge that ancestors have lived and been a part of the territory since time immemorial (George 2003; Atleo 2004). Archaeological records indicate that the earliest inhabitants of various regions in BC spread out between 9000 - 10 600 years before present (Carlson & Bona 1996). Nuu-chah-nulth boundaries, settlements, and political units would have fluctuated over time. The present-day Nuu-chah-nulth nations claim affiliation to a specific geographic territory, but share overlapping lineages, language, and cultural attributes.

The Nuu-chah-nulth Tribal Council (NTC) serves as the democratically elected body to represent fourteen Nuu-chah-nulth Nations in various political fora.²⁵ As a result, it receives funding from various levels of government for the provision of programs and services, particularly those that make sense to administer across all fourteen nations. For example, the NTC manages services for all member nations in areas such as: child welfare, economic development, education and training, financial/ administrative support for Band Councils, employment, infrastructure development, health, and a Nuu-chah-nulth

²⁴ 'Nuu-chah-nulth' translates into "all along the mountains and sea" (Nuu-chah-nulth Tribal Council, www.nuuchahnulth.org/tribal-council/welcom.html. Last accessed August 17, 2009). Although the Nuu-chah-nulth Tribal Council consists of Nations that fall within Canadian boundaries, political and social/familial affiliations with Washington State Nations remain.

²⁵ See Marshall (1993) for a detailed political history of the NTC.

newspaper (The Ha-Shilth-Sa). These services extend to the approximately 8600 registered Nuu-chah-nulth-aht (Nuu-chah-nulth Tribal Council 2009).²⁶

Table 3.1 identifies the fourteen separate nations who comprise the NTC, they are broken into the northern, central, and southern regions of Nuu-chah-nulth territory. Each nation has their own elected Band Council who makes budgetary and internal hiring decisions. Although this structure takes after Western democratic traditions, the NTC states that it is “guided by n’aas (Creator) and ha’wiih”, and will “seek the wisdom/knowledge of (our) Elders” (Nuu-chah-nulth Tribal Council 2009). Indeed, elders and hereditary chiefs continue to play important roles in priority setting and decision-making.

Table 3.1 - Member nations of the Nuu-chah-nulth Tribal Council, by region. *Adapted from Nuu-chah-nulth Tribal Council (2009).*

Northern region	Central region	Southern region
Ehattesaht	Ahousaht	Ditidaht
ka:’yu:’k’t’h/che:k:tles7et’h’	Hesquiaht	Huu-ay-aht
Mowachat/Muchalaht	Tla-o-qui-aht	Hupacasath
Nuchatlaht	Toquaht	Tse-shaht
	Ucluelet	Uchucklesaht

The ka:’yu:’k’t’h/che:k:tles7et’h’ and the village of Kyuquot

There are 498 registered members of the KCFN (Ministry of Aboriginal Relations and Reconciliation 2009). Approximately 150-175 of these individuals live in about 25 homes on the reserve, while many of the ‘off reserve’ members live on

²⁶ Here the suffix –aht means ‘people’ or ‘people of’. It can also denote ‘territory’ or ‘territory of’.

Vancouver Island in places like Campbell River, Port Alberni, and Nanaimo.

Another 20-25 Canadians of European descent live on Walter's Island, a small island in plain view of Houpsitas, and a handful more are scattered just off the reserve boundaries and on small islands on the edges of the sound.

Built amenities in or near Kyuquot include one small grocery store, two small convenience stores run out of people's homes (mostly bread, milk and sweets), two main wharves, the KCFN Band Office, a community hall, church, health clinic, kindergarten, and a small elementary-secondary school.²⁷ Electricity has been reasonably reliable since 2006 when permanent hydro lines were run into the village. Prior to this, electricity came from an old diesel run generator which was prone to frequent surges and the occasional shut-down. At this point, cellular phones do not receive service in Kyuquot, though home phones, and thus, the opportunity to have personal in-home dialup internet exists (land based lines are prone to intermittent loss of service). On Walter's Island there is a small grocery store that sells basic food and some outdoor supplies and has Canada Post mail delivery services 3 times per week, as well as some larger wharves, several salmon fishing lodges, and approximately 15 permanent and rental homes. A permanent nurse's station is located in another nearby cove where on-call nurses rotate for 2-3 week stays. There are also bi-weekly to monthly visits from medical doctors, dentists, and psychiatric counsellors.

²⁷ The Kyuquot Elementary Secondary School is located just off reserve and staffed/run by the Vancouver Island West District 84 School Board. In addition to following provincial curricula, it makes a concerted effort to tailor classroom offerings and extra-curricular activities to involve cultural and traditional knowledge. For example, it requires students to take Nuu-chah-nulth language classes and as of 2007 has been hosting morning breakfasts twice per week where elders and other community members are invited to the school to eat and interact with the students.

To supplement these services and amenities, residents of Kyuquot frequently travel to Campbell River, Nanaimo, Victoria, etc. for a wider selection of groceries and supplies, to attend to medical issues, to purchase large items for home and work such as furniture or outboard motors, and for work related responsibilities. The nearest town is Campbell River (population ~30 000), which is a combined boat-car travel time of approximately 3.5-4 hours.²⁸ Trips 'out' (especially to Campbell River) are a significant part of life in Kyuquot. In addition to offering the opportunity to stock up on supplies, they can provide a break from the geographical isolation of the village site, the opportunity to visit with family and friends, or to get out from underneath the watchful eyes that inevitably exist in a small, isolated community.²⁹

Next-of-kin, and to a lesser degree, extended family is the central social unit in the village. There are frequent dinners, potlucks, and beach barbecues where in some instances particular family groupings, and in other instances, all community members are invited to eat together. It is not unusual for individuals to leave Kyuquot for months or years at a time for school, work, and family obligations, or if other personal issues arise. However, it also seems rare that a person who has lived on reserve closes the door completely to the idea of coming back to Kyuquot again. A long-standing debate exists in the community whether or not more registered members would return if the housing or lots for

²⁸ It takes approximately 30 minutes by outboard boat from Kyuquot to Fair Harbour where a logging road begins. Travel up a logging road to the North Island Highway takes approximately 1.5-2 hours, and from there is another 1.5 hours or so to Campbell River. Alternatively, one can fly strait out of Kyuquot by a thrice weekly float plane to Gold River in about 40 minutes; however this option is much more costly.

²⁹ When in Kyuquot for multi-month stays, people would frequently comment that they could not believe how long I would stay 'in' without visiting Campbell River, or beyond.

housing were available. When visits, meetings, or online interaction occurs, talk about 'home' (i.e., the community *and* territory) generally seems to take a very fond tone.

Fishing plays an important role in the subsistence livelihoods of both Aboriginal and non-Aboriginal individuals in Kyuquot. However, as a result of license rationalization initiatives undertaken by DFO in the 1980s-1990s, very few commercial salmon and halibut licenses remain locally owned or operated. Forestry activity in the region has slowed down considerably since the 1970s-1980s. Consequently, unemployment amongst male band members appears particularly high, though the precise number fluctuates and remains unquantified. Total adult unemployment varies seasonally between 30-40% (Pinkerton & John 2008). Currently the main providers of paid employment are several fishing lodges (seasonal – summer only), forestry, the band office, the local school, a handful of small entrepreneurial ventures, and the clam dig (seasonal – winter only). Chapter Four provides a detailed exploration of shellfish values and livelihood activities and of the related management, socio-economic, and ecological changes that have occurred in the fishery over the last 5-6 decades.

The Maa-nulth treaty

On October 21, 2007, the KCFN were signatories in the third contemporary treaty ratified in BC, as part of the Maa-nulth treaty group.³⁰ Of the 310 eligible KCFN

³⁰ The group consists of five Nuu-chah-nulth Nations: Toquaht, Uchucklesaht, Ucluelet, ka:'yu:'k't'h'/che:k:tes7et'h', and the Huu-ay-aht.

voters, 192 voted 'yes' and 80 voted 'no', with a voter turn-out of 87.7%. The Provincial government passed the treaty via legislation on November 21, 2007, and the Federal government gave the final Federal legislation the royal ascent on June 18, 2009. Land and cash transfers have begun, though a final implementation time-line has yet to be set.

Through implementation, the KCFN will receive 379 hectares of former reserve land, and 2834 additional hectares of fee simple lands. The fee simple designation gives the KCFN the option to manage the lands as they choose, including resource extraction, allocation to individual members, lease or tenure to business interests, or sale of the lands back to the Provincial government. Financially, an estimated \$18.5 million in capital transfers (less any negotiation loans) over the first 10 years, \$300 000 per year over a 25 year period in resource revenue sharing payments, approximately \$11 million in time limited funding, and \$2.9 million in ongoing funding to provide agreed upon programs and services will all be delivered to the KCFN.

In terms of resource development, the KCFN will receive the right to own and manage the forest resources on treaty settlement lands, several commercial fishing licenses (to be shared across Maa-nulth Nations), and time-limited priority access to develop pre-identified shellfish tenures within their territory (see Chapters Seven and Eight). Of course, the KCFN may also choose to retain any portion of the treaty lands for non-extractive and/or subsistence use, and there are exclusive areas set aside for domestic (non-commercial) seafood harvests. The reality is that for KCFN band administrators, many difficult decisions

regarding investment, taxation, expenditures, resource use, and payouts will be required as the treaty proceeds to full implementation.

V. Data and Analysis

The research is qualitative and is built around a central place-based case study. A case study is ideal to explore resource use and access because it enables deep understanding of the socio-economic, cultural and political contexts that ultimately shape the lived experiences of the people who interact in that space (Brown & Purcell 2005; Crang & Cook 2007; DeLyser et al. 2010). Developing deep understanding of context and lived experiences, and a narrative that effectively and accurately expresses it, are central tasks of qualitative research (Andrews et al. 2008; DeLyser et al. 2010).

However, the value of a case study, and qualitative research approaches more generally, is not limited to description (Tavory & Timmermans 2009; Yin 2009; DeLyser et al. 2010). A case study is also significant in its ability to identify overlapping processes operating across multiple spatial and temporal scales. In this regard, case research is also valuable in its ability to speak to wider theoretical and political debates (Hart 2004; Brown & Purcell 2005; Yin 2009; DeLyser et al. 2010).

Thus, using a descriptive narrative, I have organized the chapters so as to tie together deep place-based understanding with commentary on broader political and economic occurrences in BC. Informed by political ecology, my analytical framework is designed to build out from, and around the case study. I

use structural and discursive analysis to document the emergence and pursuit of shellfish aquaculture expansion in BC, and its engagement with the politics of treaty making on the WCVI. I explore the ecological and market histories of the shellfish species commonly grown, the context in which the 1998 Shellfish Development Initiative emerged, the treaty-related agreements, funding, and expert opinion that enabled 35 shellfish tenures to be placed in Nuu-chah-nulth territory, and some stated and actual outcomes of expansionary efforts 12 years later. In this sense, the case study grounds overlapping political and social-ecological processes through their convergence and influence in ka:'yu:'k't'h/che:k:tl̓e7et'h' territory.

Data collection

In March 2006, I sent a letter describing my project to each member of the KCFN Band Council that requested approval to commence with it, as well as sought input and feedback. Approval was granted in late March 2006. Next, I requested and received approval from the Simon Fraser University Office of Research Ethics. As per the ethics requirements, prior to beginning an interview I asked for verbal consent from the participant using a letter of introduction to the research, and informed them that the interview could stop anytime at their request. To ensure privacy, I kept field notes, tapes, and transcripts in a closed location with limited access. When presented in the dissertation, the words of individuals are anonymous, and I have taken appropriate cautions to avoid disclosure of identities.

Appendix D details the research and data collection activities that I have undertaken from 2005 to present. Here, I limit my description to the central methodological components of the work. Altogether, I spent approximately eight months in ka:'yu:'k't'h/che:k:tl̥e7et'h' territory. Data collection during field stays involved participant observation and semi-structured interviews. In total I interviewed approximately 35 individual community members, and have had frequent social interaction with about 30-40 additional individuals. In 2005 and 2006, 30 interviews were co-conducted by Dr. Pinkerton and myself. Although the specific questions were tailored towards her research objectives, the information they elicited had overlap and revealed information relevant to this work. In the fall of 2007, I conducted interviews with 15 community members tailored specifically to this research.³¹ Appendix E presents a list of questions used to guide these semi-structured conversations. Interviews in 2005 and 2006 were audio recorded and transcribed, while interviews in 2007 were documented almost entirely through notes taken during and after the conversation.³²

During the 2005 and 2006 field stays, I also wrote intermittent field notes (approximately three times per week) that documented observations, questions, re-occurring themes, and potential threads for further research. During the 2007 visit, I recorded occurrences and observations in daily field notes. In addition to formally recording observations from interactions and conversations, field stays in

³¹ Ten of the 15 people I interviewed in 2007 had taken part in the 2005 or 2006 series of interviews. However, the later conversations were designed to elicit different information and perspective. During all three field seasons, interviewees were either regular clam diggers, members of Band Council, or well-known community leaders. Of course, sometimes individuals fell into more than one of these categories.

³² The nature of the questions in combination with the period of time (i.e., in build-up to and after the ratification of the Maa-nulth treaty), meant that most interviewees preferred not to be audio recorded.

Kyuquot also exposed me to the workings of the KCFN Band Council, to perspectives on business development, and to specific details regarding the band-owned and operated shellfish venture.

Alongside the field-based, ethnographic data collection, I also spoke with two government officials involved with aquaculture and fisheries management in BC (one Provincial and one Federal), and five individuals with intimate knowledge of Nuu-chah-nulth politics, economic development, and/or aquaculture and industrial seafood production. I collected and analyzed numerous public relations pieces, policy documents, scientific reports, consultant reports, and funding announcements related to treaty making and the BC shellfish industry. I also analyzed transcripts of relevant testimony to Provincial and Federal fact-finding committees on fisheries and aquaculture dating back to the mid 1990s.³³

Finally, Uu-a-thluk, the aquatic management body of the Nuu-chah-nulth Tribal Council, has been proactive in recording and representing Nuu-chah-nulth histories, stories, connections to the ocean, and current news.³⁴ Recently, as an awareness and fund-raising activity, Uu-a-thluk has produced an attractive, glossy cookbook featuring traditional and contemporary recipes, stories, artwork, and photographs that beautifully illustrate the longstanding and significant role of

³³ I did not conducted interviews with industry advocates, including the industry advocates and/or expert consultants identified in later chapters. This is largely a matter of scope. However, the data I have collected, including reports and transcripts of testimony to various parliamentary, senate and legislative committees, revealed very insightful industry and expert perspectives on tenure expansion and perceptions of the potential role/value shellfish aquaculture might offer coastal Aboriginal communities.

³⁴ See <http://uuathluk.ca>.

seafood in Nuu-chah-nulth territory (Uu-a-thluk 2008a). Data compiled by Uu-a-thluk contribute a fascinating perspective in complement to the ethnographic details collected during field stays. When drawing on materials gathered by Uu-a-thluk in the dissertation, I cite them directly.

Analytical framework

Post hoc analysis of programs for economic development, conservation and natural resource management are common practice for environmental researchers of all stripes. Assessments are frequently improvement-based. That is, do specific indicators suggest that a program has achieved its objective(s)? If it has not, why, and what can be improved? While these questions are certainly important, the broader political-economic dynamics that drive the program (and its specific objectives and interventions) have traditionally received less critical attention (as identified by political ecologists Wolf 1972; Blaikie & Brookfield 1987; Ferguson 1990; Leach & Mearns 1996; McCarthy 2002; Li 2007). In response, political ecology advocates analytical attention to the dynamics of politics and power surrounding social programming and interventions, and tracing their impacts on resource access and use and ecological systems (Peluso 1992; Braun & Castree 1998; Neumann 2005; Li 2007). Endeavouring to understand the activities and behaviour that interventions *facilitate* or *legitimize* is central to this type of inquiry.

Inspired by this perspective, a key assumption of my analytical framework is the premise that rights to a resource are the outcome of contingent and ongoing interplay among political, ecological, and economic processes (Peluso

1992; Ribot 1998; Sturgeon 2005; Mansfield 2007; Rossiter 2007). I understand the opportunity for Nuu-chah-nulth individuals and communities to access (harvest, use and manage) shellfish resources at any given time to rest as much in previous events and actions, as it does in a particular regulation, tenure agreement, or harvest right, etc. Therefore, Chapters Four, Five, and Six have paid particular attention to the events and structural context that have led to present-day harvest and management arrangements, and/or that stand to influence changes in rights and access in the future.

However, the data also suggest that documenting historical and structural contingencies alone would not completely reflect lived experiences in ka:'yu:'k't'h/che:k:tl̥es7et'h' territory. In particular, it would not adequately speak to the specific effects that interventions for tenure expansion had in individuals, and in turn, on the ecology of local coastal space and ongoing plans for community economic development. As I detail in Chapters Seven and Eight, the KCFN shellfish aquaculture venture has placed and developed four ocean-based tenures, but has thus far failed to live up to initial expectations and financial projections. Interview and participant observation data suggest that blame and failure have been internalized almost exclusively as individual, Band Council, or community problems, reinforcing the perceived necessity of non-Aboriginal experts to make shellfish aquaculture, and economic development more generally, work (also see Sturgeon 2007 and Yeh 2007).

These realities considered, strands of theory emanating from neo-Marxist and post-structuralist traditions *in combination*, have led me to propose that a

narrow set of outcomes or behaviours from nature and people are anticipated in the governance of shellfish aquaculture expansion on the WCVI. Tania Li (2007) takes a similar stance in her analysis of the appropriation of agricultural land and displacement of peasant farmers in Indonesia. She wrote:

(t)he transformational sequence appropriation-displacement-exploitation-accumulation, the core process explored by Marx in 'Capital', is operative in agrarian settings in many parts of the global South... To understand *why* this is happening, I need the analytical tools Marx supplied. I also need to understand *how* the conditions for this transformation were set. This means examining the ways in which government and capitalism intersect. (p. 19. Emphasis mine).

In other words, Li had to reconcile what she knew about the drivers and structures of Indonesian industrial agriculture development with what she was learning from villagers and peasant farmers about the perceptions, impacts and outcomes of interventions for community development and conservation. To unpack this statement further, it is instructive here to consider what neo-Marxist and post-structuralist scholarship regarding the political ecology of neoliberal governance brings to my analysis.

As stated in the opening chapter, political ecology emerged from a desire to consider the political economy of the environment and identify structural impositions that lead to social inequalities and further environmental degradation (Blaikie 1985; Bryant & Goodman 2008). In recent years, geographers such as Becky Mansfield (2004, 2007), James McCarthy (2005a, 2007), and Scott Prudham (2005, 2007) have contributed to our understanding of the capacities and strategies of the state and corporations in re-regulating changing conditions to suit capitalist production. Inspired by neo-Marxism, this scholarship elaborates how capitalist political-economic systems tend to understand both human labour

and nature as commodities (i.e., Smith 2008), and suggests that neoliberal policy often adopts the logic that both society and nature are best governed through market-like systems (Heynen et al. 2007). These perspectives contribute to my understanding of the allocation of private access rights to Aboriginal communities as a neoliberal approach to 'rights and title' related uncertainty, as well as helps to explain the high hopes for industrial shellfish aquaculture as a more productive and efficient contributor to coastal communities than subsistence and commercial shellfisheries.

However, in addition to considering the structural conditions that lead to inequality and environmental change, tracing the lineage and effects of uneven power dynamics in the pursuit of specific environmental and development outcomes also strengthen the research. Indeed, post-structural analyses of initiatives for environment and development are valuable, and have been particularly prominent since the 1990s (Braun & Castree 1998; Bryant & Goodman 2008). Amongst others, Braun (2002), Watts (2003), Castree (2004), and Gibson-Graham (2005) remind us that understandings of nature, society, and development are not fixed or homogeneous. Rather, their categorizations are constructed, and their meanings negotiated through power-laden relationships, across scales and over time. In this sense, interpersonal relations are rife with the potential to impact individual subjectivities and actions (Sturgeon 2007; Yeh 2007). With these perspectives, I am better equipped to consider the discursive construction of shellfish aquaculture as an ideal economic activity for coastal Aboriginal communities, and the implications of expert intervention and socio-

economic vulnerability on ka:'yu:k't'h/che:k:tes7et'h' interpretations of the band-owned and operated venture.

Drawing from both of these bodies of work, my analysis attends to ways that shellfish aquaculture expansion has been governed (broadly understood) into Nuu-chah-nulth territory. However, it has been rare for neo-Marxist and post-structuralist approaches to the analysis of neoliberal governance to intermingle within individual pieces of scholarship (Li 2007). I recognize that this relates to debates regarding power, where it resonates within society, and how it is best critiqued and resisted (Marsden 1999; Lemke 2001; Li 2007). Yet, I find the persistence of the gap to be curious, particularly as it applies to interventions for capitalist resource development. Whether explicitly or implicitly, many interventions for environment and development aim to reconstruct the scalar relations connecting a place to the nation state and the capitalist economy, as *well as* alter social relations amongst resource users, and/or between resource users and territory (Bridge & Jonas 2002; Li 2007). In these processes, both structural and discursive elements are often at play; I identify both in initiatives designed to encourage a new mode of shellfish production in Nuu-chah-nulth territory.

VI. Personal reflections and motivations

Because qualitative, cross-cultural fieldwork requires the researcher to purposefully immerse herself in the (often different) culture and surroundings of a specific location, it presents a unique set of challenges regarding position, subjectivity and ethics (DeLyser et al. 2010). On the one hand, going into the

work the researcher holds her own personal belief-system, background, and motivations. However, she is also guided by the tenets of qualitative/ ethnographic research methods that suggest she fully embrace and, to the best of her ability, achieve understanding of and compassion for the contexts of the people, places, and spaces she is exploring (Tavory & Timmermans 2009; DeLyser et al. 2010). For these reasons, a reflexive consideration of my identity and personal approach to the work will help to ensure greater clarity and transparency throughout the dissertation.

Understanding and communicating ka:'yu:'k't'h/che:k:tes7et'h' experiences with changing shellfish harvest is a central objective of the research. That I am a female Canadian of European descent might be considered a hurdle to undertaking this task. Most notably, my initial trip to Houpsitas was my first time on a Federal Indian Reserve. Of course, I anticipated experiencing and observing similarities to and differences from my personal context, as well as the likelihood that I would be oblivious to many nuances altogether (see Denis 1997; George 2003; Atleo 2004). I was also aware of the potential for any number of overt or implicit resistances to my presence or questions. Although I felt warmly welcomed at most times, during the early field stays in particular I struggled to recognize and overcome differences in communication styles, role of family, perspectives on employment and resources, as well as timing and scheduling.

From my perspective, the two single-most important traits for a researcher in the field are humility and acceptance. Of course, acceptance of other ways of being and knowing is central to participant observation and interviewing.

However, it was also crucial for me to acknowledge that, even though over time I grew to feel quite accepted and comfortable while in Kyuquot, my position would remain as outsider. I do not write from an indigenous perspective. However, I believe that I can appreciate the contemporary reality of moving amongst the Aboriginal and non-Aboriginal cultures that have come to share overlapping histories and material space in BC. Teaching, talking with friends, reading and listening to the media, and observing everyday tensions in urban settings have heightened my awareness of the varied interpretations and public perceptions of Aboriginal issues and Aboriginal relations in BC. In this regard, I strongly believe that living and working in the metropolitan lower mainland region between lengthy stays in Kyuquot has solidified my potential to speak to relations between Aboriginal and non-Aboriginal people in the province.

Three personal motivations have evolved and guided me through the work. First, I believe that the multiple and overlapping values extant in ocean and marine resources must be considered in schemes for management and allocation; this reality has tended to be overlooked as ocean space faces growing pressure from capitalist interests (St. Martin 2005a,b; Campbell 2007). As this research suggests, the values derived through shellfish harvest on the WCVI are not simply financial, and thus, projections for revenue potential from aquaculture cannot adequately inform decision-making regarding the suite of potential activities that might take place in the coastal environment. Second, intertidal clams represent one of the last accessible commercial fishing opportunities available to Aboriginal communities on Vancouver Island. Therefore, serious

consideration of the relative socio-cultural and economic impacts is warranted, particularly if ongoing tenure expansion and productivity increases are the objective of the Provincial government and various industry advocates. Finally, having been first exposed to the outcomes of the KCFN shellfish business, and then come to understand how it and others were pursued and promoted in Nuuchah-nulth territory, I am motivated to deconstruct narratives that present it as a natural or logical option for coastal economic development (e.g., opening evidence in Chapter One).

Linda Tuhiwai Smith, a Maori scholar and activist, argues that conceptualizing research as an act of hope, rather than as a neutral act of knowledge acquisition, is the first step in releasing its emancipatory potential (Smith 1999). Inspired by this sentiment, I have conceptualized and undertaken the research with the aim of achieving a deep understanding of the drivers and implications of shellfish aquaculture expansion as they have played out on the Nuuchah-nulth territory, making ka:'yu:'k't'h/che:k:tl̓e7et'h' experiences illustratively central. In response to public relations pieces and consultants' reports that assume the profitability potential, social acceptability and appropriateness of shellfish aquaculture expansion BC as foregone conclusions, I present the findings so as to reveal inconsistencies in interventions for shellfish aquaculture development and expansion (also see Gibson-Graham 1996, 2005, 2006; St. Martin 2001, 2005a,b).

VII. Conclusions

This dissertation explores how, in response to the increasing uncertainty caused by global resource markets, environmental decline, and the ceding of vast tracks of land back to Aboriginal nations, political and industry leaders are seeking new means by which to achieve continued capitalist development and economic expansion in BC. The findings suggest that a narrow view of socio-economic well-being is emerging through treaty-related and expert interventions for shellfish aquaculture expansion and Aboriginal economic development in Nuu-chah-nulth territory. This view prioritizes overlapping state and Aboriginal rights to territory, and encouraging capitalist resource development over self-determined resource use.

The dissertation is built around a case study that documents the overlapping values and arrangements in the intertidal clam fishery for the ka:'yu:k't'h/che:k:tles7et'h', and examines the KCFN owned and operated shellfish aquaculture venture that emerged in the early 2000s. Interviews and participant observation have revealed opportunities and tensions arising from efforts to increase ocean-based tenures for shellfish aquaculture and in Nuu-chah-nulth territory. However, as is characteristic of scholarship in political ecology, my research question and objectives also require consideration of tenure expansion in relation to wider political and ecological processes. Therefore, I have also conducted historical, discursive, and institutional analysis that documents the pursuit and explicit construction of shellfish aquaculture as an industry to rival the intertidal clam fishery in terms of the production of specific

shellfish species, and as a natural and logical option for coastal Aboriginal communities. Through this component, I illuminate the basic requisites for profitable shellfish aquaculture, and document the work the Province and industry in particular have done to align existing socio-economic, ecological and political conditions accordingly.

At the core of my analytical framework is the perspective that access to resources is subject to the power-laden interplay between knowledge, policy, local institutions, and broader economic forces (Brown & Purcell 2005; Neumann 2005). I have incorporated neo-Marxist and post-structuralist perspectives on neoliberal governance to illustrate both why and how shellfish aquaculture remains prominent as a strategy for Aboriginal community economic development. Finally, because 12 years have elapsed since the 1998 Shellfish Development Initiative, also compare and contrast the projected and actual outcomes of the 1998 Shellfish Development Initiative.

CHAPTER FOUR - SHELLFISH HARVESTS ON THE WCVI: CULTURE, SUSTENANCE AND LIVELIHOOD

hilh'tsa'at (ocean, our giver of life)

hustuup (to harvest from the beach)

...

At low tide on the same beach, chitons (ciidaxtp), gooseneck barnacles (ce?iidaw), and mussels (X'uč?b) would be very abundant. Once or twice a week, a few of us would gather all of this delicious seafood. We would start a campfire or two on the beach and cook all of these foods at the same time, with three or four huge cooking pots, and invite everyone down to the beach for an evening feast together. Today, when our nation goes on camping trips on these same beaches in July, we still do that (Wikinnash - Carl Edgar Jr., Ditidaht First Nation. From Uu-a-thluk (2008a), p. 51).

I. Introduction

The opening chapters provided initial background regarding the changing politics of state-Aboriginal relations, the Nuu-chah-nulth Nation and the Nuu-chah-nulth Tribal Council, as well as the ka:'yu:'k't'h/che:k:tləs7et'h' peoples, their territory, and community. Details ahead will centre on shellfish harvest, use and management, shellfish aquaculture techniques, initiatives for shellfish tenure expansion and Aboriginal participation in the aquaculture industry. With this chapter, I illustrate the socio-economic, commercial, dietary and cultural activities that coalesce in the harvest of intertidal shellfish in ka:'yu:'k't'h/che:k:tləs7et'h' territory and on the WCVI more generally. This includes documentation of some perceptions and practice of management and access rights by the KCFN in the commercial intertidal clam fishery.

In addition to shellfish harvest providing cultural and subsistence opportunities, since at least the 1980s the DFO managed commercial intertidal clam fishery has been a significant contributor to the winter incomes of many Aboriginal individuals and families on the WCVI (Pinkerton & John 2008). However, with increased participation in the late 1980s, standing stocks and harvests of Manila clams have fluctuated at different times in different regions. More recently, the fishery has also been affected by periodic water quality related closures and price variability (also see Pinkerton & John 2008). I will go on in this chapter to discuss some of the complexities surrounding fluctuations and closures, as well as introduce some alternatives initiated by DFO to increase Aboriginal access to the fishery, and have been adopted by the KCFN. I conclude that although the intertidal clam fishery faces challenges, it continues to fulfil important roles for many ka:'yu:'k't'h/che:k:tləs7et'h' people and is quite likely culturally and economically important to other Aboriginal harvesters as well.

To make this argument, I synthesize background and ethnographic data on Nuu-chah-nulth shellfish use and changes in the DFO managed intertidal clam fishery, based on what I have learned from informants and management reports. I blend this information with rich socio-cultural information collected by Nuu-chah-nulth peoples themselves for projects such as the Nuu-chah-nulth sea creatures project and a Nuu-chah-nulth cookbook (Uu-a-thluk 2008a). Section II in particular is strengthened by words and perspectives gathered and collated by Nuu-chah-nulth individuals, and I am grateful to those who have undertaken these ambitious and valuable initiatives. My central objective is to speak to the

changing shellfish uses, as well as management plans that pre-existed or overlapped with initiatives that enabled band-owned and operated shellfish aquaculture in ka:'yu:k't'h/che:k:tes7et'h' territory. In particular, I explore the multiple roles of the commercial fishery and go into details of its management and some ecological characteristics of the various clam species that have been the focus of the fishery over the years.

II. When the tide is out, our table is set: shellfish harvest in Nuuchah-nulth territory

In Nuuchah-nulth territory, an ongoing politics (currently manifested in Uu-a-thluk, the aquatic management body of the NTC), and in many individuals a spirituality, prioritizes the communal harvest and equitable allocation of resources (Marshall 1993; George 2003; Atleo 2004; U-a-thluk 2008). Equitable allocation ensures that all Nuuchah-nulth-aht are taken care of and that resources may continue to fulfill their socio-economic, subsistence, ecological, and sacred roles in the future (George 2003; Atleo 2004; Marshall 1993; Uu-a-thluk 2008a).³⁵ This type of prioritization is precisely what fuels interest in indigenous management arrangements and their propensity for sustained resource use in the face of diverse, seasonal and variable ecosystem dynamics, as well as complex socio-political relations with neighbouring groups and Nations (Turner et al. 2000; Troster 2003; George 2003; Atleo 2004; Pinkerton & John 2008). Seafood and

³⁵ Literature reviewed in Chapter Two and discussion in Chapter Three supports the applicability of this statement today in Nuuchah-nulth territory, regarding the roles of small-scale, subsistence and barter seafood harvests.

other marine resources are central to Nuu-chah-nulth identity and connection with territory (George 2003; Atleo 2004; U-a-thluk 2008).

Under an indigenous Nuu-chah-nulth management system, the 'beach-keeper' held responsibility for intertidal resources and the shoreline more generally (Drucker 1951). The position was multi-purpose, and similarly to other roles regarding salmon streams and other resources, it was allocated through chiefly/family lineages and protocols. Beach-keepers were responsible for the management and care of the beach, including the allocation and harvest of resources. They were also responsible for welcoming visitors who arrived by water and gathering intelligence regarding their background and purpose. Thus, the beach-keeper role contributed to community well-being and connectivity to the environment and other humans. In this sense, the wider political or socio-economic identity of individuals and families whose lineage connects back to the beach-keeper position may have links to the accessibility, ecological health and productivity of beaches.

Indeed, awareness of these roles remains today. The sentiment of 'identity in resource care and use' was eloquently articulated in the comments of an informant in 2005. She said:

(t)here used to be a job for every person in the community, no matter how small, there was still a job, there was still something to do to look after our earth. It was our community work. There was a group for the beaches, there was a group for the forest, for the hunters, the fishing, the shellfish. Just for everything there was somebody to look after. Right now it seems you're not allowed to go anywhere unless somebody out there says 'ok, you can go do it' (Nuu-chah-nulth elder and Kyuquot resident, June 2005. Interviewed by E. Pinkerton & J. Silver).

With the statement, she also articulated a clear recognition of, and slight frustration with, the spatial and/or temporal limitations that external forces and authorities have placed on patterns of resource harvest and care over time.

Resource access protocols remain such that if families or members of another community harvest resources in the territory of others, reciprocation in other resource harvests is enabled and encouraged. In this way, subsistence harvest and sharing allows for greater diversity of food across Nuu-chah-nulth territory. Thus, where present, accessible and permitted, shellfish harvests are important for food and other cultural uses at present (Kenyon 1980; Uu-a-thluk 2008a). Under DFO regulations for food, social and ceremonial (FSC) harvests, communal licenses are issued to designated individuals and/or vessels, with reporting requirements attached (Doyle 2002). In the case of clams, FSC harvesting can take place at any time, on any open beach, provided water contamination closures are not in effect.

Clams, abalone, mussels, oysters, urchin, chitons and cockle have all been harvested for food, trade, and ceremony amongst the Nuu-chah-nulth at various times (D.C. Harris 2008; Uu-a-thluk 2008a).³⁶ Table 4.1 provides the Nuu-chah-nulth words for these and various other shellfish, along with a listing of a variety of common uses (some past, some present). During my stays in Nuu-chah-nulth territory I heard several of these words used in conversation, most frequently in

³⁶ Smithyman (2004), Williams (2006), Uu-a-thluk (2008a), and Jacobsen (2009) provide accounts of the significance that seasonal seafood harvest played to the year-round well-being and to political-economic relations to peoples of the Pacific Northwest pre-European contact and during the 1700-1800s.

reference to their role as a food source (e.g., look at these t'ucup my Auntie brought from down island for us today³⁷).

Table 4.1 - A selection of significant shellfish to the Nuuchah-nulth, along with spellings in a dialect of the Nuuchah-nulth language. *Adapted from: Nuuchah-nulth Sea Creatures Project, undertaken by Uu-a-thluk, the Nuuchah-nulth Aquatic Management Body; Uu-a-thluk (2008)*

Nuuchah-nulth name	Common name	Common usages (past and present)
hičin	Littleneck clam	Chowder, drying & smoking
yaʔisi	Butter clam	Chowder, drying & smoking, bait
huupisi	Cockle	Chowder, steam/boil
t'ucup	Sea urchin	Raw. Outer spines used as prongs in tools
ʔapcʔin	Abalone ³⁸	Raw. Shell used in jewelry, decoration in carving.
łilimakłi	Prawn	Soup, steam/boil, deep fry, bait
hasaamac	Dungeness crab	Steam/boil, bait
ł'uč'um	Mussel	Chowder, drying, smoking
hiix ^w a	Dentalium	Shell used in jewellery and decoration, used as monetary units in barter and trade
čidaxtp	Chiton	Steam/boil

³⁷ This is not a direct quote, but paraphrases a conversation that I had with a ka:yu:k't'h woman who was cracking and eating raw urchin with her mother on reserve one afternoon. The urchin had been brought to Kyuquot by a family member as urchins are increasingly difficult to find in northern Nuuchah-nulth territory.

³⁸ In 1990 commercial and food, social and ceremonial fisheries for Northern abalone (*Haliotis kamtschatkana*) were closed entirely. Stocks did not respond positively after closure and in 1999 the abalone was listed as *threatened* by the Canadian Committee on the Status of Endangered Wildlife in Canada (Sloan 2004).

The commercial intertidal clam harvest in ka:'yu:'k't'h/che:k:tles7et'h' territory

In addition to an active year-round FSC harvest of shellfish, many Nuu-chah-nulth people have been involved in the commercial intertidal clam fishery on Vancouver Island since its inception around the beginning of the 20th century (Kenyon 1980). Geographic location and knowledge of territory gave Aboriginal communities distinct advantages in the fishery, particularly in terms of identifying and accessing remote beaches (Williams 2006). This may have been especially the case in the northern communities such as Kyuquot where there is a smaller overall population and fewer access roads.

Achieving a reasonable profit from commercial harvest activity is a central motivator for present-day participation in the intertidal clam fishery. Aboriginal peoples hold roughly fifty percent of commercial clam licenses in BC, and a 2009 estimate suggests that up to eighty percent of those licensed to dig clams on the WCVI are Nuu-chah-nulth (Ha-Shilth-sa 2009). There are approximately 60 commercial licenses held in Kyuquot alone (Uu-a-thluk 2007; Pinkerton & John 2008). However, as I suggest below, there are also strong socio-cultural attractors to participation in the DFO managed commercial harvests. During contemporary commercial clam harvests in ka:'yu:'k't'h/che:k:tles7et'h' territory, the pursuit of both economic and socio-cultural goals are possible, and are indeed enjoyed by many.

Currently, a clam harvester may participate in a commercial opening within their harvest area if they have a license (more on harvest areas below). Within an area there may only be certain beaches or areas open due to water quality or

existing shellfish tenures. Harvest openings occur at low tides in winter months (roughly December-April). A harvester might anticipate ~12-20 nights of digging per year (6-7 openings of 2-3 nights). The licensed harvester digs clams into large mesh sacks and then tags his/her sacks with an identification number for recording purposes. The tag allows product to be tracked and enables harvesters to legally sell their product to a Federally registered shellfish processor. In Kyuquot, diggers coordinate a drop-off to a middle-person who travels in to a designated location to buy the sacks of clams. Travel expenses are generally worked into the price per pound the buyer pays for the clams. This buyer then sells the clams to a processing plant where they are cleaned, graded, processed and packaged for sale or further distribution.

A skilled and/or determined digger might make about \$400-850 per night.³⁹ On any given dig roughly 20-35 licensed ka:'yu:'k't'h/che:k:tlɛs7et'h' participate, of whom 7-10 might earn this amount. However, any earnings are important in the winter, particularly given that fish-guiding season is long finished and will not begin again until June-July. One harvester said in a 2005 interview:

(w)e've got the best diggers (on Vancouver Island). Other places they go digging, but they don't hit it as hard as we do. Well they have other means of income ... Here we are more or less restricted ... clamming and goosenecking are like (the) main industry for us come winter time (ka:'yu:'k't'h male, ~45 years old, July 29, 2005. Interviewed by E. Pinkerton & J. Silver).

³⁹ This implies a harvest volume of 425-775 lbs @ ~\$0.85-1.10/lb. At points in the 1980s and 1990s, it was possible to earn in the range of \$700-1000 per night. These values come from confidential harvest and payment data supplied by KCFN.

In addition to being seasonally significant, the pattern of employment the harvest offers (2-3 hard nights of work, followed by a week or two off) seems to be ideal for many people in Kyuquot. Time away from formal employment means time with family, time for other odd jobs, time to go to Campbell River and stock up on supplies or take care of other appointments, time for relaxation, or time for the harvesting or preparation of other resources.

On the nights of a clam dig people leave from Kyuquot and travel anywhere from 0.5-3 hours by boat to get to beaches. People tend to harvest clams in groups, and as a result, they share boats and fuel costs, and pool resources like food, batteries (for head lamps) and clam sacks. 'Scouting' for beaches with high densities of harvestable clams is another activity alternated amongst groups of diggers. Talking about a specific instance of this activity in 2005, an informant said:

At first people were saying there's nothing there, and we were like, ok we'll just scout it out anyway, me and my friends, and we just hit the beach, digging one spot, run and move over and just two or three of us would survey the beach for the rest of us because we had eight other people in the boat ... but we found 'em pretty good, so we told them where to go and what's going to be the easiest. We had the ladies go to the good ground where it's just sand and gravel and nice easy strokes to dig (ka:'yu:'k't'h male, ~33 years old, August 3, 2005. Interviewed by E. Pinkerton & J. Silver)

By sharing information, this strategy allows all diggers to save gas money and time on the nights of digs (time to dig is limited due to incoming tides).

On rare occasion, groups set up camp for a couple of nights on beaches further away from home so as not to have to make the boat trip back between

low tides. When the camp is large enough, individuals responsible for cooking and driving may not partake in the clam digging, although they will receive informal payouts from the harvesters. At certain times, the KCFN may also provide a boat that takes harvesters to nearby designated beaches. This way a wider segment of the community can get out and harvest. Overall, my interpretation corroborates with Pinkerton and John (2008) who stated that the commercial significance of the clam fishery transcends age and gender. They suggested that,

(t)he clam fishery is the only commercial fishery pursued as a family fishery by all ages and all genders: spouses often dig as a team as well as children and parents, youth and elders. The community (Kyuquot) thus has an unusually strong *interest in* and *identification with* the resource (p. 683. Italics theirs).

In addition to commercial opportunity, the commercial fishery also offers the chance for people (including youth) to be out in their territory. The value of time spent in areas of territory that might otherwise remain unseen was meaningful to several individuals I have interviewed or spoken with. In 2006, one man said:

Back when I was young, there were areas for community use in seafood. As much as I would like my kids to stay here, they would like to go to town where the grass is greener - for school, to meet people from around the world. It gets harder to pass along our knowledge and sites (ka:'yu:'k't'h male, ~40 years old, May 23, 2006. Clam co-management committee meeting).

He went on to conclude:

We must utilize the sites we have. I have experienced life in this community without using the lands to full extent, there is so much more (ibid).

Here, the distinction between economic and socio-culturally significant activity is blurred. With the opportunity to harvest clams in more remote areas of territory, knowledge, skills and stories are transferred, and human and social-ecological relationships have the potential to be (re)constituted. Along with a fairly well distributed opportunity for income, and time spent in and learning about traditional territory, commercial harvests also provide the simultaneous opportunity to set clams and other shellfish such as mussels and oysters aside for FSC use. Shellfish of different varieties are often brought home from a commercial harvest to make into chowder, to smoke, and to give to elders and other relatives.

III. Species of the commercial intertidal clam fishery

BC's commercially harvested intertidal clams receive rather less conservation, management and media attention than other well known aquatic species of the Pacific Northwest such as the orca whale, sea otter, or sockeye salmon. Yet, shellfish, and intertidal ecosystems more broadly, play a significant role in coastal productivity and health. They provide habitat and produce nutrients for other species, and enable important services such as primary nutrient production and nitrogen cycling, which are of significance to larger scale biological and oceanographic processes (Emmerson et al. 2001; Bendell-Young 2001, 2006; Salomon et al. 2007).

Commercial intertidal clam harvests have been occurring in BC since prior to the turn of the 20th century; for example, in the early 1900s clam canneries existed in Sidney (1905-1939), Nanaimo, Vancouver, and Alert Bay (1914)

(Harbo et al. 1997). Records of clam landings were not kept until 1951 (DFO 2004; Pinkerton & John 2008). Until roughly the 1970s the ecologically indigenous Butter clam (*Saxidomus gigantean*) predominated in harvests, and to a lesser degree, the indigenous Razor clam (*Siliqua patula*) was also targeted.⁴⁰ Both species were sought for their larger body size, which made them more attractive for popular uses of the time: canning, drying and making chowder (The ARA Consulting Group, Inc. 1993; Williams 2006). Reports indicate that Butter clams were favoured by BC Ferries Co. for their cafeteria chowder (Heaslip 2008), and by Motts Inc. for use in their 'Clamato Juice' product (Williams 2006). Table 4.2 provides an overview of the commercially relevant clam species discussed in this chapter.

However, in the 1970s, a growing percentage of BC shellfish product became bound for American markets, and harvest effort began to focus on smaller 'steamer-sized' clams as a result (The ARA Consulting Group, Inc. 1993). Steamer clams are preferred for restaurant dining where clams are served fresh-steamed or deep-fried as appetizers, or in grocery stores where they are pre-processed and sold as ready-to-eat product (Broadley et al. 1990; The ARA Consulting Group, Inc 1993). The smaller indigenous Littleneck clam (*Protothaca staminea*) displayed the characteristics of a good steamer clam, including an attractive looking shell. However, when steamed, its shell does not open as consistently or easily as the current commercially dominant species, the

⁴⁰ Razor clams are only found in a sub-section of the WCVI, and are most prominent on Haida Gwaii, so their presence in this research is minimal.

Table 4.2 - Common clams in the BC commercial intertidal harvest. *Compiled from The ARA Consulting Group, Inc. (1993), DFO (1999) DFO (2004)*

<i>Scientific name / Common name</i>	Range and Habitat ⁴¹	Commercial significance
<i>Venerupis philippinarum</i> Manila clam	Exotic (early 1930s). Range: Central mainland coast, WCVI, Strait of Georgia Mid intertidal, firm sand-gravel beaches. Burrow just below surface (to 10cm)	Currently most significant by volume harvested
<i>Protothaca staminea</i> Littleneck clam	Indigenous. Range: Coastal BC High-mid intertidal in firm, gravel beaches. Burrow just below surface (to 10cm)	Currently second most significant by volume harvested
<i>Saxidomus gigantea</i> Butter clam	Indigenous. Range: Coastal BC Lower intertidal in substrates including porous sand, gravel and mud. Burrow to 25cm	Formerly most significant (up to late 1970s)
<i>Siliqua patula</i> Razor clam	Indigenous. Range: Haida Gwaii; WCVI (Clayoquot Sound) Sandy, exposed beaches, burrows from just below surface to 25cm. Do not form permanent burrows.	A small fishery on Haida Gwaii
<i>Nutallia obscurata</i> Varnish/savory clam	Exotic (early 1990s). Range: Mostly Georgia Strait, expanding in WCVI Sand/gravel beaches often in association with streams or freshwater runoff. Where overlap with Manila and littleneck clams, they are found deeper than other species	Increasing harvester interest, though designation as a harvestable shellfish pending and markets still uncertain

⁴¹ Range is reported within BC only. In many cases populations extend south or north of provincial boundaries.

ecologically exotic Manila clam (*Venerupis philippinarum*⁴²). The manila quickly rose in significance during the 1970s as well. By the 1980s, BC processors and wholesalers preferred it, and it was shipped almost exclusively to the United States (Clayton et al. 1990).

Since about 1995, the ecologically exotic Varnish clam (*Nutallia obscurata*) has been introduced from Southeast Asia, and has begun to colonise in parts of BC. Varnish clams are small in size and have an attractive shell colour, with both traits giving them potential in the steamer market. Processors and wholesalers are in fact working to expand the market for them, and they have already been dubbed the 'Savoury clam' for the purposes of advertising. There is some concern that *N. obscurata* has the potential to out-compete established stocks of Littleneck and Manilas for intertidal space and resources (DFO 2008b). As of 2001, aquaculturists were permitted to harvest Varnish clams if they happened to grow within shellfish tenures. However, harvest with a commercial clam license has yet to be allowed. Plans to designate them as harvestable catch in the commercial fishery have been initiated (Gillespie et al. 2001).

⁴² The Latin name *Venerupis philippinarum* is interchangeable with *Tapes philippinarum*, and both are used in reference to Manila clams in BC. I use the former throughout the dissertation.

Some important physiological characteristics of intertidal clams

Intertidal clams are broadcast spawners.⁴³ This means that both males and females emit gametes into the water, which is where fertilization occurs. Herein rests the source of variability in recruitment to standing stock. As Ketchen et al. (1983) noted:

(a)s a group it is difficult to generalize the life histories of clams, as, for example, sexual maturity is not so much a function of age as of size. Likewise, time of spawning varies depending on species and environmental conditions such as temperature ... Growth rates are generally faster in the Strait of Georgia than elsewhere (in BC) (p. 1113. Brackets mine).

Fertilized eggs develop into motile larvae that drift and are dispersed by water currents (Ketchen et al. 1983). That the early stages of life occur largely in the water column adds to the variability of recruitment to a particular beach from year to year (i.e., the impacts of tides, storms, and predators are not constant). After a few weeks, larvae will settle on beaches and begin to display adult characteristics (ibid). Adult clams are relatively sessile and feed on phytoplankton and other nutrients that float through the surrounding water column.

Manila clams require water temperatures of 13-14 °C for gonadal development, and 15 °C for successful spawning (Gillespie & Bourne 2005). Spawning in BC occurs during two times of the year: mid-June to September in the Strait of Georgia, and during August on the central mainland coast and WCVI (DFO 2009c). The motile pelagic phase in larval manilas lasts 3-4 weeks, and

⁴³ Here I focus largely on some quantitative characteristics of Manila clams. This is because of their prominence in the commercial fishery, and because they are currently the main clam species grown by BC shellfish aquaculturists. Therefore, the ecological background is also useful for later discussions of the technicalities of clam aquaculture. The general physiological patterns (i.e., broadcast spawn, life stage development) hold true for Butter, Littleneck, and Razor clams.

when a juvenile reaches 5 mm it burrows and permanently remains in that spot (ibid). Generally, Manila clams prefer loose sand-gravel beaches and burrow below the surface, to a depth of approximately 10 cm in the mid to high intertidal (DFO 1999). This location, further away from the water and shallow in the substrate, makes them the easiest of the intertidal clams to dig in BC.

Spawning and recruitment are not the only processes that exhibit variability with relation to the clam life cycle. Growth rates during adulthood may vary as well (Gillespie 2001). Manila clams may live up to 10 years and reach a maximum shell length of 75 mm. However, legal harvest size is 38 mm total length. Under 'optimal' conditions in the Strait of Georgia it would take this species ~3.5 years to reach that size (DFO 1999). However, conditions affecting growth rates vary with both tidal elevation (Gillespie & Bourne 1998; Gillespie & Kronlund 1999) and geographic location (Ketchen et al. 1983). In other words, no two beaches are the same, and therefore, standing stocks of harvestable clams do not necessarily accumulate at the same rate. In comparison to the Strait of Georgia, local knowledge and scientific estimates (Gillespie & Bourne 2005) from the WCVI place time to harvestable length of a Manila clam at anywhere from 3-6 years.

To summarize, the proclivity of a given beach to produce a commercially desired shellfish species varies with its physical characteristics, frequency and extent of spawn, adult growth rates, and existing standing stock (DFO 1999).⁴⁴ In turn, these characteristics vary with different oceanographic conditions such as

⁴⁴ Further variability is added through the presence, density and species composition of predators such as moon snails, sea otters, and sea birds (Bendell-Young 2006).

temperature, flow, and composition of particulates and phytoplankton. Given that Manila clams are an exotic species to the Pacific Northwest, and that it is a data-poor fishery, it has been particularly difficult for scientists and fisheries managers to predict recruitment patterns in BC from year to year (Gillespie & Bourne 1998).⁴⁵ It has been even more difficult to quantify the ways that these characteristics vary outside of the Strait of Georgia (ibid). Of course, ecological variation presents an element of uncertainty for production, a conundrum for shellfish aquaculture on the WCVI that I explore further in Chapters Five and Six.

IV. Institutional characteristics of the commercial intertidal clam fishery

When DFO first asserted management authority over the intertidal clam fishery in 1951, mandatory catch reporting through sales slip collection was the first requirement to be implemented (DFO 2004). It was through this mechanism that landings were initially monitored, though in-season reports from known buyers and processors now comprise the main source of harvest data (DFO 2008b). Between the 1950s and 1980s size restrictions and area closures for harvest management or due to sewage contamination and/or paralytic shellfish poisoning (PSP) were the main management mechanisms implemented (Heaslip 2008).

The early 1980s saw an overall increase in participation in clam fisheries in BC as prices for steamer clams rose. Increased participation must also be considered in light of the fact that access to other commercial fisheries such as

⁴⁵ Regular stock assessments do not occur on every commercial beach in the province; it would be unreasonable to expect this. Rather, intertidal clam harvest openings are “managed based on comparison of annual catches in each area and the reported catch per unit effort” (DFO 2008b, p. 15).

salmon and halibut was becoming increasingly limited (Pinkerton & John 2008; Pinkerton & Edwards 2009; Pinkerton & Silver, in press). The volume of landings from the intertidal clam fishery peaked in 1988 (3 608 tonnes); between 1988 and 1990, the volume of clams landed decreased by an estimated 29% (Broadley et al. 1988; Clayton et al. 1990).

The precise relationship between increased participation, landings, and price are unclear. However, Clayton et al. (1990) suggest that the decrease in landings pushed the price of BC Manila clams above the level that some foreign buyers were prepared to pay. This may have resulted in a decline in market competitiveness for BC processors/wholesalers as comparable product from New Zealand and US took its place. In 1988, DFO began to reduce and stagger intertidal clam harvest openings in an attempt to create a continuous supply to the market and stabilize prices (Broadley et al. 1988; Mitchell 1997). In 1989, it introduced new management mechanisms: individual harvester licenses (category Z2) and area-based management (DFO 2004; Heaslip 2008). With these changes, DFO asserted control over who could access shellfish resources and where.⁴⁶

With the individual Z2 licenses and an area-based system in place, entry to the fishery remained open in the sense that anyone could apply for a clam license and license fees remained low (~\$90). However, harvesters would be restricted by their licenses to one harvest area only. Figure 4.1 shows the

⁴⁶ Also see Pinkerton & John (2008) and Pinkerton & Silver (in press) for description of regional management bodies and decision-making regarding harvest openings and target harvest volumes.

commercial fisheries harvest areas as designated by DFO, while Figure 4.2 shows the clam sub-harvest areas. Nuu-chah-nulth territory falls almost entirely within Area F, while Kyuquot Sound is designated as Sub-Area 26. Harvesters from Area F can dig in any of the sub-areas that fall within it.

Figure 4.1 - BC commercial fisheries harvest areas. *Adapted from DFO (2004).*

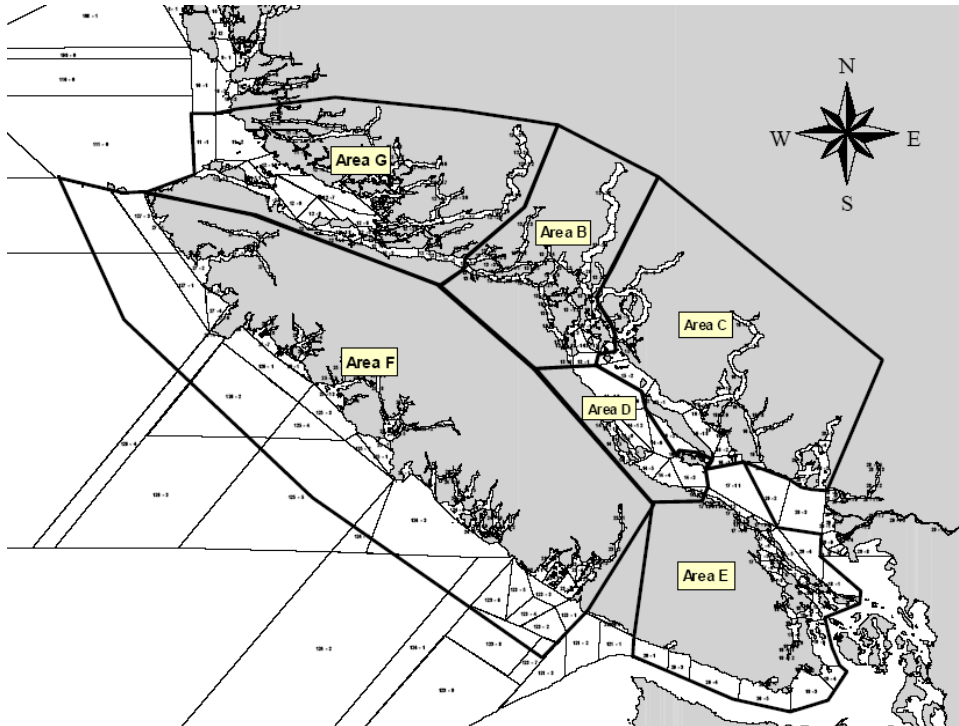
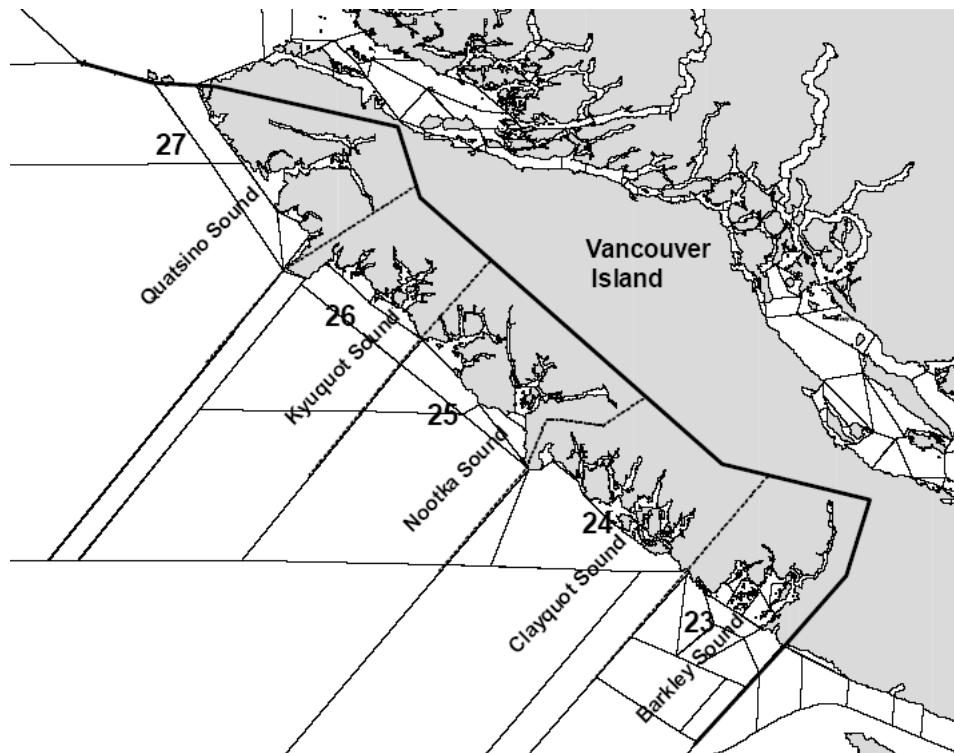


Figure 4.2 - Clam sub-areas in harvest area F. *Adapted from: DFO (2004).*



Clam management reform, 1992-1998

In 1992, in conjunction with the BC Ministry of Agriculture, Food and Fisheries, DFO initiated a broad review and series of consultations regarding future prospects in the clam fishery (Heaslip 2008; Pinkerton & Silver, in press). ‘Clam Reform’, as it was nicknamed, was largely about limiting the number of individual Z2 licenses available for the fishery to reduce fishing effort (Heaslip 2008; Pinkerton & John 2008). This is an example of rationalization, where access rights are narrowed to fewer individuals. In reference to the potential for reform, a 1993 exploratory report ominously concluded: “participation in the commercial fishery cannot go unlimited forever” (DFO 1993, p. 10).

In 1997, several new policies came out of the clam reform consultation process, including: Z2 license limitation and non-transferrability, an initiative for increased Aboriginal access through Aboriginal Commercial Licenses (ACLs) and pilot beach harvest arrangements, and the potential to develop regionally based clam management boards (DFO 1993, also see Pinkerton & John 2008; Pinkerton & Silver, in press). To qualify for a commercial Z2 licence in the limitation process, an individual must have held a license in five out of six years between 1989 and 1994 (Heaslip 2008). Table 4.3 shows the total number of Z2 licenses in circulation in BC 1995-2004; notice the drop from 1572 licenses in 1997, to 907 in 1998. I was unable to obtain data beyond 2004, although it can be assumed that the number of allocated licenses remains similar or perhaps slightly less, as if a license holder wishes to stop harvesting, (s)he must retire the license. Currently, there are approximately 26 Z2 licenses held in Kyuquot (Pinkerton & John 2008).

Table 4.3 - Number of Z2 Licenses allocated between 1995-2004 (licenses in 1989 = 1870, highest ever 1995 = 2448, previous highest 1990 = 2068). *Data compiled from DFO (1999) and Gillespie et al. (2005).*

	1995	'96	'97	'98	'99	'00	'01	'02	'03	'04
# of Licenses	2448	1906	1572	907	915	977	964	993	1011	978

Attention to Aboriginal fisheries and employment: Aboriginal Commercial Licences and reserve-front Pilot Beach Harvests

Despite the overarching intent to rationalize access, efforts were made by DFO to acknowledge and accommodate the unique Aboriginal interest in the clam fishery. First, the Aboriginal Commercial License (ACL) program was introduced under the auspices of the Aboriginal Fisheries Strategy in order to recognize the significance of the clam harvest to Aboriginal communities. The ACLs are identical to the regular Z2 licences in that they enable participation in a given harvest area, but can be allocated by the Band Council. This system allows for a more targeted and/or personalized allocation of licenses. In 2002, there were 564 ACLs in BC (Doyle 2002); currently the KCFN controls approximately 36 (Pinkerton & John 2008). The KCFN chooses to allocate its ACLs for a harvest, or series of harvests, based on need and a rotating waiting list. As noted in 2005 by an informant in Kyuquot:

(a) few times too it's based on need. Like there's families that got nobody in their house that got a source of income, well they'll get a (ACL) license. I was on the list. So I phoned (the fisheries manager) up and told him my ACL was available because I'm a commercial (Z2) digger (ka:'yu:'k't'h male, ~45 years old, July 29, 2005. Interviewed by E. Pinkerton & J. Silver, brackets mine).

This system allows for flexibility to localized needs, as well as the opportunity to revoke licenses to penalize harvesters who repeatedly break rules (for example, harvest prior to opening or taking undersized clams).

Second, the pilot-beach harvest management system (also referred to as Aboriginal Communal License) was designed to enable small-scale, closely

monitored harvests on beaches that fronted or were adjacent to reserves (inhabited or uninhabited) within a Nation's territory. In order to obtain a pilot-beach agreement with DFO, the applicant Nation had to identify the reserve-front beach(es), conduct stock assessments, and develop a management plan that sets a target harvest rate based on the density of legal sized Manila clams on the beach (Doyle 2002). In 2002, approximately five bands had pilot-beach agreements in BC (ibid).

V. A layer of complexity: water quality and food safety

That shellfish are suspension feeders poses an additional hurdle for contemporary commercial clam harvesters and wholesalers: flesh contamination. Bacteria, viruses, heavy metals, and other toxins may be taken up into the shellfish and concentrate in the meat, which then cause harm to the unknowing consumer. As a result, shellfish face intense managerial and consumer scrutiny (Wiseman & Gobas 2002; David et al. 2007), and shellfish harvested in BC and all over the world today face marketability constraints placed upon them by concerns for human health. In approximately 1988, BC shellfisheries began facing bacterial and viral, heavy metal, and dioxin related closures of various size and duration. These management mechanisms placed additional temporally and spatially incongruous limits on access for harvesters in different regions.

The Canadian Shellfish Sanitation Program (CSSP) is a management program administered by various Federal departments to ensure that harvested shellfish do not harm human health. Environment Canada (EC), DFO, and the Canadian Food Inspection Agency (CFIA) run the CSSP cooperatively, and it

encompasses all forms of shellfish harvest: FSC, recreational, wild-grown harvests, and aquaculture. EC is responsible for surveying and sampling known shellfish growing waters. DFO is responsible for monitoring and enforcing these regulations, which include harvest closures in areas with unacceptable biotoxins and ensuring that harvested shellfish meet appropriate standards. Finally, the CFIA monitors shellfish processing plants and the shellfish that are destined for market (be it local or international). In fact, many of the stipulations of the CSSP must meet internationally accepted standards designed to protect consumers who ingest product from increasingly global sources (Beach 2006). To assure that exported shellfish are healthy and harvested from approved areas, the US Food and Drug Administration and the European Union (DFO 2008b) frequently audit the CSSP.

Depuration

Depuration is a cleansing process that encourages shellfish to purge viral and/or bacterial contaminants from their flesh. After harvest, a certified processor will bathe clams for 48 hours in tanks of flowing disinfected water and, with flesh sampling, these shellfish may be sold into the market (Gillespie et al. 2005). In 1994, the approval of depuration in the intertidal clam fisheries allowed for some beaches closed under the CSSP to re-enter the intertidal clam fishery under a DFO depuration license (DFO 1999). Quotas were set for depuration beaches and their harvests were closely monitored (Gillespie et al. 2005). Depuration helped to increase the supply of BC Manila clams to markets during the 1990s, and therefore, depurators (often shellfish processors) and regulatory agencies

were generally supportive of depuration harvest arrangements. However, the depuration licenses represent a further reconfiguration of access rights in some areas.

A First Nation with a pilot-beach agreement may also obtain a depuration license. To do this it must reach a joint-venture agreement with a depurator, amend the harvest plan, and identify individuals to monitor the harvest and ensure that clams are coming only from designated beaches or areas (Doyle 2002). Harvesters participating in any depuration harvest were required to sell their product to a licensed depurator, and in some instances, licensed depurators were also allocated marginally contaminated beaches (Gillespie et al. 2005). In 2005, there were five depuration facilities licensed in BC (ibid). Depurated shellfish receive a lower price than shellfish harvested from unrestricted beaches due to the extra processing costs (a difference of ~20-30 cents per pound).

VI. Alternative harvest arrangements in ka:'yu:'k't'h/ che:k:tles7et'h' territory: communal licenses and a conditional management plan

As documented in Pinkerton and John (2008) and described in Pinkerton and Silver (in press), between 1999-2004 the KCFN did in fact have a successful and locally supported pilot-beach depuration harvest on two of the most productive clam beaches in their territory (see Pinkerton & John 2008, and more on their conversion to shellfish aquaculture tenures in Chapter eight). Standing stock on the beaches was quantified, and a sustainable harvest rate set. Under the management plan, the KCFN fisheries authority was able to exclude outsiders,

regulate the number of diggers during harvests and the intensity of harvest (through ACL allocation), monitor clam quality standards and the sale of product to buyers, and set/enforce any additional rules (Pinkerton & John 2008). The KCFN success was seen as a promising example of the potential in the pilot-beach system for other Nations on the WCVI (ibid).

However, under the CSSP, Environment Canada had been conducting biannual rounds of water sampling in Kyuquot Sound since 2001 (spring/autumn) to ensure that bacteria counts met the acceptable levels for human consumption of shellfish (Beach 2006). The autumn 2004 round of water tests brought surprising results: elevated counts of faecal coliform bacteria, originating from mammalian faecal matter. It was particularly unusual to find sustained high faecal coliform counts in a remote area where there is very little human settlement (i.e., potential for sewage outflow). Nonetheless, 8423 hectares of growing waters in Area 26 were closed for the upcoming winter clam season (Beach 2006). While many beaches were closed, harvest from the two beaches that had communal license/pilot beach management plans in place continued under a depuration agreement with a Vancouver Island shellfish processing company.

Community members were understandably concerned, and not only because it affected the opportunity for winter clam harvests and impacted the prices paid for clams from pilot-beach harvests. They were also upset because the fall sampling occurs around the autumn 'first flush', which refers to the return of the fall rains after the (usually) relatively dry August and September months (Beach 2006). The heavy rains of the first flush tend to wash out debris and fallen

foliage, which includes animal and bird faeces.⁴⁷ However, the first commercial clam fishery openings are not generally until October or early November, so there was a fairly widespread belief that by the time the winter harvests came around, water conditions would have returned back to acceptable levels.⁴⁸ As facilitated through Katie Beach's master's research (2006), a program of water sampling was designed and funded in collaboration with the KCFN fisheries, DFO, EC and CFIA, and undertaken with the KCFN fisheries during the winters of 2005 and 2006. The tests were undertaken at a selection of three beaches and showed clean results during the harvest times. These findings allowed for the opening of two beaches to the commercial fishery, and one of the Aboriginal Communal License beaches, under a 'conditional management plan'. Clams from these beaches no longer needed to be depurated, and thus, earned full price for harvesters.

Pilot-beach harvest agreements, and/or where necessary, conditional management plans and depuration arrangements for locally managed harvests, pose a real possibility for Aboriginal communities on the WCVI. Under the 2007 ka:'yu:k't'h/che:k:tles7et'h' conditional management plan, the former KCFN Band Manager, noted that \$2000 in water sample costs translated into about \$10 000

⁴⁷ There is ongoing interest in testing whether logged watersheds are more prone to high flushing because animals use new foliage more often to feed and because there is less protection against run-off. Beach (2006) undertook initial research that suggested that there was enough noticeable variability between logged and un-logged areas to warrant further study.

⁴⁸ Many community members claimed to be eating clams and feeling just fine. An Uu-a-thluk newsletter also noted: "most Nuuchahnulth in the area would know better than to eat shellfish after a major rainfall" (Uu-a-thluk 2007, p. 1). However, due to budgetary restrictions and the typically stormy winter weather (which makes travelling to Kyuquot Sound by float plane and getting out again in time to get the samples to the lab difficult on many days) the potential for additional winter sampling by Environment Canada was not considered.

in income for community members per dig (~\$60 000-70 000 over the winter) (Uu-a-thluk 2007). He went on to say that the income is critical “for members to get through the winter”, and noted that “(o)ther than one commercial salmon fisherman, KCFN members are shut out of every other fishery (Uu-a-thluk 2007, p. 2). Overall, programs such as the pilot-beach and conditional management plans give communities the opportunity to undertake management activities, exclude outsiders, as well as strategically chose locations to manage or re-open during times of adverse contamination conditions.

VII. Conclusions

In 2005, the landed value of intertidal clams from the commercial intertidal clam fishery accounted for 2% (~\$2.2 million) of the total landed value of wild-grown shellfish in BC (DFO 2009).⁴⁹ However, the evidence I have presented here suggests that the value of the fishery cannot be weighed solely by its contribution to the provincial GDP. At least half, and on the WCVI up to 80%, of its participants are Aboriginal. In 2004 (last data available for Z2 licenses), this would have equated to at least 489 Aboriginal Z2 license holders in the province.⁵⁰ In addition to the Z2 licensees are those individuals who are able to harvest on an ACL, as allocated through processes designed by their respective Band Councils. In addition, year-round shellfish harvesting for subsistence continues to be rooted in relations and patterns of allocation tied to communal

⁴⁹ The total landed value of wild grown shellfish in BC for 2005 was ~\$111 million. Geoduck, horse clams and prawns represented 89% (~\$99 million) of the total landed value.

⁵⁰ Dunlop (2000) estimated that in 1998-1999 the average earning per Z2 license was \$2 685. An updated estimate has not been calculated.

use and benefit and, in some cases, familial/chiefly duties, and relationships with the wider territory.

I have provided evidence to suggest that, in ka:'yu:'k't'h/che:k:tl̩s7et'h' territory, the ongoing and overlapping socio-cultural, economic and subsistence values are significant. The intertidal clam harvest offers winter employment opportunity when summertime activities are at a lull and household cash flow may be lower, and it does not require participants to be away for any more than 2-3 days at a time (and mostly just in the evening-late night). Participation requires a relatively inexpensive licence, a boat with an outboard motor, some sacks, flashlight, and a rake (i.e., the fishery can be qualified as 'small-scale'). Harvesting allows people to be out in their territory together. Furthermore, institutions have evolved to allow flexible, locally relevant harvest arrangements under certain conditions. Overall, the commercial intertidal clam harvest allows for a mixture of commercial, subsistence, and communal harvest activities to happen together.

Future prospects for the DFO managed intertidal clam fishery

Principally because of external market demands, the commercial intertidal clam fishery has moved away from local species such as Butter and Littleneck clams. Standing stocks of the in-demand exotic Manila clam built and spread in BC starting in the 1930s when they were first introduced. However, by the early 1990s, stocks had been depleted, and landings in many regions of the province were sustained by (variable) annual recruitment (Gillespie et al. 2005). As Beach (2006) summarizes, the low overall economic returns from the fishery places

management agencies in a predicament because “(t)he revenue from this industry is thus minimal, and so the agencies in charge of managing it have limited resources to give back” (p. 12).

Despite the decline in landings of steamer clams (Manilas in particular), DFO concludes in its *2007-2009 Intertidal Clam Integrated Fisheries Management Plan* (DFO 2008b) that intertidal clams stocks are not a conservation concern. It projected its management mandate for the near-to-medium future to include:

(l)icence limitation, area licensing, minimum size limits, and time and area closures ... In season management of the intertidal clam resource will continue in a precautionary way utilizing consultation with area diggers and local First Nations and stakeholders (DFO 2008b, p. 16).

These mechanisms continue existing limitations and arrangements regarding management and access rights. However, there is ongoing flexibility to the involvement of regional management bodies (DFO 2008b).

Nonetheless, DFO does express concern regarding the future of the fishery. In 2008, it stated:

the trend in the commercial fishery is of declining landings due in part to reduce (*sic.*) effort, unauthorized harvesting, lower prices, alienation of beaches to aquaculture, and sanitary closures (DFO 2008b, p. 10).

Further,

(c)ompetition for markets seems to be increasing. There is increased production from clam farms, production from depuration fishery, and production from Washington State beaches all entering the same markets. Further, other countries such as Chile and Mexico are producing similar product. With so many possible sources of product, the value of the commercial fishery may in fact be reduced in the future (DFO 2008b, p. 14).

Indeed, there is evidence to suggest that unsteady supply of Manila clams to processors/wholesalers limits their ability to compete in desired American markets (Broadley et al. 1988). As a result, these industry interests may have placed additional pressure on management agencies, harvesters, and aquaculturists to maintain levels of production (see Broadley et al. 1988; Clayton et al. 1990).

Shellfish aquaculture – a more certain alternative?

In 1997, Coopers and Lybrand calculated that the BC shellfish aquaculture industry could increase in value from \$12 to \$100 million by 2007, most significantly through a doubling of the tenured space available to shellfish farming. The projected potential of expanding Manila clam aquaculture contributed a significant amount to this projection (between \$27-46 million). Claims-making regarding the benefits of industry expansion that happened in conjunction with this report was fascinating and will be a focus of the analysis to come. I briefly review some central arguments here.

Decreasing intertidal clam fishery landings and water quality concerns were often invoked to suggest that shellfish aquaculture offered superior economic and sustainability potential (Kingzett 2003). The industry was also touted as an ideal Aboriginal economic development strategy because of longstanding and multifaceted Aboriginal shellfish use (e.g., Doyle 2002; Salmon 2006). For example, an Indian and Northern Affairs Canada report entitled *Cultivating Opportunity: A management strategy to expand First Nations' Participation in BC's Shellfish Aquaculture Industry* (i.e., Doyle 2002) states:

First Nations situated along the coast of British Columbia with their long traditions of using shellfish for food and cultural purposes and plentiful access to productive shellfish growing sites are ideally positioned to take advantage of the employment and economic benefits of shellfish aquaculture (p. 4).

At least publicly, little attention was given to how spatially and temporally variable ecological conditions like recruitment, growth rates, or water quality might affect profitability in different regions of the province. Nor was there overt consideration for the different production and business model that aquaculture presented.

The strong claims put forth for shellfish aquaculture expansion into the WCVI contributed strongly to my desire to explore relationships between expansionary initiatives, Nuu-chah-nulth traditional territory, and the work done by treaty-related funds, measures, and stipulations. With Chapters Five and Six, I explore how the pursuit of an internationally competitive shellfish aquaculture industry in BC has been initiated, and how it in turn hinges on amenable ecological conditions and on Aboriginal cooperation (or at least, tolerance towards industry expansion). In Chapter Seven, I return to elaborate the KCFN experience over the last decade with a band-owned and operated shellfish venture. These findings destabilize the subtext of certainty so prevalent in early claims and arguments made for industry expansion.

CHAPTER FIVE - A PROLOGUE TO EXPANSION

In the early 1990's, a Canadian marine scientist named Brian Kingzett was engaged in an ecologist's dream job. The province of British Columbia wanted to know how much of its Swiss-cheese coastline had the potential for shellfish aquaculture, and it hired Kingzett to find out. Kingzett was following a long line of explorers, including James Cook and George Vancouver, commissioned to mess about in boats along one of the wildest and most breathtaking coasts in North America. He surveyed the shore from Victoria all the way to the border with Alaska, recording the locations and characteristics of the beaches, surveying the species present, and snapping photographs of the most promising spots (Jacobsen 2008, online).⁵¹

I. Introduction

This passage is taken from an online blog that is targeted at oyster enthusiasts (both the ecologically and gastronomically inclined), and was part of a description and photo essay recounting a 2008 research expedition to Nootka Sound, on the WCVI. The expedition occurred so that researchers could formally identify and record populations of the rare Olympia oyster (*Ostrea conchaphila*) that Kingzett had come across in the 1990s while undertaking shellfish aquaculture assessments.⁵² As the story continues, Jacobsen recounts with excitement the chance meeting between Kingzett and an oyster expert working with a regional coastal restoration non-governmental organization (NGO). According to

⁵¹ The fact that Jacobsen conjures British explorer-traders, Cook and Vancouver is fascinating. Their purpose was partially to forge strategic political-economic alliances with local Aboriginal groups for trade in sea otter pelts and other resources found within coastal traditional territories, and partially to map and record the territory for its potential as a new colony (Braun 2000; Harris 2004).

⁵² Also see Jacobsen (2009) for a book-length treatment of Olympia oyster history and restoration efforts in the Pacific Northwest. In his introduction, Jacobsen retells some of the adventures Kingzett had over seven summers while he was assessing up to 2000 BC beaches for their shellfish aquaculture potential.

Jacobsen, this meeting led to the expedition, and ultimately, the successful location of *Olympia* oysters in Nootka Sound in 2008. However, my incorporation of the story here has little to do with interest in the population status of the indigenous species of oyster.

For me, the story illuminates the role of Provincially funded assessment activities beginning in the early 1990s and building up to initiatives for shellfish aquaculture expansion beginning in 1997. The BC Ministry of Agriculture, Food and Fisheries, now the Ministry of Agriculture and Lands (MAL), commissioned the coastal assessments as part of its task to regulate and develop the industry in the province. The assessments resulted in reports that document intertidal and nearshore space with the physical characteristics known to be amenable to successful oyster and clam aquaculture (Cross & Kingzett 1992; Cross & Kingzett 1993; Cross 1993a,b; Cross et al. 1995; Kingzett 1995; Kingzett et al. 1995a,b; Axys Environmental Consulting 1997; Blythe et al. 2004). The reports provide extensive one-time assessments of locations within the five WCVI sounds (Barkley, Clayoquot, Nootka, Kyuquot, Quatsino) and document physical characteristics including salinity, temperature, relative exposure, intertidal slope and composition, and tidal height (Cross & Kingzett 1992). Time-series data for environmental variables and actual growth rates for proposed shellfish was not included in the reports.

Eventually, the reports would lead to a calculated representation of the economic potential of shellfish aquaculture in BC, and then to the official mandate for industry expansion into new areas of the province. As I will show in

Chapter Six, based on the availability of 'capable lands' on the WCVI and the top productivity levels of shellfish growers in the province in 1995, Coopers & Lybrand (1997) projected that the shellfish aquaculture industry could be worth \$100 million within 10 years. However, a longer historical and ecological context of the shellfish aquaculture industry sheds important light on the species that farmers grow, their evolved physiological traits, and the nature of the techniques developed to optimize their growth. I examine this context here.

My purpose is threefold: (1) to present the general regulatory mechanisms and market and production background surrounding the contemporary industry in BC; (2) to illustrate a longer social-ecological history of shellfish cultivation and aquaculture activities, including the introduction of exotic oyster and clam species; and, (3) to return to the passage above to set the scene for the remaining chapters.

II. Managing access, regulating impacts

A 1988 Memorandum of Understanding negotiated on aquaculture management between the Federal and Provincial governments defines a separation of government management responsibilities. Federal responsibilities include the conservation and management of wild-growing fisheries stocks, the orderly use of navigable waters, managing the collection of wild-growing stock and juveniles, and setting shellfish health and safety requirements. The Provincial government is responsible for licensing and the management of many elements of the aquaculture industry, including the size and location of tenures, industry practices, and environmental monitoring (Howlett & Rayner 2004; VanderZwaag

& Chao 2006). Unlike New Brunswick, and Newfoundland and Labrador, BC has not consolidated related regulatory measures and requirements into an Aquaculture Act (Howlett & Rayner 2004).

Entrepreneurs wishing to grow shellfish in BC must obtain an aquatic tenure from the Province. The tenure grants private access to intertidal and nearshore ocean space over a specific period. To receive a tenure, potential shellfish farmers must submit a one time application fee of (in 2009, the fee was \$1260). Numerous Federal and Provincial departments must grant various permissions and conditions on the tenure. Considerations include, but are not limited to, impacts on the rights of upland owners and the environment, community opposition, and adjacent navigable waters. If the application is successful, aquatic tenures are generally granted for 20-25 years, after which renewal may be sought. The farmer must pay rent based upon land assessment values defined in land policy. For the first five years, the lease fee is 1% of the land value, at which point the rent jumps to either 4 or 5% (Ministry of Agriculture and Lands 2005).⁵³ Ultimately, applications are approved by, and rents for tenures are paid to the Province of BC.

Aquatic tenures for aquaculture fall into three categories: intertidal; subtidal (<10m); and deep water (>10m) (Joyce 2008). Different tenures are

⁵³ As of April 1, 2009, the assessed land value for shellfish aquaculture is \$5830/ha (MAL 2005). In 2002, GS Gislason & Associates Ltd. suggested that in addition to tenure payments, startup investment for clam culture is approximately \$40 000 per hectare, while oyster culture might require about \$20 000 per hectare. For taxation purposes, BC aquaculturists are designated as 'farmers', and thus entitled to agricultural tax exemptions and deductions (Howlett & Rayner 2004).

amenable to a different array of species and growing technologies. Therefore, where possible, shellfish entrepreneurs will often bundle tenure types together in order to grow different species. This strategy has been especially popular since the late 1980s. Currently, estimates of the cumulative ecological effects of numerous tenures over a given area are not quantified as part of the application and tenure allocation process.

Interactions and implications

Dumbauld et al. (2009) identify three types of shellfish aquaculture activities that may induce consequences for aquatic ecosystems. These include: (1) material ecological processes (waste production, nutrient consumption, changes to intertidal composition); (2) the addition of foreign physical structures (anchoring structures, nets, posts, etc.), and; (3) pulse disturbances (harvest, species removal, changes in habitat availability). Any consequence will have a varying magnitude, scale, and potential for cumulative spatial or temporal impact, the effects of which would be unique to the characteristics of the estuarine system in question. In the open Pacific Northwest, sediment and nutrient concentration in the water column tend to be relatively high and influenced by large tidal exchange and proximity to deeper oceanic upwellings (Dumbauld et al. 2009); this is particularly so for the WCVI and open coast north of Vancouver Island (Taylor & Haigh 1996).

As BC does not have an overarching piece of legislation that guides aquaculture management, much activity undertaken on tenures falls under the Provincial *Waste Management Act* (Howlett & Rayner 2004). Inspectors from the

appropriate ministries enforce requirements of the Act. In 2001, the industry association, the BC Shellfish Growers Association (more below), drafted an *Environmental Management System and Code of Practice* (i.e., BCSGA 2001), to assist farmers and increase public. According to the Association, the purpose of the document was “to develop and foster good neighbour farming practices”, with an intended result of “a working partnership with the general public to address nuisance issues and to protect and enhance marine resources” (BCSGA 2009a, p. 10). The code of practice document identifies existing legislative requirements under numerous Provincial and Federal acts, and makes recommendations on how a farmer can ensure they are met. As it is a ‘code of practice’, BCSGA 2001 is not legally enforceable, and the degree to which farmers currently follow its recommendations is unclear. Howlett and Rayner (2004) describe the code as an “instrument of coregulation” (p. 176) and contend that it is largely descriptive (i.e., does not incorporate quantitative performance standards or baselines).

Concerns regarding site specific impacts and ecological interactions that result from shellfish aquaculture in BC do exist. That these effects have not received attention as expansion, zoning, and tenure allocation has proceeded has been frequently cited in related literature over the last decade (Jamieson et al. 2001; Bendell-Young & Ydenberg 2001; Howlett & Rayner 2004; Zydalis et al. 2006; Whiteley & Bendell-Young 2007). Amongst others, Bendell-Young and Ydenberg (2001), Jamieson et al. (2001), and Zydalis et al. (2006), insist that the ongoing implications of foreign farming structures, such as netting and long-lines,

for other species in the ecosystem such as foraging seabirds, spawning herring, and eelgrass populations require further examination and ongoing monitoring.

In addition to these site and/or species-specific impacts, the cumulative impacts of many shellfish sites across larger ecological scales in BC remain understudied. As Jamieson et al. (2001) noted: “(t)o date, no studies have addressed the cumulative effect on ecosystems from bivalve culture” (p. 40). Cumulative impacts may include: alterations to planktonic communities (Jamieson et al. 2001), changes in community composition, diversity, and competition (Whiteley & Bendell-Young 2007), sedimentation leading to harmful algal blooms (Bendell-Young 2001), and changes in genetic structures of wild-growing populations (Jamieson et al. 2001; Miller et al. 2006). There is also evidence to suggest that shellfish aquaculture increases preferable habitat for some fish and productivity and/or water quality through nutrient cycling (Jamieson et al. 2001). Industry communications and public relations pieces frequently cite these potential benefits.

The ecological impacts of intensified shellfish aquaculture are not a focus of this research. However, this background provides an important reminder that the precise ecological implications of intensified shellfish aquaculture are difficult to predict over broad spatial and temporal scales (Grant et al. 1995; Gibbs 2004). Moreover, a paucity of research and planning concerning potential cumulative impacts of shellfish aquaculture in BC currently exists (Bendell-Young & Ydenberg 2001; Jamieson et al. 2001). Uncertainty surrounding long-term ecological implications makes it difficult, if not impossible, to tease out the socio-

economic benefits and drawbacks of a particular development path, and to understand how outcomes may be distributed and experienced by different groups of people (Blaikie 1995). The uneven distribution of risks and impacts is not new to Aboriginal communities, and as documented by Joyce (2008), Aboriginal respondents in several coastal areas of the province recognize potential negative impacts from shellfish aquaculture on food, ecosystems, and sovereignty, and indicate concerns regarding the overall trajectory of the industry.

III. Industry structure and background

The BC Shellfish Growers Association (BCSGA) identifies its roots in early oyster cultivation activity that began in 1903. The BCSGA institutionalized formally in 1948 under the name BC Oyster Growers Association. Following a name change in 1990, it became the provincial shellfish aquaculture industry association, and by 2007 it had 183 members (BCSGA 2009a). In 1995 there were 258 shellfish businesses holding ~400 aquatic tenures, representing an area of ~2100 ha of foreshore in coastal BC (mostly Baynes Sound, Oekover Inlet, and Desolation Sound) (Coopers & Lybrand 1997). Then the wholesale value of the industry was \$10.5 million, a jump from \$4.1 million in 1988 (ibid). By 2008, there were 322 companies controlling 506 tenures, covering 3334 hectares of foreshore. See Table 5.1 for data 1998-2008, and Appendix C for a 2007 map of tenure locations.

Table 5.1 - BC shellfish aquaculture industry: Companies, sites, hectares tenured, and wholesale value 1998-2008. *Data compiled from the BC Ministry of the Environment (2009a,b).*

	1998	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08
# Firms	236	283	231	278	278	302	300	304	314	321	322
# Sites	427	437	417	455	455	464	481	487	489	450	506
Hectares tenured	2300	2300	2400	2700	2700	2812	2937	3019	3123	3339	3334
Wholesale (\$ Millions)	12	18.1	22.9	25.6	28.4	30.7	26.3	30.2	33.7	32.8	27.0

Pacific oysters and Manila clams are the two predominant species produced by the industry. In 2008, they comprised 84% of the total wholesale value of cultured shellfish in the province. In addition to clams and oysters a variety of species are grown, and new species development is a growing trend (scallop, mussels and geoduck in particular). See Table 5.2 for current information on the species most commonly grown.

Shellfish from BC are largely for export to the United States, or increasingly, to Asian countries (currently Japan, Hong Kong, or China). In January 2009, Brian Kingzett estimated that up to 90% of the shellfish produced by the BC industry are exported (Area 'H' Village Planning Project Advisory Group, 2009). Prices per pound for shellfish tend to fluctuate. However, they have not shown the same downward trends as salmon has since the mid-1990s (Joyce 2008). Industry advocates argue that this indicates that there is room in shellfish markets for new entrants, and that BC can develop as an international competitor (BCSGA 2009a).

Table 5.2 - Most common commercialized species in the BC shellfish aquaculture industry. *Data compiled from multiple sources.*

Scientific name / Common name	Origins in BC	Products	Market/ desired market traits
<i>Crassostrea gigas</i> Pacific oyster	Exotic. Introduced from Japan in 1912/1913	Live, shucked (fresh & frozen), smoked, canned	Local, USA/ mild, sweet flavour, plump body, meat texture
<i>Venerupis philippinarum</i> Manila clam	Exotic. Introduced from Japan in early 1930s	Live, shucked (fresh & frozen), canned	USA/ most highly sought steamer clam: sweet meat, uniform size, shell colourful and opens consistently when steamed
<i>Patinopecten yessoensis</i> Japanese scallop	Exotic. Intentionally introduced from Japan for R&D in early 1990s	----	----
<i>Patinopecten caurinus</i> - <i>Patinopecten yessoensis</i> Pacific scallop	Exotic. Hybrid of japanese and weathervane scallops. ⁵⁴	Live, shucked (fresh & frozen)	Local, USA, Europe/ sweet flavour, large body size
<i>Mytilus galloprovincialis</i> Gallo mussel	Exotic. Data n/a	Live, shucked (live & frozen)	Local, USA / plump and sweet meat
<i>Panope abrupta</i> Geoduck clam	Indigenous. Approved for culture in BC in 2005.	Live, shucked (fresh; body and siphon often sold separately)	Hong Kong & China / freshness, siphon size

⁵⁴ The Pacific scallop was originally developed in the 1980s at the Pacific Biological Station of DFO, and commercialized by Island Scallops Ltd (Bourne & Bunting 2009).

The provision of BC shellfish to international markets occurs through local processors and/or distributors. As such, marketing, sales and distribution decisions tend to rest largely with these firms, rather than with shellfish growers themselves. Of course, this is the norm with many resources. However, it does differ from high volume resource commodities whose production often tends towards vertical integration. In 2006 there were 36 recognized companies legally registered to process shellfish products in BC⁵⁵. Of those, 12 processors account for more than 90% of all industry sales, while six account for 75% of all sales. These are: Mac's Oysters, Evening Cove Oysters Processing, Fanny Bay Oysters⁵⁶, Limberis Seafood Processing Ltd., Aquatec Seafoods Ltd., and Albion Fisheries (BCSGA 2009a).

In this sense, shellfish farmers must respond to the demands of processors/exporters, who are in turn responding to the demands of their *desired* markets, which are increasingly international. Although it has not been a focus of this research, I have encountered several references to the tensions that this creates in the commodity chain. In their 2009 strategic plan, the BCSGA noted that although

quality products are generally being produced, processors have noted a lack of consistency in product quality. Without the ability to produce a quality product consistently, an expectation in the marketplace, it has been difficult to establish and maintain markets ... Indeed farmers and processors have differing views on what is needed to meet the requirements of the marketplace (BC Shellfish Growers Association 2009a, p. 11.).

⁵⁵ Salter (2002) estimates that 60% of processing/wholesaling is done in Baynes Sound, and 20% in the Lower Mainland.

⁵⁶ The Fanny Bay enterprise is renowned as a highly successful, locally grown business. In 2007, the company was sold to Taylor Shellfish Inc., of Washington State. Taylor is one of the largest shellfish aquaculture firms in the world.

This dynamic speaks to the contemporary economic realities of seafood production more generally. Where markets were once supply driven, they are increasingly driven by consumer demands for quite specific physical traits (i.e., 'qualities' as in Mansfield 2003a,b), and by wholesalers and buyer demands for timing and price competition (Young et al. 1999; Iles 2004; Muir 2005). As quoted in a business trade magazine published in 2001:

(y)ou cannot develop new markets without a consistent supply of product, and steady, predictable year-round production is the goal for every new species that is being brought into aquaculture. It is a question of getting animals to spawn when you want them to rather than when nature dictates. Scientists and industry are finding ways to alter the timing of these natural events to their advantage (Lockett 2001, p. 56, in Bavington 2005, p. 202).

Indeed, under a private property regime for industrial aquaculture, the overarching intent is to grow desired species as inexpensively as possible (Anderson 2002; Bavington 2005). This may mean imposing conditions upon species that do not match their evolved physiological preferences, modifying local conditions to suit preferences, or a combination of the two. In the sections to follow, I explore this statement in the context of the two most significant species to the BC shellfish aquaculture industry: Pacific oysters and Manila clams.

IV. Producing competitive seafood: ecological introduction, changing practice, and species diversification

The potential for BC's shellfish aquaculture industry to meet contemporary, and largely non-local, demands for specific shellfish products rests in the introduction and colonization of exotic oyster and clam species in the province beginning as

early as the turn of the 19th century.⁵⁷ That Manila clams and Pacific oysters, the two most important shellfish species currently grown in BC, are exotic to its waters is openly acknowledged by industry. As a past BCSGA president said:

it is just a question of finding the right species for the existing environmental conditions. In our case, the Japanese (Pacific) oyster, little-neck clam (*sic.*)⁵⁸ and scallop happen to do very well in British Columbia, which is why the existing shellfish farming industry is based on those three non-native species (Bowman 2000, brackets mine).

Bowman's statement also conjures a sense of the differing degrees of public and scientific scrutiny that Atlantic salmon farming and shellfish farming have faced in the province.

New oyster growing techniques that emerged in the 1970s play a significant role in the increased potential for BC shellfish farmers to compete in international seafood markets. Oysters, shellfish that have naturally evolved as intertidal species, can now be grown in nearshore or deep-water on anchored long-lines and/or in floating rafts (i.e., off-bottom techniques). Several productivity advantages result. Clayton (2002) identifies them as: faster growth (~1-2x) because feeding can occur continually rather than only when the tide is in; higher yield per unit of tenure (utilization of horizontal and vertical space); fewer predators/lower mortalities, and; under some conditions, the production of a more visually attractive product with a more mild flavoured meat. In other words, the

⁵⁷ If clam gardens are taken into consideration, it is conceivable that ongoing archeological and ecological work on clam gardens will uncover the beneficial impacts of these practices on the current suitability of some beaches for wild growing and cultured shellfish.

⁵⁸ Presumably this is an error, as littleneck clams are native species to BC. There is a market for them, and they are harvested off tenures where they occur. However, widespread intentional cultivation does not occur.

techniques manipulate elements of oyster physiology to the advantage of the farmer.

Whereas at one time oysters might be grown in sacks slightly elevated off of the beach or been scattered and left in the intertidal to 'grow out' to full size, their production has now largely moved out into the nearshore or deep-water with off-bottom techniques such as rafts and long-lines as described above. As the BCSGA website states:

(t)he oyster-growing industry in British Columbia has been revolutionized over the past twenty years. Since off-bottom methods of growing oysters have been developed, more and more production is moving from intertidal to deep water. Many beaches with suitable substrate material where oysters have been grown are now being converted to clam culture or clams are co-cultured with oysters. The development of off-bottom growing methods for oysters has pushed productivity and technology to new levels. Where once oyster growing was more like ranching, it is now more like farming and agri-business. (BCSGA 2007c, online).

Shifting oyster production (and now mussel and scallop) into the nearshore has allowed for increased productivity by: (1) growing oysters faster at higher densities, and, (2) freeing intertidal space for intertidal clam culture. Below I provide a longer historical context showing how human induced changes in the composition of the intertidal zone and imposed ecological conditions have culminated to produce this contemporary opportunity.

Oysters

The only oyster indigenous to BC is the Olympia (*O. conchaphila*). The first reported commercial landings of this species occurred in 1884 (Gillespie 2009). The fishery continued until 1936 at which point all accessible stocks collapsed

(Ketchen et al. 1983).⁵⁹ According to Ketchen et al. (1983), the collapse was precipitated by a combination of severe winter mortalities in 1929, overfishing, and the increasing competition from newly colonizing species of oysters. Olympia oysters are smaller and grow more slowly than the introduced species that would go on to be actively cultured in BC (Gillespie 2009). Of course, the inability of *O. conchaphila* to recover from anthropogenic and natural disturbances has contributed largely to the fact that their numbers have never recovered. Arguably, these same traits (i.e., small size and slow growth rate) also make them less desirable as a candidate for commercial reintroduction (Ketchen et al. 1983).

In the early 1880s, the Eastern/American oyster (*Crassostrea virginica*) was introduced as a potential commercial species (Gillespie 2007). However, it was quickly obvious that wide ranging colonization was not going to be possible in the Pacific Northwest. Introduction efforts ended shortly thereafter. A small residual population of *C. virginica* persists near the mouth of the Nickomekl River, which flows into Boundary Bay (Ketchen et al. 1983; Gillespie 2007). Although it has not grown successfully in BC, *C. virginica* is cultured widely on the Eastern seaboard and Gulf of Mexico and remains the most voluminously produced species in the North American shellfish aquaculture industry (Lavoie 2005).

⁵⁹ In June, 2003 *O. conchaphila* was listed as a 'species of special concern' under the Canadian Species at Risk Act (Gillespie 2009).

The Pacific oyster (*Crassostrea gigas*) was the next oyster introduced in the province.⁶⁰ *C. gigas* has had a more successful ecological and economic fate in the province than either the Olympia or the Eastern varieties. The first Pacific oysters in BC arrived from Japan in 1912 or 1913 (Ketchen et al. 1983). Soon after, individual fishermen intentionally brought these oysters to Ladysmith Harbour and Fanny Bay to see how they would grow. By 1925, there was evidence of some naturally occurring reproduction at Ladysmith Harbour (Ketchen et al 1984). In the same year, the regular importation of juvenile Pacific oysters from Japan also began (Ketchen et al. 1983; Lavoie 2005). Between 1929 and 1932, approximately 4 million oyster seeds were imported (Ketchen et al. 1983). Pacific oyster seed came to BC from Japan until the beginning of World War II in 1939, when prevailing politics stopped any further shipments. Nonetheless, significant naturally breeding populations of *C. gigas* had established themselves in the Strait of Georgia (Coopers & Lybrand 1997).

Like clams, oysters reproduce by emitting gametes into the surrounding waters meaning that fertilized juvenile oysters also have a pelagic phase. According to Ketchen et al. (1983), the first widespread Pacific oyster spawning (or 'spatfall') event occurred in BC in 1942, when summer sea surface temperatures in the Strait of Georgia were above normal. Spatfall was reported as being "extensive throughout much of the Strait and even into many bordering

⁶⁰ According to Gillespie (2007), there were several species introduced accidentally with *C. gigas*. These included: algae (*Sargassum muticum*), eelgrass (*Zostera japonica*), gastropods (*Batillaria attramentaria*, *Cecina manchurica*, *Nassarius fraterculus*, and *Ocenebrellus inornata*), and bivalves (*Neotrapezium liratum* and, most notably, *Venerupis philippinarum*). The species with pelagic dispersal phases, particularly *S. muticum* and *V. philippinarum*, have spread to northern coastal areas.

mainland inlets” (Ketchen et al. 1983, p. 1111). Large events occurred once again in 1958 and 1961, but remained confined to the Strait of Georgia. Warm water temperature contributes to large Pacific oyster spatfall events in BC (Ketchen et al. 1983), but the precursors and diffusion of spat were not well understood at the time (Heritage et al. 1976).

By 1930, the *C. gigas* was the dominant oyster harvested in the province (Gillespie 2009) and, indeed, a dominant intertidal species in the Strait of Georgia and other southern regions of the province (Ketchen et al. 1983). Yields rose from the late 1940s to a peak in 1963, at which point they dropped sharply for several years (Ketchen et al. 1983). Evidently, the mature oysters resulting from the natural spatfalls of '42, '58, and '61 had largely been harvested, and adequate levels of seed importation had not occurred in the interim (ibid.). Legislation that prohibited tenure holders from harvesting wild-growing oysters except under permit was put in place soon after; farmers could harvest from specified beaches where access was restricted and/or standing stock surveys were conducted (ibid). By 1950, licensed shellfish growers in BC were given permission to collect juvenile oysters from regulated areas and 'set' them in foreign structures such as empty oyster shells.⁶¹ This meant that enterprising farmers could purposefully collect spat by laying empty shells during spawning

⁶¹ Pendrell Sound was reserved as a seed-producing area where growers could collect wild grown spat under the Provincial *Land Act* as early as 1950 (Howlett & Rayner 2004).

events. Set oysters were then left out on beaches to ‘grow-out’, and most cultured product was sold into the shucker market.⁶²

Epicurean interest grew around oysters on the half shell during the 1970-80s, and with it came the need to ascertain an even more steady supply of seed to produce high quality single, in-shell oysters.⁶³ In response to changes in demand, new growing techniques and new sources of seed arrived in BC by way of Washington State. By 1974, the first off-bottom techniques for oyster growth were implemented by Sabine Seafoods Ltd. on Lasqueti Island; the total value of aquacultured oysters in the province in this year was \$880 000 (K-C Business Plan 2002). DFO also expanded its spatfall forecasting program in 1974 with the hopes of improving “the basic empirical relations used in forecasting and also discover optimal forecasting strategies” (Heritage et al. 1976, p. 1). With better spatfall forecasting, it would be possible for shells and new types of artificial spat collecting containers (also referred to as cultch) to be immersed in the water at the right time/place/depth to maximize collection and setting success.

Despite efforts, spat collection was soon overshadowed by hatchery-reared seed from the US as the main source of juvenile shellfish. Advances in laboratory technology meant that private American hatcheries and nurseries became, and continue to this day to be the primary sources of seed (Coopers & Lybrand 1997). As one BC industry consultant noted in 2002:

⁶² ‘Shucker’ oysters refer to those grown for the purposes of removing the meat from the shell prior to sale and proceeding with further processing such as canning, drying, or freezing.

⁶³ Between 1974-1980 production of oysters in BC for the half shell market grew from 22 467 dozen to 41 353 dozen (Ketchen et al. 1983). As these oysters were presented in shell and targeted towards high-end culinary consumers, a new range of visual characteristics would be considered in assessing their ‘quality’.

(a)dvances in hatchery technology for the remote setting of oyster larvae and the option of “single seed” put the control of industry development in the hands of industry rather than (*sic.*) reliance on the vagaries of nature (K-C Business Plan 2002, p. 10).

Nonetheless, farmers in BC today actually consider logistic uncertainties in purchasing and importing American produced Pacific Oyster seed (border issues, and American businesses often supplied first) to be a significant hurdle to further industry expansion (BCSGA 2009a).⁶⁴ Oyster farmers (of smaller operations in particular) must be highly organized and order seed well in advance to have their ongoing production needs met. Perhaps as a result, the summer of 2009 saw renewed interest in the Pendrell Sound spatfall monitoring program.

Clams

Manila clams arrived in BC through shipments of Pacific oyster seed from Japan in the 1930s (DFO 1999; Gillespie 2007). They were first identified in Ladysmith harbour in 1936 (Bourne in Broadley et al. 1988), and by the 1940s they had colonized in Departure Bay and then throughout the Strait of Georgia (*ibid*). Their arrival on the WCVI seems to have occurred when juveniles, mixed in with Pacific oyster spat, were introduced to Barkley Sound. By the late 1950s, Manila clams were reported to exist as far as Esperanza Inlet (*ibid*). Although further spread north beyond Brooks Peninsula was unanticipated (it tends to act as a biological barrier), in 1966 they were found in Quatsino Sound. In the 1970s, populations were found in Bella Bella, and as of 1988, the northern most population was

⁶⁴ There is currently only one large-scale shellfish hatchery in BC. In 2008, plans for a cooperatively owned hatchery at the Centre for Shellfish Research circulated (BCSGA 2008), while the summer of 2009 saw a renewal of the spatfall monitoring program.

identified in Port Hardy. Bourne suggests that these originated from spawn that travelled from Quatsino Sound (in Broadley et al. 1988).

However, spreading does not imply that Manila clams developed significant densities on every beach. Rather, specific substrate and temperature conditions play a role in annual recruitment and the growth of standing stock. Optimal substrate conditions include pea gravel, sand, mud, and shell on beaches with little to no slope, and the absence of excessive silt or freshwater runoff (Kingzett 1999). Variability in Manila clam reproduction in BC waters was detailed in Chapter Four. However, it is crucial to note that successful spawning, fertilization, and juvenile survival require temperatures in a range of 13-15 °C (Gillespie & Bourne 2005). Tidal and water column dynamics also play a role in where larval clams land and will develop in their sessile adult stage. To illustrate the varied response of Manila clams to northern waters, it is useful here to consider the story of the intentional introduction of Manila clams to Haida Gwaii. In 1962, Manila clams were introduced intentionally, but they did not successfully colonize (Gillespie & Bourne 1998). The precise reason remains unknown. However Gillespie and Bourne (1998) suggest below-necessary water temperature for gonadal development and/or spawning, unfavourable temperature and/or salinity conditions preventing larval settling or development, or winter conditions that induce high mortality in juvenile manilas (winter kill).

In fact, Gillespie and Bourne (1998) expressed curiosity as to how Manila clams were able to colonize in Northern waters (i.e., northern WCVI and up to

Bella Bella), yet were unable to do so in Haida Gwaii. In offering a final hypothesis regarding unsuccessful Manila colonization, they commented:

(o)ne further explanation for failure to establish a Manila clam population in either location would be worth investigating. It is possible that a genetic strain of Manila clams has developed in northern B.C. waters that allows successful breeding and survival at lower temperatures than strains of Manila clams in southern B.C. If this is the case it would be worth investigating whether brood stock from the Bella Bella area would permit establishment of a Manila clam population in either Masset Inlet or Naden Harbour (on Haida Gwaii) (p. 14. Brackets mine).

For the purposes of this work, Gillespie and Bourne's (1998) findings are of interest in that they suggest that under certain physical conditions Manila clam colonization is much less likely to occur.

As market demand for steamer clams increased in the 1980s, interest in clam culture grew in BC (Broadley et al. 1988).⁶⁵ The first harvest of BC farmed Manila clams occurred in 1984 when slightly less than five tonnes were produced (The ARA Consulting Group, Inc. 1993). In 1991, DFO and the Provincial government also signed a letter of understanding regarding "the promotion of the development of a viable clam culture industry in British Columbia and the provision, through cultivation, of sufficient high quality product to meet market demand on a timely basis" (quoted in Mitchell 1995). Intertidal clam tenures were first granted in 1991 (Coopers & Lybrand 1997), but expansion was limited by Provincial policy that did not allow new foreshore to be tenured for clam culture (Clayton et al. 1990, Mitchell 1995). Broadley et al. (1988) and Clayton et al. (1990) suggest that there was a desire to maintain public access to intertidal for subsistence, recreational, and commercial harvests, especially until the benefits

⁶⁵ The techniques used in BC for planting and growing out Manila clams were developed in Washington State during the 1970s and 1980s (Coopers & Lybrand 1997).

and economics of clam culture were proven. However, the policy was revoked shortly thereafter. By 1995, slightly less than 1000 tonnes of farmed BC Manila clams were harvested, with a wholesale value of approximately \$3.8 million.

Where the use of the intertidal for oyster culture involved placing and protecting growing oysters on top of the intertidal substrate, successfully growing Manila clams requires a more intensive physical modification of the environment over several years. Under the regulations set for clam tenures, farmers were granted permission to alter the physical characteristics of the intertidal so that their Manila clam seed might grow more quickly and/or at higher densities. Coopers and Lybrand (1997) commented on the trend in intertidal conversion and the techniques favoured by farmers:

(g)enerally, on existing shellfish tenures which have high clam culture capability, as much ground as possible is being turned into intensive clam rearing areas. Activities include grooming of substrate, seeding and predator netting (p. 7);

and,

(clam farming requires) the use of heavy machinery to modify, construct or groom intertidal culture plots (exhibit 8. Brackets mine).

Unlike oysters, farmers are not allowed to intentionally collect clam spat, nor have practices to set wild-growing clam larvae on specific beaches (while avoiding high mortality rates) been developed. Rather, culturists in BC rely primarily on 'seeding' tenures with hatchery-reared juveniles, most often originating from the United States. Juveniles are grown from larval phase to anywhere between 2-20mm and then planted and allowed to burrow in the sediment on the tenure (BCSGA 2007b).

Incidental recruitment to clam tenures via cultured and/or wild-growing Manila clam spawning events is also welcome, as it has the potential to increase the density of clams on a given tenure. Identifying and vying for clam tenures on beaches that already produced high yields of Manila clams (high natural recruitment and low mortalities) is therefore attractive to shellfish farmers (Joyce 2008). In theory, these beaches require the least amount of work, or with effort, hold the most potential for higher yields⁶⁶. Furthermore, with tenure an entrepreneurial farmer acquires sole access rights to existing standing stock and thus, (s)he can harvest it at leisure and re-invest the initial profit into the aquaculture business.

In the mid-late 1990s, anticipation regarding the productivity of clam culture was high. However, the conversion of intertidal tenures was just getting under way. Coopers and Lybrand (1997) suggested that,

(t)he clam farming industry is still in a growth phase as existing tenures have not been fully developed and many clams are currently in their first grow-out cycles. A significant trend is toward full conversion of intertidal ground to clam farming. At present, 63 companies have amended their aquaculture licences on 118 sites to include manila clams as a culture species (p. 6).

Further,

(c)lam production on intensively farmed beaches will approach maximum sustainable levels once brought into full production, a process which will likely require several years (p. 7);

and,

⁶⁶ Positive claims for the industry are made based on the relatively small amount of coastline it required to increase clam production in the Strait of Georgia (Coopers & Lybrand 1997). However, it does vie for the same space as the intertidal clam fishery. Joyce (2008) documents specific instances of popular commercial intertidal harvest beaches lost to aquaculture, both on the mainland and Vancouver Island.

we have focused on maximizing productivity and utilizing marginal areas through substrate modification – this has been costly and has not yet resulted in the level of production hoped for (Aquaculturist comment regarding tenure modification for clam farming, as quoted in exhibit 8).

This evidence suggests that despite the ability to further control production, altering and seeding a clam beach does not necessarily provide immediate positive economic returns. For less than ideal beaches, time and effort is required to bring them towards 'full production'.

It is beyond the scope of this work to test the Bourne/Gillespie hypothesis regarding genetic mutation in a strain of northern Manila clams. Nonetheless, their inference provides further indication of differences between colonized and cultured Manila clams on the WCVI, particularly the northern sounds (Quatsino, Kyuquot, Nootka). If it was uncertain in the late 1990s how long it would take to convert intertidal areas into profitably producing clam beds in protected southern waters, it should have been also unclear how long it would take in other areas. I consider this issue further concerning shellfish aquaculture on the WCVI in Chapters Six and Seven.

V. Conclusions

During the 1950s-1990s, the Provincial and Federal governments developed allocative and regulatory regimes in BC so that fishers and farmers could access intertidal territory, and eventually, shellfish spat (both wild-growing and hatchery-reared/imported). Over time, these regimes have been altered to allow farmers the opportunity to modify intertidal habitat and incorporate new technology to better suit shellfish growth. Under amenable ecological conditions and with the

rights granted by an aquatic tenure, Pacific oysters and Manila clams can now be co-cultured, allowing increased efficiencies and competitiveness in international seafood markets. In the mid 1990s, successful growth and productivity increases were achieved by some businesses, particularly on the southeastern side of Vancouver Island. As noted in Coopers & Lybrand (1997):

(t)he production of these two species (clams and oysters) has during the past ten years become increasingly interrelated, especially at the processor level” (p. 4).

Additionally,

(a)s the oyster industry developed, most of the good intertidal land in the traditional growing areas became leased (p. 5).

Though not the focus of this study, ecological impacts result from habitat alteration, new/intensified farming practices, and the introduction of species at new densities and compositions. Research and monitoring regarding cumulative impacts of shellfish farming must be undertaken as this industry continues to grow (Jamieson et al. 2001).

Proceed with expansion! What about experiment?

My primary purpose with this chapter was to illustrate how in BC, species introduction, ecological change and new growing techniques underlie contemporary market competitiveness, and in turn, the expansionary pressure I focus on in the next chapter. The illustration serves as a reminder that the successful (re)production of specific species, particularly exotic ones, is a highly variable process that depends on many amenable ecological and socio-economic conditions coalescing in specific regions, and even specific tenure sites, over a long period of time. Despite the naturalization of private access tenures and

shellfish aquaculture as the best or only alternative to decreasing shellfish landings and Aboriginal economic development in BC, their 'certainty' balances on a precarious grouping of agreeable social, economic, and ecological conditions.

To conclude, I return briefly to the opening comments in this chapter regarding the biophysical capacity assessments for shellfish aquaculture that occurred in the early 1990s. This helps me to summarize what I have already presented as well as refocus on what remains to come. Thus far, the dissertation suggests that the Provincially funded assessments were undertaken by industry-based consultants at a point in time when:

- the potential for unconstrained industrial resource development in Nuu-chah-nulth territory was mixed. Most notably, treaty resolution was uncertain and conflict regarding resource development was simmering (preface, introductory chapters);
- the intertidal clam fishery was not a conservation concern, though landings of Manila clams were declining and management arrangements changing. The fishery remained significant in its ability to meet a diversity of needs in ka:'yu:k't'h/che:k:tləs7et'h' territory (Ch. 4); and,
- the long-term viability of, and economic returns from, clam and oyster tenures in remote and/or northern areas of the province had yet to be proven (Ch. 5).

With this perspective, the economic viability, social acceptability, and regulatory capacity for an expanded shellfish aquaculture industry, especially into untreated Aboriginal territory, appears more uncertain. Chapters Six and Seven illustrate how shellfish aquaculture was explicitly conceived of and rapidly sought after on the WCVI (Nuu-chah-nulth territory) as a way to increase the ecological

and economic 'productivity' of coastal BC; experimentation or alternatives received much less attention.

CHAPTER SIX - CERTAINTY I: TERRITORY AND INCREASED PRODUCTION

88% of current farm production comes from the East Coast of Vancouver Island where the potential for industry growth is limited compared to the West Coast. Many of the areas offering excellent potential for new and expanded shellfish sites lay (*sic.*) within the traditional territory of the Nuu-chah-nulth people (Stevenson Community Consultants 2003, p.12).

Capturing the promise of shellfish aquaculture economic opportunities for coastal communities and First Nations will only be optimized through a pro-active coordinated effort ... Building on the momentum already achieved, the CSR (Centre for Shellfish Research) can play a central role in effective delivery of industry development initiatives (Centre for Shellfish Research 2005, p. 4).

I. Introduction

In the late 1990s, technological and regulatory change meant that the practice of shellfish co-culture on intertidal, foreshore and deep-water tenure bundles was increasing. Between 1993 and 1995, Manila clam overall production increased by 45%, while shucked oyster production grew by 28% (Coopers & Lybrand 1997). This dramatic growth occurred largely because productivity per hectare was on the rise on some existing tenures (Clayton et al. 1990). However, new tenure space was limited and according to aquaculture proponents, business profitability concerns existed because the “small scale of production, limits the ability of the industry to supply export markets” (Coopers & Lybrand 1997, p. 8. Also see Kingzett 2005a,b). Further, despite enthusiasm for the potential of ‘clam farming’, the economics of widespread intertidal conversion for Manila clam production remained unproven.

This chapter explores subtleties in prominent arguments for expansion and increased per hectare productivity in the BC shellfish aquaculture industry as they were conceived and promoted in the late 1990s. The virtues of more tenures and increased productivity were widely communicated by industry advocates through consultancy reports, testimony to legislative/parliamentary/senate committees, and public relations pieces. Because it contained the first financial projections for an expanded industry, a pivotal document of this genre is the Coopers and Lybrand (1997) report. Based on productivity trends from 1993-1995 and an 'inventory of capable lands' on the WCVI, the report projected that the BC shellfish aquaculture industry could be worth as much as \$100 million in 10 years time.

The present-day pursuit and regulation of shellfish aquaculture expansion in BC is virtually inseparable from the financial projection made in Coopers and Lybrand (1997). Foremost, it buttressed what would be the central mandate of the Provincial government's 1998 BC Shellfish Development Initiative (SDI): to double the amount of tenure space available in the province over a 10-year period. However, in addition to physical space, some would come to implicate the productivity level of the average BC shellfish farm/farmer as part of the profitability problem. Solving this 'problem' would necessitate infrastructural development, training and technology transfer, R&D, and in some cases, attracting foreign investment capital. Vancouver Island University's *Centre for Shellfish Research* has risen to fill this perceived void.

It was also alongside the SDI's expansionary goals that strong statements regarding Aboriginal participation in shellfish aquaculture began to emerge, including those regarding the amenability of shellfish aquaculture with Aboriginal culture and lifestyles, and pre- and post-treaty economic development strategies. With this chapter, I will also begin to illustrate how tenure expansion moved into Nuu-chah-nulth territory.⁶⁷ I show how the initiation of band-owned and operated shellfish tenures was occurring rapidly during a moment defined simultaneously by immense optimism *and* heightened sensitivity regarding potential productivity and profitability per hectare. I explore ka:'yu:k't'h/che:k:tl̓es7et'h' experiences of these events further in Chapter Seven.

II. The anatomy of Coopers and Lybrand (1997)

It is an industry with great potential. In 1997, Coopers and Lybrand were contracted to do a study of the economic potential of our industry for Industry Canada. The study evaluated the economic potential of oyster, clam and scallop production within capable marine lands on the west coast of Vancouver Island. That study found that the B.C. shellfish farming industry has the potential to become a \$100 million industry over the next 10 years. Currently, it is about \$10 million ... This potential could be realized with only a doubling of the existing land base (Salmon 2000).

The Economic Potential of the British Columbia Aquaculture Industry

project (i.e., Coopers and Lybrand (1997)) was overseen by a steering committee of representatives from the Department of Western Economic Diversification; the B.C. Ministry of Agriculture, Food and Fisheries; the Department of Fisheries and Oceans; the B.C. Shellfish Growers Association; and the B.C. Salmon Farmers Association. The study and report were led “by David Egan of Coopers and

⁶⁷ To reiterate, Nuu-chah-nulth territory encompasses much of the WCVI, including four sounds (Barkley, Clayoquot, Nootka, and Kyuquot).

Lybrand Consulting in association with Don Tillapaugh of Aqua-Vision consulting, who conducted the biophysical capability and production trend analysis” (Coopers & Lybrand 1997, p. 2). It is unclear how much representation existed on the committee from Vancouver Island Municipal/Regional councils or Aboriginal governance bodies, or whether they were invited to contribute to the study at all.

Central to the report, and the two separate projection scenarios it modelled, were assumptions that overall increases in economic productivity (mean profit per hectare) would continue across the industry, largely because wide differentials between farms existed in 1995. Table 6.1, adapted from the Coopers and Lybrand report, shows the overall mean productivity, mean productivity of all farms reporting in 1995, and mean productivity of the top 5% of industry producers, all with regard to clams and oysters. The table identifies large gaps between the industry mean, and the mean productivity of the top 5% of tenures. The report concludes this was the case because: “(a)n increasing number of progressive shellfish growers have focused investment and energy on technological innovations which have improved productivity dramatically” (Coopers & Lybrand 1997, p. ii).

Table 6.1 - Shellfish aquaculture production and landed value per hectare of tenure in 1995. Adapted from exhibit 13 in Coopers & Lybrand (1997).

	Overall mean		Mean reporting in 1995		Mean top 5%	
	Quantity	Value (\$)	Quantity	Value (\$)	Quantity	Value (\$)
Manila clams (pounds)	2411	4071	3482	5885	11162	18864
Single oysters (dozens)	1425	3784	1706	4531	6225	14362
Shucked oysters (gallons)	107	1589	163	2428	591	8839

In its first projection, the Coopers & Lybrand model assumed a scenario in which no new land was released for tenures between 1997 and 2006, but increases in productivity per hectare were similar to 1993-1995. Based on these rates, the model projected that by 2003/2004 the mean productivity per hectare on clam tenures would be “approaching the levels of the leading producers in 1995” (Coopers & Lybrand 1997, p. 24).⁶⁸ It also projected that by 2006, mean productivity in oysters would be similar across the industry to what was “already being achieved by the best producers in 1995” (ibid). Though this model scenario has been rarely publicized outside of the report, it projected that the industry would achieve a wholesale value of ~\$58 million by 2007.⁶⁹

The biophysical capacity assessments identified in Chapter Five (Cross & Kingzett 1992; Cross & Kingzett 1993; Cross 1993a,b; Cross et al. 1995; Kingzett

⁶⁸ The report in fact states that “(t)his is still well below the target which industry believes is attainable” (Coopers & Lybrand 1997, p. 24).

⁶⁹ \$27 million would come from clam production and \$31 million from oyster production. It is unclear whether the authors interpreted productivity increases would occur as smaller businesses were being bought out, or because most existing farmers would successfully come to produce more product/hectare.

1995; Kingzett et al. 1995a,b; Axys Environmental Consulting 1997) form an important component in the second model scenario. An 'inventory of capable lands', as originally identified in the WCVI biophysical capacity assessments, was tabled in the report. According to the inventory, 1022 hectares with intertidal shellfish capability and 6545 hectares with deepwater shellfish capability were available for tenure (Coopers & Lybrand 1997, Exhibits 10 & 11). At the time, Barkley Sound had the most tenures, with 2.6% (47 of 1810 ha deep water) and 13% (38 of 291 ha intertidal) of capable lands already under production for shellfish. None of the capable lands identified in Kyuquot Sound or Quatsino Sound (two most northern sounds on WCVI) had been tenured. In total, 7557 hectares of capable lands on the WCVI were identified, which was just under four times the total number of hectares under tenure in the province at the time (~2000 ha).

Under the second model scenario, Coopers and Lybrand (1997) assumed that of the 7557 hectares, 530 would be released for intertidal culture and 1754 would be released for deepwater culture over the next 10 years (at a rate of 10% per year). This would more than double the total amount of shellfish tenure space in the province. A three-year minimum grow-out time for oysters and clams on new tenures was assumed and productivity was projected to continue towards top 1995 levels. This model scenario yielded the \$100 million projection.⁷⁰

Although their economic potential was implied in the report, capable lands on the

⁷⁰ \$46 million would come from clam production and \$53 million from oyster production. Thus, in actuality, the model projected a \$99 million wholesale value. Presumably it was speculated that new species would add at least \$1 million to the wholesale value.

mainland coast of BC were not 'inventoried', nor were they considered in the projection. The report stated:

(w)hile further work to compile figures on the total inventory of lands capable of supporting shellfish culture for the entire coast of B.C. would be informative, it is not felt to be necessary in order to predict the significant economic potential of the industry. Our assumptions about the expansion during the next 10 years are considerably less than the biophysical capable (*sic.*) potential in the province (Coopers & Lybrand 1997, p. 19).

To this point in time, there have been a handful of criticisms regarding Coopers and Lybrand (1997) and its financial projections. Tollefson and Scott (2006) note that the report gave little consideration to significant pre-requisites necessary for an industry to compete in international markets, such as high investor interest and a coherent marketing strategy. Howlett and Rayner (2004) also identify a broader lack of policy legitimacy and poor public perception regarding aquaculture, and conclude that expansion would require public consultation, planning mechanisms and conflict management in coastal zones. These criticisms are valid and have been addressed in some subsequent reports and plans regarding shellfish aquaculture development, some of which I discuss further below.

In addition to these, I would add that although the biophysical capacity of intertidal spaces on the WCVI had received one-time capability assessments, their long-term productivity and profitability potential remained largely untested. In this sense, the projections were tenuous because they assumed the potential of farms on the WCVI to be essentially the same as longstanding farms located in the Strait of Georgia. As stated in the report itself, the data analyzed did not "reflect the diverse biophysical capacity of the various regions (Coopers &

Lybrand 1997, p. 20)”. In other words, the model did not account for the potentially different economic, ecological, and socio-cultural constraints that shellfish growers in different parts of the province might face. Even though a new farmer agrees to the ‘diligent use’ of his/her tenure and faces incentive to make profits once leasing, to assume a constant productivity per hectare across a nascent industry was, and continues to be, problematic.⁷¹

III. The 1998 Shellfish Development Initiative

In 1998, the BC Shellfish Development Initiative was officially launched. In essence, it represents a substantial commitment to pursue regulatory change that would encourage tenure expansion into other parts of the province, the WCVI first and foremost. The website of the Provincial Ministry of Agriculture and Lands, says of the initiative:

(i)ntroduced in November 1998, the plan is to double the amount of Crown land available for shellfish aquaculture to 4,230 hectares within 10 years, at which time studies have indicated the industry could generate as much as \$100 million annually (Ministry of Agriculture and Lands 2010).

The SDI was clearly driven by the findings in Coopers and Lybrand (1997). However, at least according to public record, early political efforts focused largely on the expansion of tenure space available to shellfish aquaculture. Little attention was paid to the issue of increasing productivity per hectare, even though it was clearly also an important assumption in the original \$100 million projection.

⁷¹ The diligent use requirements stipulate that aquaculturists must begin work on the tenure site within 12 months of receiving all licenses, permits etc., and must submit a management plan with their tenure application outlining their anticipated full level of production (to be reached within five years).

To facilitate new tenure applications, a shellfish unit of the Crown Corporation, British Columbia Assets and Land (BCAL), was created so that areas where shellfish would be suitable (socially acceptable and ecologically productive) could be pre-identified and made available.⁷² This approach was well received by industry, as described by Sam Bowman, former president of the BCSGA in testimony to the Canadian Senate Standing Committee on fisheries in the year 2000. He said:

there is a new one-window approach, through the British Columbia Assets and Land Corporation ... That is the central window for new applicants in the shellfish and other aquaculture industries to approach for a licence on Crown land. They deal with all of the referral agencies, including DFO, the Coast Guard, DFO fish habitat and fish management, and other user groups, including the commercial fishing sector, the recreational boating sector, and native bands, the Ministry of the Environment provincially, and so on (Bowman 2000).

Where it had not necessarily been the focus in early discussions (e.g., in Broadley et al. (1988) and Clayton et al., (1990)), or even Coopers and Lybrand (1997), Aboriginal participation in expansionary efforts also became a central priority from the very early stages of the SDI. Ruth Salmon, former executive director of the BCSGA, said in testimony to the same committee as above,

(t)he first phase of the Shellfish Development Initiative has been the allocation of Crown lands to several First Nations for the development of shellfish farms. The second phase has been the granting of 66 expansions to existing tenures, which we will talk about later. This will be followed by the allocation of new sites for shellfish farming. (Salmon 2000).

Similarly, in 2003, Kingzett wrote:

⁷²BCAL became Lands and Water BC (LWBC) in 2002. It remains a corporation of the Government of BC, and is responsible for allocating Crown land and water resources to “stimulate the province’s economy through balanced economic and environmental decision making” (LWBC 2005, p. 3). A land delegation agreement between the Ministry for Sustainable Resource Management and LWBC gives the corporation legal authority to act on behalf of the Province in land tenure administration and Crown land sales. This includes responsibilities to administer and license Crown water resources (LWBC 2001).

(n)ew tenure opportunities are being opened along the coast through consultation processes that identify acceptable areas, a development rate, and appropriate criteria for tenure approval. The government is at the same time assisting First Nations to identify the best sites for their own shellfish farms, and to develop business plans. This new approach is achieving two goals: expansion of the industry in a manner compatible with important First Nations values and community interests; and the establishment of businesses owned and operated by First Nations near their own communities (Kinzett 2003, p. 10.)

Given its projected economic potential at the time, it is not surprising that many politicians and industry advocates, and some Aboriginal leaders perceived shellfish aquaculture to be a promising economic development strategy.

However, the political-economic reality of the early 2000s must have also rung clear to various SDI advocates; pending treaty agreements, requirements for consultation and accommodation, and the special Aboriginal interest in the intertidal clam fishery, all meant that strong actions to enable Aboriginal participation in shellfish aquaculture would have to occur alongside any expansionary measures. *If shellfish aquaculture expansion was going to be accepted into rural, remote areas of the WCVI, Aboriginal leaders and communities would have to be at least somewhat amenable to the idea.*

Memoranda of Understanding for shellfish tenures

Since the initiation of the SDI, tenure allocation to Aboriginal communities and nations has proceeded rapidly. Salmon (2006) estimated, “of the 104 new tenures issued since 1998, most have gone to First Nations” (p. 5). Doyle (2002) identified over 20 nations in various stages of identifying or negotiating tenures, while Salmon (2006) identified 18 nations that had successfully leased tenures. Nine of the nations identified in Salmon (2006) are Nuu-chah-nulth.

Many of the tenures allocated to Aboriginal communities have come through treaty-related Memoranda of Understanding (MoU). The Provincial government has been pursuing treaty-related shellfish tenure MoUs through the BCAL since approximately 2000-2001. When signed, the MoUs designate specific foreshore sites for current or future tenure under section 17(1) of the *BC Land Act* (Doyle 2002; Salmon 2006). The MoU sites are reserved exclusively for a nation for a period of ten years, during which time it must present the province with a shellfish development plan, officially tenure, and begin to implement standard diligent use requirements. If these stipulations remain unmet after 10 years, the MoU states that the reserved tenure sites become open to application from other interests (Doyle 2002).⁷³ During the ten-year window, MoU tenures may also become written into actual comprehensive treaty agreements, which is what happened in the case of the KCFN when the Maa-nulth treaty was ratified (more in Chapter Eight).

IV. The SDI and expansion into Nuu-chah-nulth territory

As discussed in Pinkerton and Silver (in press), aware of the potential for shellfish aquaculture to expand on the WCVI, the NTC and a number of clam diggers initiated discussions through a regional aquatic management body regarding the acceptability of shellfish aquaculture and the future of the commercial intertidal clam harvest in 1999. Some internal consensus was achieved and a 'clam reconciliation' proposal was made to the Provincial and

⁷³ The first 10 years on several MoUs will be ending in 2010-2011. It is uncertain how literally the agreements will be interpreted (i.e., if in fact desirable tenures will be re-allocated). The fact remains that these stipulations exist, increasing uncertainty for Nations who have had difficulty in meeting the diligent use requirements.

Federal governments. The proposal recommended that essential commercial fishery beaches be maintained as common property, that any displaced Z2 or ACL license holders be compensated, that Nuu-chah-nulth communities have the time and space to experiment in shellfish aquaculture, and that the rate of shellfish tenure allocation to non-Aboriginal interests on the WCVI remain conservative (ibid).

Pinkerton and Silver (in press), and several informants to this research indicate that although the clam reconciliation proposal was briefly considered by the Province, questions regarding whether or not shellfish aquaculture should proceed on the WCVI were ultimately passed over for questions pertaining to siting (e.g., where tenures would go and how quickly they would be allocated). The overarching message from Provincial regulators and industry advocates was that shellfish aquaculture was coming, and it would be best for the Nuu-chah-nulth to try to take control of how it unfolded within their territories. Treaty-related measures would facilitate this process financially, logistically, and legally.

The Nuu-chah-nulth Shellfish Development Corporation

In 2001, the Nuu-chah-nulth Tribal Council hired Roberta Stevenson to explore the potential of band-owned and operated shellfish aquaculture businesses for interested nations.⁷⁴ Soon after, the decision was made to form the Nuu-chah-nulth Shellfish Development Corporation (NSDC) and appoint Stevenson as Chief Executive Officer. Under her direction, between 2001-2005, the NSDC was

⁷⁴ Stevenson is a shellfish farmer and industry advocate, who lives on the east coast of Vancouver Island.

formally incorporated (2003), and ~\$5 million was fundraised through various government grants, treaty related funding, and other sources. Ultimately, the NSDC acted as training/planning coordinator and as business partner, and provided some funding and collateral to each Nuu-chah-nulth Nation that wished to initiate shellfish aquaculture through this process.

A large portion of the fundraised capital came through a treaty related measure (TRM), negotiated with the Province in recognition of the significant role that shellfish had historically played in the Nations. Doyle (2002) discusses the generalities of shellfish aquaculture TRMs, noting that three had been negotiated by 2002 (one each with the Sliammon, Snuneymuxw, and Nuu-cha-nulth). The TRM funds were targeted specifically at business planning, start-up, and ensuring that Nations were “making better use of their pilot (clam) licenses” (Doyle 2002, p. 14. Bracket mine). Funded work under these terms included site and clam stock assessments, product development plans, and training in husbandry and business.

As the CEO of the NSDC, Stevenson’s responsibilities included coordinating tenure site assessments, budgetary work and business plans for any interested Nuu-chah-nulth Nations. Her resume, obtained from a campaign website during her attempt to earn the Liberal nomination as candidate for Provincial Legislature in a 2008 by-election, highlights additional responsibilities and accomplishments during this period. In addition to liaising between Nuu-chah-nulth Nations and the Provincial government, Stevenson was responsible for “securing, reporting and spending of treaty related measures funding”, as well

as “budget development, monitoring, administration and disbursement”. She “(t)ained and supervised all managers and workforce”, and “(s)ecured and established 35 farm sites on Vancouver Island West Coast” (Stevenson 2008). Finally, Stevenson created and ascertained copyright for the *Nootka Shellfish Brand* on behalf of the NSDC.⁷⁵ Although there is not any product sold under the brand currently, the copyright remains and the Nuu-chah-nulth may choose to use it in future ventures. In early 2005, Stevenson’s contract finished, and she began her current position as Executive Director of the BCSGA.

Between 2001 and 2005, the NSDC facilitated approximately 35 shellfish tenures, encompassing over 100 hectares, in Nuu-chah-nulth territory. Many of these tenures arose from MoU agreements as discussed above. Table 6.2, adapted from Salmon (2006), shows all tenures obtained by Nuu-chah-nulth Nations as of that year. As will be discussed further in Chapter Seven, the KCFN signed a MoU agreement assigning a 10 year priority access window for 13 potential tenures, and two clam and two oyster tenures were developed immediately. However, despite the overarching NSDC structure, very little band-to-band communication or formal cooperation occurred between operations, outside of a longer-term plan to pool shellfish and market it under the Nootka brand. Essentially, each band-owned and operated business operated in isolation, and the NSDC focused solely on shellfish (rather than any wider seafood production).

⁷⁵ See <http://www.nootka-shellfish.com/>

Table 6.2 - Shellfish aquaculture tenures obtained by Nuu-chah-nulth nations, 2001-2006, many through treaty related MoUs and/or partially funded by treaty related measures. Adapted from Salmon (2006).

Nation	Region	Tenures	Tenured Area in hectares
Ehattesaht	Northern	Yes	55.1
Huu-ay-aht	Southern	Yes	24.2
ka:'yu:'k't'h/che:k:tes7et'h'	Northern	Yes	44.7
Mowachaht/Muchalaht	Northern	Yes	10.1 (21 offered)
Tla-o-qui-aht	Central	Yes	21.3
Toquaht	Central	Yes	10.0
Tseshah	Southern	Yes	6.1 (7.9 offered)
Uchucklesaht	Southern	Yes	9.8
Ucluelet	Central	Yes	9.7
TOTAL			191

V. 2002 Vancouver Island Economic Developers Association reports

By 2002, four years after the SDI initiative was launched, about 400 hectares of new tenures had been leased and the wholesale value of the shellfish aquaculture industry in the province had risen to \$28.4 million. This represented an increase in wholesale value of about 42% from 1998. However, skepticism was rising as to whether the SDI goal of \$100 million by 2007 would be possible.

A subsequent set of consultants' reports, commissioned by the Vancouver Island Economic Development Association (VIEDA), identified ongoing difficulties shellfish farmers faced in obtaining new tenures and when trying to intensify

production of existing ones (Salmon & Kingzett 2002; Salter 2002).⁷⁶ In particular, resistance grew amongst residents of some coastal communities regarding visual, noise, and environmental impacts (e.g., the Association for Responsible Shellfish Farming formed in 2001⁷⁷). Further, concern was mounting in Aboriginal communities on Vancouver Island and the central mainland regarding the loss of space for commercial and subsistence shellfish harvest and the very notion of having to ‘lease’ intertidal space from the Provincial government in the first place (Joyce 2008; Joyce & Satterfield 2010).

Nonetheless, the VIEDA 2002 reports worked to reconfirm the potential of shellfish aquaculture in BC, while simultaneously articulating a revised vision and economic projections for the industry. In particular, Salmon and Kingzett (2002) championed “50 in 5” – a growth to \$50 million in 5 years (i.e., by 2007). They argued that this goal could be achieved by focusing on improving mean productivity on existing tenures to \$20 000 wholesale per hectare, as opposed to placing effort into granting new ones.⁷⁸ They wrote:

(f)rom the beginnings of the shellfish aquaculture industry through to the 1970s, the industry generally operated as family or ‘lifestyle’ businesses, often under-utilizing the existing land-base and employing a ranching philosophy, relying on inconsistent collection of seed stocks in the wild. (Salmon & Kingzett 2002, p. ii).

Further,

⁷⁶ VIEDA’s involvement in shellfish aquaculture development on Vancouver Island coalesced in its “New Marine Frontier” (NMF) program. The purpose of the program is to promote the potential of the industry to international investors. Appendix F provides an illustrative example of VIEDA’s approach to promotion and vision for industry growth.

⁷⁷ See <http://www.responsibleshellfishfarming.ca/maintable.htm>

⁷⁸ In 2004, the mean farmgate value per hectare was \$7000, and the mean wholesale value per hectare was \$14 000 CDN (GSGislason & Associates Ltd. 2004). I have been unable to obtain current values, but the wholesale value of the industry fluctuated 2004-2008 and has risen 2008-2010.

(t)he Coopers and Lybrand vision for the industry has not been completely successful as the focus has been solely on the allocation of new sites. The vision in this document takes a new approach to the problem ... The vision examines the current structural make-up of the industry, and the related health that such a structure implies. Similarly, it suggests that by increasing the productivity, efficiency, and profitability of the industry a natural restructuring can be made without having to double the available land-base (Salmon & Kingzett 2002, p. v.).

The reports argued that groundwork for a more intensive use of existing shellfish tenures, including mechanization and co-culturing various new species, would have to be in place for the industry is to achieve its potential. The authors acknowledged that their vision would also likely imply a change in the structure of the industry (i.e., tenure consolidation. Also see Kingzett 2005a). In this sense, the VIEDA reports present a re-interpretation of shellfish development in BC from one of *geographical expansion*, to one of *technological intensification*. The distinction remains contentious even today, and to some, directly betrays the longstanding roots of the industry (i.e., local, small-scale, 'mom and pop' type farms).

VI. Training and technology transfer: the Centre for Shellfish Research

In light of the push towards intensification that the VIEDA 2002 reports advocate, it is perhaps not surprising that a research institution devoted specifically to the advancement of the shellfish aquaculture industry emerged on Vancouver Island in 2001. The Centre for Shellfish Research (CSR) is a unit of Vancouver Island University (VIU, formerly Malaspina College) in Nanaimo. The CSR officially opened its doors in 2004, and articulated its goal to “use the world-class facility to examine the science, technology and government policies needed to support and sustain B.C.’s diversifying shellfish aquaculture industry” (Malaspina University-

College 2004, online). Don Tillapaugh was appointed director of the CSR in 2001.⁷⁹

Although connection between academia and industry is an increasingly common phenomenon, facilitating the advance of the shellfish aquaculture industry in BC is the cornerstone of the CSR's *raison d'être*. A former executive director of the BCSGA said: "the initial creation of the centre in 2001 formalized a long-standing partnership between Malaspina and the shellfish industry for research and training needs" (Malaspina University-College 2003, online). Since its opening, the centre has initiated programming and research in production and animal health, communications, education and training, socio-economic and governance research, and ecological interactions.⁸⁰

That the CSR exists within a university assists its mandate in several ways. Most obviously, it provides the facilities, personnel, and programming to train a skilled and enthusiastic workforce. As stated in a 2010 public relations piece, the CSR works to:

ensure the development of a skilled workforce that will support the growth, diversification and competitiveness of the BC shellfish aquaculture industry, a primary objective of the CSR is to facilitate the transfer of technology & training to industry. (Centre for Shellfish Research 2010, online).

⁷⁹ Tillapaugh has a BSc in Marine Biology and a 30-plus year career in aquaculture. He has served as a government aquaculture specialist, owner/operator of an aquaculture company, senior manager of a major aquaculture enterprise, Executive Director of the BC Salmon Farmers Association, consultant, aquaculture instructor, and currently sits on the fish and fisheries task force at Genome BC (Genome BC 2007).

⁸⁰ In 2004, the CSR was awarded a Tier II Canada Research Chair (CRC) in Sustainable Aquaculture Development, and hired Dr. Penny Barnes to fill the position and be research manager of ecological interactions research program. However, as of summer 2010, the CRC and research manager positions have been vacant for over a year.

In addition to broad degree granting programs, the CSR has developed focused Aboriginal training and accreditation curricula, aided in particular by funding from the Provincial government. For example, in 2002 the Ministry of Agriculture, Food and Fisheries funded a 3-year project with a grant from the BC Economic Measures Fund, administered by the Treaty Negotiations Office (Hiemstra 2004). The purpose of the project was to develop shellfish culture training, or 'capacity building', for First Nations communities (ibid).

A variety of funding options have become available to the CSR because of its affiliation with a university. Since its inception, operational and research funding has been granted by over 20 Federal, Provincial, and private sources (Tillapaugh 2007). Typically, the funds target specific research projects or facilities development (ibid). Table 6.3 overviews some of the publicized funding the CSR has received since 2001. The funding totals over \$20.8 million (though the list may not be exhaustive, as these are simply the funds to which I could find reference in CSR documents or press releases).

Table 6.3 - Funding ascertained by Vancouver Island University's Centre for Shellfish Research. *Data compiled from online press releases and from Tillapaugh (2007).*

Date	Amount (CDN \$)	Source/project
April 2009	4 300 000	Provincial (matches CSR fundraising)/ Deep Bay Field Station
April 2009	4 300 000	Federal (matches CSR fundraising)/ Deep Bay Field Station
February 2009	100 000	Fed (DFO) Aquaculture Innovations and Market Access Program/ Raft design research
May 2008	410 000	Fed (Western Economic Diversification)/ Shellfish Genomics Lab
March 2008	1 000 000	Private (Island Coastal Economic Trust)/ Deep Bay field station
August 2006	266 000	Prov/ Daily operations, Deep Bay field station and targeted training and development for Kwakiutl District Council
April 2006	2 250 000	Prov (Ministry of Economic Development)/ Implement coast-wide First Nations aqua-business training program
February 2006	200 000	Prov/ BC Innovation Council Chair in Aquaculture and Environment
June 2005	1 000 000	Fed (NSERC)/ Tier 2 Canada Research Chair in Ecological Interactions (Shellfish Aquaculture)
June 2005	312 500	Fed (Canadian Foundation for Innovation)/ Additional Funding for Canada Research Chair
February 2005	450 000	Fed (Canadian Foundation for Innovation Institutional Operation Fund – 5 years) / Facilities technician
July 2004	460 000	Fed (Western Economic Development)/ Partnership agreement funding for offices and meeting room plus additional scientific staff
March 2004	900 000	Fed (Canada Foundation for Innovation)/Innovation and infrastructure operating fund awards
July 2002	545 000	Fed (Western Economic Diversification)/ Operational funding
July 2002	680 000	Prov/ Economic measures Funding to develop the First Nations Shellfish Aquaculture Training Program
March 2002	100 000	Prov(Ministry of Agriculture, Food and Fisheries)/ Operational funding
2002	650 000	Prov (economic measures fund)/ First Nations Shellfish Aquaculture Training Program
February 2002	1 500 000	British Columbia Knowledge Development Fund/ Infrastructure and development of CSR
January 2002	1 475 000	Fed (Canadian Foundation for Innovation) / Infrastructure and development of CSR
Total	20 898 500	

Beyond the classroom and laboratory: a role in advocacy

In addition to research, training, and facilities development, the CSR has also pursued its mandate through lobbying for the shellfish aquaculture industry more generally. There have been several publicized examples of this activity since 2001. First, the role of the CSR as liaison or contact point for investors who may be interested in the BC shellfish industry was identified in a 2005 profile document. It states:

(n)ot only is the CSR's research network growing, but it is also becoming an important point of contact for potential investors. Recently, the CSR has hosted meetings with Taylor Shellfish Ltd., the largest integrated shellfish company in the Pacific Northwest (>US \$40m in sales) and Landa Holdings of the Netherlands. Both companies see the potential and are seeking investment opportunities in the BC shellfish aquaculture industry. In addition, some of the major BC salmon farming companies are also becoming active in shellfish aquaculture. All of these signals indicate that the industry may yet realize its true potential; and the CSR will play an important role in facilitating and supporting that potential (CSR 2005, online).

Next, in a 2006 communications strategy undertaken on behalf of the BC Shellfish industry, Ruth Salmon articulated a public relations role for the CSR, in this case, specifically regarding the opening of its new Deep Bay field station. She wrote that in addition to its R&D activities, the field station “enhance public support for shellfish aquaculture, attaining the necessary social licence through a ‘soft’ engaging and educational approach”, and that this approach will lead to “the integration of shellfish aquaculture into the fabric of coastal society” (Salmon 2006, p. 3).

Finally, on May 28, 2009, the CSR and the BCSGA signed a Memorandum of Understanding with one another. Although I have not obtained a

complete version of the agreement, an excerpt of phrases posted on the BCSGA website in 2009 reads:

(c)onsidering that the CSR... is a respected centre for research and development and technology transfer in support of a sustainable shellfish industry..., and Considering that the BCSGA is the official representative of the BC shellfish industry and devoted to its well-being and development..., and Considering that both parties have much in common, share overlapping missions, and wish to collaborate as much as possible toward realization of their common goals..., (this) Memorandum of Understanding would be of great value in creating and supporting enduring ties between the two parties (BCSGA 2009b; excerpt here is as presented on website).

The wording clearly reconfirms the intent to ensure “enduring ties” between the two institutions in their pursuit of “overlapping missions”.

Overall, the rapid initiation and development of the CSR speaks to the support that this institution has from many political and industry leaders, and the range of funding that has been directed to the idea of shellfish aquaculture expansion in BC. Its role in the technological intensification approach to industry development, particularly via research regarding shellfish genomics, broodstock, and husbandry techniques is now central to the pursuit of the elusive \$100 million industry. Its role in Aboriginal ‘capacity building’ in support of Aboriginal aquaculture ventures, as well as its public lobbying and public relations efforts are also growing. As I discuss these further in Chapters Seven and Eight, all of this activity contributes to the depoliticization of shellfish tenure expansion and intensified shellfish production.

VII. Conclusions

As frequently presented, the rationale for the Shellfish Development Initiative was simple: if the number of hectares tenured doubled over ten years, a \$100 million industry would be possible given current prices, markets, and existing capable lands on the WCVI. Though lofty, and now proven largely unrealistic, the projection spurred a period of extreme optimism, plentiful funding, and tenure allocation to Aboriginal groups through treaty-related measures and MoUs. It also placed industry advocates in a position to leverage funds and consult as experts (more in Chapters Seven and Eight). Moreover, as I will now move on to discuss, these effects achieved further industry certainty in that they depoliticized regulatory activity that stood to impact existing socio-economic and political relations, such as communal and commercial shellfish harvests and public access and right of way along the coast. The SDI did little to address the impacts that aquaculture expansion might have on existing commercial, cultural or subsistence shellfish harvests *vis a vis* losses in access to the intertidal (see Joyce 2008).

Aboriginal communities on the WCVI were well aware of the high probability that tenures would be sought in their territories, and of the implications expansion had for the future of the intertidal clam fishery. As one Nuu-chah-nulth shellfish aquaculture business plan, prepared by an industry consultant, stated:

(t)his industry, with its menu of current, new and potential culture species has the growth potential to collectively outstrip the commercial industry (K-C Business Plan 2002, p. ii).

With such statements circulating, the message was broadcast that in order to retain control over the intertidal getting on board early with shellfish aquaculture would be necessary. This is not to say that coastal communities who took out tenures were simply passive recipients of SDI funding and tenure MoUs, or uncritical consumers of the expansionary mandate. Nor would it be accurate to say that the desire to profit from shellfish aquaculture did not exist. The political and economic reality for reserve-based communities nearing treaty agreements is such that profitable local businesses are desirable, and projections of the time seemed to indicate that shellfish aquaculture had high profit potential.

Salmon (2006) reconfirmed the expectations for Aboriginal owned and operated farms when she wrote that, “a blue wave of new activity, led predominantly by First Nations, is expected to propel further rapid growth (past the initial industry peak of \$30.7 million in 2003)” (p. 4. Brackets mine). She went on to write:

(i)t is widely recognized and expected that First Nations will take a lead position in the BC shellfish aquaculture industry. This expectation arises not only because of the potential economic development opportunities, but also because of the many compatibilities – both cultural and social – that exist between aboriginal communities and shellfish culture (Salmon 2006, p. 4).

I move on now to discuss how Aboriginal communities have been conceptualized and targeted by industry experts for aquaculture development initiatives. I discuss the KCFN experience with band-owned and operated shellfish tenures to illustrate some localized effects.

CHAPTER SEVEN - CERTAINTY II: INTERVENTION FOR ENTREPRENEURIAL ACTION

It was not clear why certain groups of BC stakeholders, who did not perceive a shift from wild to cultured fisheries to be in their best interest, had not taken a stronger stance on shellfish leaseholds or at least refrained in greater numbers from acquiring lease sites. Instead, the data indicated increases in both numbers and extent of leaseholds, including tenures owned by First Nations (Joyce 2008, p. 151)

First Nations bands who expressed largely indifferent or even negative perceptions about shellfish aquaculture development, were nonetheless defying the cultural and economic status quo to engage with policies which they believed were not in their long-term best interests (Joyce 2008, p. 152-153).

I. Introduction

In her doctoral dissertation, Alyssa Joyce (2008) documented spatial changes in intertidal access rights in various regions in the province (WCVI, the Broughton Archipelago, and Sunshine Coast), quantified harvester perceptions of impact to the commercial intertidal clam fishery, and confirmed that beaches known to produce well in the fishery are attractive to aquaculturists for shellfish tenures.⁸¹ Mapping and discussing spatial changes in access rights, and the potential for conflict that they create, were central to Joyce's work (also see Joyce & Canessa 2009). Through interviews, she also found some band administrations and/or Aboriginal individuals who were pursuing shellfish aquaculture tenures and ventures to be uncertain that doing so best suited their long-term socio-economic or cultural needs. Joyce speculates about why they might go through the process

⁸¹ Between 2000 and 2005, 81.8% (n=22) of commercial clam harvesters interviewed in the study areas had experienced displacement from beaches where they had once harvested with their Z2 or ACL clam license (Joyce 2008).

to secure shellfish tenures. A detailed analysis of specific decisions or power dynamics was beyond the scope of her dissertation. However, the observations suggest that the power dynamics that I engage in this chapter may be operating more broadly than Nuu-chah-nulth territory.

Specifically, I use this chapter to document the development of four shellfish tenures (two intertidal and two deep-water) by the KCFN for the purposes of a band-owned and operated shellfish aquaculture venture. The venture was in partnership with the NSDC, and the tenures enabled through a treaty-related MoU. However, in addition to the existence of structural incentives to participate, interviews with band administrators and other community members indicate that decision-making and perceptions of the shellfish venture have been influenced by broader socio-political dynamics. The interview data, in combination with analysis of planning and business documents, and industry discourse suggest that the influence stems, at least in part, from the work of ‘experts’ who promote shellfish aquaculture and Aboriginal economic development as being an ideal cultural fit, and who are often contracted to manage and oversee specific initiatives.⁸²

My purpose is to provide a sense of the influence and impacts of expert narrative and business planning in ka:’yu:’k’t’h/che:k:tles7et’h’ territory. I begin by illustrating how Aboriginal peoples and communities have been identified and

⁸² I use the term expert here in order to characterize those who, because of their role in the industry or professional experience/affiliation, are frequently called on to define, advise, and direct industry growth. As described in the next section, creating a central role for experts in planning and implementation is characteristic of neoliberal governance. Readers of scholarly literature on development will be well aware of its neoliberal undertones (see: Ferguson 1990; Escobar 1995, 1998; Li 2007; Sturgeon 2007; Walker et al. 2008; Yeh 2007).

targeted for shellfish-related projects and development assistance. Next, I return to describe the pursuit and planning of the KCFN shellfish aquaculture venture specifically. In the lead up to the placement of the tenures, optimism regarding profit potential was elevated amongst leaders and other community members to the point where business success was understood to be highly probable. However, the KCFN shellfish venture has yet to turn a profit, and further, has contributed to the altered functionality of pre-existing communal harvest arrangements for the intertidal fishery (also see Pinkerton & Silver, in press). Interviews suggest that business planning did not adequately reflect local goals and realities, yet community members identify problems and outcomes as resting in locally rooted problems, rather than cause to question the appropriateness of the business plans or the wider 'ideal fit' narrative. I conclude by commenting on how these findings may speak to experiences of vulnerability.

II. Intervention and the role of expertise

Informed in particular by Ferguson (1990), Escobar (1995, 1998) and Li (2007), I recognize the identification and characterization of a target population as a necessary precursor to a development initiative. In this sense, power aligns strongly with those who define the terms, targets and practices of a given initiative. Frequently, these individuals are characterized as experts, and as Li (2007) reiterates, are in the position to "structure a field of possible actions", and initiate development schemes that come to "blend seamlessly into common sense" (p. 5). In this case, by identifying shellfish aquaculture as an 'ideal fit' and

as more productive or beneficial than subsistence or commercial intertidal harvest, experts have helped to depoliticize the enclosure of ocean space.

Further, experts and others who propose intervention are often not of the same social or cultural group as the intended beneficiaries (Watts 2003; Li 2007; Yeh 2007; Walker et al. 2008). In the present study, I have found this to be almost exclusively the case. Writing from the position of an industry expert herself, Salmon (2006) identified the 'consultant-based' trend that has characterized programs for Aboriginal participation in the BC shellfish aquaculture industry. Whether through research and consulting, business report, testimony, or, most recently, through programs for capacity building, non-Aboriginal individuals and organizations appear to have largely defined the initial terms, procedures and processes for ka:'yu:k't'h/che:k:tl̓es7et'h' engagement in the expanding industry.

Space and scope limit an exhaustive presentation of all materials that directly or indirectly construct what I call the 'ideal fit' narrative (see Appendix A, Appendix G, Coopers & Lybrand 1997, K-C Business Plan 2002, Salmon & Kingzett 2002, Hiemstra 2004; and Salmon 2006 for illustrative examples). However, two messages have prevailed strongly since the late 1990s. First, that the act of growing and harvesting shellfish is highly compatible with existing Aboriginal socio-cultural and economic norms, and that doing so is more productive than participating in subsistence and commercial shellfish harvests. The second message is that, with their access to remote coastal areas and existence of available labour (i.e., high levels of unemployment), Aboriginal

peoples are ideally situated to meet the demands of an expanding industry. Arguably then, an overarching discursive strategy has been to use the harvest practices, traits of Aboriginal communities and shellfish product, rather than the industry structure and its overarching economic and ecological imperatives, to rationalize development interventions. Two pieces of evidence are illustrative here.

The first is a 2002 Department of Indian and Northern Affairs Canada report entitled *Cultivating Opportunity: A Management Strategy to Expand First Nations' Participation in BC's Shellfish Aquaculture Industry* (or, Doyle 2002).⁸³ The report confirmed Aboriginal nations as “specific target groups to benefit from the (shellfish development) initiative” (p. 6. Brackets mine). Doyle continued by suggesting that coastal groups have been targeted because “(s)hellfish development offers so many compatibilities and advantages for Aboriginal communities that it makes an ideal candidate for economic development” (p. 7). The compatibilities identified include a longstanding traditional use of shellfish; potential for local employment; lifestyle compatibility; compatibility with Aboriginal environmental values; opportunity for the reinvestment of returns; and, high potential for future vertical business integration. At the same time, Doyle identified the “three most pressing issues” facing coastal Nations in their “quest to

⁸³ The author, Cassie J. Doyle, was the President and CEO of the BC Assets and Lands Corporation from 1999 to 2003. Citing experimentation with clam tenures in Halalt territory (near Duncan BC, on the Strait of Georgia), the report claims that there is an “enormous difference in economic benefits between harvesting of wild grown clams under a pilot beach agreement and putting the same area into aquaculture production” (p. 12). Further, it suggests that Pilot Beach licenses are questionable in their long-term sustainability, because they allow for “harvesting of Manila clams with no provision for seeding activities” (ibid). Data on profits and job creation to illustrate the success in Halalt territory are not included in the study.

launch successful aquaculture ventures” as financing, tenure and regulatory approvals, and, training and education (Doyle 2002, p. 15). Indeed, these ‘hurdles’ seem to be in conflict with the compatibilities identified above, and overcoming them rests in the pursuit of specific ecological and socio-economic conditions that are quite different than those required for communal shellfish harvest (or other uses of the coastline such as cultural or spiritual sites, ecotourism, or housing development).

Further evidence of the role that industry experts retain to exert influence exists in a series of statements made by Ruth Salmon between 1996 and 2006. Through a variety of professional roles, including her current position as the Executive Director of the Canadian Aquaculture Industry Alliance, Salmon has had many opportunities to provide opinion regarding initiatives for Aboriginal participation in the BC shellfish industry.⁸⁴ In a 1996 testimony to the Federal Senate Standing Committee on Natural Resources, she stated:

(s)hellfish farming presents a unique opportunity for First Nations to develop sustainable businesses in rural coastal communities. Some of the most productive beaches suitable for culture on the coast are fronting native reserve lands. Therefore, the involvement of First Nations in shellfish aquaculture is a natural one ... First Nations already have many of the skills required for shellfish culture (Salmon 1996).

This testimony occurred just prior to the Coopers and Lybrand report, and just over a year prior to the initiation of the SDI. Initiatives for Aboriginal participation in the BC industry had not been widely pursued at this point, and discussion

⁸⁵ The CAIA is the national industry and lobby association for Canadian aquaculture producers and other related businesses. Salmon also acted as Communications Director of the CSR and senior associate with the *Blue Revolution Consulting Group* of Vancouver Island. Between 1996-2001, she was the Executive Director of the BCSGA.

between the Nuu-chah-nulth and the Province were just beginning to proceed. Here, Salmon's rationale is based principally on the physical attributes and availability of willing labour that she understands to exist in coastal Aboriginal communities.

In 2000, after the SDI was initiated, Salmon testified in Senate once again, this time to the Standing Committee on Fisheries. Through a series of questions and answers, she now suggested that a fundamental shift (i.e., in labour and economic practice) must occur before profitability in Aboriginal shellfish ventures would become the norm. The exchange between Salmon and the questioning Senator proceeded as follows:

Senator Perrault: Members of the committee have been told by an official of DFO that the First Nations have very mixed feelings about aquaculture. Some First Nations are participating in the expansion of shellfish farming, which was mentioned very briefly during the presentation. Are First Nations generally more supportive of shellfish aquaculture than of salmon aquaculture? If so, what is the extent of their involvement in shellfish farming?

Ms Salmon: Yes. I think that they view shellfish farming as closer to the kind of activities in which they have traditionally been involved. There is increased interest from bands in getting involved in aquaculture.

Senator Perrault: They are good fisher people, are they not?

Ms Salmon: Yes. I think that if there is a problem, it is that the mind-set needs to be shifted from fishing to farming. While they are interested, there is a learning curve in understanding what farming is, what it involves and how to go about it. Certainly, they are good fishermen and they do have an interest in the whole area of shellfish production. There is a mind-shift required (Salmon 2000).

Once again, Salmon identified the perception of Aboriginal interest in shellfish production. However, she also indicated that a 'shift in mind set' from fishing to farming must occur in Aboriginal communities and/or individuals before success

in the industry will be realized. With this statement, Salmon gave less credence to the existing Aboriginal skill set than she did initially.

In 2006, Salmon made a strong statement about the necessity for communities that become involved in aquaculture to be fully aware of how different it is from fishing, including the farm like husbandry practices. In her capacity as Communications Director for the CSR, she wrote:

(w)hile shellfish harvesting is a familiar cultural activity for all FN on Vancouver Island – aquaculture is a farming enterprise – and therefore many of the husbandry practices are different from practices of the wild fishery. Band members need to be fully aware of what is involved in shellfish aquaculture including realistic expectations of the rewards and returns available (Salmon 2006, p. 13).

She concluded that the development of the First Nations Shellfish Aquaculture Training program (FNSAT) at the CSR is essential as it will “support the necessary transition from ‘consultant based’ to ‘First Nation based’ capacity for shellfish aqua-business development” (CSR 2006, p. 15).

Though fascinating even when taken on their own, I contend that Salmon’s series of statements illustrate the contribution that experts and consultants have made in defining the problems, solutions, and future direction of development interventions for Aboriginal participation in the shellfish aquaculture industry. Further, I suggest that nuances in Salmon’s changing perspective on the barriers to (profitable) Aboriginal participation are representative of a wider awareness that seems to be currently emerging. Although shellfish aquaculture continues to be publicized as an amenable or culturally ideal economic activity for Aboriginal communities, the variety of openly acknowledged difficulties band-owned and operated ventures face is growing. Recent initiatives, such as the CSR’s FNSAT

program, are indicative of the solution that consultants and experts might now recommend: to increase ‘community capacity’ in the areas of shellfish husbandry, business management and local governance. These objectives fall in line with Peck’s characterization of neoliberal policy in that they work to construct “market(-like) order” to society (Peck 2008, p. 4).

III. The KCFN shellfish aquaculture tenures and business venture

The previous chapter documents initiatives that emerged from the SDI to enable Nuu-chah-nulth owned and operated shellfish ventures, while the previous section provides a sense of the role that experts have played in defining a wider narrative regarding tenure expansion and Aboriginal participation since the mid 1990s. Interviews, government reports, and various Nuu-chah-nulth shellfish business plans indicate that both influences have contributed to decision-making regarding the pursuit of shellfish aquaculture as an economic development strategy in ka:’yu:’k’t’h/che:k:tles7et’h’ territory. They also appear to play a role in current community perceptions of the aquaculture venture. With the remainder of the chapter, I present my understanding and interpretation of these series of events and provide evidence to support it.

By the late 1990s, Band Council saw the pursuit of tenures and a for-profit shellfish venture as being amenable with their objectives of building a community economy to provide wage-earning opportunity, a source of pride, and eventually, a moderate stream of revenue for reinvestment in the community. The KCFN shellfish venture was coordinated and overseen by the NSDC, which through a

contract in 2001, became a part owner in the business with the Kyuquot-Checlesht Development Corporation, a corporation of the Band Council. Though any number of personal relationships and interactions led to the Council's final decision to pursue tenures, support was buoyed in 1999-2002 because of the opportunity that the NSDC partnership presented, knowledge that expansion was occurring, changes in the intertidal clam fishery, and because of the wider optimism surrounding the industry that permeated Vancouver Island at the time.

In 2001-2002, a MoU between the BCAL and the KCFN was negotiated and signed. The agreement secured a 10 year window of priority application for 13 specific tenure sites in ka:'yu:k't'h/che:k:tl̓s7et'h' territory (K-C Business Plan 2002, Appendix A).⁸⁵ Amongst stipulations regarding siting and participation in consultation requests by non-KCFN tenure applicants, the MoU states:

(a) The diligent-use policy requirements for shellfish tenures will be applied to the tenure at the end of year five (5) after the date on which the tenure is issued; and

(b) The production requirements in the tenure agreement will allow for staged implementation with reduced production requirements for the first four (4) years after the date of the issuance of the tenure (K-C Business Plan 2002, Appendix A).

Four of the 13 sites were subsequently chosen and tenured, and a business development plan written (i.e., K-C Business Plan 2002).⁸⁶ The plan, undertaken by a consulting firm in Victoria, projects that developing and operating four

⁸⁵ The limited time frame of the MoU meant that KCFN priority to apply for the 13 tenure sites would end after 10 years. At this point the sites would be open to other non-KCFN applicants. As discussed further in Chapter Eight, Maa-nulth treaty fisheries stipulations have extended, but not ended, the limited window of application priority.

⁸⁶ Out of respect and agreements regarding confidentiality, quantitative financial details of the business plan are not revealed here, nor have they been a part of my analysis of the KCFN shellfish venture. The details and quotations I present remain broad, although I believe they illustrate a sense of the optimism, logistical recommendations, and ecological assumptions it contains.

shellfish tenures to full capacity would allow the KCFN to be able to begin paying back loans taken out for the business at the end of year five of operations; profit would be possible by year eight.⁸⁷ The financial projections were attractive and assumed to be feasible by the Kyuquot-Checlesseht Development Corporation and Band Council.

With the flurry of activity in Kyuquot, optimism and interest regarding the potential of the business grew further among many community members. In interviews, individuals often recalled their high hopes for the venture. In 2005, one ka:'yu:'k't'h man said:

I was really interested in enhancing clams on the beaches. People from out there that do this ... they make it sound so good (July 10, 2005. Interview by E. Pinkerton & J. Silver).

He articulated the perception that 'people out there' were successfully enhancing clam beaches, and that through information presented to the community, he was impressed by the opportunity it might present to the KCFN.

The two initial intertidal (Manila clam) tenures were located on the beaches that had been allocated pilot-beach license agreements in 1999 (Malksope and Cachalot⁸⁸), while the two deep-water (Pacific oyster) tenures were located in front of these beaches. Capitalization of the tenures began quickly; a process that included building oyster rafts, and buying a second-hand

⁸⁷ Profit would be on top of wages paid to individuals who harvested clams and who were hired to maintain the four tenures.

⁸⁸ As discussed in Chapter Four. Recall also that widespread water quality-related closures occurred in 2004. Cachalot was closed, but re-opened under a Conditional Management Plan in the winters of 2005 and 2006. Malksope was not closed, but a depuration fishery remained operational.

boat, shellfish seed and netting. In some places, the intertidal beaches were physically modified (rocks moved, nets placed) in preparation for the placement of hatchery seed in year two of operations. The harvest of existing wild-growing clam stock was scheduled to occur in years two, three and four. After these years, according to the plan, clam harvest would arise largely from planted hatchery seed, rather than natural recruitment (K-C Business Plan 2002). Harvest of oysters would begin in year three of operations. With privatized access and a new harvesting schedule in place, the terms of the existing communal beach arrangement with DFO for commercial intertidal clam harvest ceased, though due to water conditions, depuration was still required on Malksope and the conditional management plan persisted on Cachelot 2005-2007.

However, the stipulations regarding diligent tenure use now grew in significance. After all, these are the requirements by which it is determined whether the tenures will be retained by the KCFN, or deemed 'underutilized' and become available to other interested parties in the future. Considering the diligent use stipulations and the pre-existence of the pilot-beach licenses, the choice to tenure Malksope and Cachalot might seem counterintuitive, or even risky. Why were other, less socio-economically significant beaches passed over for the fledgling venture? Doyle (2002) sheds light on the logic similar to that which I believe influenced the initial KCFN tenure placement. She wrote:

(w)hat is important about pilot beach agreements is that the information gained through stock assessment data and management planning may prove most useful for future aquaculture development. The pilot beach projects can provide sound experience with the commercial development of the shellfish resource and may, in future, facilitate the approvals necessary for conversion to a shellfish aquaculture tenure (Doyle 2002, p. 12).

In this light, the decision is clarified. The standing stock and a sustainable harvest rate had already been quantified on these beaches, and the existing knowledge and experience represented logistical and financial advantages over other sites.

However, the tenure placement also provides evidence of the narrowed “field of possible actions” (Li 2007, p. 5) that were in play in the decision. Doyle’s (2002) logic, and the logic employed in the placement of the tenures, *implicitly disregards risks presented by ending communal harvest arrangements in favour of tenure*. Risks include: debt and financial loss for the Band Council, impacts to wild-growing shellfish/commercial fishery harvests and the overlapping socio-economic and cultural values they hold, environmental change, and potentially, loss of the tenure altogether (if diligent use requirements are not achieved).

Implementing the KCFN tenure business plan: transplanting standard industry practice?

If there is one cardinal rule for growing shellfish in BC it is this: there is no recipe. Although the industry is moving towards mechanization, modularization and standardization, there is no single method or device that will perform identically at all sites. Techniques that work well in one place may be substandard in another. Each growing site is unique and it is up the grower to find the best means to produce oysters for any given location (BCSGA 2007c, online).

Ideally, once the decision had been made to pursue the shellfish venture, business planning would have been designed to navigate the ecological, logistical, and socio-economic specificities unique to the tenure sites and to KCFN objectives. However, as Pinkerton and Silver (in press) document, several

specific assumptions in the plan do not account for the variation that a different region and model for business development (i.e., band-owned and operated) might present.⁸⁹ It is thus likely that the plan over-projected the profit potential of the venture, or at the very least, the number of operating years it would take to achieve projections. Put succinctly, many business, husbandry and harvest details in the KCFN business plan were based on 'standard industry practices' used and developed by experienced aquaculturists, operating on the east coast of Vancouver Island. Here, I identify some specific contradictions between standard industry practice and actual outcomes as the KCFN venture proceeded.

First, although Malksope and Cachalot beaches had been the subject of quantitative stock assessments and received good ratings in biophysical capacity assessments for clam culture (Kingzett et al. 1995a; Blythe et al. 2004), time-series testing to compare growth measures of hatchery produced juvenile Manila clams against wild-growing Manila clam productivity had not been undertaken. Rather, as it was common industry practice at the time, liquidating standing wild-growing clam stocks for reinvestment in the business was advised. However, in 2003, Wickham & Loucks noted:

(i)n recent years, culturists have discovered that when optimal husbandry practices are employed, such as predator protection and regular digging of substrate, natural recruitment and survival of wild clams onto culture plots may equal or exceed seeding requirements. Purchase of clam seed represents a significant investment to clam culturists (as much as 27% of operating budgets), and may make clam culture uneconomical (Wickham & Loucks 2003, p. 25).

⁸⁹ These assumptions include: projected growth rates and farm-gate shellfish prices, underestimation of transportation and other logistical costs, the cultural acceptability of beach husbandry techniques, and general claims regarding the productivity of aquaculture vs. wild grown clams (see Pinkerton & Silver, in press).

As discussed in Chapters Five and Six, the long-term benefits of seeding clam beaches, as opposed to letting them recruit naturally was relatively unproven, particularly in the two northern most sounds on the WCVI (Wickham & Loucks 2003; Whiteley & Bendell-Young 2007). Thus, it would have been extremely useful to know whether seeding and the growth rates of hatchery-reared shellfish would offer justifiable returns on Malksope and Cachelot. If in fact the difference in productivity between seeding and naturally occurring recruitment was less than anticipated, the plan might have considered less seed, gradually increasing the amount of seed over time (if warranted), or no reliance on purchased seed at all.

The business plan also assumed that a limited number of hired tenure employees would harvest clams rotationally off designated areas of the tenure. However, after the plan was implemented, clam harvests on Cachelot and Malksope continued largely as communal commercial fishery digs where access was controlled by the KCFN, and considerations for local needs could be made. Participants dug with their ACL or Z2 licenses and contributed to the cost of tenures and business operations by incurring a charge per pound harvested, taken automatically off their payout that occurred through the Band Council. In other words, rather than following a strict profit-centred model, the clam tenures in particular were managed in an effort to maintain harvest opportunities and distribute income more widely throughout the community. A secondary impact of allowing community access to the tenures was that it was difficult to ensure that digging occurred within the area of beach pre-determined for that harvest rotation

(i.e., some harvesters dug under the placed nets, as in Pinkerton and Silver (in press)).

Another feature of the business plan was that harvests of clams and oysters were to occur year-round. This is certainly common practice in more accessible locations. However, year-round harvest in remote areas with poor access to large, refrigerated transportation is less realistic.⁹⁰ In 2005, one digger recalled an attempted summer clam harvest:

they tried last summer but it was too hot. A lot of them were dying really fast, just in two days. On the third day a lot of them grabbed their sack and a lot of the clams were dying already. I mean you could do it in the summer: the thing is that we'd need a lot of diggers just to go in there and get the amount of pounds needed (ka:'yu:'k't'h male, ~33, August 3, 2005. Interviewed by E. Pinkerton & J. Silver)

An additional difficulty rests in the fact that many ka:'yu:'k't'h/che:k:tles7et'h' individuals are less interested in shellfish harvest during the summer months when there is more availability of wage-earning opportunity, and a variety of other activities happening. Both issues would place limits on the ability of a KCFN venture to take advantage of the opportunities for summer clam harvest (DFO 2008b).

In these examples, 'best industry practice' does not necessarily suit localized realities and/or objectives in Kyuquot. My intent in presenting them is not to undermine the business plan, nor is it in an effort to explain away the lack of financial success the KCFN venture has obtained thus far. Rather, I suggest

⁹⁰ Recall that buyers travel in to Fair Harbour for clams harvested in the intertidal fishery, and for the trip to be profitable the KCFN have to ensure a pre-defined quantity and quality of shellfish. Presumably similar stipulations would be in place on trips made for cultured shellfish product.

that they illustrate incongruence between the KCFN's business objectives and capacities, and the plan's profit-centred intent and standard practice focus. In this sense, the business plan shares a similarity with Kingzett and Salmon's (2002) calls to increase per-hectare productivity on all tenures in the province. Recall that in this instance the '50 in 5' projection was based upon the assumption that shellfish aquaculturists would freely and successfully adopt intensified production practices and that social, economic, and ecological conditions were homogeneous in all coastal regions of the province.

In actuality, these findings illustrate that innumerable local realities dictate the *potential* productivity per hectare on any given farm, which may in turn be different again from the *ideal* intensity of production from the perspective of the entrepreneur(s). 'Standard' practices on any given site might not suit the social, economic, or ecological realities of a community-owned and operated business. For example, a site may not allow for the density of production needed to overcome the logistical hurdles imposed by remoteness, or a community may also wish to pursue ecotourism or other economic activities that must be planned in coordination with shellfish aquaculture (Huppert et al. 2003).

IV. What next?

In 2007, during my last multiple-month stay in Kyuquot, NSDC operational funding and logistical support had largely ended, and it was clear that the economic returns projected for the KCFN tenures were not going to transpire during the projected timeline. The oyster rafts were still in the water, but not producing marketable product. Clam seeding had occurred on the intertidal tenures within the last year, but indications did not suggest increases in standing stock. As water quality and related requirements permitted, communal clam digging continued on the tenures. It remains unclear to the KCFN how to proceed with the tenures. The future path of the NSDC was also unclear; Stevenson's contract ended in 2005, many of its funding sources were ending, and other Nuuchah-nulth bands were facing difficulties with their ventures.

The hopeful interest that I understood to have once existed for the shellfish tenures and KCFN business venture seemed to be giving way to bewildered frustration, and in some cases, blame and mistrust. Most often, blame was perceived to belong within Kyuquot, placed on others, self-internalized, or on general inexperience or an inherent entrepreneurial incompetence. Band administrators and employees were exasperated with being responsible for unfamiliar maintenance and husbandry activities that complicated their already busy jobs and made them vulnerable to criticism. As one ka:'yu:'k't'h woman said in 2007:

(i)t's just too complex to figure out unless you have an expert or a full-time person hired by the band (ka:'yu:'k't'h woman, September 20, 2007. Interviewed by J. Silver).

For her, and several others, the difficulties encountered through the band-owned and run shellfish venture had ultimately reinforced the necessity for yet another shellfish expert.

A related sentiment was revealed in a common perception that the treaty-related funding, MoUs, and NSDC partnership had offered a real option to the community to use as a post-treaty stepping-stone. In a 2007 conversation, a band administrator reflected,

more than other fisheries where we have just been removed from them basically without consultation or any consideration for the effects, the province gave us shellfish aquaculture and said here you go, do it (from J. Silver's fieldnotes. October 2007).

The feeling of missed opportunity pervaded, as did the sense that other communities, businesses, or bands given similar attention were not encountering any difficulties at all. In several instances, slight reassurance seemed to arise from my mention of wider difficulties that I understood other ventures to be facing. Growing concern also existed about the continuing lease fees to the Province, and the potential to lose the tenures to outsiders over time.

Despite concerns, blame and frustration, questions regarding the overall appropriateness of shellfish aquaculture as an economic development strategy were rarely raised. Some individuals spoke about potentially acquiring their own tenures, while others showed interest in reviving the band run venture with the assistance of non-Aboriginal business partners. A few had heard of other bands

trying to sub-lease tenures to other entrepreneurs, though this arrangement was generally understood to be risky. Ultimately, the events seem to have reinforced shellfish aquaculture as an acceptable business opportunity, under the right conditions and with the right set of (expert) skills.

Despite a real sense of loss and uncertainty regarding the shellfish venture, an equally frequent concern voiced during my engagement with community members and band administrators in 2007 was whether, and on what scale, the winter intertidal clam fishery would continue to be available in the future. Would community members retain the ability to head out with friends and family members to dig clams, earn winter income, and provide food into the future? The answer depends on many factors including water quality, market demands, available intertidal space, and actions by fisheries/aquaculture managers and license holders. However, it seems clear that to the ka:'yu:'k't'h'/che:k:ties7et'h', it would be unacceptable to pursue shellfish aquaculture to the exclusion of commercial and subsistence harvests.

The fact that hopes for the commercial intertidal clam fishery continued amongst the fallout of the shellfish venture raises an even broader question. At what rate or to what degree is it desirable to work towards the profit-centred model of economic development, if it risks affecting important opportunities for diverse communal, subsistence, seasonal, and/or informal wage-earning activities? This overarching question is one that communities must navigate themselves as they plan and implement their unique objectives and plans. However, the remaining chapters will refocus attention onto how the case I have

presented in the dissertation speaks to current approaches to Aboriginal relations and treaty making in BC, and their potential to complicate or unduly influence this important decision-making process.

V. Conclusions

This chapter identifies the convergence of structural and discursive components in broad expansionary initiatives aimed at Nuu-chah-nulth territory, and in the pursuit and community perceptions of the KCFN shellfish aquaculture venture specifically. The 'ideal fit' narrative permeates Aboriginal shellfish development initiatives and business planning, and solidifies a role for industry experts in carrying them out, and in redefining the narrative over time. The proposed implementation of standard industry practices tailored largely to conditions in the Strait of Georgia signifies the inappropriate assumption of ecological and socio-economic homogeneity on the WCVI.

Through personal interactions, text and visual media, many ka:'yu:'k't'h/che:k:tles7et'h' (particularly band administrators) had been alerted to the expansion of shellfish aquaculture since at least the late 1990s. In 2000-2001, based on the desire to provide wage-earning opportunity, strengthen community pride, achieve profit for community reinvestment, as well as the concern that the industry would expand uncontrolled into ka:'yu:'k't'h/che:k:tles7et'h' territory, the Kyuquot-Checlesht Development Corporation was formed and entered into partnership with the NSDC. Hope and enthusiasm regarding the shellfish venture grew during this time and was related to the profit potential projected by the externally produced business plan. However, many practices in the plan have

turned out to be incongruent with the unique conditions of a community-owned and operated venture in ka:'yu:k't'h/che:k:tes7et'h' territory.

Although the findings I have presented in previous chapters suggest that the shellfish aquaculture industry in BC faces a variety of ecological, market and regulatory uncertainties, community perceptions of the KCFN venture in 2007 seem to disproportionately internalize blame as a local problem in an otherwise profitable industry. Lewis and Kelman (2010) suggest such a reaction in the face of dispossession or changing access rights may actually indicate the experience of vulnerability. They conclude:

instead of appropriately being understood as the result of external political or commercial processes and influences, vulnerability continues sometimes to be considered a product of bad luck, and internal lack of awareness, apathy or inadvertent everyday practice (Lewis & Kelman 2010, p. 198)

If this is true in the case of the KCFN venture, ongoing experiences of *vulnerability* may actually work to reinforce the notion that shellfish aquaculture is an ideal economic development activity, and that industry experts will be of ongoing necessity. Even though significant interest remains in maintaining opportunities for commercial and subsistence driven intertidal clam harvests, shellfish aquaculture continues to be a likely candidate for future funding and business activity.

In further consideration of relative experiences of vulnerability, it is also useful to highlight another perception of the 'failed' initiatives in Nuu-chah-nulth territory. Stevenson, in her new position as Executive Director of the BCSGA, publicly interpreted the poor outcome of the Nuu-chah-nulth shellfish ventures in

the broader context of difficult business conditions and logistics. In a 2006 testimony to the BC Special Committee on Aquaculture she said:

(w)e've tried to see the industry expand into other regions — certainly on the north coast, west coast. I myself put in 35 farms for the Nuu-chah-nulth Tribal Council. But with the cost of doing business in remote locations, which I'm sure you guys would like to see some economic benefit to, shellfish cannot do it. Why can't we do it? There are lots of reasons, but a big one is that the cost of doing business in this province is huge (Stevenson 2006).

By claiming the financial cost of doing business in Nuu-chah-nulth territory as the overarching reason why band-owned and operated ventures have not been profitable, Stevenson argues that the government should lower tenure fees, a standardized cost of business encountered by *all* shellfish aquaculturists in the province.⁹¹ This is a fascinating approach, and one that may suggest Stevenson's lack of vulnerability in her new role as executive director of the BCSGA. She is now in the position to take a strategic perspective on the difficulties in Nuu-chah-nulth territory and re-focus political attention towards wider industry objectives.

Initiatives targeted at Nuu-chah-nulth communities employed both structural and discursive elements to prioritize private access tenures, encourage the use of expert business advice, and promote the adoption of standard industry practices. In his description of fisheries and ocean development on the American east coast, Kevin St. Martin (2007) eloquently described capitalization in the oceans as a “fundamental economic transformation” (p. 532) that involves the institutionalization of private property rights as well as “a new pattern of the

⁹¹ The MAL reduced tenure and renewal fees by ~50% in June of 2007. In a speech announcing the change, former Minister Pat Bell said: “(i)n reducing application fees for new and replacement tenures, the industry will be able to expand existing production and attract new producers, including First Nations” (Ministry of Agriculture and Lands 2007).

distribution of surplus via wage relations and capital mobility” (p. 533). Ferguson (1990), Escobar (1995, 1998), and Li (2007) remind us of the powerful role that experts play in instigating and/or facilitating such transformation. The case of the KCFN shellfish aquaculture venture also illustrates that interventions for development are vulnerable to broader political-economic aspirations, and that the highest risks are often borne by the targeted groups.

CHAPTER EIGHT - IF WISHES WERE SHELLFISHES: PROJECTIONS VERSUS OUTCOMES OF THE SHELLFISH DEVELOPMENT INITIATIVE

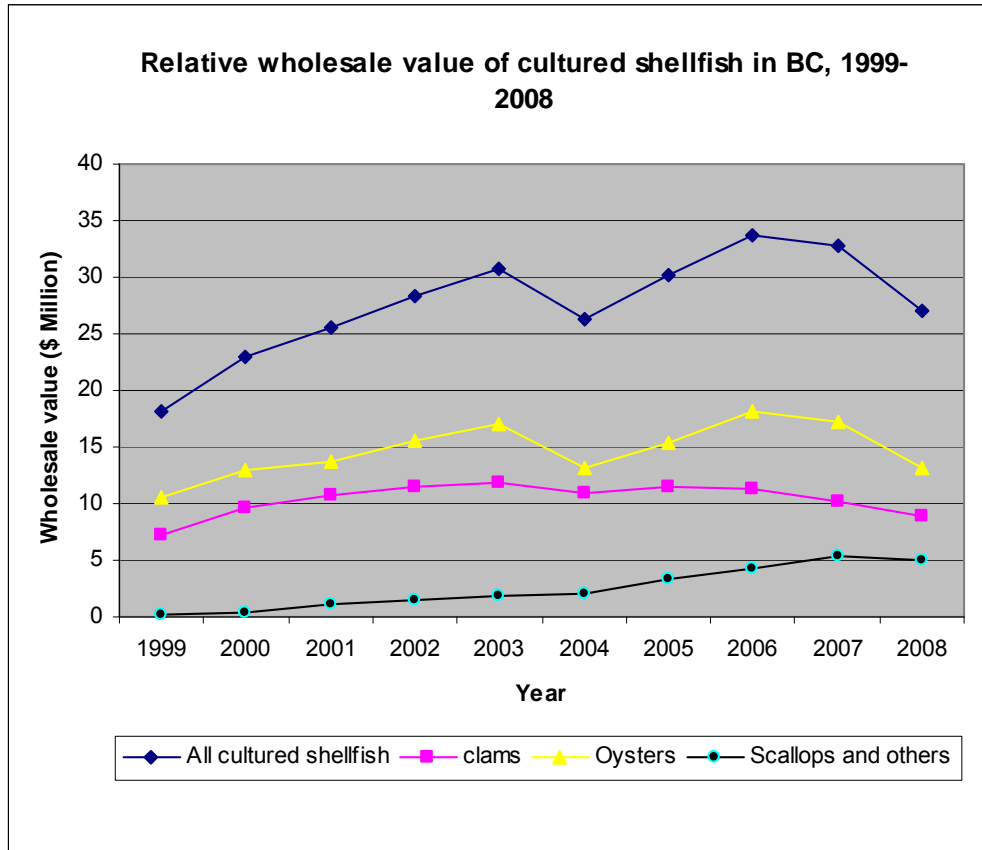
When Nanaimo's Centre for Shellfish Research opened its doors on the campus of Malaspina University-College in 2002, it was hoped that establishing a centre of research in the city would help expand the \$20 million industry to about \$70 million by 2007. Don Tillapaugh, the centre's director, said that the industry has expanded but its value is currently approximately \$34 million, less than half of what was hoped for at this point. He cited a variety of reasons for the low number, including the high value of the dollar. But he said much-needed investment in the industry is starting to take off and he firmly believes it will eventually reach its full potential (The Province 2008, online).

I. Introduction

I have used the last two chapters to examine initiatives introduced to achieve Aboriginal participation in shellfish aquaculture, document related agreements and funding in Nuu-chah-nulth territory, and explore specific perceptions and outcomes in ka:'yu:'k't'h/che:k:tl̓es7et'h' territory. Here, I broaden my scope once again to consider some stated and actual outcomes of the BC Shellfish Development Initiative. As publicly acknowledged, the SDI has failed to achieve its financial and spatial objectives; by 2007, the industry had a wholesale value of just \$32.8 (dropped to \$27 million in 2008), coming from 3339 ha of tenured ocean space. This number falls well below the projections for a \$100 million

wholesale industry on 4500 ha.⁹² Figure 8.1 illustrates the actual wholesale values of the shellfish aquaculture industry for the years 1999-2008.⁹³

Figure 8.1 - Relative wholesale value of various cultured intertidal shellfish in BC, 1999-2008. *Data compiled from Government of BC.*



Of course, numerous factors have led to the shortcomings; several prominent misestimations of Coopers and Lybrand (1997) and the SDI were discussed in Chapter Six. These included: insufficient consideration for the

⁹² Recall that the report projected that even with no new tenure space the industry would have a wholesale of \$56 million in 2007.

⁹³ The largest overall increase over the ten-year period arose from 'scallops and others', rather than oysters and clams, the two species that received the bulk of the focus in the Coopers and Lybrand (1997) report.

competitiveness of international seafood markets; lack of investor interest and coherent marketing strategy; negative public perceptions of aquaculture; lack of mechanisms for coastal zone conflict resolution; and, as this research has found, the assumption of a (high-end, industrial) homogeneous productivity potential from shellfish businesses run by different people in different regions of the province.

In their 2004 analysis of the regulatory mechanisms used to encourage industry expansion in BC, Howlett and Rayner (2004) conclude:

(t)he expansion ... brought many additional players and problems to the table, involving First Nations' claims, high costs, poor transportation links and processing infrastructure ... The government was found to be surprised not only by these events, but also by the hostility of communities to the expansion and intensification of shellfish farming in areas where leases had traditionally been concentrated (p. 179).

I concur with their assessment, and in addition, question the underlying assumptions regarding productivity potential in different parts of the province. However, I also contend that this analysis of the SDI must be balanced with a consideration of the wider activity that it has actually enabled to strengthen the future prospects, and more significantly, the staying power of the industry and its attendant property arrangements. As I show here, great strides have been made towards entrenching shellfish aquaculture related infrastructure and institutions in coastal BC; the financial projections have been an important tool in this process.

My overriding purpose in this chapter is to illustrate that a significant legacy of the SDI is in fact the work it has done to strengthen structural and institutional conditions that favour privatized access to ocean space for the market-driven production of seafood products. First, I document the stated and

actual outcomes of the SDI and related financial projections, including the case of Manila clam production specifically. Then, I focus on the strengthening of the BC Shellfish Growers Association and Centre for Shellfish Research, and institutional and structural changes in Nuu-chah-nulth territory. The evidence and discussion further contextualize my case-study findings, as well as allow me to begin to summarize the research findings and build concluding arguments.

II. Putting the projections to work

As confirmed through the previous two chapters, for an industry that was worth approximately \$12 million in 1996, the projections made in Coopers and Lybrand (1997) were particularly enticing to individuals with interests in seafood production, coastal development, and Aboriginal community economy. Recall Ruth Salmon's statement to the Senate Standing Committee for Fisheries in the year 2000:

(i)t is an industry with great potential. In 1997, Coopers and Lybrand were contracted to do a study of the economic potential of our industry for Industry Canada. The study evaluated the economic potential of oyster, clam and scallop production within capable marine lands on the west coast of Vancouver Island. That study found that the B.C. shellfish farming industry has the potential to become a \$100 million industry over the next 10 years. Currently, it is about \$10 million ... This potential could be realized with only a doubling of the existing land base (Salmon 2000).

Informants to this research knowledgeable of, and involved in, initiatives on the WCVI confirmed that the SDI initiated an era of extreme optimism amongst political, industry and some Aboriginal leaders.

However, in retrospect, the financial projections and the anticipated timeframe of an expanded shellfish aquaculture industry now appear to be more

aspirational than definitive. Table 8.1 summarizes the prominent projections that have occurred over the last 15 years, and contrasts them with the actual wholesale value reported for the industry in the year projected. The initial projections of Coopers and Lybrand (1997) and the SDI continue to appear particularly optimistic, and even the revised '50 in 5' target (i.e., Salmon & Kingzett 2002) over-projected by ~32%.

Table 8.1 - Financial projections made for BC shellfish aquaculture industry. *Data compiled from various sources.*

Source of original projection	Projection (wholesale value)	Projection Met?
Ruth Salmon, former Executive Director of the BCSGA (Salmon 1996)	\$50 million by 2006	Actual wholesale value in 2006: \$33.7 million Not Met
Coopers & Lybrand (1997)	\$100 million by 2007	Actual wholesale value in 2007: \$32.8 million Not Met
Shellfish Development Initiative 1998	\$100 million by 2007	Actual wholesale value: 2007: \$32.8 million Not Met
Salmon and Kingzett (2002); Salter (2002), both for VIEDA	\$50 million by 2007	Actual wholesale value: 2007: \$32.8 million Not Met
BC Shellfish Growers Association (2002)	\$70 million by 2007	Actual wholesale value: 2007: \$32.8 million Not Met

Tenure expansion has certainly occurred and pushed the boundaries of industrial shellfish activity northward.⁹⁴ However, the productivity core of the industry largely remains in longstanding centres; in 2002 (last available data), 29% of the tenure area and 52% of the shellfish farmgate value came from Baynes Sound alone (Kingzett & Salmon 2002). In 2003, of the 320 total person years employment (800 full-time or part-time jobs) directly attributable to shellfish aquaculture in BC, 45 were located on the WCVI and North Vancouver Island (Ministry of Agriculture and Lands 2009).⁹⁵ It could be informative to undertake an updated analysis of these indicators, but the relatively stationary wholesale value in the industry suggests that the distribution of production and employment across regions would be similar to the 2003 figures.⁹⁶

Despite their increasing implausibility, the financial projections have in fact often been invoked to argue for or legitimize regulatory change, public funding, increased foreign investment, and private access to ocean space in order to increase ecological productivity. In this way, the projections provide a concrete tool to help build political and financial support for shellfish aquaculture. Table 8.2 presents a selection of some of the most prominent invocations of the financial projections. Many of these have already received attention in the dissertation as pieces of data, and thus, some of their wider impacts made evident. However,

⁹⁴ See Appendix C for a 2007 map of tenure locations in BC.

⁹⁵ Recall from Chapter 5 that between Z2 and ACL licenses, over 1000 (and perhaps as many as 1300-1400) individuals have access to the intertidal clam fishery in BC. Although it would not be appropriate to compare employment hours vs. number of licenses directly, considering the effects and distribution (spatial and between Aboriginal – non-Aboriginal) of each would be informative.

⁹⁶ As shown in Figure 8.1, the wholesale value of the industry has fluctuated by no more than \$5 million since 2003.

Table 8.2 - Selection of references to projections in table 8.1. *Data compiled from various sources.*

Year	Document	Projection	Used to leverage
1998	Province of BC Shellfish Development Initiative	\$100 million by 2007	Public and political support for funding initiatives to double space available to shellfish tenures and eventually diversify species grown
2001	Kyuquot-Checlesseht Business Plan, via NSDC (K-C Business Plan 2002))	C&L \$100 million by 2007	Community buy-in to the business plan and pursuit of tenures; highlighted potential that shellfish culture will over-take commercial fishery in future
2002	VIEDA shellfish aquaculture industry potential and economic profile reports (Salmon & Kingzett 2002; Salter 2002)	\$50 million by 2007	Attract foreign investment through promise of intensified production on existing tenures (mean productivity to \$20 000 per hectare by 2007)
2002	Indian and Northern Affairs Canada Aboriginal aquaculture industry participation strategy (Doyle 2002)	C&L \$100 million No date	Advocates development intervention through a “strategic management project” (p.20) to ensure increased Aboriginal participation
2006	Testimony by current Director of BCSGA to BC Special committee on sustainable aquaculture (Stevenson 2006)	C&L \$100 million No date	General political support, regulatory consideration separate from the salmon aquaculture industry, and decreased tenure costs
2006	BC Shellfish Aquaculture Industry Communications Strategy (Salmon 2006)	Both C&L \$100 million and VIEDA \$50 million No date	Remote communities must take advantage of BC’s coastal biophysical capacity by ascertaining tenures. Public relations by the CSR will aid this process
2008	CSR Press Release announcing the Shellfish Aquaculture Field Station (The Province 2008)	Both C&L \$100 million and VIEDA \$50 million No date	Attract foreign investment. Reassure that the industry will meet projections, especially through species diversification and other R&D at the CSR

other press releases, consultant's reports, and news articles related to expansion in other regions/territories in the province exist (for example, see Kingzett & Salmon 2002; Kingzett 2005a; Island Coastal Economic Trust 2008).

Furthermore, the financial projections are often synchronized with statements regarding the superiority of aquaculture when compared to other uses (fisheries in particular, but also as treaty territory, tourism, public access, protected area). In fact, a 2004 assessment report on BC aquaculture, published by the Province identified over-projection as an ongoing concern. It says:

(a) major deficiency of BC finfish and shellfish aquaculture sectors is the lack of a current, credible analysis of economic costs and benefits, particularly to coastal communities and First Nations, from industry development and operation. (GSGislason & Associates Ltd. 2004, p. 137).

Overstated financial projections make accurately measuring costs and benefits of pursuing tenures over other activities difficult. This issue, along with understanding the cumulative socio-economic and ecological impacts of shellfish aquaculture, must both be addressed before a more fair, rational, and sustainable use of BC's coastline might occur.

The case of intertidal clams

A particularly stark example of incongruence between stated and actual outcomes of the SDI rests in intertidal clam farming (the \$100 million projection anticipated \$46 million from farmed clams). Based on financial and productivity arguments, a frequent contention is that clam culture is an optimal use of space, particularly in comparison to the intertidal clam fishery. In her 2000 testimony to the Senate Standing Committee on Fisheries, Ruth Salmon explicitly asserted

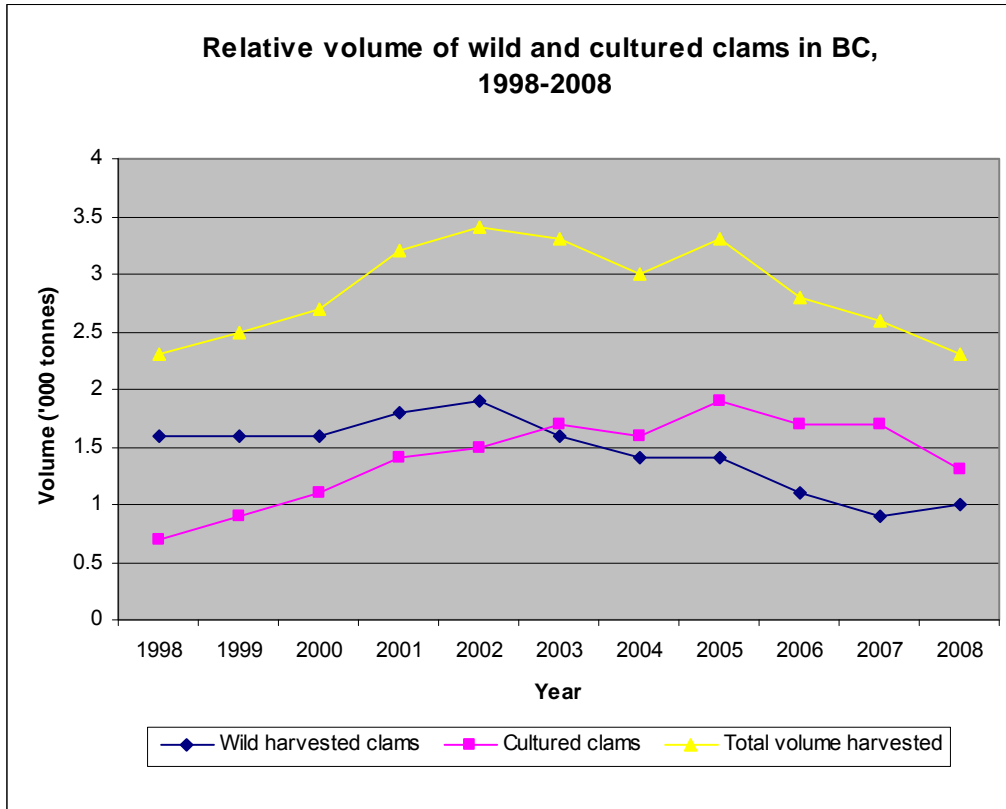
that clam farming is more efficient and productive than BC's commercial fishery, and that expanding tenure space only minimally interferes with the intertidal fishery. She said:

(e)xpansion of intertidal tenures will remove only a small fraction of the total ground utilized by the wild clam fishery. However, this will provide a disproportionately larger return in terms of increased production and employment due to the greater efficiency of farming relative to fishing. For example, converting 10 per cent of the ground currently used by the wild fishery to farming will result in at least a tenfold increase in clam production -- approximately equivalent to the entire present clam fishery (Salmon 2000).

The premise, of course, is that the private access rights to intertidal and nearshore space create the incentive for farmers to develop their intertidal tenures so that intertidal clam density would increase to contribute higher volumes/hectare than the existing commercial fishery. By 'mono-cropping' beaches with Manila clams, clam production would no longer be constrained by variable natural recruitment and inter-species competition.

However, in 2007, cultured clams had a wholesale value of only \$9.3 million. Figure 8.2 suggests intertidal clam production on shellfish tenures to be slowing and possibly decreasing. Further, the graph illustrates that the *total* volume of Manila clams produced in BC has in fact returned to approximately the same level that it was in 1998. This outcome is actually quite curious. If, on average, it takes three to five years to grow out hatchery produced Manila clam seed (Coopers & Lybrand 1997), a steady increase in cultured Manila clam production should be beginning to emerge.

Figure 8.2 - Relative volume of all harvested intertidal clams in BC, 1998-2008. Total volume harvested has returned to level at which it was in 1998. Data compiled from Government of BC.



With an intertidal tenure, farmers receive private access to existing stock of intertidal clams and are able to reinvest the profits in their businesses, but are not required to re-stock the sites immediately and/or completely. Data to clarify how much the increase in farmed intertidal clams from 1998-2005 occurred because of rapid harvest from newly tenured beaches are not available, and farmers' decisions regarding re-planting and subsequent harvest clearly relates to market price for Manila clams (which has been unstable due to the relatively high value of the Canadian dollar 2007-2009). However, the slowing trend suggests that either (a) planted clams have not grown as initially anticipated,

and/or (b) clams were not re-planted at the rate they were initially harvested. Ultimately, the unexpected outcome should raise larger questions about the long-term economic sustainability of intensive Manila clam aquaculture in BC and the potential that farmers will look to other species for their intertidal tenures (e.g., geoduck, cockles, abalone).

III. Structural and institutional strengthening

I move on now to discuss evidence that the SDI, and the financial/spatial/productivity goals it identified as being ascertainable, has enabled institutional and structural change that favours privatized access for seafood export. In particular, the BC Shellfish Growers Association and the Centre for Shellfish Research at Vancouver Island University have emerged as major institutional strongholds. Through a Memorandum of Understanding, these institutions have formally agreed to work together to “collaborate as much as possible toward realization of their common goals” (BCSGA 2009b, online). This partnership strengthens the likelihood of further species diversification/co-culture and the continued pursuit of interventions for Aboriginal participation in the industry.

I also explore some lasting implications of the SDI in Nuu-chah-nulth territory specifically. Although Nuu-chah-nulth businesses have faced difficulties in achieving profitable band-owned and operated shellfish ventures, the SDI left an institutional imprint with the Nuu-chah-nulth Shellfish Development Corporation and its *Nootka* brand label. Potential structural implications also exist in the shellfish harvest and tenure stipulations that exist in the ratified Maa-nulth

treaty (and potentially in treaties of other Nuu-chah-nulth Nations who remain in negotiations).

The BC Shellfish Growers Association and the Centre for Shellfish Research

Since 1998, the BC Shellfish Growers Association has maintained its advocacy position, and strengthened its vision and ability to support industry expansion and growth. Current leadership is focusing on streaming information to association members, the media, and the public more efficiently, as well as on developing capacity in marketing and attracting funds for technology transfer (BC Shellfish Growers Association 2009a). For example, in August 2009, the BCSGA received \$150 000 from Canada's recession stimulus *Economic Action Plan* to "increase the shellfish industry focus on marketing, public relations, communications, and technology transfer" (Roberta Stevenson, in BCSGA 2009c). In the fall of 2009, the BCSGA hired a marketing director and in January 2010, the association revealed its *PacificKiss* brand label (see Appendix G).

The BCSGA strategic plan (2009a) also articulates that the "sector is in need of ongoing and well-funded research and development that will focus on the development side", and that this need is best met through strategic partnerships (p. 20). Under the partnership mantra, there has been significant dovetailing and cooperation between the BCSGA and the Vancouver Island University's Centre for Shellfish Research. This now formalized relationship enables the convergence of industry interests, academic funding and research, and the

opportunity for dissemination of knowledge and technology through training and communications (BC Shellfish Growers Association 2009a).

A central focus of the partnership between the BCSGA and the CSR is to enable an increase in mean per hectare productivity, and potentially overcome higher costs of doing business in more remote regions of the province.

Diversifying production capabilities into new, more lucrative species is seen as an important ingredient to achieve this goal in the coming decade.⁹⁷ As Doyle (2002) summarized:

(t)here is considerable interest in having the necessary research carried out to allow new species to be approved for cultivation as these are products with potentially much higher profit margins than oysters and clams. High-end species such as geoduck clams and abalone are particularly important for communities in more remote locations on the north coast as their value can absorb the higher transportation costs involved in bringing them to market (p. 7).

Table 8.3 presents a current list of species that are attracting interest from growers and the CSR.

In fact, it is highly probable that product diversification will become a focus of industry effort over the next 5-10 years (in both R&D and lobbying government for regulatory approvals). However, Don Tillapaugh, Director of the CSR, concludes that because of the difficulties and expenses one firm would face in successfully developing a new species for production, “the CSR’s mission is to undertake this type of research on behalf of the entire BC shellfish industry” (CSR 2008, online). For example, the CSR houses a research program focused on shellfish health and husbandry, which includes shellfish genomics research,

⁹⁷ However, there are also shorter term shared projects between the two, such as the development of a mechanized clam harvester and a new wave of more durable and efficient oyster rafts (Canadian Aquaculture Industry Association 2009).

and is working to develop intensive production techniques for existing and new species (such as the basket cockle, *Clinocardium nuttallii*).

Table 8.3 - Shellfish species in initial interest, experimental, early commercialization stages. Adapted from BCSGA Encyclopedia, MAL and CSR websites.⁹⁸

Common Name	Scientific name	Origins in BC	Stage of development
Basket/Nuttal's cockle	<i>Clinocardium nuttallii</i>	Indigenous	Experimental/early commercial.
Kelp, seaweed, and algae	<i>Various</i>	Indigenous	Early commercial. Markets uncertain.
Giant/California sea cucumber	<i>Parastichopus californianus</i>	Indigenous	Experimental.
Green sea urchin	<i>Strongylocentrotus droebachiensis</i>	Indigenous	Experimental/early commercial
Red sea Urchin	<i>Strongylocentrotus franciscanus</i>		
Eastern blue mussel	<i>Mytilus edulis</i>	Exotic	Early commercial, demand uncertain.
Mediterranean or gallo mussel	<i>Mytilus galloprovinciali</i>		
Western blue mussel	<i>Mytilus trossulus</i>	Indigenous	Early commercial. Demand uncertain.
European oyster	<i>Ostrea edulis</i>	Exotic	Commercial.
Eastern oyster	<i>Crassostrea virginica</i>		
Spot prawn	<i>Pandalus platyceros</i>	Indigenous	Experimental. Aims to meet ¼ of current market demand on BC producers within 5-7 years.
Littleneck clam	<i>Protothaca staminea</i>	Indigenous	Commercial.
Varnish clam	<i>Nuttalia obscurata</i>	Exotic	Commercial. Markets developing.
Pinto abalone	<i>Haliotis kamtschatkana</i>	Indigenous	Experimental.

⁹⁸ Experimental implies that the stages of culture and grow out for the animal have not reached a point where they would be widely competitive in the market (whether it for price, quality, etc). See <http://www.bcsqa.ca/about/industry-encyclopedia>; <http://www.al.gov.bc.ca/fisheries/>; and, <http://www.viu.ca/csr/>

The CSR is also working to create a niche for itself in ‘Aboriginal capacity building’. In the early 2000s, the CSR “identified a critical need to build Band capacity for shellfish aquaculture development” (CSR 2005, online), and developed the resulting First Nations Shellfish Aquaculture Training Program in 2004. Courses in this program included topics such as beach management, animal husbandry, and business management. The programming for Aboriginal training has actually attracted the attention of the BC Ministry of Aboriginal Relations and Reconciliation, whose minister visited in March of 2006. A 2006 CSR press release on the visit states:

(a)s the CSR’s programs and initiatives align with many of the goals of the Ministry, Minister Christensen was interested to learn first hand about shellfish aquaculture. Aware of the coast-wide interest among First Nations to become involved in shellfish aquaculture, he was encouraged by what the CSR is doing – both in research and training – to support the success of First Nations in shellfish aqua/businesses (CSR 2006, online).

To extend the reach of the training to more remote communities, a partnership for regional delivery of course materials between the CSR, the Northwest Community College and North Island College has been arranged (CSR 2005).

Nonetheless, the greatest challenge the CSR faces is funding continuity and securing new funding sources (Tillapaugh 2007). In a 2007 overview report of the CSR’s activity, Tillapaugh openly contemplated moving towards a funding model that relies, at least partially, on private contract research. He wrote:

(d)uring the first 5 years, the CSR has focused on mainly ‘public good’ research supported by funding from the Federal and Provincial governments. The CSR conducted one small project for a private shellfish company in 2004, and in 2005 and 2006 received an increased number of enquiries for private collaborations. Due to the fact that the CSR is entirely ‘soft’ funded, the availability of public or private research funding will determine the focus of future endeavors (Tillapaugh 2007, p. 5).

In other words, rather than research that raises “the bar of the entire industry simultaneously” (Tillapaugh 2007, p. 5), the CSR may move towards private contract research that raises “the bar of the industry one company at a time” (ibid.), especially if public funding begins to become increasingly scarce. The privatization (or partial privatization) of CSR, which has grown largely through public funding, could have potentially wide reaching ramifications for small-scale producers and their ability to remain competitive within the industry.

Nuu-chah-nulth Seafood Development Corporation

Treaty-related funding and agreements from the SDI enabled the emergence of the Nuuchahnulth Shellfish Development Corporation in 2001. At that time, the approach was to encourage Nuuchahnulth ventures to quickly adopt standard industry practices in shellfish husbandry and harvest. As illustrated in Chapter Seven, a profit-centred business and production model does not necessarily translate neatly onto band-owned and operated shellfish aquaculture operations in remote communities. Rather than increasing socio-economic certainty through shellfish aquaculture, initiatives in Nuuchahnulth territory have struggled to achieve profit.

However, beginning in 2007 and unfolding currently, the NSDC is in the process of re-making itself. Now the Nuuchahnulth *Seafood* Development Corporation, it is under new leadership who wish to take a more nuanced approach to increasing Nuuchahnulth participation in the wider BC seafood industry, as symbolically represented by the change in name. In 2008, the NSDC envisioned:

a holistic approach to economic development - by understanding that helping people find and create opportunities for business and development means taking into account health, education, personal choice and environmental sustainability (Uu-a-thluk 2008b, online).

NSDC leadership wishes to pursue these goals by making a concerted effort to have individuals and bands learn from one another, combine seafood-related processing and marketing efforts, and seek markets and buyers who are interested in the 'Nuu-chah-nulth story', while simultaneously providing the opportunity for individual bands to maintain local control and decision-making authority.⁹⁹

There are potential advantages to more cooperation and communication among bands that might have been competitors under the original model. A shared cultural background, an outlook on business beyond the bottom line of profit (i.e., distributing wage-earning opportunities, maintaining local ecological integrity, communicating effectively between all bands within the NTC), in addition to the ability to efficiently take advantage of economies of scale are considered to be advantages in the seafood business (McCay 1980; Mansfield 2003, 2004). Further, there is increasing literature that documents the willingness of consumers to pay a premium for ecologically certified and/or socially responsible seafood (Mansfield 2003, 2004; Iles 2004; VanderGeest 2007), which could be pursued by the NSDC under the existing *Nootka* brand.

However, to comment here on the potential for future financial success by the revamped NSDC would be speculative. Treaty negotiation and implementation continues to unfold in Nuu-chah-nulth territory, and outcomes of

⁹⁹ See <http://www.ncnshellfish.com/aboutus.shtml>

the successful fisheries litigation remain unclear. Whatever paths the NSDC pursues towards business development and/or harvest arrangements, the overarching body (Nuu-chah-nulth Seafood Development Corporation) would not presently exist without its roots in the early years of the SDI.

Maa-nulth treaty shellfish stipulations

Because it is one of the first contemporary agreements to be ratified, the Maa-nulth treaty presents an important opportunity to assess how pre-treaty agreements carry over into actual treaty documents. The fisheries chapter designates priority access to thirteen shellfish aquaculture tenure sites in ka:'yu:k't'h/che:k:tles7et'h' territory; these arise largely from the MoUs for tenure sites discussed in Chapters Six and Seven.¹⁰⁰ Similarly to the MoUs, the sites must only be used for aquaculture and if they remain undeveloped after 25 years, they become open to other interested parties.

The fisheries chapter also contains specific stipulations regarding the harvest of wild-growing shellfish. Separate from the reserved tenure sites, are beaches set aside for food, social, ceremonial (FSC) shellfish harvest known as 'exclusive intertidal areas' (see Chapter 10 in Maa-nulth 2006). Regulations regarding these areas explicitly state that FSC shellfish cannot be sold commercially, unless the Nation decides to pursue tenures on them. Once a tenure is granted, the beaches cannot be returned to the commercial fishery or to

¹⁰⁰ Many of the sites are the same tenures originally identified through the MoU; thus, upon treaty implementation, the 10 year time window is effectively extended to 25. Crown negotiators have remained unwilling to put title to foreshore on the negotiation table because strong precedence regarding the maintenance of public coastal access and right of way exists.

an exclusive intertidal area. Thus, to place a tenure on an exclusive intertidal area would risk losing further communal space. The remaining intertidal and nearshore areas in the treaty territory are left open to the DFO managed commercial intertidal clam fishery, or may be pursued by any party for shellfish tenure.

Arguably, the treaty stipulations structurally fragment shellfish harvest activities within the Maa-nulth territories, and create uncertainty for existing commercial and subsistence harvest activities in several ways. First, there is the potential to lose access rights to more intertidal and nearshore space. Whether the band chooses to pursue its own business, sub-lease tenures to other interested aquaculturists, or lose priority access after the 25-year window, the reserved tenures are less likely over the long term to remain accessible for uses other than shellfish aquaculture. Even if they remain undeveloped, their potential as future tenure space now exists 'on the books', and may be accessed for aquaculture production in future decades. Finally, subsistence harvest is marginalized through its separation from remaining commercial harvest and potential tenure beaches; the separation runs counter to patterns of overlapping values in shellfish harvest as discussed in Chapter Four.

IV. Conclusions

It is clear that despite a wide gap between stated and actual outcomes, the SDI has enabled an overall strengthening of the industry. In particular, the BCSGA and the CSR, have emerged as leaders in the pursuit of intensified productivity per hectare tenured and export oriented towards international seafood markets.

Both appear to be 'on the same page' with regard to the best/most productive uses for the intertidal zone, and are focused on marketing and public relations that support intensification objectives. For example, in 2008 Tillapaugh suggested the CSR's new field station in Baynes Sound will be in the position to achieve "general acceptance for the shellfish industry in BC", and simultaneously grab the "attention of the world's shellfish growers and consumers" (Tillapaugh, in Island Coastal Economic Trust 2008). Ascertaining 'social license' for the industry is a significant component of achieving intensified production goals and the ongoing staying power of the industry.

In Nuu-chah-nulth territory, the future path is less clear, though the SDI has certainly left imprints. The NSDC is revamping its approach to shellfish ventures and participation in the wider seafood industry, and has the potential to remake the corporation to better suit a variety of economic and non-economic values. Nonetheless, its overarching corporate structure is a part of the historical imprint left by the SDI. The Maa-nulth treaty stipulations make the pursuit of shellfish tenures in a nation's territory more straightforward. However, time windows of opportunity place pressure to develop tenures and simultaneously increase the risks of losing territory or intertidal access over the long-term. Nations may develop or re-establish independent shellfish ventures. However, there is also increasing opportunity to enter into business in partnership with existing shellfish businesses, or to develop tenures for the purposes of sub-leasing them to firms looking to expand. The pressure to develop tenures, and

the risks Nations face in doing so, is a tangible example of how certainty for the Province and industry may increase uncertainty for the Nation.

In a 2007 paper entitled *Sustaining sustained yield: class, politics, and post-war forest regulation in British Columbia*, Scott Prudham identified the “extended political moment” (p. 259) when industrial, sustained yield forestry was institutionalized as the best, or most natural, utilization of BC’s public forests.¹⁰¹ With his analysis, Prudham took a step back from the industry, now dominated by large multinationals and engrained in the provincial psyche, and showed that its regulatory regime and driving purpose were never givens; alternative forest uses and management regimes did exist. He argued that public consent for the privatization of forest access/tenure allocation to multinational corporations was achieved through the simplified representation of complex social and ecological systems in public discourse and development initiatives.

In consideration of the preceding chapters, Prudham’s findings concerning the institutionalization of industrial forestry in BC should now provoke questions concerning the development of BC’s shellfish aquaculture industry and the future of alternative uses of ocean space, including commercial and subsistence shellfish harvests. Has the SDI approach to shellfish aquaculture development worked to institutionalize large-scale commercial shellfish aquaculture as the *status quo*? The findings presented in the dissertation provide evidence to suggest that this may be the case. Moving on now to the final chapter of the dissertation, I will focus on drawing connections among shellfish aquaculture

¹⁰¹ He focused on two Royal Commissions on Forestry held in BC during 1940s and 50s.

expansion, the case study I have presented, and British Columbia's emerging approach to Aboriginal relations.

CHAPTER NINE - OVERVIEW, COMPLEMENTARY RESEARCH, AND CONCLUDING REMARKS

I. Introduction

In British Columbia, the allocation and regulation of private access rights to public forest, fish, energy and mineral resources is a cornerstone of the economy.

Maintaining political-economic certainty, including incentives for industrial resource development and the minimization of conflict over territory, has always been a prominent objective in the governance of Aboriginal peoples and Aboriginal relations. At various historical moments, dispossession, expropriation, legal control and top-down management have been employed to achieve these ends. Narratives regarding the appropriate and efficient use of resources have legitimized structural actions. Nonetheless, rights to land and coastal territory in much of the province currently remain legally and politically un-clarified.

As I argued in the introductory chapters, the lagging BC Treaty Commission process, in combination with changing legal, economic, and social imperatives have created the conditions for the emergence of the 'New Aboriginal Relationship' (NAR). The NAR prioritizes an incremental approach to the reconciliation of Aboriginal and state rights where arrangements to increase Aboriginal access to resources under state-sanctioned arrangements like tenure, quota, permit etc., occur prior to finalized treaty agreements. To develop these resources, it also promotes Aboriginal entrepreneurship and partnership with

non-Aboriginal businesses. While these aspirations may appear novel relative to injustices and exploitation of the past, this research suggests that they stand to encourage the proliferation of uneven power dynamics and/or vulnerability in resource use and development, decrease diversity in options for alternative harvests and self-determination, and obscure alternative paths to sovereignty. Like its predecessors, the NAR favours the continuation of capitalist resource development, while diffusing the potential for resistance and dissent.

The promotion of shellfish aquaculture as a simultaneous strategy for commodity export and economic development provides a fitting case to explore these dynamics. Informed by the projections surmised in Coopers and Lybrand (1997), the 1998 BC Shellfish Development Initiative launched a wave of political, industry, and consultant-based effort to double the amount of ocean space tenured for shellfish aquaculture, and to identify and develop tenures for band owned and operated businesses. Indeed, tenure expansion and Aboriginal participation are the two objectives that, at least initially, were most central to the SDI. In reality, however, the first objective (expansion) simply would not be able to occur without the second (Aboriginal consent and participation).

Specifically, the core chapters of the dissertation have documented the:

- various uses of shellfish in Nuu-chah-nulth territory, overlapping ka:'yu:'k't'h/che:k:tləs7et'h' values in the intertidal clam fishery, and specialized arrangements of rights and property for Aboriginal use and licensing in the commercial fishery (Ch. 4);
- history of the shellfish aquaculture industry and the production of a competitive industry through the co-culture of several exotic species (Ch. 5);

- emergence of initiatives for Nuuchahnulth participation in shellfish aquaculture arising out of the SDI (Ch. 6);
- the role of consultants/experts in defining problems and solutions for Nuuchahnulth participation in shellfish aquaculture and analysis of the KCFN shellfish venture (Ch. 7); and,
- stated and actual outcomes of the SDI and consideration of the work financial projections have done to strengthen the industry (Ch. 8).

With this chapter, I summarize the dissertation and consider the central research findings according to four themes. I also discuss its broader contributions and limitations, and offer recommendations for complementary research and action. Finally, I conclude the dissertation with some closing thoughts on certainty and the NAR more generally.

II. Review and discussion

Nicholas Rose (1999) says that to analyze governance and the dynamics of political power is to consider “what authorities of various sorts wanted to happen, in relation to problems defined how, in pursuit of what objectives, through what strategies and techniques” (p. 20). This point of view is central to my analytical approach, informed by political ecology and designed to explore the politics of shellfish aquaculture expansion on to the WCVI. Ultimately, the dissertation explores why and how industrial shellfish aquaculture has been promoted as an ideal Aboriginal economic development strategy, and documents some outcomes in ka:’yu:’k’t’h/che:k:tl̓es7et’h’ territory.

The research builds out from a case study that identifies overlapping uses of shellfish in Nuuchahnulth territory, documents the coalescence of economic

and non-economic values in the intertidal clam fishery for ka:'yu:'k't'h/che:k:tles7et'h' harvesters, and explores the KCFN owned and operated shellfish aquaculture venture. Interwoven with the ethnographic details, I provided evidence of the work undertaken to encourage Aboriginal interest in expansion, and facilitate tenure allocation in Nuu-chah-nulth territory. Then, to capture how entrepreneurial activity was prioritized and promoted, I looked outwards to consider contemporary state-Aboriginal relations and treaty making in BC. In particular, I identified the neoliberal tendencies of enclosure and depoliticization as being significant in their contributions to the expansionary mandate. Finally, I documented the structural and institutional strengthening that the SDI has facilitated for the industry more broadly.

The findings can be considered in terms of four central themes: (1) the persistence of diverse shellfish values and significance of communal harvest arrangements, (2) the overlapping contingencies that have produced BC's shellfish aquaculture industry, (3) the practices that seek privatized ocean space and encourage entrepreneurial actions in Nuu-chah-nulth territory, and (4) the Shellfish Development Initiative and its institutional effects. Together they suggest that the the incremental NAR approach played a role in advancing tenure expansion into the West Coast of Vancouver Island. They also illustrate that problematic assumptions regarding ecological imperatives and socio-economic objectives in Nuu-chah-nulth territory have complicated the widespread adoption of 'standard industry practice' and increased productivity per hectare of ocean space tenured.

Persistence of diverse shellfish values and harvest arrangements

As evidenced in the words, stories and even recipes I encountered during the research, ecologically indigenous shellfish are valued for important nutritional, cultural, and social attributes by many Nuuchahnulth people. No matter the contribution of commercial shellfish production to local livelihoods, the very act of harvesting, distributing, and consuming local shellfish contributes to individual and/or collective identity, health, and well-being. These findings suggest that the maintenance of communal access to shellfish for a variety of uses is central to retaining diverse opportunities for Nuuchahnulth self-determination and sovereignty.

Further, the DFO managed intertidal clam fishery is one of the last accessible commercial fisheries on the coast, and at least 50% of current license holders are Aboriginal. The fishery remains accessible in that it requires a relatively inexpensive licence (that designates the holder to a harvest area), a boat with an outboard motor, some sacks, flashlight, and a rake. Nuuchahnulth participation in the commercial intertidal harvest is driven largely by financial interest and offers flexible money-earning opportunities to a wide range of participants. However, the ethnographic findings also illustrate that in ka:’yu:’k’t’h/che:k:tles7et’h’ territory, socio-economic, commercial, dietary and cultural values coalesce through participation in the commercial fishery.

The volume of clams harvested from the fishery has declined since the late 1980s, and processors find it more difficult to meet the demands placed on them by international clients. However, BC clam stocks are not of conservation

concern, and the fishery continues to offer short stints of work to a wide range of ka:'yu:'k't'h/che:k:tles7et'h' in the winter months. Further, DFO has developed management arrangements that allow bands to allocate special commercial licenses, identify and develop specific beaches in the pilot beach/communal license program, and harvest shellfish under conditional management plans. The Band Council of the Kyuquot-Checlesheht First Nation has taken advantage of all three of these arrangements, although business planning for shellfish aquaculture did not account for their existing utility.

Overlapping contingencies in the production of BC's shellfish aquaculture industry

Currently, the two most prominent species grown in the BC aquaculture industry are ecologically exotic. Manila clams and Pacific oysters were introduced from Asia to the southern waters of the province in the early decades of the 20th century. Their ranges expanded according to further human introductions and ecological conditions. However, growth rates and densities continue to vary in different regions. Coastal residents, harvesters, and entrepreneurs have long engaged in commercial oyster production. In the 1970s, raft-based culture technology developed in Washington State and was adopted gradually in BC. With this change, oyster culture began to move off the intertidal and into the nearshore. The technology increased oyster growth rates and opened intertidal space for clam culture. High expectations regarding increases in productivity led to the projection of a \$100 million industry by 2007, originally made in Coopers

and Lybrand (1997). The potential for increased production contributed greatly to expansionary interest.

Despite the discourse and business planning that works to naturalize the industry and expansion as simple extensions of existing local ecological processes and cultural practices (for example, Appendices A and F), this research illustrates that species introduction, habitat alteration, advanced growing techniques, and international market demands are what actually underlie the current profitability potential of the BC shellfish aquaculture industry. The profitability of a venture depends on many amenable ecological and socio-economic conditions coalescing in specific tenure sites, over a long period. This being the case, ecological and socio-economic heterogeneity across regions means that choice of tenure location in combination with extensive testing and experimentation for growth rates, etc., are key to business success.

Looking to the future, intensified production technologies and the addition of new species to tenures will likely remain attractive to aquaculture entrepreneurs because they offer new ways to adapt to the localized ecological and socio-cultural conditions and to increase the value of shellfish produced per hectare under tenure. Further, compared to commercial fisheries of wild-growing shellfish, expanded and intensified shellfish aquaculture production is particularly attractive to politicians and participants in the seafood industry (processors, buyers, and some growers). For government, the allocation and regulation of private access tenures is more efficient and profitable. For some growers,

processors, and wholesalers, aquaculture presents the potential for more control over the demands of their clients regarding physical qualities and supply.

Practices that seek ocean space and entrepreneurial actions in Nuu-chah-nulth territory

The 1998 Shellfish Development Initiative (SDI) came on the heels of the Coopers and Lybrand (1997) projection for a \$100 million industry by 2007. With it came a period of extreme optimism, plentiful funding, tenure allocation to Aboriginal groups through treaty-related measures, and the emergence of the Centre for Shellfish Research at Vancouver Island University. It also placed industry advocates in the position to leverage funds, consult as experts for coastal communities, and develop new educational curricula targeted at Aboriginal people and other residents. In other words, expectations regarding the ecological productivity and profit potential of tenures communicated in reports such as Coopers and Lybrand made it easy to tout the financial virtues of aquaculture for rural communities and the provincial economy. However, the projection also made it difficult to accurately weigh the costs and benefits of ocean-based tenures for shellfish farming. In this vein, the dissertation consolidates evidence suggesting how these conditions worked to depoliticize the enclosure of ocean space on the WCVI, an activity that affects existing socio-economic and political relations, public access, right of way along the shoreline, and the weight given to alternative uses of the intertidal.

Treaty-related funding enabled the creation of the Nuu-chah-nulth Shellfish Development Corporation (NSDC). In addition to concerns about

uncontrolled tenure expansion in Nuu-chah-nulth territory, treaty-related agreements and consultant-based business plans provided further incentive for Nuu-chah-nulth communities to pursue tenures in their territory. With an industry advocate as the Executive Director, the NSDC oversaw the development of shellfish businesses in at least ten of fourteen Nuu-chah-nulth communities, including the placement of at least 35 tenures. To this point, the businesses have seen little financial success, leaving it unclear as to what will happen with the tenures and whether the band-owned and operated model will continue. Other options include a single Nuu-chah-nulth business controlling all tenures, lease or transfer of tenures to other non-Nuu-chah-nulth businesses, or to individual Nuu-chah-nulth entrepreneurs.¹⁰²

In the case of the KCFN shellfish business, hopes were initially very high regarding its profit potential. However, consultant-based business planning did not recognize the potential for variance away from the ecological and socio-economic norms of 'standard industry practice'. The problematic assumption, so central to the \$100 million and '50 in 5' projections (that new shellfish farmers would rapidly meet rising 'industry standards'), also appears to have been at play. In this sense, the unrealistic expectations also reflect wider neoliberal assumptions that the initiatives for Aboriginal participation might produce entrepreneurial citizens who would simply meet, and continue to match, rising productivity values. In ka:'yu:k't'h/che:k:tləs7et'h' territory, the experience of the 'failed' tenures seems to have reinforced the need for shellfish aquaculture as an

¹⁰² At least one Nuu-chah-nulth nation has already been approached by another shellfish business regarding a leasing arrangement for existing shellfish tenures.

economic development strategy and/or perceived necessity of shellfish experts to work within the community. Nonetheless, community interest in the commercial intertidal clam fishery remains equally firm; I encountered no evidence to suggest that it would be acceptable for any one shellfish activity to be pursued to the exclusion of another.

Institutional outcomes of the Shellfish Development Initiative

In 2007, the BC shellfish aquaculture industry had a wholesale value of \$32.8 (dropped to \$27 million in 2008), coming from 3339 ha of tenured ocean space. Of course, these numbers fall well below the goal for a \$100 million wholesale industry on 4500 ha by 2007. In particular, intertidal clam production is showing a somewhat counter-intuitive slowing trend. I concluded Chapter Eight by suggesting that although it has not reached its initial spatial or financial objectives, the 1998 Shellfish Development Initiative has nonetheless facilitated institutional and structural strengthening in the industry. As a result, it is better positioned to move towards productivity goals and species diversification in years to come.

Financial projections have been frequently invoked by politicians and industry advocates to argue for continued privatization of ocean space and the allocation of funding to supportive institutions and infrastructural projects. In particular, the BC Shellfish Growers Association and the Centre for Shellfish Research have emerged as winners in this regard. Funding and governmental support have coalesced around both institutions, whose shared vision for intertidal and nearshore ocean space involves private access, increased

productivity and species diversification, and export into international seafood markets. Strong evidence of this vision rests in the fact that both institutions have signed a MoU of cooperation, and are currently placing much focus on new species development, marketing/brand recognition, public relations, and educational programs.

In Nuu-chah-nulth territory, the NSDC is another example of an institution that arose out of the SDI. However, its objectives appear to be more broad. Under new leadership, the Nuu-chah-nulth Seafood Development Corporation is now reconsidering its approach and thinking about how to remake the corporation to better suit a variety of economic and non-economic values. Currently, its focus is on how to achieve successful participation in the wider seafood industry while maintaining local control over territory and rates of development. More shellfish tenures and re-vamped shellfish aquaculture business(es) may or may not become part of this vision. However, any success the Nuu-chah-nulth Seafood Development Corporation achieves in asserting livelihood objectives in Nuu-chah-nulth territory rest in the initial funding and logistical support made possible by the SDI.

On the other hand, in the territories of Maa-nulth nations, treaty stipulations have the potential to affect the pace at which tenures are placed and developed. Technically, Maa-nulth nations may choose not to develop tenures set aside in the treaty. However, the limited time windows written into the agreement places pressure to develop tenures or lose them after 25 years, and thus, increase the risks of losing territory or intertidal access over the longer-

term. Further, there is increasing opportunity to enter into partnership with existing shellfish businesses, or to develop tenures for the purposes of sub-leasing them to firms looking to expand into more remote regions of the province. Of course, only time will reveal exactly how many tenures are placed in Maa-nulth territories and who will benefit from their development. The pressure to develop tenures, and the risks Nations face in doing so, is tangible reminder that certainty from the perspective of the state or industry may be somewhat different from how it is experienced by the Nation or its members.

III. Research contributions

The case study of shellfish aquaculture expansion on the WCVI was presented in the context of changing approaches to Aboriginal relations in BC. Through negotiations and pre-treaty funding and agreements, Nuu-chah-nulth communities were targeted as beneficiaries of tenures that grant private access to ocean space and require the industrial production of shellfish. However, the communal harvest of numerous wild-growing shellfish species already contributed to the cultural, nutritional, and economic well-being of many Nuu-chah-nulth individuals and communities. The tensions that ensued reaffirm the significance of self-determined resource use as a central element of Aboriginal sovereignty, and clarify the potential that initiatives for capitalist resource development in Aboriginal communities have to reproduce uneven power dynamics and social inequality in the province. In this regard, the dissertation invites critical reflection regarding the NAR approach to Aboriginal relations.

Informed by literature regarding neoliberalism and governance, I identified privatization, enclosure, and depoliticization to be facilitating the re-regulation and re-conceptualization of tenured ocean space as an ideal starting point for economic development in coastal Aboriginal communities. Nuuchahnulth territory was incorporated into promising financial projections regarding the shellfish aquaculture industry, the Shellfish Development Initiative created the need for development assistance and formalized roles for shellfish experts, while treaty-related mechanisms placed new private access tenures and funded band-owned and operated ventures. This top-down approach did not lend itself to an accurate and contextually sensitive consideration of the costs and benefits of band-owned and operated ventures. These findings reveal the problematic nature of social, economic, and ecological assumptions regarding the potential of shellfish aquaculture on the WCVI, and confirm significant difficulties in governing nature and society through market-inspired initiatives.

Analytically, the diverse data I collected, and thus the perspectives from which I considered shellfish aquaculture expansion, led me to incorporate both neo-Marxist and post-structuralist theory. In political ecology, it has been rare for these approaches to overlap in a single piece of scholarship (Li 2007). However, I would argue that they present the opportunity for a researcher to engage with the varied processes by which power, and in turn, governance proceeds across scales and over time. Neo-Marxist theory and scholarship was certainly valuable in that it led me to trace the neoliberal logic that both society and nature are best governed as market-like systems. However, post-structuralism encouraged my

analysis of the discursive constructions of shellfish aquaculture and the implications of expert intervention and socio-economic vulnerability in the case of the venture in ka:'yu:'k't'h/che:k:tl̥s7et'h' territory. In combination, the two theoretical perspectives allowed an integrated analysis of environmental governance in action.

In the realm of industrial food production, aquaculture is relatively new. In Canada, industrial aquaculture is gaining attention for its economic potential, and it is indeed quite likely that it will continue to be pursued and promoted as a beneficial development strategy for communities in numerous coastal regions of the country (VanderZwaag & Chao 2006). While industrial aquaculture may offer benefit to some entrepreneurs and consumers, the dissertation also serves as a reminder that political efforts to see aquaculture expand may misestimate or misrepresent local social and ecological imperatives, and in turn, stand to impact existing practices and ways of life that already make important contributions to community well-being. Research that employs a political ecology approach is well positioned to document unintended or unjust consequences in the re-regulation and allocation of ocean space for industrial seafood production, and to capture how these activities are presented to coastal residents and Canadian citizens (for whom public resources are ultimately managed). This dissertation illustrates the necessity of such work, and provides an example and framework for future researchers.

IV. Some limitations and recommendations for complementary work

In documenting a series of events that have unfolded on the WCVI and analyzing them against the broader politics of aquaculture expansion and state-Aboriginal relations, this research identifies a pattern in the way that ocean space has been regulated and allocated for shellfish aquaculture in BC. Given the existence of initiatives for Aboriginal participation in shellfish aquaculture in regions beyond the WCVI (more below), and the encompassing nature of treaty negotiations in the province, there is reason to believe that the pattern may be repeating itself more broadly. Nonetheless, the research findings presented here do not confirm repetition or speak to outcomes or implications of interventions for Aboriginal aquaculture businesses in different communities or regions. Case-specific research in other parts of the province would be necessary before in-depth comment or comparison of existing shellfish values, funding, business planning, and tenure placement, etc. would be possible. This limitation is simply a reality of case-based research. However, the dissertation does not speak to the potential ecological and legal implications of aquaculture expansion, nor have I conducted a detailed cost-benefit analysis of the enclosure of ocean space for tenure in ka:'yu:k't'h/che:k:tles7et'h' territory. These limitations require further elaboration here.

First, I have not quantified shellfish growth rates on the WCVI, or on the specific tenures developed by the KCFN. Further, I have not conducted any experimentation that enables me to hypothesize regarding the cumulative ecological impacts of shellfish aquaculture on the WCVI. As discussed in Chapter

Five, my observations regarding the potential implications of varying shellfish growth rates on the NW coast of Vancouver Island rest on shellfish assessment reports by DFO (i.e., Gillespie & Bourne 1998; Department of Fisheries and Oceans 1999; Gillespie & Bourne 2005). The values in these reports were reconfirmed in the repeated assertion by ka:'yu:'k't'h/che:k:tes7et'h' individuals that shellfish reach harvestable size anywhere between 1-3 years later than they do on the east coast of the island. Work to establish growth rates of wild-grown and hatchery-reared shellfish at different tenure sites would be useful, particularly in calculating costs and benefits of enclosure for shellfish aquaculture in specific locations. As also discussed in Chapter Five, a paucity of research on the cumulative ecological impacts of shellfish aquaculture in BC exists. The findings from this research indicate that further research on the topic is warranted, particularly as shellfish tenures expand and the diversity of shellfish species farmed grows.

Second, the research has not undertaken a legal analysis of the possibility that Aboriginal rights and title may extend out into ocean space, or considered the impact that aquaculture expansion may have on debates related to the recognition, compensation, or accommodation of said rights and title. However, there is reason to believe that these issues may enter the courts if expansion

continues to proceed, and production continues to intensify.¹⁰³ Finally, I have not conducted an in-depth, quantitative cost-benefit analysis of conversion to tenure in the case of the venture in ka:'yu:'k't'h/che:k:tes7et'h' territory. Research of this nature would require consideration of the distribution of intertidal shellfish licenses and the calculation of individual incomes from the harvest, the quantification of cultural/social/health values attached to the subsistence harvest, the costs of any ecological impacts of shellfish aquaculture, as well as consideration of values that might arise from alternative uses like ecotourism or conservation.

The politics and implications of shellfish aquaculture expansion, and industrial aquaculture expansion more generally, is a topic that I believe requires immediate and careful attention from researchers across a range of academic disciplines. I recommend that research regarding cumulative ecological impacts, including consideration of a diversification in the species grown in BC, detailed analysis of the legal implications of enclosure for tenure, and meaningful cost-benefit analysis of said enclosure, inform future decisions and policy regarding shellfish aquaculture expansion. Below I identify two threads of complementary work that illustrate the significance of this recommendation. In addition to

¹⁰³ For example, in November 2009, five Nuu-chah-nulth nations (Ehattesaht, Mowachaht/Muchalaht, Hesquiaht, Ahousaht, and Tla-o-qui-aht) won a BC Supreme Court case arguing that the *Fisheries Act*, including DFO management of many major fisheries, has infringed on rights to harvest and sell fish. However, the court did not recognize Aboriginal rights and title to ocean space.

The First Nations Fisheries Council has sought legal council on the issue of ocean tenures for aquaculture in BC, their implications for rights and title, and roles and responsibilities that may be implicated by the 2008 Hinkson decision (see http://www.fnfisheriescouncil.ca/index.php/more-info/search-documents/doc_details/489-legal-opinion-summary).

broadening understanding, the recommended work would strengthen the findings in this dissertation by comparing the way that tenure allocation and development is occurring in other parts of the province.

Complementary work: expansion on the central and north coast

The WCVI is not the only remote region of the province to receive attention for its shellfish growing potential. Aboriginal communities on the central and north coast of the province (including Haida Gwaii) have also become involved with shellfish aquaculture. In 2001-2002, an initiative to build shellfish aquaculture on the north coast was launched in partnership with The Turning Point Initiative and the Tsimshian Stewardship Committee. These two organizations bring together 12 coastal First Nations (Kingzett & Norgard 2003), none of whom has ratified treaty agreements. To initiate the north coast project, Lands and Water British Columbia, Inc. commissioned a strategy document, undertaken by a consulting firm (see Kingzett & Salmon 2002). Of course, that industry-based consultants were largely responsible for the logistics and business planning in this case represents a similarity to the research presented in the previous chapters.

In an aquaculture industry magazine, Kingzett and Norgard (2003) described their approach to the development initiative as being highly experimental. They wrote,

(a) variety of species and deepwater culture techniques are being tested at each site. Pacific Oysters are being grown in two styles of stacked trays, and in string-cultch methods, while Blue and Mediterranean mussels are both being grown in High Flow trays. Japanese scallop juveniles were seeded into pearl nets. Three species of kelp are also being tested at four sites. Seed from the same sources was deployed at each site and is being monitored almost simultaneously... A rigorous program of monitoring growth survival and environmental parameters is being used (p. 6)

Their approach appears to diverge from that applied in Nuu-chah-nulth territory in that experimentation with various growing techniques, numerous species, and deliberately testing growth rates has occurred. In theory, this information would allow for more informed decisions about how to proceed with a shellfish aquaculture business, or whether shellfish aquaculture is the optimal use of that particular ocean space at all. Knowledge such as this could have been beneficial in the Nuu-chah-nulth case. However, I would also note that the experimentation referred to here has the potential to help non-Aboriginal industry interests understand ecological conditions and growth rates in this relatively un-tenured part of the province. In this sense, funding and planning for Aboriginal participation stands to benefit the wider industry.

In a 2009 guest editorial in the *Vancouver Sun* on the wider Turning Point Initiative Executive Director, Art Sterritt, writes,

(w)e had a choice. We could miss the boat and watch development dollars and markets go to other stakeholders and other countries or actively promote the development of a strong, diversified environmentally sensitive shellfish aquaculture industry. We chose to act (Sterritt 2009).

The passage evokes a sense of pressure similar to that experienced in Nuu-chah-nulth territory. Yet, Sterritt (2009) also suggested that, “(c)ommunities have wholeheartedly embraced this shellfish-aquaculture opportunity”, and that “relationships have been forged with multinational and international corporations to move the project from what some believed was an impossible goal to a reality that will include nine farms and a hatchery”. The dichotomy between the two statements suggests that in-depth research regarding perceptions, risks, and costs/ benefits, as well as the power dynamics of governance, could be revealing

and provide a useful comparison to the case presented in this dissertation. It will be important to have an understanding of events in this region if expansionary pressure continues.

Complementary work: the role of new species and the ongoing allocation of rural tenures

Producing a range of species and/or products is increasingly central to maintaining profitability in the seafood industry (Young et al. 1999; Mansfield 2003a,b; Muir 2005; Evers & Knight 2008). As indicated in Chapter Eight (Table 8.3 in particular), diversifying the permitted mix of species grown in BC is currently receiving attention for its potential to increase the competitiveness and profitability of the shellfish industry. Seeing the number of different species farmed grow requires advancement in the areas of regulation and policy, genetics, husbandry, processing, and marketing.

In his assessment of the economic impact and future economic potential of the BC shellfish industry, Salter (2002) predicts that new species will include “abalone, geoduck, tilapia and a host of other species; each with varying potential in a given area” (p. 30). He goes on to note that “(n)ew species cultivation is most likely to happen with experienced operators”, and that “(t)hose operators are located in areas with the least biophysical capacity (ibid)”. This would suggest that the space required for larger tenures and diversified shellfish production rests in more remote regions of the province (i.e., away from Baynes Sound). However, experienced and/or profitable operators would be the firms most likely to pursue diversified production first. If Salter is correct, the pattern of

depoliticized enclosure in remote coastal regions stands to intensify. Large and/or established shellfish operations may seek more tenures in remote regions, particularly if new species offer the higher profit margins necessary to overcome the logistical costs of business further from processing and transportation centres.

Ongoing attention must be paid to how new tenures in remote regions are allocated and used over time. Will the parties who originally attain tenures retain and develop them over time, or, will they be rented/leased/transferred to third parties? Is there increasing possibility that, similar to the BC salmon aquaculture industry, tenures will consolidate in the hands of a few firms, thus reducing potential for new entrants or small businesses? Might these trends actually decrease the territory available to Aboriginal communities for non-industrial shellfish harvests as the years go by? These are questions of justice and equity, and as I have shown, the answers matter deeply to community well-being, and meaningful opportunities for self-determination and sovereignty.

V. Conclusions

The objectives of this research included documenting the multiple values of shellfish in Nuu-chah-nulth territory, exploring the drivers of tenure expansion in BC, and investigating ka:'yu:'k't'h/che:k:tles7et'h' experiences with shellfish aquaculture as a community economic development strategy. In analyzing the data and writing the dissertation, a wider objective was also to frame the findings within the broader context of the politics of the New Aboriginal Relationship. Aspirations for certainty emerged as a central theme.

For ka:'yu:'k't'h/che:k:tl̥e7e't'h' harvesters, certainty appears to rest in the flexibility to maintain certain ways of being within indigenous territory, including the opportunity to freely pursue both economic and non-economic values from shellfish. Aquaculture and other aquatic business opportunities seem to be perceived as but one in a suite of ocean-based activities that could contribute to the overall well-being of the community. Alternatively, certainty for state and the shellfish industry seems to rest in the assurance that private access to productive ocean space will proceed into the future, and that international market demands for specific species and volumes can be met. To achieve this outcome, tenure placement had to expand into different parts of the province and mean productivity per hectare had to increase. In the process, Aboriginal territory and livelihoods were implicated through initiatives for shellfish business development. Be it in modified habitat and local property relations, or through inserting incentives for industrial resource production into treaty-related agreements, altered relationships to territory and new entrepreneurial approaches to community development represent the ultimate manifestation of this vision of certainty in this case. In these contradictions, certainty in the first sense remains elusive, or perhaps, generally misunderstood by the actors who promote the expansionary mandate.

Whether the outcome of court decisions, treaty making, or agreements to reconcile rights outside of the BCTC process, new access to traditional territories and the resources within them will only continue to be recognized, or perhaps, legislated for Aboriginal groups in BC. Through the NAR and similar incremental

approaches, the next decade is bound to bear witness to unprecedented Aboriginal entrepreneurship and Aboriginal-led resource related development in the province. Indeed, increased Aboriginal participation in resource development is novel considered against the province's longer history of injustice, exclusion and exploitation. However, as this research suggests, increased participation through state regulated and allocated private access rights does not necessarily ensure the equitable distribution of benefit, nor does it give equal weight to alternative visions for resource use and their relationship to self-determination and sovereignty. Thus, along with the inevitable success stories, disparities and disputes will persist through the NAR approach, and perhaps, stand to grow even wider. Politicians, other public leaders, and researchers must be vigilant and acknowledge the existence and implications of multiple perceptions of certainty.

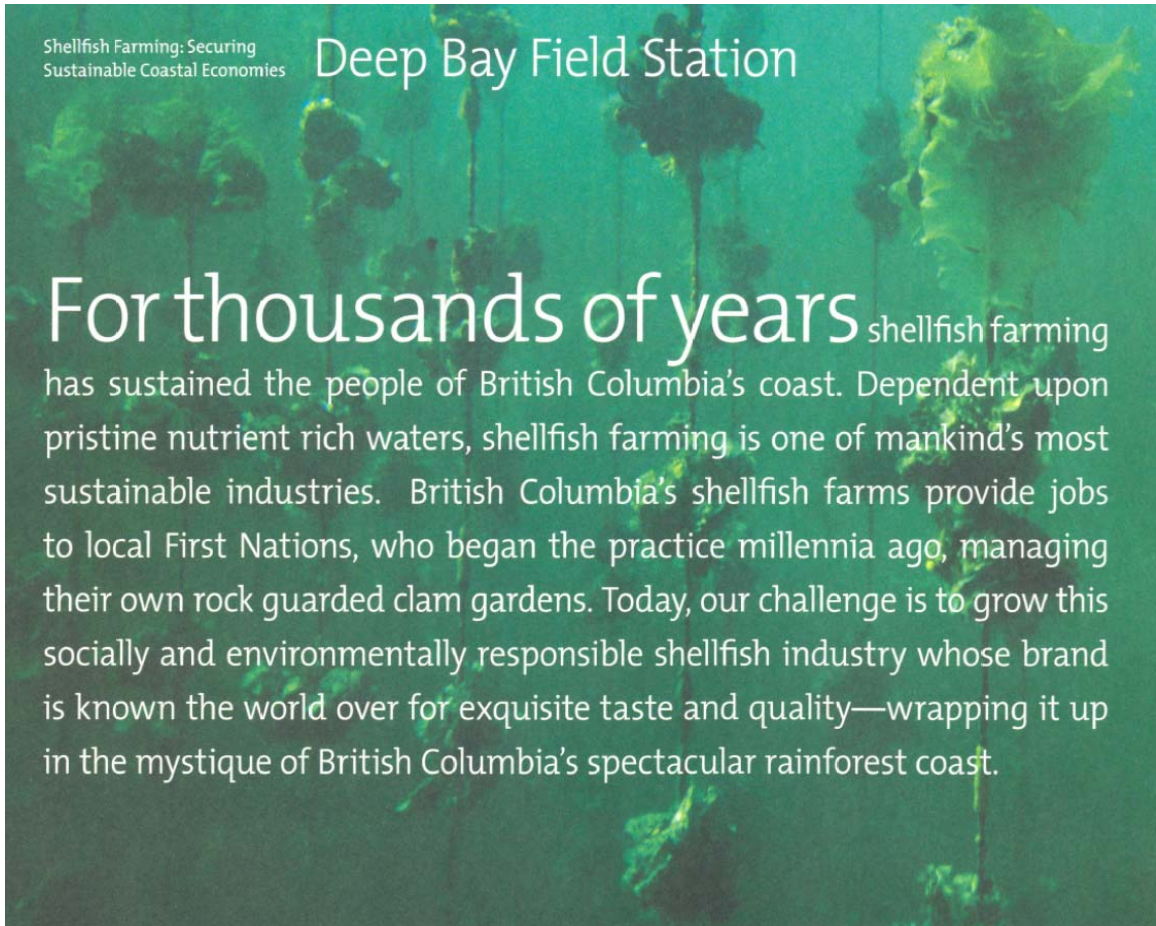
Finally, in the broadest sense, the findings suggest that the allocation of private property rights for industrial development persists as a central factor in the governance of Aboriginal peoples and their diverse relationships with swathes of territory. Structurally, directed funds, time-limited private access rights woven into treaty agreements and the promotion of business partnerships between Aboriginal and non-Aboriginal entities, are incentives designed to guide communities towards certain types of resource use. Discursively, what was once the work of colonial narratives regarding vacant land and underutilized resources has come to be legitimized by neoliberal threads regarding the cultural amenability of enclosure, the empowering potential of entrepreneurial capacity building, and the appropriateness of the market to meet any number of social,

economic, and environmental needs. Certainly, these signs suggest a powerful perception of 'development' as the production of surplus through wage labour and the export of raw resource commodities in order to 'float all boats'. However, the changing nature of approaches to Aboriginal rights and title that has characterized the last few decades of the province's political history also suggests the counteractive strength of localized resistances and broader collective actions.

APPENDICES

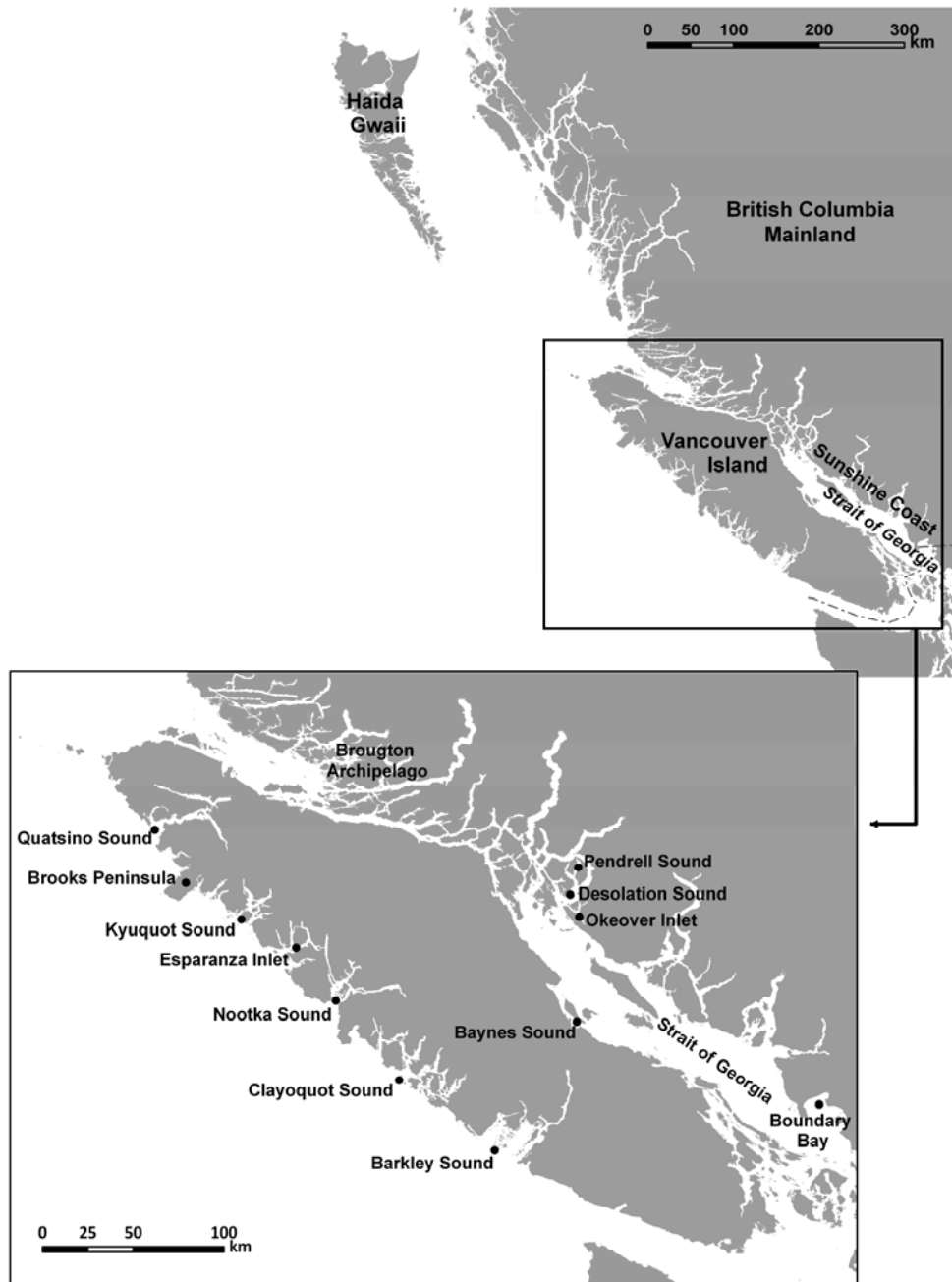
Appendix A

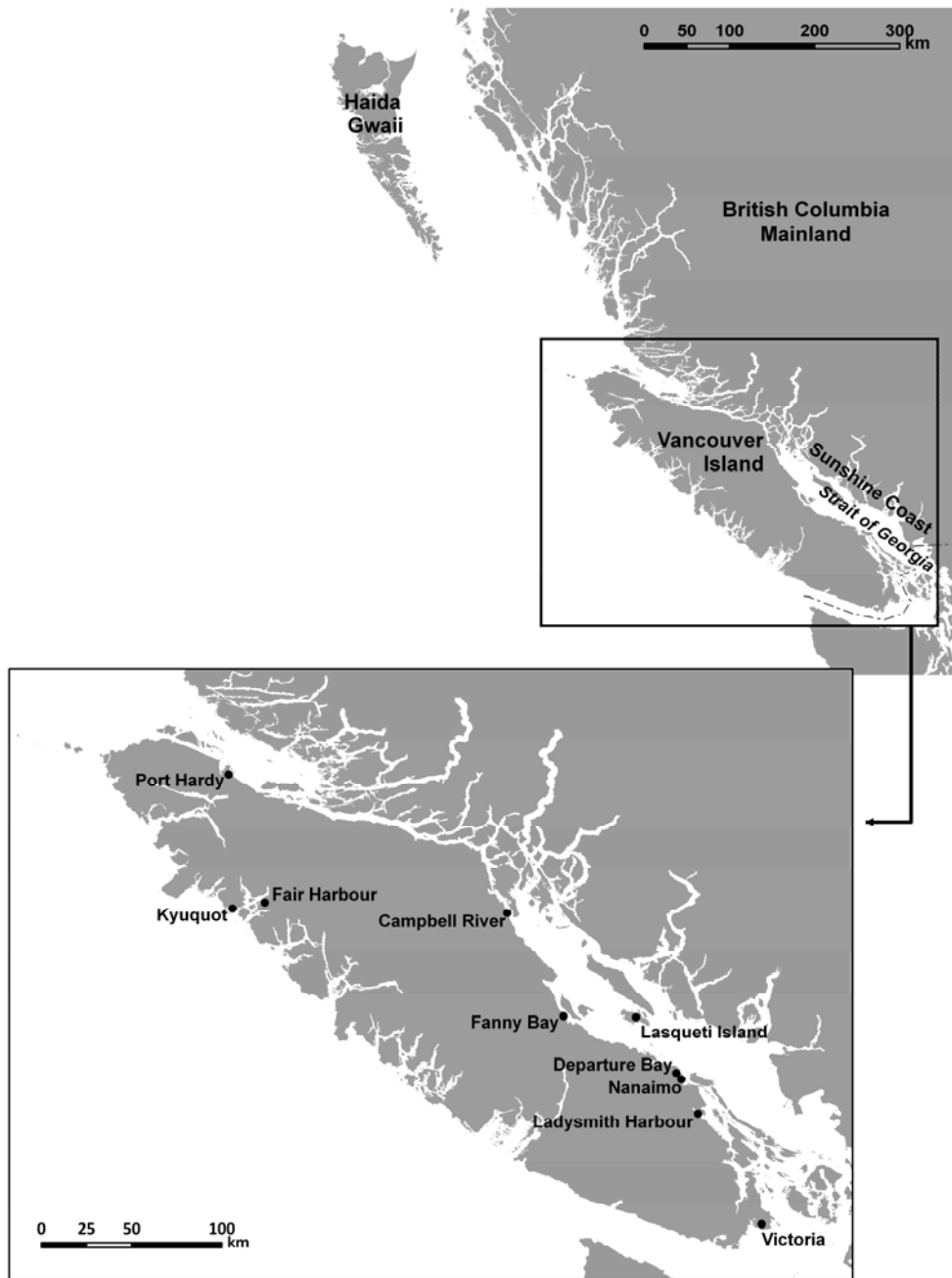
Cover of promotional booklet for the Deep Bay Field Station, scheduled to open in Baynes Sound in the autumn of 2010. The field station is the newest infrastructural addition to Vancouver Island University's Centre for Shellfish Research, founded in 2001.



Appendix B

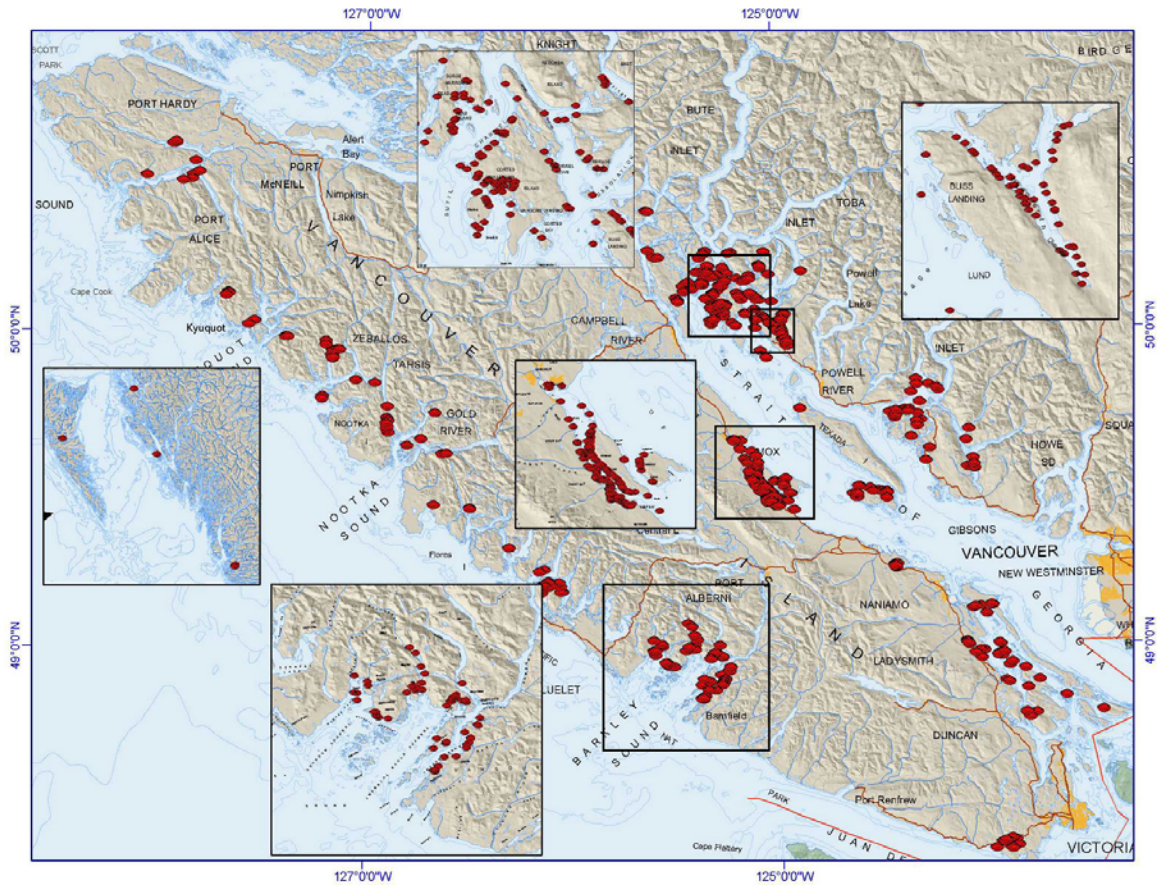
Maps of coastal BC identifying bodies of water and human settlements identified in the dissertation (maps by J.Barrett 2010. Base map: *Watershed Atlas, Integrated Land Management Bureau of BC*).





Appendix C

Shellfish Tenure Locations in BC (BCSGA 2007a)



Appendix D

Overview of data collection activities.

Year	Activities
2005	<ul style="list-style-type: none"> • Field stay: July & August • Background building by reading and collecting policy documents and relevant literature
2006	<ul style="list-style-type: none"> • Field stay: May & June • Phone interviews with various authorities on shellfish and seafood • Background building on historical clam management and reform in BC • Collection of contextual data
2007	<ul style="list-style-type: none"> • Field stay: September – late November • Phone interviews with various authorities and government officials • Analysis of the KCFN shellfish aquaculture venture • Analysis of Maa-nulth treaty and treaty-related agreements and documents • Exploration into the 1998 BC Shellfish Development Initiative (objectives and implementation) • Analysis of the BC Treaty Commission and BC's New Aboriginal Relationship • Analysis of testimony to Senate, Federal, and Provincial 'fact-finding' committees regarding aquaculture • Collection of contextual data • Adoption of dual neo-Marxian – Foucauldian framework regarding why shellfish aquaculture was being pursued, and how it was being advanced through Aboriginal participation
2008	<ul style="list-style-type: none"> • Field visit: five days in May • Exploration of larger (national and international) trends in aquaculture development • Attendance at the EAT!Vancouver food trade show • Collection of contextual data • Formal analysis and case study formulation begins
2009	<ul style="list-style-type: none"> • Field visit: one week in May • Attend/participate in Aquaculture Industry of Canada meetings • Collection of contextual data • Continued testing of findings against local conditions and alternative interpretations

Appendix E

Range of interview questions used in fall 2007 (tailored to interviewee)

- **Livelihood**
 - What do you do for a living
 - Do you run any of your own businesses?
 - How do you think a treaty settlement will change Kyuquot?
 - What is your opinion of the shellfish industry?

- **Clams: History and Background**
 - How important is clam harvesting to your income (e.g., – 1st, 2nd, 3rd, ...)
 - How long have you harvested clams?
 - What kind of license do you have?
 - Where do you harvest?
 - Who do you sell clams to?
 - What changes have you noticed in the clam fishery since you started digging?
 - What makes a successful businessperson?

- **Clams: Future**
 - What beneficial characteristics does Kyuquot have that help it in the shellfish industry?
 - What beneficial characteristics do your people have that help them in the shellfish industry?
 - Could the shellfish industry be better in Kyuquot?
 - What do you think makes a successful clam harvester?
 - What do you think makes a successful clam buyer or harvester?
 - Do you think you will still be digging clams in five years? Describe how you see the shellfish industry working 5 years from now.

Appendix F

Vancouver Island Economic Developers Association news release announcing 2006 'Shellfish West' marketing campaign.



NEWS RELEASE

FOR IMMEDIATE RELEASE

February 10, 2006

Let Our World Be Your Oyster

With the immensely attractive offer to 'let their world be your oyster,' the Vancouver Island Economic Developers Association (VIEDA) has launched its new Shellfish West marketing campaign.

The marketing materials and website are aimed at a national and international audience of investors interested in developing shellfish processing capacity in support of the emerging shellfish industry on Canada's West Coast.

With increasingly rare opportunities in the world for pristine shellfish growing areas, the Canadian west coast offers an abundance of potential sites. This capacity is supported by cutting-edge shellfish research facilities and a highly skilled and willing work force. Further, governments at all levels are interested in developing and supporting the industry. These features alone make the West Coast a prime location for a shellfish processing plant or hatchery.

- 15 -

The "Let Our World Be Your Oyster" campaign features a brochure, tradeshow booth, and most impressively, a beautiful new website at **shellfishwest.com**.

The website and brochure were designed to save potential investors valuable time by offering reliable, comprehensive data about the Canadian west coast shellfish industry.

"We asked ourselves what we would want to know to help us make the decision to go ahead if we were interested in investing in the shellfish industry," said VIEDA president Marilyn Hutchinson. "The website provides very in-depth, high quality information about the region, the industry, and the investment opportunities offered here."

The marketing materials are also visually impressive, drawing from the location they promote.

"Canada's West Coast offers some of the world's most beautiful, pristine, marine geography, and we wanted to highlight this feature," said Hutchinson. "What better way to prove our claim than with these striking pictures?"

"We want to underline the fact that West Coast communities are attuned to the needs of investors, and that we have a truly impressive offer for them. We anticipate that after getting the information out about our shellfish industry, investors will seize the opportunity for sustainable, long-term growth that is now available on our coast," she said.

VIEDA offers assistance to potential investors with site identification, introduction to community leaders and business case preparation.

In addition to their website and brochures, the Vancouver Island Economic Developers Association's marketing efforts include attendance at trade shows across Canada, the United States and abroad. Industry partners interested in selling product to export markets join VIEDA at the shows.

For more information contact Blair Salter, VIEDA's marketing manager, at 604-943-1170 or visit the shellfishwest.com website.

Appendix G

Public relations image and PacificKiss brand label produced by the BC Shellfish Growers Association.¹⁰⁴




BC
SHELLFISH GROWERS
ASSOCIATION

Contact us with questions or
product requests, anytime.

BCSGA - Unit F, 2002 Comox Avenue, Comox, BC
T: 250 890 7561 | www.bcsga.ca



¹⁰⁴See <http://www.bcsga.ca/wp-content/uploads/2007/06/2010-Guide-Footer.jpg>, and <http://www.pacifickiss.ca/>. Last Accessed January 24, 2010.

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