Understanding Values in Canada's North Pacific:

Capturing Values from Commercial Fisheries

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Prepared by Ecotrust Canada and the T. Buck Suzuki Foundation

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ABOUT THE AUTHORS

T. Buck Suzuki Environmental Foundation
The T. Buck Suzuki Foundation was founded in 1981 by commercial fishermen to protect habitat, prevent pollution, and promote sustainable fisheries. The Foundation strongly supports ecosystem based management using integrated marine planning to get there, connecting decision makers with affected communities and stakeholders through open, collaborative processes.

Ecotrust Canada
Ecotrust Canada is a registered charity that works in partnership with others to find solutions for the challenges facing our communities and our economies in the 21st century. We have over 15 years' experience working from the bottom-up to create an alternative approach to development – an approach that recognizes that financial, environmental and social/cultural interests be in better balance if we are to achieve long term reliable prosperity.

Because the fishing industry is a key economic driver in coastal B.C. we have worked extensively with fishing enterprises, fishing associations and departmental ministries to conduct research, provide training, deliver monitoring services, create decision-support tools, and support marketing and sales efforts. Our fisheries team is respected in both NGO and industry circles for their approach and integrity.

Ecotrust Canada maintains a staffed office in Prince Rupert that is directly involved with the commercial fishing fleet both through the provision of monitoring/observing programs and through community-based fisheries business planning.

EXECUTIVE SUMMARY

Often the role commercial fishing plays in communities is poorly documented; this is the case in Canada's Pacific North Coast. To address this gap, this study documents the full suite of values that wild-capture-commercial fishing brings to communities in Canada's Pacific North Coast Integrated Management Area (PNCIMA). Our findings illustrate that the role commercial fisheries play in the formal economy is just the tip of the iceberg of the full suite of values that they bring to communities. Our hope is that our results can inform fisheries management and policy in British Columbia and the ongoing integrated marine planning processes.

To address the complex threats to our oceans, fishery management and integrated marine planning aim to meet ecological, economic and social objectives. In order to have effective management and planning processes, it is essential for decision-makers to understand and include impacts of all marine users and resources. In BC, commercial wild-capture fishermen (henceforth referred to as 'fishermen') are historically important stakeholders of the marine environment, but the full value that this industry brings to families and communities is not well documented. A recent socio-economic and cultural assessment of PNCIMA[1] provides valuable information for decision-making (e.g. the role commercial fisheries play in the regional and provincial formal economy), but this study acknowledges that important gaps still exist. For example, there is a lack of community-level information about the role commercial fisheries play in supporting local economies. The study notes that another important data gap is the lack of detailed information about the key role commercial fishing plays in both First Nations and non-First Nations communities. Another study[2] has developed a framework for thinking and classifying Valued Socio-Economic Components (VSECs) – elements of social-ecological system that humans view as significant or valuable – but little information is available about the intangible values, specifically those associated with commercial fishing in PNCIMA. The risk of limited access to information on the intangible value of a sector is that the full value of that sector could be greatly underestimated.

In this study we document the full suite of tangible financial, other tangible, and intangible values that wild-capture-commercial fishing brings to families and communities in PNCIMA. It is especially important, and relatively uncommon, to characterize the less tangible values an industry brings to a community because commercial activities can make large contributions to social capital. An economy can be defined in terms of its capital (i.e. assets available for use) and the production, consumption, and transfer of that capital. There are various types of capital including financial capital (money), fixed capital (machinery and infrastructure), natural capital (natural resources), human capital (labor), and social capital (social networks and community). Overall, social capital is perhaps the most difficult type of capital to define and measure, but is often vaguely but intuitively described as 'the glue of trust among society and social networks that holds the economy together.' Some studies suggest that high social capital is associated with improved economic and social well-being as households that are more connected to others in their community tend to, for example, have higher incomes and better health[3]. Social capital also captures the idea that social bonds and norms are critical for sustainability. The

exchange of goods or knowledge among people and/or continued relationships over time (i.e. reciprocity) contributes to long-term obligations between people, establishes rules of engagement, and builds trust[4]. With these bonds, people can have the confidence to invest in collective activities (like resource management), knowing that others will do so too[5]. Because less tangible values, like social capital, describe the structure and functioning of communities, understanding these values will lead to better-informed fisheries management and social objectives for integrated marine planning (e.g. the PNCIMA process) and will support economic objectives because less tangible values affect the formal economy.

We present our study and findings in two parts:

Part 1 - Approach:

We summarized PNCIMA regional economic value of commercial wild-capture fishing based on landings. This part of the report provides context for understanding the resources in the region and how access to these resources has changed over time.

Part 1 - Summary of Findings:

In terms of the formal economy, PNCIMA had some of the most valuable (cumulative landed dollar value) fishing areas in Canada's Pacific Coast. In 2010, those fishing areas in PNCIMA yielded $167 million in landed value which ballooned to $415 million in wholesale value – just over half of that year's province-wide marine wild-capture wholesale value.

By mapping the landed value of PNCIMA commercial fisheries, we provide information useful for integrated marine planning. Evaluating which fishing areas are most economically valuable at different spatial scales revealed a complex pattern: depending on the spatial scale, we found different areas are most-to-least important for particular fisheries and/or particular years. This complexity suggests that decision-makers should consider the effects of planning options on a variety of spatial and temporal scales and combinations of fisheries to fully understand impacts.

Part 2 - Approach:

We characterized the less tangible socioeconomic and cultural values that commercial fishing contributes to PNCIMA fishermen, families, and the communities of Prince Rupert and Lax Kw'alaams. This case study is based on key informant interviews with fishermen. From interview responses we highlight four major themes: 1) economic ripple effects from respondents' fishing expenditures, 2) the role commercial fishing vessels plays in the gifting and trading of seafood, 3) the lifestyle of commercial fishermen, and 4) the intergenerational significance of commercial fishing.

Part 2 - Summary of Findings:

Revenue from PNCIMA commercial fisheries supports local formal economies. Revenue from fishing that fishermen spent on fishing supplies rippled through hundreds of different businesses, especially in Prince Rupert, the main port for the fishermen interviewed. Our interviews revealed that revenue supported communities far beyond the fishermen

themselves. The 23 fishermen we interviewed financially supported more than 200 different individuals or businesses, concentrated in Prince Rupert, but from as far away as Japan, to equip or maintain their fishing operations.

In addition to playing an important economic role in the formal economy, our results indicate that the commercial fishing industry permeates the social, cultural, and economic interactions between people and their environment in our case study communities. In other words, participation in commercial fishing created complex networks between fishermen, their families, and the community at large.

The gifting and trading of seafood caught on commercial vessels created a 'food community' that provided everything from food security to ensuring higher standing in the community. During interviews, fishermen talked at length about the key role played by commercial vessels in a surprisingly large and complex system of gifting and trading seafood. Respondents reported that each year about 100 people received food from an individual respondent as a gift or in trade. Thus, over 2,000 people received seafood as a gift or in trade annually from the 20 respondents who answered this question.

Overwhelmingly, participation in the commercial fishing industry was not viewed solely as employment, but as a lifestyle that connected people to each other, to their communities and to the physical space they occupy. In fact, our respondents identified many of the less tangible aspects of commercial fishing as the most important to them. The cultural connections inherent to their participation in the industry and the hope to share them with future generations were the strongest value associations. The provisioning of food was also important to respondents, as well as values found in stewardship, education, lifestyle, and income. They told stories of important life skills and lessons learned through fishing and the culture that the tradition of the industry has created in people's daily lives and the lessons they pass down to their children.

Conclusions:

The wild-capture commercial fishing industry in Canada's Pacific North Coast plays an important role in the formal economy and beyond, contributing 100's of millions of dollars in economic output and a full suite of further less tangible values to fishermen and their communities. Although these non-monetary values are less apparent or measurable in the formal economy, they contribute significantly to social capital, well-being, and resilience of coastal communities and therefore economies. Therefore, this full suite of benefits of commercial fisheries should be considered during fishery management and integrated marine planning. In addition, our approach to synthesizing interview information provides a coherent means to summarize the complex inter-relationships among tangible financial, other tangible, and intangible values that were characteristic of each interview. This approach to understanding less tangible values could easily be applied to industries beyond commercial fisheries.

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SECTION 1: BACKGROUND

Because our study aims to inform fisheries management and policy in British Columbia and the ongoing integrated marine planning processes, here we provide an introduction to and an overview of those subjects.

The ability of global marine ecosystems to provide the goods and services people need is increasingly under stress. Marine ecosystems provide food for billions of people, they regulate climate, produce most of the oxygen we breathe, and in addition, seafaring traditions are at the core of many cultures [6–10]. Globally, the cumulative effects of overfishing[a], pollution, habitat destruction and climate change are threatening ocean health and its ability to provide vital goods and services[11–14].

Maintaining healthy global oceans as existing pressures continue, new ones emerge, and human populations increase, requires a comprehensive and adaptive approach to fishery management and integrated marine planning.

1.1. Fishery management & integrated marine planning: incorporating less tangible values

In Canada, the Sustainable Fisheries Framework states that fishery management strives to foster environmentally sustainable fisheries that also support economic prosperity in the fishing industry and fishing communities[15].

Effective integrated marine planning[b], as it is termed in Canada[16], must meet ecological, economic and social objectives. To understand and include the interests and impacts of all marine users and resources, decision-makers rely on comprehensive ecological and socio-economic data to support integrated management.

To date, fishery management in Canada and integrated marine planning globally have considered mostly tangible environmental and some economic factors, but the less tangible social and cultural factors are emerging as important to understand. The locations and amounts of species, habitats, and human activities, and the costs and benefits (in dollar values or

[a] Overfishing has multiple meanings beyond "fishermen taking too many fish". Ray Hilborn explores the many definitions in his 2012 book "Overfishing: what everyone needs to know". Here we are referring to the biologically destructive types of overfishing that drive stocks towards extinction.

[b] Integrated marine planning is the term used in Canada, though ecosystem-based Marine Spatial Planning (MSP) is another common moniker used globally. MSP is emerging as a comprehensive governance framework designed to move away from sector-by-sector management and to inform the spatial distribution of ocean activities in ways that will support current and future uses, reduce conflicts, and sustain ecosystem health and services.

number of jobs) of zoning options are common datasets used in integrated marine planning[17]. Increasingly, however, there is interest in expanding understanding about less tangible benefits known as Cultural Ecosystem Services (CES)[18,19] the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience including, e.g., knowledge systems, social systems and aesthetic values[20]. Most commonly, these values are attributed to recreational activities, but certainly commercial activities, like fishing, can yield spiritual, social and cultural values, especially if such an industry is rooted in tradition.

In addition to playing a tangible role in the formal economy, commercial activities can also play an important, but less tangible, role in structuring society and the economy. Commercial activities can make large contributions to social capital – often vaguely but intuitively described as 'the glue of trust among society and social networks that holds the economy together'. The World Bank conceptualizes social capital through the dimensions of groups and networks, trust, collective action, social inclusion, and information and communication[21]. Understanding these less tangible values, like CES or social capital, will lead to better-informed social objectives for integrated marine planning and support economic objectives because CES and social capital affect the formal economy. For example, there is general consensus among many economists that social capital affects economic performance, with the hypothesis that the more social capital there is, the more productive the economy will be[3].

Incorporating social and cultural factors into fishery management and integrated marine planning is in its infancy, but new tools are emerging. It is challenging to define and measure these largely intangible values because the typical practice of assigning a dollar value to something like the cultural and spiritual importance a person attributes to spending their life on the water isn't easy or maybe even appropriate[22]. New protocols and tools are emerging for engaging stakeholders in gathering this kind of information. For example, researchers are learning that allowing respondents to describe the importance of intangible values in words and stories may be more effective than 'quantifying the unquantifiable'[19]. In addition, we are learning that maps are not able to display all kinds of value equally because intangible values are harder for people to assign to a physical location on a map[19].

1.2. Integrated marine planning and commercial fisheries in British Columbia

In British Columbia, the Pacific North Coast Integrated Management Area (PNCIMA) is the site of an ongoing integrated marine planning process. This region stretches from Brooks Peninsula on the west coast of Vancouver Island and Campbell River on the east coast of Vancouver Island north to the international border, and includes Haida Gwaii and all waters in between. Its western boundary is the base of the shelf slope[23] (Figure 1). In 2009 there were 118,170 persons living in the lands adjacent to the marine zone that is included in PNCIMA. This includes 14 incorporated communities, 17 unincorporated communities, and 32 First Nations communities[1]. PNCIMA is the largest (in geographic area) marine managed area in Canada's

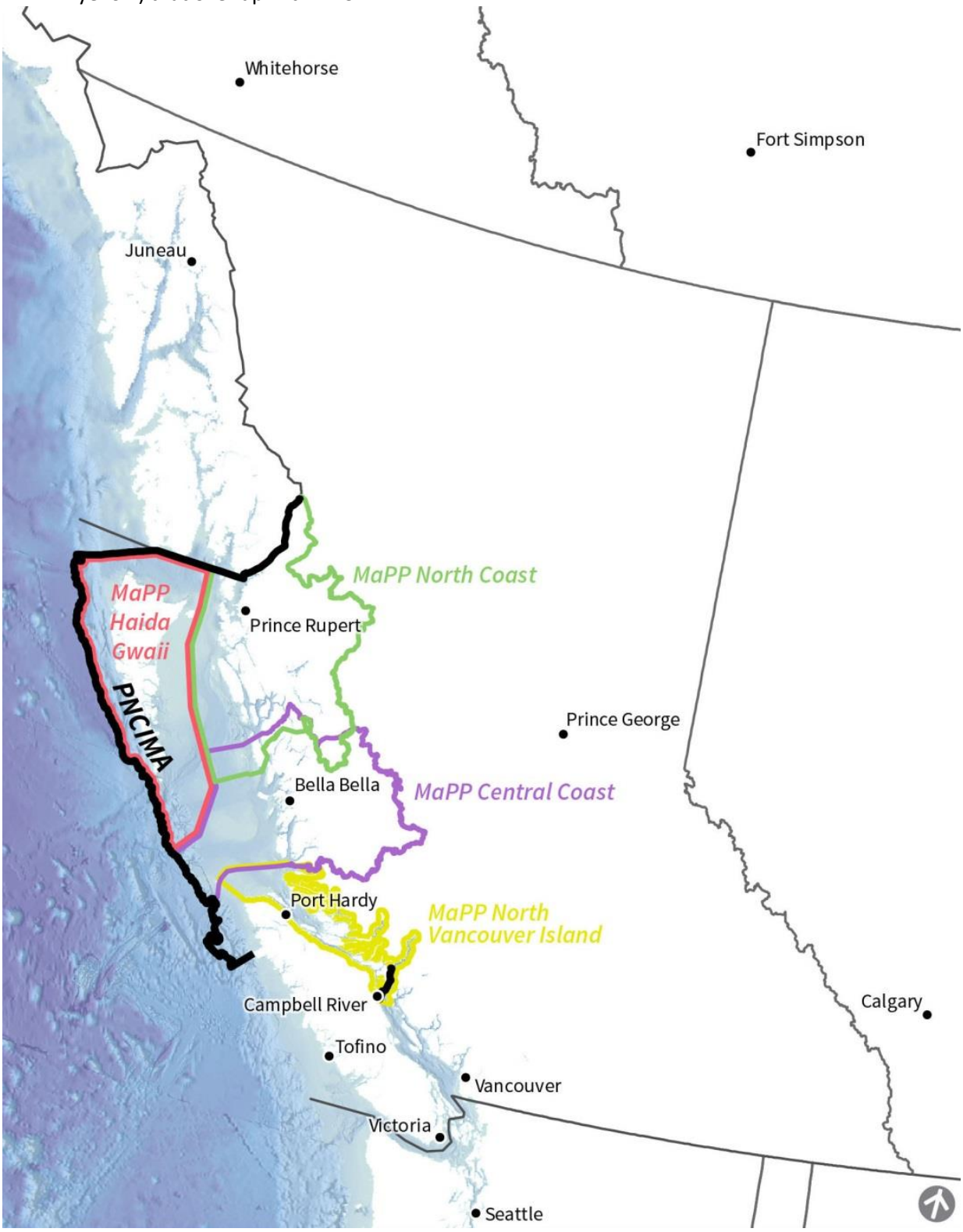
Pacific Coast, covering approximately 102,000 square kilometers, and is just one of numerous marine planning initiatives underway in this region[c].

The PNCIMA planning process aims to develop a plan for the region that reflects an ecosystem based management approach (*see definition in Appendix 1*), fosters economic prosperity and sustainable development, and increases communication and coordination among governing authorities and stakeholders on matters of marine management and conservation. To achieve these goals, planning will need to integrate environmental, social and economic considerations. Planning will also need to engage all interested parties (there are at least a dozen industries active in this region, e.g. commercial and sport fishing, tourism, forestry, aquaculture, shipping, recreation, and marine energy and mining[1]) in the collaborative development and implementation of an integrated management plan[d].

[c] There are five Marine Area Planning Partnership of the North Pacific (MaPP) planning processes in Canada's Pacific North Coast led by the Province of BC and First Nations. There are six federal planning processes in Canada's Pacific North Coast including: Gwaii Haanas National Marine Conservation Area, Scott Islands National Wildlife Area, Hecate Strait Glass Sponge Marine Protected Area, Bowie Seamount Marine Protected Area, Northern Shelf Marine Protected Area Network and the PNCIMA. The federal government also leads numerous coastal fisheries planning-related processes.

[d] More detail on PNCIMA is available in Appendix 2.

FIGURE 1: Pacific North Coast study area Boundaries of management regions highlighted: PNCIMA (our study area) in black, and the four MaPP areas (North Coast in green, Haidi Gwaii in red, Central Coast in purple, and North Vancouver Island in yellow) that overlap with PNCIMA.



BC's commercial fisheries are key stakeholders in the PNCIMA process. BC has a long tradition of seafaring and seafood has been central to BC's economy and culture for over a century, and for First Nations, for millennia. BC's commercial fisheries now play an important role in global food security. For example, in 2011, BC seafood (sourced from aquaculture and wild-capture fisheries) was served in approximately two billion meals in 74 countries[24]. Wild-capture fisheries constitute the fourth largest primary industry in the province after forestry, mining and agriculture[25]. The diverse ocean ecosystems of PNCIMA support the primarily resource-based economy made up of significant commercial fishing and processing sectors[26,27]. In addition, PNCIMA is a significant catch area for most BC fisheries[28], bringing in roughly half of the provincial total landed value for all fisheries, and is home to slightly less than half of the provincial experienced labour force in commercial fisheries[1].

Commercial fisheries in BC, and the communities that rely on the industry, have undergone fundamental changes in the past three decades. Today commercial fisheries are much more complex to manage; there are fewer fishermen, less fish landed in small coastal communities, and less income going back to these communities. Multiple factors are driving these changes including increased competition for ocean space (wind farms, aquaculture, tourism, marine protected areas, shipping, recreation, shoreline development)[29], an increasingly complex regulatory burden (onboard observers, dockside monitoring, electronic monitoring, marine credentials, multiple jurisdictions, multiple management processes, more stringent pollution controls)[30], rising costs (fuel, quota, gear, repairs, insurance)[31], declining infrastructures (docks, wharfs, grids, storage, fuel docks, marine lifts)[32], rising Canadian dollar (at least over the last decade), rapidly changing ecosystems (decreasing oxygen at depth, ocean acidification, rising temperature)[33], and the push toward economic efficiency (larger boats, longer trips, centralized processing, all weather fishing)[32].

Times are particularly hard for commercial fishing communities in PNCIMA, providing an important opportunity for improvement with integrated oceans management planning. Unemployment in PNCIMA (9.3%) is markedly higher than the provincial rate of 6.6% and a recent study suggests that communities in the region bear higher socio-economic hardship than is the case elsewhere in B.C.[1,27]. Overall human wellbeing for coastal communities is on the decline driven in part by declining access to fish, declining investments, crumbling infrastructure, lower retention of youth, reduced access to capital, declining local transportation, fewer schools, increasing costs for goods and services, higher unemployment, and increasing drug and alcohol use[1]. PNCIMA (led by the federal government) and the Marine Planning Partnership of the North Pacific (MaPP – led by the Province and First Nations), and the Gwaii Haanas National Marine Conservation Area (lead by Parks Canada and the Council of the Haida Nation) – provide an important opportunity through integrated oceans management planning to reverse these trends.

Understanding the role commercial fisheries play in PNCIMA communities is an important aspect of the PNCIMA planning process, but is thus far poorly understood. In order to have effective planning processes, it is essential for decision-makers to understand and include the interests and impacts of all marine users and resources.

A recent socio-economic and cultural assessment of PNCIMA[1] provides valuable information for decision-making (e.g. the role commercial fisheries play in the regional and provincial formal economy), but this study acknowledges that important gaps still exist. For example, there is a lack of community-level information about the role commercial fisheries play in supporting local economies. The study notes that another important data gap is the lack of detailed information about the key role commercial fishing plays in both First Nations and non-First Nations communities. Another study[2] has developed a framework for thinking and classifying Valued Socio-Economic Components (VSECs) – elements of social-ecological system that humans view as significant or valuable – but little information is available about the intangible values associated with commercial fishing in PNCIMA needed to decide on VSECs. The risk of limited access to information on the intangible value of a sector is that the full value of that sector could be greatly underestimated.

This study endeavors to capture a broad range of values of the commercial fisheries sector in PNCIMA, at the level of the community. This depth of analysis is necessary to inform planning and decision-making processes that stand to impact this resource, the fisheries and adjacent communities.

1.3. Our study

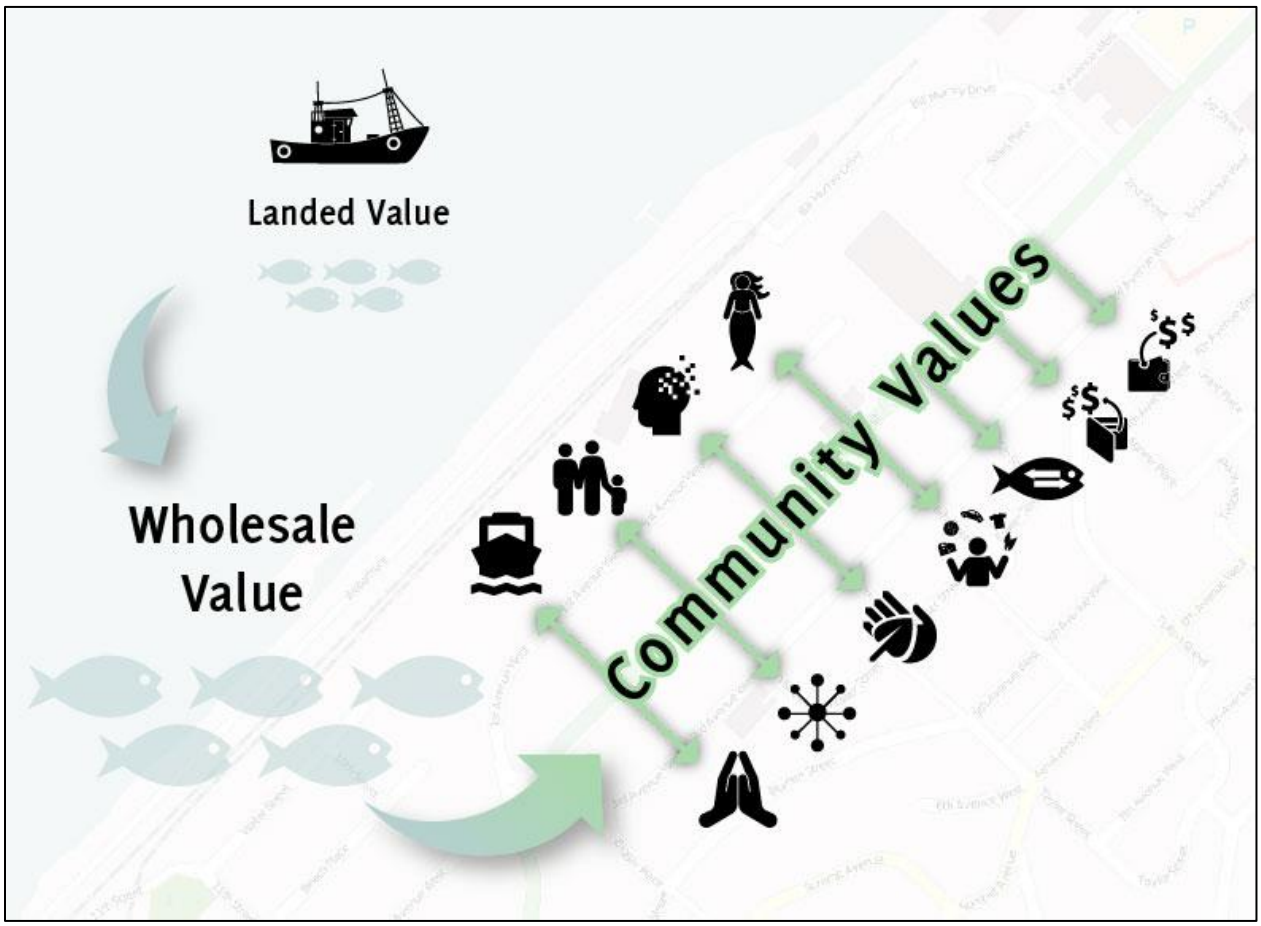
The goal of this report is to document the tangible and intangible ways in which commercial wild-capture fisheries are important to the families and communities in PNCIMA. The report is a collaboration between the T. Buck Suzuki Environmental Foundation and Ecotrust Canada and is presented in two parts.

Part 1: Summarizes PNCIMA regional economic value of commercial wild-capture fishing based on landings. This part of the report provides context for understanding the resources in the region and how access to these resources has changed over time.

Part 2: Characterizes the broad and complex spectrum of socioeconomic and cultural values that commercial fishing contributes to PNCIMA fishermen, families, and communities (Figure 2).

This characterization is based on in-person interviews with fishermen where we asked questions related to 10 categories of values associated with commercial fishing.

FIGURE 2: Socioeconomic and cultural values Our study documents the tangible (e.g. landed and wholesale) and intangible (e.g. cultural & intergenerational) values that commercial wild-capture fishing brings to communities. Community values are, from top left, closest to wholesale value: transportation, intergenerational, education, culture & tradition, fishing income, fishing expenses, gifting & trading of seafood, lifestyle, stewardship, networks, and spiritual.



While the interview format addressed the 10 specific categories of values separately, because respondents viewed the values as closely tied together we present our interview findings and flesh out the most important values mentioned by our respondents by focusing on the following four aspects associated with commercial fishing:

1. Economic ripple effects from respondents' commercial fishing expenditures,
2. The role a commercial fishing vessel plays in the gifting and trading of seafood,
3. The lifestyle of a commercial fisherman, and
4. Intergenerational significance of commercial fishing.

Although the purpose of our study was not to explicitly measure social capital within fishing communities, our intentions to examine and document how the industry and those involved are embedded within and support their communities can definitely be described as an exploration into social capital.

This portion of the study is intended to serve an illustrative function – painting a data-driven picture of the values of the commercial fishing industry that most often go unreported and unrepresented. While the community subjects of this illustration were from Prince Rupert and Lax Kw'alaams, both communities within the PNCIMA region, the study was not designed to provide results that can be directly extrapolated to all of PNCIMA.

By documenting the many ways people value commercial fisheries – allowing fishermen to verbalize the many ways this industry touches their personal, professional and community lives – we aim to illuminate a more complete picture of the value of wild-capture commercial fisheries in PNCIMA.

We believe that this research can help advance discussions between stakeholders and decision makers for the future good of marine resources as well as add important new depth and dimension to decision-making and policy setting.

1.4. Definition of common phrases and terms used in this document

For consistency and clarity, certain phrases and terms used throughout this document should be taken to mean the following:

- Ex-vessel revenue - the amount fishermen are paid for their catch at the first point of sale
- Fisheries/fishing – for the purpose of this study these terms refer to commercial wild-capture fisheries/fishing
- Fishermen[e] – for the purposes of this study this term refers only to commercial, wild-capture fishermen, unless noted otherwise
- Landed value – the dollar value of seafood when it arrives at shore
- CES – Cultural Ecosystem Services
- DFO – Fisheries and Oceans Canada
- EBM – Ecosystem-based management
- PNCIMA – Pacific North Coast Integrated Management Area
- MaPP – Marine Planning Partnership of the North Pacific

[e] 'Fishermen' is the term voted on in 1996 by the women (the men abstained) in the United Fishermen and Allied Workers Union (UFAWU). It was their determination that this term, instead of fisher or other such terms, would encompass both men and women working in the fishing industry, so we follow the same standard.

- SECOA – The Socio-Economic and Cultural Overview and Assessment Report for the PNCIMA. Full citation for the report is in references section.

SECTION 2A: METHODS – PART 1

To establish a better understanding of the current economic value of fisheries in PNCIMA we summarized total annual catch and landed value in this region from 1996 to 2010, using data provided by DFO. We also mapped landed value to understand how economic value is distributed 1) generally across the study region, 2) across five key fisheries, and 3) over time for one focal fishery.

2A.1. Study area

Our study area is PNCIMA (Figure 1 and described in detail in *Section 1.3 Our study*, above). Because PNCIMA's boundaries do not exactly match the management areas reported in DFO catch and landed value statistics, we chose to include all management areas that fall mostly within these boundaries.

The following DFO management areas are included in our study:

- Pacific Fisheries Management Areas: 1-13, 27, 101-111, 127, 130, 142
- Salmon Management Areas: A, C, D & F
- Groundfish Management Areas: 3D, 5A-E
- Clam Areas: A, B, G

2A.2. Data sources

In 2011, for preparing this report, Ecotrust Canada requested landed weights and dollar values for all commercial wild-capture fisheries in B.C. from DFO. The data received varied in terms of its spatial scale, years available, and the collection method used. To include a fishery in this study we had to have data a) for both landed weight and value, b) for the years 1996-2010, and c) at a spatial scale that allowed us to determine whether fish were caught inside or outside PNCIMA. Where possible we filled data gaps with data available in DFO Integrated Fisheries Management Plans or from DFO online sources[f]. These criteria resulted in a database of 23 fisheries (fishery/gear combinations; Tables 1 and 2), catching at least 80 different species (see Appendix 3).

Although two of these fisheries, Rockfish and Groundfish trawl, did not meet all of our selection criteria, we include them in the analysis as estimates recognizing that they do not meet the same quality standard as the rest of our data. From DFO we received data for these two fisheries at the coastwide scale and needed to parse out how much catch and dollar value came only from PNCIMA. To do this, we calculated the annual proportion of the catch for these two

[f] For example: http://www.pac.dfo-mpo.gc.ca/stats/comm/summ-somm/index-eng.htm Accessed May 16, 2013.

fisheries that originated from PNCIMA and used that proportion to estimate the total pounds caught and landed value for those two fisheries from 1996 to 2010. We used published estimates of the proportion of catch that originated from the PNCIMA for these two fisheries[34]. Because published estimates were available only for the years 1996 to 2005, for the years 2006 to 2010 the proportion of catch from PNCIMA was equal to the average proportion from 1996 to 2005. In addition, we subtracted catch of hake Groundfish trawl because this fishery operates mostly outside PNCIMA. This approach assumes that the proportion of catch from PNCIMA is the same as the proportion of dollar value from PNCIMA which may not be accurate, which is why we classify these data as estimates only.

For the most part we present information on the target species caught only (e.g. geoduck caught on a geoduck licence), but there are a few fisheries for which we also included non-target species when data were available: halibut, salmon gillnet, salmon seine, salmon troll, shrimp trawl, rockfish hook and line, and Groundfish trawl. Appendix 3 lists the species included in our analysis for each fishery and how we categorized them for analysis.

For fisheries that have been included, we had to eliminate some data to protect the identity of fishermen and fishing practices. In accordance with DFO's 'Three Party Rule' any data originating from a management area where three or fewer vessels fished in a given year were removed. For example, our dataset has no information for the sardine and pilchard fishery for the years 1997, and 2000-2003 because each statistical area had too few participating vessels.

It is important to note that because of the Three Party Rule, catches and dollar values for smaller or more diffuse fisheries, including those using aboriginal licences, will be under-reported in our analysis.

(Tables 1 & 2 on following pages)

TABLE 1: Landed Weight Landed weight data from DFO included in this analysis with details about years included, fishery area designation type (Pacific Fishery Management Areas: PFMAs; Groundfish Management Areas: GMAs), the DFO office that provided the data, and data collection method.
** = Landed weights caught within PNCIMA estimated differently than in other datasets (see methods), X = no fishery in that year, 3 = no data available due to DFO's 3 party rule.*

		Year																			
Fishery name	Fishery more info (e.g. Gear or area)	9 6	9 7	9 8	9 9	0 0	0 1	0 2	0 3	0 4	0 5	0 6	0 7	0 8	0 9	1 0	Area designation	Data source	data collection method
Crab																	Crab Areas	DFO Regional Data Services Unit	sales slip
Euphausiid																	PFMAs	DFO Regional Data Services Unit	sales slip
Geoduck																	PFMAs	DFO Regional Data Services Unit	sales slip
Geoduck																	PFMAs	DFO Regional Data Services Unit	validated logbook
*Groundfish trawl																	Coastwide	DFO Catch Statistics Unit	sales slip
Halibut																	PFMAs	DFO Regional Data Services Unit	validated logbook
Halibut																	PFMAs	DFO Regional Data Services Unit	sales slip
Herring Food, Bait, Pond & unspecified																	PFMAs	DFO Regional Data Services Unit	sales slip
Herring Roe	Gillnet, driftnet & seine																PFMAs	DFO Regional Data Services Unit	sales slip
Herring Spawn on Kelp																	PFMAs	DFO Regional Data Services Unit	sales slip
Intertidal clam																	Clam Areas	DFO North Coast Bivalve Manager, DFO South Coast Bivalve Manager, Pacific Region Integrated Fisheries Management Plan - Intertidal Clams 2007-09, DFO Regional Data Services Unit	validated logbook
Octopus	Dive, gillnet, jig, shrimp trawl, trap, troll																PFMAs	DFO Regional Data Services Unit	sales slip
Prawn and Shrimp	Trap																PFMAs	DFO Regional Data Services Unit	sales slip
*Rockfish	Hook and line																Coastwide	DFO Catch Statistics Unit	sales slip
Sablefish	Hook and line & trap																GMAs	DFO Fisheries and Aquaculture Management	validated logbook
Salmon	Gillnet																Salmon areas	DFO Catch Statistics Unit	sales slip
Salmon	Seine																Salmon areas	DFO Catch Statistics Unit	sales slip
Salmon	Troll																Salmon areas	DFO Catch Statistics Unit	sales slip
Salmon	Gillnet, Seine & Troll																PFMAs	online DFO Annual Fishery Statistics	unknown
Sardine/Pilchards			x	3			3	3	3	3							PFMAs	DFO Catch Statistics Unit	sales slip
Scallop	Dive, Dredge & Trawl																PFMAs	DFO Regional Data Services Unit	sales slip
Sea Cucumber																	PFMAs	DFO Regional Data Services Unit	sales slip
Sea Urchin (green)																	PFMAs	DFO Regional Data Services Unit	sales slip
Sea Urchin (green)																	PFMAs	DFO Invertebrate Data Management	logbook
Sea Urchin (red)																	PFMAs	DFO Regional Data Services Unit	sales slip
Shrimp Trawl																	PFMAs	DFO Regional Data Services Unit	sales slip
Shrimp Trawl																	check	DFO Invertebrate Data Management	validated logbook
Tuna	Schedule II Tuna - Troll																PFMAs	DFO Catch Statistics Unit	sales slip

TABLE 2: Landed Value Landed value data from DFO included in this analysis, with details about years included, fishery area designation type (Pacific Fishery Management Areas: PFMAs; Groundfish Management Areas: GMAs), the DFO office that provided the data, and data collection method.

** = Landed values from PNCIMA estimated differently than in other datasets (see methods)*

		Year																	
Fishery name	**Fishery more info (e.g. Gear or area)**	**96**	**97**	**98**	**99**	**00**	**01**	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**Area designation**	**Data source**	**data collection method**
Crab																	PFMAs	DFO Reginal Data Services Unit	sales slip
Euphausiid																	PFMAs	DFO Reginal Data Services Unit	sales slip
Geoduck																	PFMAs	DFO Reginal Data Services Unit	validated logbook
Geoduck																	PFMAs	DFO Reginal Data Services Unit	sales slip
*Groundfish trawl																	Coastwide	DFO Catch Statistics Unit	sales slip
Halibut																	PFMAs	DFO Reginal Data Services Unit	validated logbook
Halibut																	PFMAs	DFO Reginal Data Services Unit	sales slip
Herring Food, Bait, Pond & unspecified																	PFMAs	DFO Reginal Data Services Unit	sales slip
Herring Roe	Gillnet, driftnet & seine																PFMAs	DFO Reginal Data Services Unit	sales slip
Herring Spawn on Kelp																	PFMAs	DFO Reginal Data Services Unit	sales slip
Intertidal clam																	PFMAs	DFO Reginal Data Services Unit	sales slip
Octopus	Dive, gillnet, jig, shrimp																PFMAs	DFO Reginal Data Services Unit	sales slip
Prawn and Shrimp	Trap																PFMAs	DFO Reginal Data Services Unit	sales slip
*Rockfish	Hook and line																Coastwide	DFO Catch Statistics Unit	sales slip
Sablefish	Hook and line & trap																GMAs	Combination of sources	calculated
Salmon	Gillnet																Salmon Areas	DFO Catch Statistics Unit	sales slip
Salmon	Seine																Salmon Areas	DFO Catch Statistics Unit	sales slip
Salmon	Troll																Salmon Areas	DFO Catch Statistics Unit	sales slip
Salmon	Gillnet, Seine & Troll																PFMAs	online DFO Annual Fishery Statistics	unknown
Sardine/Pilchards		x	3			3	3	3	3								PFMAs	DFO Catch Statistics Unit	sales slip
Scallop	Dive, Trawl & Dredge																PFMAs	DFO Reginal Data Services Unit	sales slip
Sea Cucumber																	PFMAs	DFO Reginal Data Services Unit	sales slip
Sea Urchin (green)	Dive																PFMAs	DFO Reginal Data Services Unit	sales slip
Sea Urchin (green)	Dive																PFMAs	Combination of sources	calculated
Sea Urchin (red)																	PFMAs	DFO Reginal Data Services Unit	sales slip
Shrimp Trawl																	PFMAs	DFO Reginal Data Services Unit	sales slip
Shrimp Trawl																	PFMAs	DFO Reginal Data Services Unit	validated logbook
Tuna	Schedule II Tuna - Troll																PFMAs	DFO Catch Statistics Unit	sales slip

2A.3. Data analysis

Trend in total landed weight and dollar value

Due to the often-cyclical nature of fisheries, we present landed weight and dollar value for a series of years from 1996 to 2010. Given the wide variety of fisheries we included in this analysis there were a few steps we needed to take to standardize datasets to make them comparable. We converted all landed weights to pounds. We present dollars un-adjusted for inflation for landed values because we wanted to be consistent with the way DFO presents the data. For fisheries that spanned over the change in calendar year, we used the year in which the fishery ended. In one case, the sablefish fishery, the fishery changed its season in 2007 from August 1-July 31 to February 21-February 20. To transition the fishery, DFO counted the period from August 1, 2007 to February 20, 2009 as a single season. For our analyses, we counted these 18 months as the 2008 season. Consequently, there is no 2009 data for this fishery.

To provide some detail on how different sectors contribute to the total annual landed weight and value of fisheries in PNCIMA, we binned fisheries into groups using the BC Ministry of Agriculture's classification, which is as follows:

- **Crab:** Crab
- **Groundfish:** Halibut, Sablefish
- **Herring:** Herring food, bait, pond, and unspecified, Herring roe, Herring spawn on kelp
- **Salmon:** Salmon by gillnet, seine, and troll
- **Shellfish:** Euphausid, Geoduck, Intertidal clam, Octopus, Prawn & shrimp by trap, Scallop by dive, trawl, and dredge, Sea cucumber, Sea urchin (green), Sea urchin (red), Shrimp by trap
- **Tuna and Other:** Sardine, Tuna

Wholesale value: 2010

To quantify how landed value from commercial fisheries gets magnified as it moves further into the economy and communities, we calculated wholesale value from all commercial fisheries in PNCIMA for our most recent year of data, 2010. To do this, first we calculated a landed value to wholesale value multiplication factor by fishery sector from data available for 2010 from the BC Ministry of the Environment[35]. Then we multiplied our 2010 total landed value in PNCIMA by the sector-specific factors to get 2010 wholesale value in PNCIMA (Table 4).

Mapping landed value

To visualize how the economic value of fisheries was distributed across Canada's North Pacific we used the database of DFO landed values described above to create maps of landed value. The three map graphics that are included with this report are: 1) cumulative total (one map summing all fisheries and all years 1996 to 2010); 2) cumulative total (1996 to 2010) for five key target species; and 3) annual totals for one focal fishery – halibut.

In order to make the maps, we created a subset of landed value from our original database of

catch and landed value for 23 fisheries. First, we removed the Rockfish and Groundfish trawl fisheries because we did not have data at the appropriate spatial scale for mapping these fisheries. Second, for the remaining fisheries that had data on non-target species (halibut, salmon gillnet, salmon seine, salmon troll, and shrimp trawl) we removed values of non-target species, with the exception of sablefish. Sablefish values consist of sablefish caught on a sablefish licence plus sablefish caught on a halibut licence. We focused the maps on target species for consistency across years and ease of visualization. As a result, total values represented in maps and graphs will not match up for the five fisheries listed above.

Next, we normalized landed values by the size (in hectares) of the fishery management area. It is important to normalize values because the statistical areas are arbitrary sizes and it may be that more value is landed from a specific area because it is larger. By normalizing the numbers, we are removing this bias and making it easier to compare value between the statistical areas.

Finally, to allow for comparison of landed value across years we displayed the range of landed values using a Defined Interval classification method.

We chose five fisheries to map in more detail that are regionally important and also cover a range from highly mobile to sedentary species. These key species are crab caught by trap, geoduck caught by dive, halibut hook and line, sablefish hook and line, and all salmon fisheries (gillnet, seine, and troll). We look at halibut landed values in the most detail to investigate how landed value in individual management areas may change over time.

SECTION 2B: RESULTS – PART 1

Although both catch and landed value of commercial fisheries in PNCIMA fluctuated over the 15-year period we looked at (1996 to 2010), year after year the region contributed 100's of millions of commercial ex-vessel revenue to the regional economy. In fact, in terms of cumulative landed value, PNCIMA had some of the most valuable fishing areas in the province. Specific economically significant areas within PNCIMA varied both by fishery and across years within a fishery.

2B.1. Trend in landed weight and value

The trend in total catch in PNCIMA was relatively stable from 1996 to 2005, hovering around 170 million pounds landed. Starting in 2005, there was a downward but variable trend, with just over 119 million total pounds caught in 2010 (Figure 3a).

The total landed value of commercial fisheries has fluctuated from year to year by a maximum of 53%, with the highest year being 1996 ($267 million) and the lowest year being 2009 ($125 million; Figure 3b)[g].

(Figures 3a and 3b on following pages)

[g] Our calculations of landed value in PNCIMA are similar to, though somewhat higher than, those reported in the SECOA[1]. Our estimates of total catch and landed value will under-estimate actual totals because data were unavailable for some fisheries and some records could not be included to protect fishermen's privacy (DFO's 3 party rule). In addition, before evaluating the portion of coast-wide values attributable to PNCIMA, we validated our coast-wide data with other published values[g]. The specific methods used to summarize landed value data are not provided in the SECOA report, so it is not possible to determine exact reasons for differences, however it appears the SECOA consistently reports coast-wide landed value estimates lower than those published elsewhere for same years[g].

FIGURES 3a and 3b: LANDED WEIGHT AND VALUE Landed weight (a) and value (b) of commercial wild-capture fisheries in the Pacific North Coast from 1996 to 2010. Grey bars show estimated additional value from all species caught on groundfish trawl (with the exception of Pacific hake) and Rockfish licences. See Tables 1 and 2 for list of licences included in this analysis.

FIGURE 3a: LANDED WEIGHT

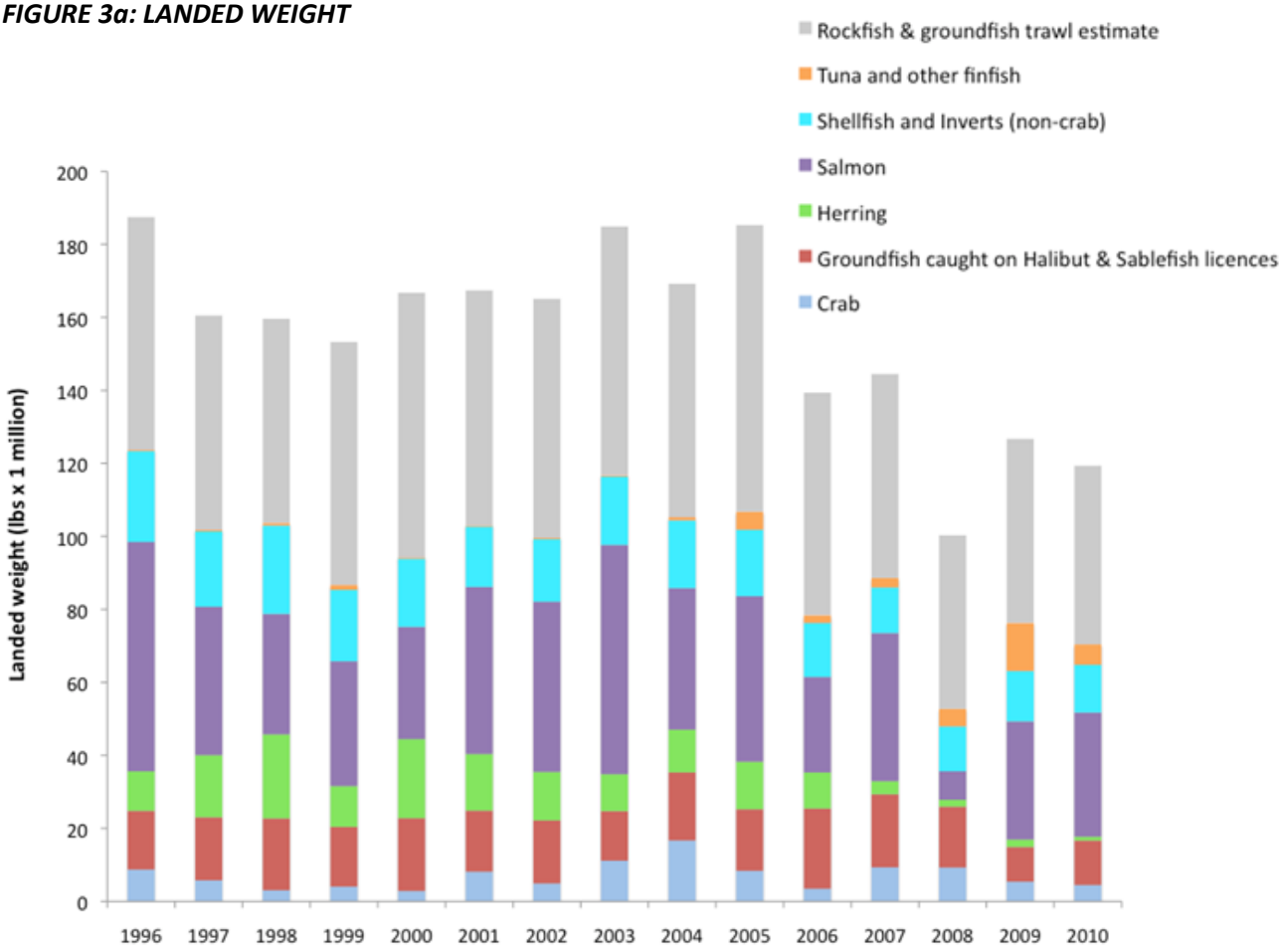
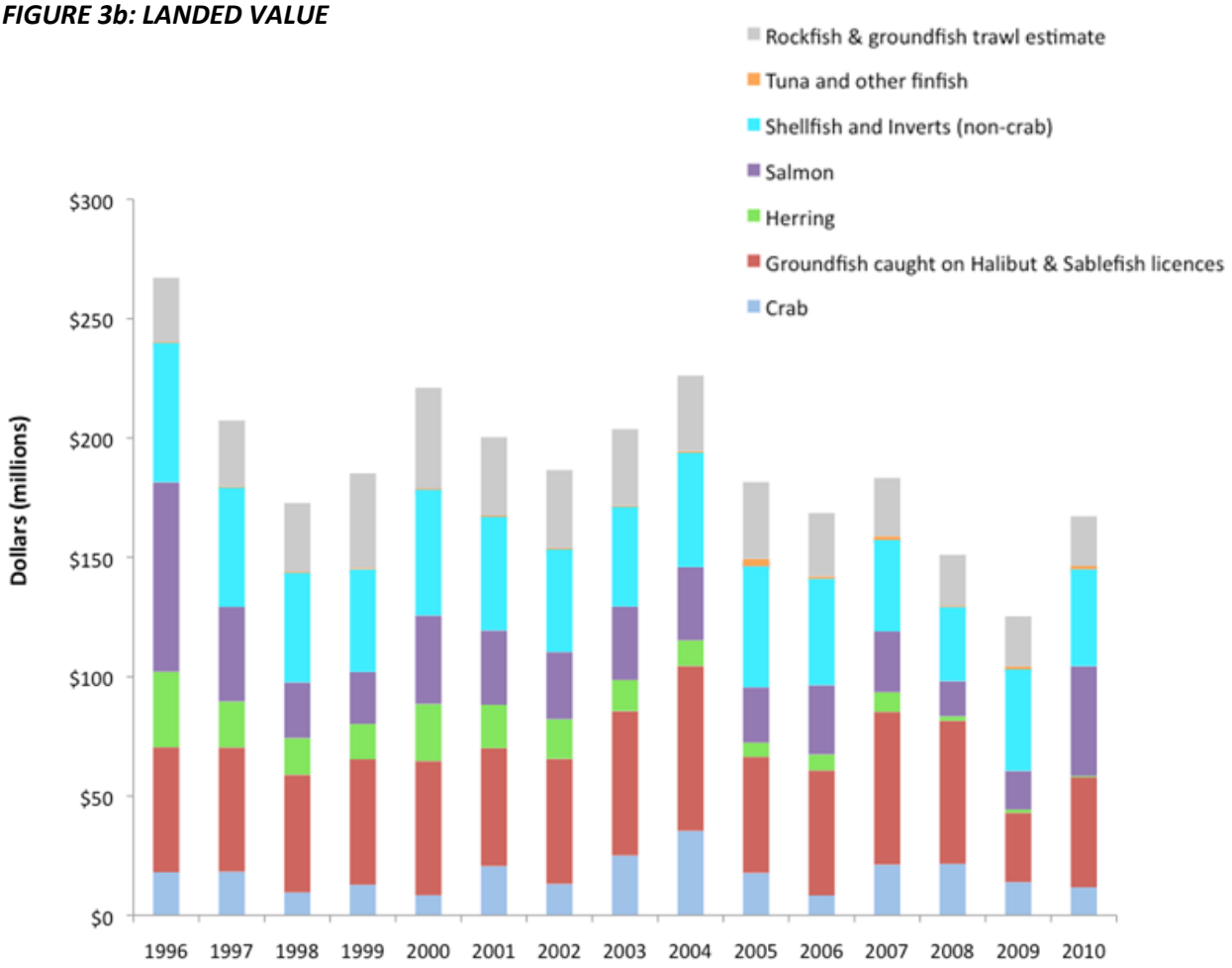


FIGURE 3b: LANDED VALUE



2B.2. Wholesale value: 2010

Wild-capture wholesale value for 2010 in PNCIMA is just over $415 million which is almost 2.5 times greater than the $167 million landed value we estimated for that same year (Table 3). It is also interesting to note that this wholesale value in PNCIMA is just over half of the Ministry of Environment's estimate of province-wide marine wild-capture wholesale value ($811 million; Table 3).

TABLE 3: ESTIMATE OF WHOLESALE VALUE Estimate of wild-capture wholesale value from fish caught in Canada's Pacific North Coast during 2010. Note: [1] Calculations from this study; [2] BC Ministry of the Environment Oceans and Marine Fisheries Branch; [3] Total of Groundfish and Rockfish and Groundfish trawl estimate.

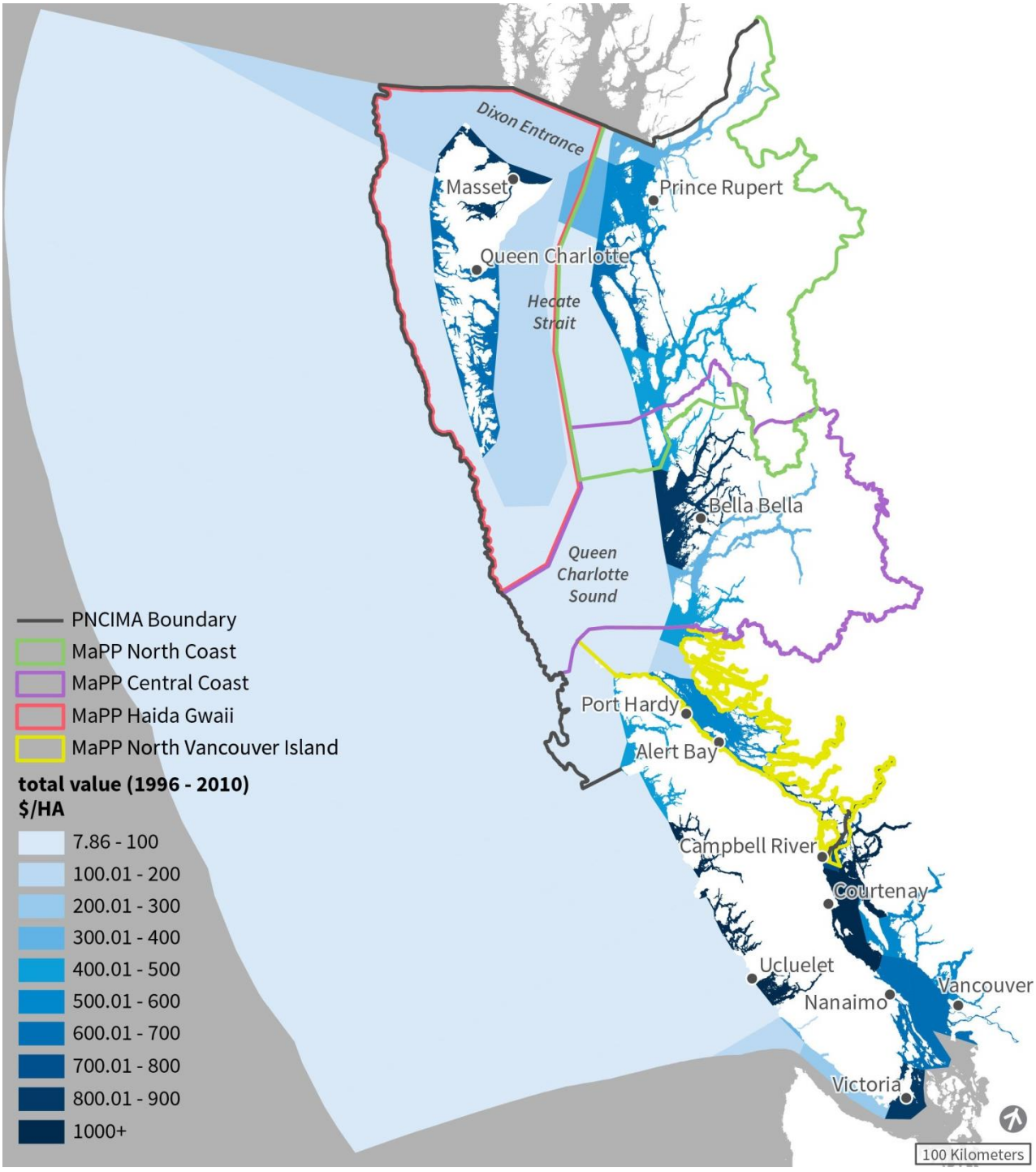
Category	2010 Canada's Pacific North Coast landed value[1]	2010 Coastwide landed value[2]	2010 Coastwide wholesale value[2]	Landed to wholesale value factor[1]	2010 Canada's Pacific North Coast wholesale value[1]
Crab	$11,733,141	$33,700,000	$73,100,000	2.17	$25,450,820
Groundfish[3]	$67,103,799	$111,900,000	$275,100,000	2.46	$164,971,002
Herring	$324,320	$11,800,000	$35,800,000	3.03	$983,952
Salmon	$46,040,538	$69,300,000	$237,800,000	3.43	$157,986,146
Shellfish and Inverts (non-crab)	$40,626,442	$75,200,000	$114,900,000	1.53	$62,074,178
Tuna and other finfish	$1,370,827	$28,100,000	$74,900,000	2.67	$3,653,911
2010 Totals	***$167,199,067***	***$330,000,000***	***$811,600,000***		***$415,120,011***

2B.3. Mapping landed value

Cumulative total landed value – all fisheries and all years

The economic value of fisheries (landed value) varied widely across the fishery areas in BC, with some of the highest cumulative value areas falling inside the boundaries of PNCIMA (Figure 4). The fishery areas with the highest cumulative landed value, yielding more than $800 per Hectare for all fisheries during the years 1996 to 2010, were along the coasts of mainland Northern BC, Haida Gwaii, and the central east and west coasts of Vancouver Island.

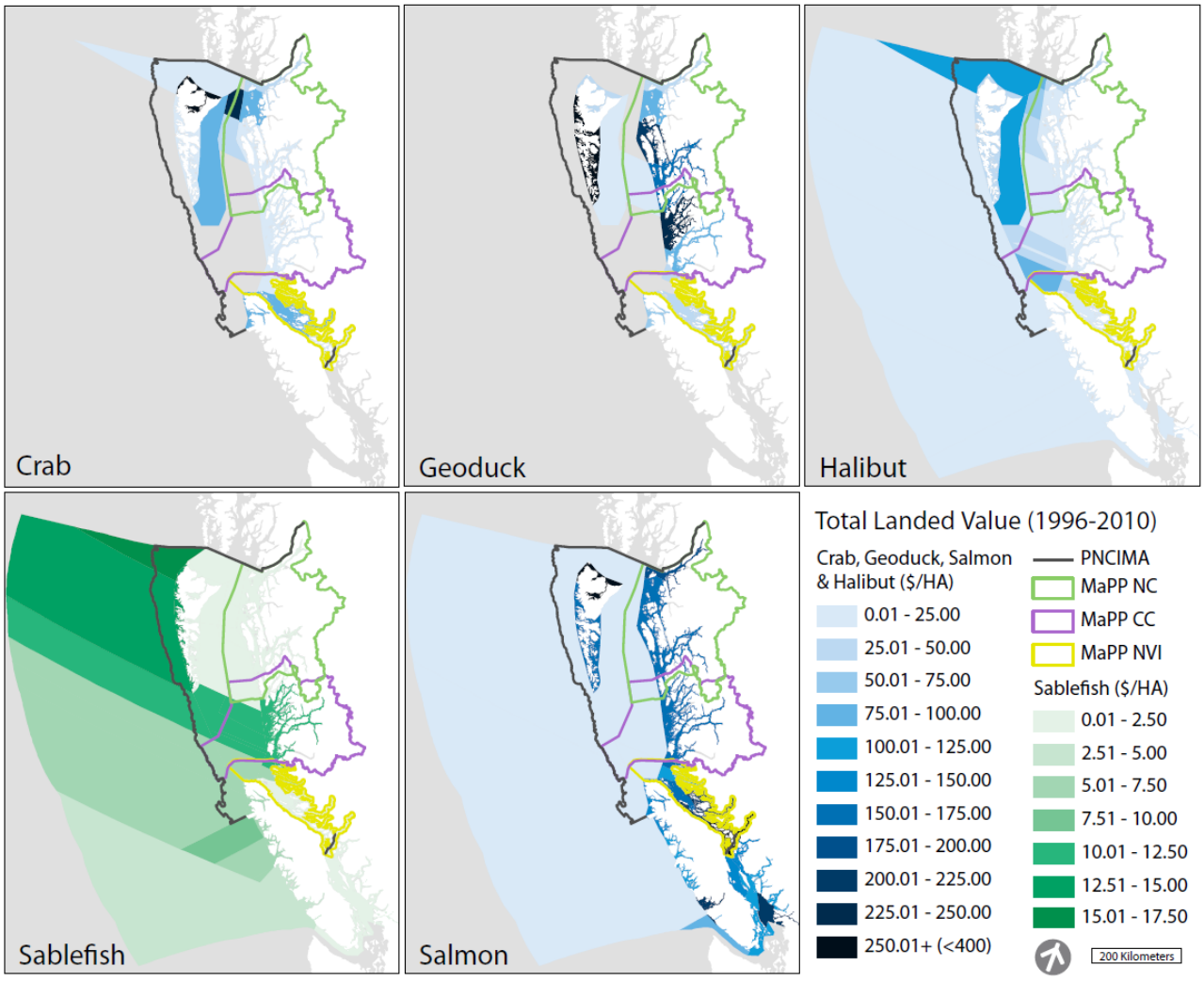
FIGURE 4: CUMULATIVE TOTAL LANDED VALUE FOR ALL TARGET SPECIES Cumulative total landed value (all fisheries for all years 1996-2010) of all commercial wild-capture fisheries. See Tables 1 and 2 for list of licences included in this analysis, though groundfish trawl and rockfish estimates are not included here. Units are un-adjusted dollars normalized by the size (in hectares) of each fishery management area.



Cumulative total landed value for five key fisheries

When we unpack the data a bit more we see that there are also fishing areas that provide high economic value to individual fisheries that are not apparent when we look at all fisheries summed together (Figure 5 compared to Figure 4). For example, coastal fishing areas are less important for sablefish, and the crab and salmon fisheries have pockets of very high economic value fishing/management areas toward the southern end of Vancouver Island (outside PNCIMA; Figure 5).

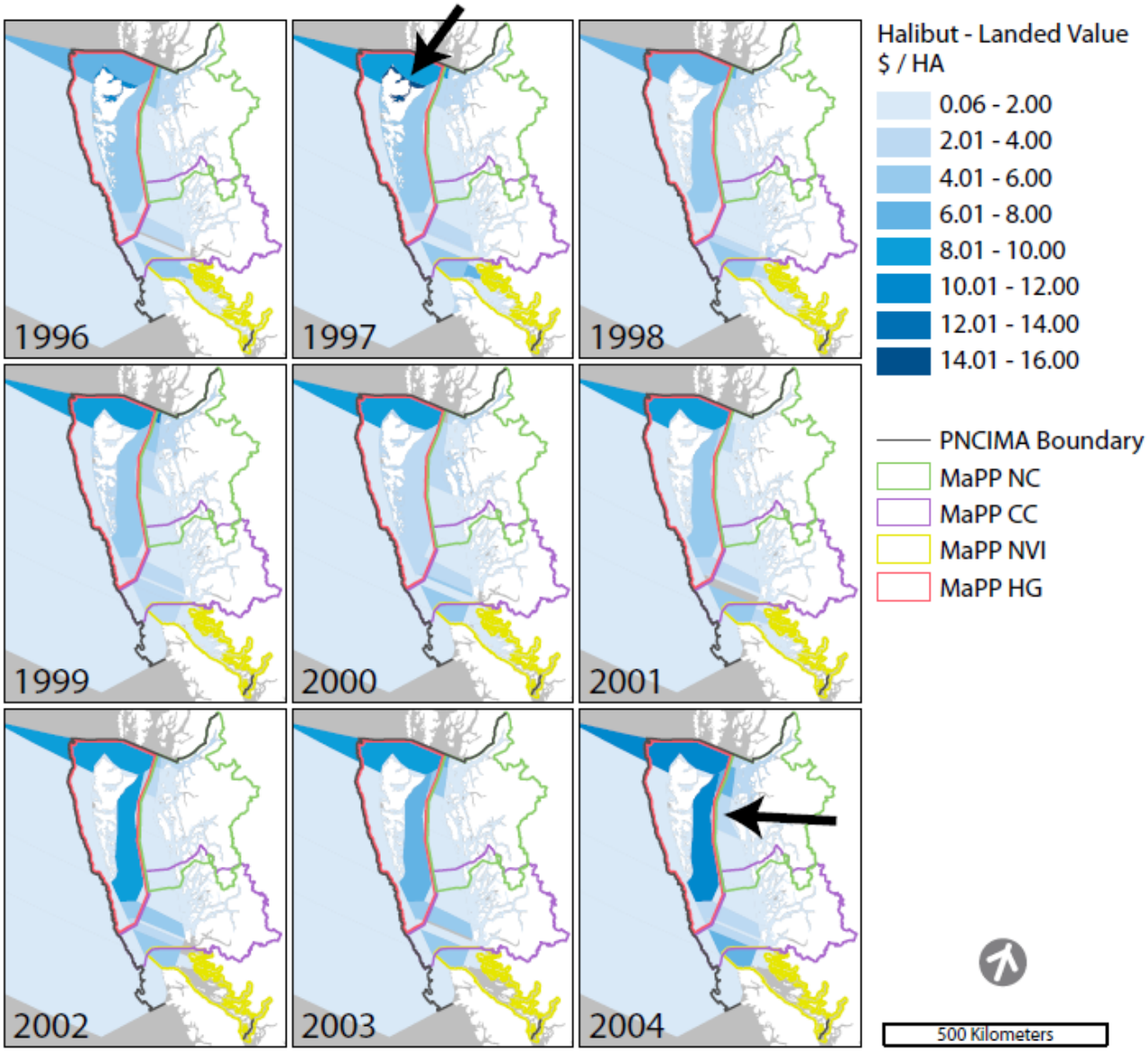
FIGURE 5: LANDED VALUE FOR FIVE KEY FISHERIES Cumulative total landed value (1996-2010). Units are un-adjusted dollars normalized by the size (in hectares) of each fishery management area. Sablefish data are in Groundfish Management Areas (green) and all others are in Pacific Fishery Management Areas (blue).

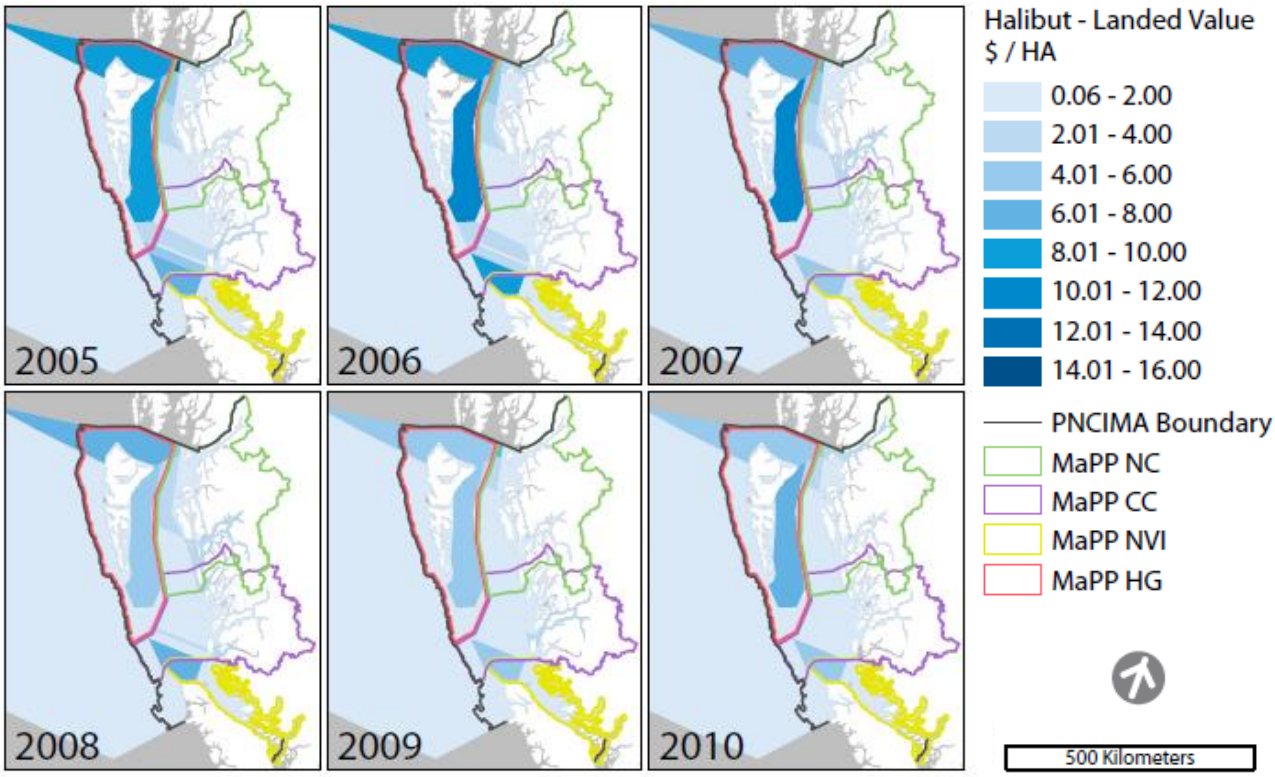


Annual target Halibut landed value

When we look just at a single fishery – halibut in this case – we can see that across the years there are changes in which fishery areas produce the most economic value (Figure 6). For example, in some years (1996, 1997) the coastal waters of Northern Haida Gwaii (indicated with an arrow in Figure 6) earn the highest dollars per hectare, while in most other years the management area to the north and east of Haida Gwaii (indicated with an arrow in Figure 6) earn the highest dollars per hectare.

FIGURE 6: LANDED VALUE FOR HALIBUT Annual target halibut landed value. Units are un-adjusted dollars normalized by the size (in hectares) of each fishery management area. Arrows indicate areas mentioned in the text.




2005
2006
2007
2008
2009
2010
Halibut - Landed Value
$ / HA
0.06 - 2.00
2.01 - 4.00
4.01 - 6.00
6.01 - 8.00
8.01 - 10.00
10.01 - 12.00
12.01 - 14.00
14.01 - 16.00
PNCIMA Boundary
MaPP NC
MaPP CC
MaPP NVI
MaPP HG
500 Kilometers

SECTION 3A: METHODS – PART 2

To capture the breadth of possible values commercial fishing brings to families and communities in PNCIMA, we asked fishermen to describe the tangible financial, other tangible, and intangible ways in which commercial fishing was important to them and to their communities.

Our goal with interviews was to describe the landscape of values associated with commercial fishing as a starting point for more focused research[36]. Therefore, we prioritized understanding the complexity of values (we asked questions related to 10 different categories of values, described in *Section 3A.3 Interview design*) over documenting depth for any particular value and designed our sampling accordingly: we talked to as many different kinds of commercial fishers as possible and used key informant interviews[37]. To help respondents verbalize less tangible values and reflect upon them we took a narrative, or story-telling approach that was based on Klain and Chan 2012[19] and created a visualization of values as respondents described them.

3A.1. Study Area

One of our focal communities, Prince Rupert, is a large fishing port with about 200[h] active commercial fishing vessels[38–40]. Our second focal community, the neighboring First Nation of Lax Kw'alaams, is much smaller, but has a high concentration of commercial fishing boats (60[41]) and fishermen. We also included in interviews one respondent who resides in an island community neighbouring Prince Rupert, Dodge Cove, but fishes out of Prince Rupert.

3A.2. Interview sample

We sought interviews with commercial wild-capture fishermen across a spectrum of 'boat profiles' from Prince Rupert, Lax Kw'alaams and Dodge Cove. These boat profiles represent the many ways that commercial fishing is organized in B.C. (See Appendix 4 for more detail on fleet structure.) Boat profiles fall somewhere on a spectrum from 'owner-operator' to 'hired fisherman'. An owner-operator owns all fishing equipment (the boat, gear, licence/s, and/or quota) and does the fishing himself. In contrast, a hired fisherman does not own the fishing equipment, but instead fishes a boat, gear, licence/s and/or quota that are owned by another individual, a company, or a First Nations Band. There is a spectrum in between where the fisherman owns part of the gear, the boat and the licenses. We sought key informants that would know best all of a boat's activities and the complexity of associated values.

[h] This number is a best estimate from a composite of sources, given complexities in where a vessel is registered and where it is moored.

From November 2012 to January 2013 we interviewed 23 fishermen who came from a range of boat profiles. All respondents were experienced commercial fishermen with 17 to 65 years fishing experience. With the exception of one deckhand, all respondents were skippers of their vessel. The one respondent who currently acts as a deckhand was previously a captain and now crews for his son. Five respondents were owner-operators and at the other end of the spectrum, two respondents were hired fishermen. The remaining 16 respondents fell somewhere between these two extreme boat profiles. Respondents worked on boats ranging from 20 to 79 feet long. Sixteen respondents fished from Prince Rupert and seven fished from Lax Kw'alaams. Sixty percent of respondents had First Nations heritage and there were 22 males and one female respondent.

3A.3. Interview design

We designed a semi-structured interview protocol that enabled respondents to verbalize and visualize the ways in which their fishing is currently important to them. Our design builds on a protocol[19] designed to enable respondents to articulate the relative monetary and non-monetary values associated with Cultural Ecosystem Services. Given the changes in the BC fishing industry and the relative length of experience of respondents, to situate our study in the present we asked respondents to focus their responses on fishing activities that took place during a typical, recent (no more than five years ago) fishing season.

Interviews began with signing a consent form and confidentially agreement along with a brief project description, both in writing and verbalized by the interviewer. Interviews lasted three to five hours and occurred at the Ecotrust Canada or T. Buck Suzuki office, a community hall, a Band office, or at the interviewers' hotel. Interviews were conducted by two trained interviewers; the lead interviewer was primarily responsible for engaging the respondent in dialogue and the interview assistant was primarily responsible for taking detailed notes (some in the form of a mind map) on a large sheet of paper. Interviews were also audio recorded with respondents' permission. Our interview protocol (see Appendix 5 for list of detailed questions asked) involved three parts:

Part 1 – Each interview began with questions about the respondents' background, fishing experience, and details about ownership of fishing equipment needed to classify a boat profile.

Part 2 – The interviewer asked open-ended questions about tangible financial, other tangible, and intangible values associated with commercial fishing. We asked questions related to 10 categories of values, the structure of which is illustrated in Figure 7 and defined as follows:

1. Culture: Aspects of commercial fishing relating to culture or family or community tradition

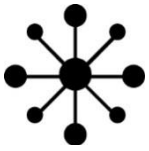
2. **Education:** Learning that has occurred during commercial fishing

3. **Gifting and trading of seafood:** Whether the commercial vessel is used to catch seafood destined for gifting or trading and the details of how the process proceeds[i]

4. **Intergenerational:** Aspects relating to past or future generations associated with commercial fishing

5. **Lifestyle:** Aspects of commercial fishing that provide a way of life that is important to respondents

6. **Monetary:** The expenses paid to run a fishing operation and financial returns from commercial fishing work



7. **Networks:** Membership or participation in professional or informal associations, unions, clubs, campaigns, etc.

8. **Spiritual:** Experiences associated with commercial fishing that inspire becoming aware of forces larger than oneself and/or feelings like awe, reverence, humility, or even fear.

9. **Stewardship:** Role commercial fishermen play in protecting the marine environment, sustaining fish populations, etc.

[i] We asked only about seafood caught with the appropriate licence: commercial, recreational, or Food Social and Ceremonial.

10. **Transportation:** Whether and how the commercial vessel also provides important transportation

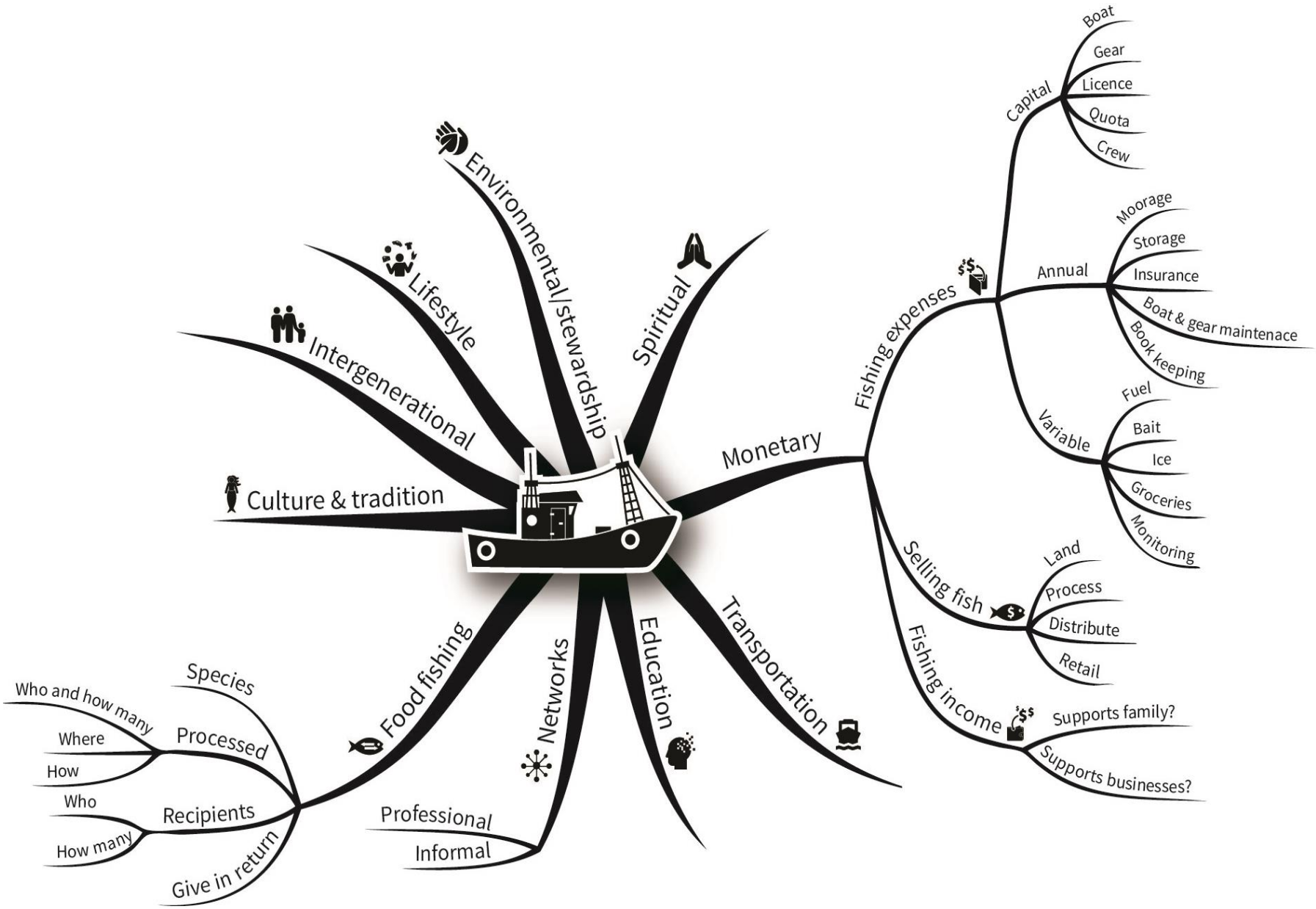
Part 3 – In the final part of the interview we asked respondents to reflect on the values discussed throughout the interview and on the visual mind map that was created. We asked them if they wanted to emphasize any values as being especially important and whether the mind map would look differently in the past or if commercial fishing ceased.

3A.4. Interview analysis

To analyze the over 70 hours of recorded interviews, we used a combination of: 1) digitizing detailed notes taken by the interview assistant during interviews; 2) examining the hand-written mind-map poster created during each interview; and 3) transcribing digital audio recordings of interviews to summarize responses.

In *Section 3B – Results Part 2*, we present a combination of tables, maps, and figures to illustrate and describe the findings of our analysis. Often the choice of illustration was straightforward; for example tables are well suited to display quantitative results while word clouds can better display a thematic analysis of qualitative responses. Thematic analysis is a process of reviewing interview responses to identify patterns or ideas or 'themes' that exist in the data. The themes become categories for analysis[19,42,43]. In other cases we found it most powerful to allow the fishermen's words to speak for themselves, and so we included many direct quotes in our findings as well. It is important to note that not every question was answered by every respondent and for some questions an individual respondent may have given multiple answers; thus, total number of responses will not always sum to the total number of respondents.

FIGURE 7: STRUCTURE OF INTERVIEWS Categories of values covered during interviews and structure of interview questions. Topics covered by more open-ended questions have fewer or no sub-branches.

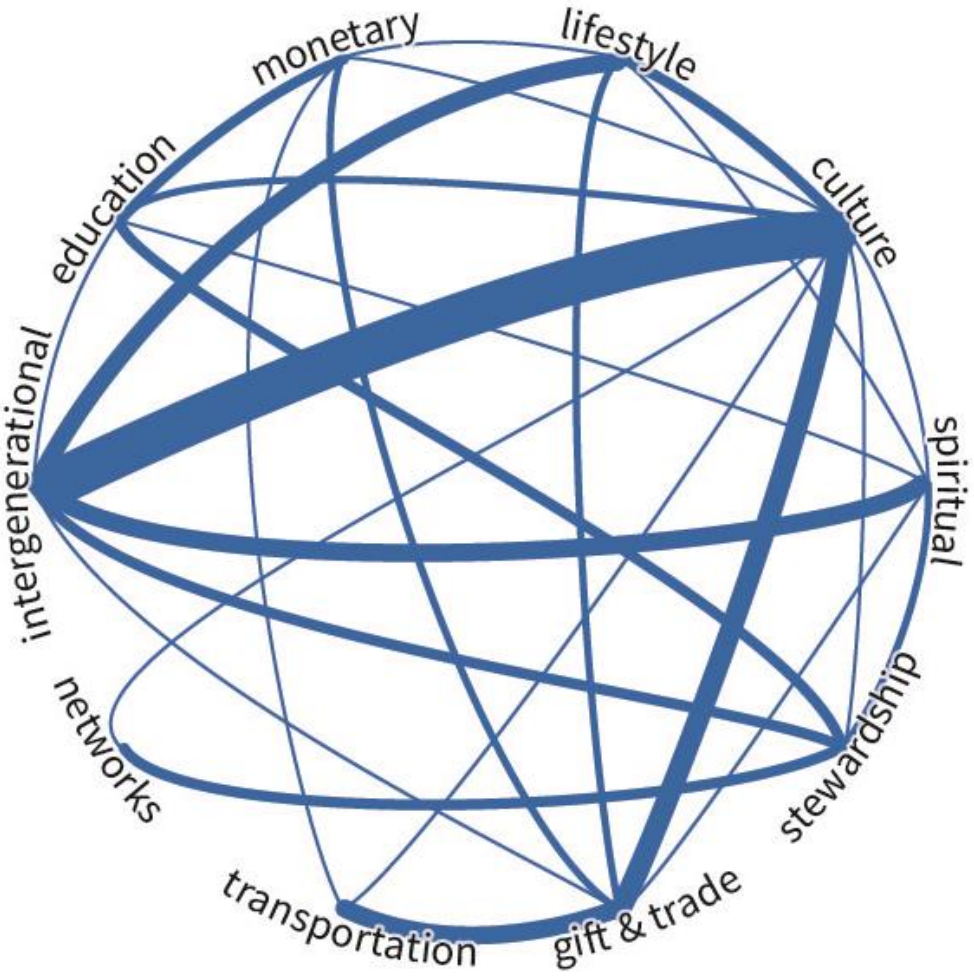


SECTION 3B: RESULTS – PART 2

Each of the 10 different categories of values associated with commercial fishing (see *Section 3A.3. Interview design*) were considered to be important by respondents, and often in an overlapping manner. When respondents answered a question about one value, aspects of another value category would frequently come up. For example, a respondent might mention under education that he received valuable lessons about the marine environment through his commercial fishing career. Then, when asked about stewardship, he might mention that what he had learned through fishing about the marine environment motivated him to see himself and to act as an important steward of the ocean.

Figure 8 illustrates the linkages that emerged between the 10 value categories throughout our interviews. The line width is proportional to the number of times a link between two values was mentioned. The number of connections and overlapping significance between the value categories is immense; not one value category remained separate from all other values.

FIGURE 8: LINKS BETWEEN VALUES Line width proportional to number of times a link between two values was mentioned, n = 23 respondents.



As previously mentioned, the financial value of commercial fisheries is often the only value examined in political, economic and fisheries management decision-making processes concerning the industry. However, among our respondents, the monetary value category ranked relatively lower among connections and links to other categories.

It followed behind values associated with culture, intergenerational, food, spiritual, stewardship, lifestyle, and education.

Of course, this is not to say that the monetary value of commercial fishing was not significant to our respondents; indeed respondents spoke at length as to how they valued the ability to make a living as a commercial fishermen. Rather, it is interesting to note that the financial aspect of this value category did not lend itself as well to connecting to the other value categories, and more interestingly perhaps, how significant and interrelated other value categories are that are more likely to remain unexamined.

Finally, networks and transportation were the two value categories least linked to other values. It is important to note again that within the context of our interview, 'networks' were defined in the applied sense of the word, in terms of membership in commercial fishing associations for example, and not in the broader sense of community connections and interrelations.

While the interview format addressed the 10 specific categories of values separately, we report in detail on a subset of those values. It is clear that the respondents viewed the values as closely tied together. As such, reporting results and findings for each category separately would result in a highly redundant report. Instead, we chose to present our interview findings and to flesh out the most important values mentioned by our respondents by focusing on the following four aspects associated with commercial fishing:

1. Economic ripple effects from respondents' commercial fishing expenditures,
2. The role a commercial fishing vessel plays in the gifting and trading of seafood,
3. The lifestyle of a commercial fisherman, and
4. Intergenerational significance of commercial fishing.

Exploring these four particular aspects surrounding our interviews not only fills data gaps identified in previous studies[1], but also provides a coherent means to relate the interlinked, complex relations between tangible financial, other tangible, and intangible values that were characteristic of each interview. There are certainly other themes to explore from the rich information collected that we hope will be the focus of future research.

3B.1. Mapping Economic Ripple Effects

Economic contributions of the commercial fishing industry are typically measured in terms of ex-vessel revenue, or the amount fishermen are paid for their catch at the first point of sale. That isn't the end of the economic story, however, because those revenues are not static. In fact, every dollar of ex-vessel revenue paid to commercial fishermen can lead to a more than proportionate increase in economic activity. This is because commercial fishermen spend their revenue across the economy-at-large to maintain their fishing operations and as personal living expenditures. For example, to go fishing, fisherman purchase gear, bait, and other supplies and hire a crew – all of whom are paid accordingly. Then the suppliers and crew members also spend their income in the regional economy – for their own supplies or at local shops, restaurants, etc. – inducing more economic activity. In economics this type of stimulated economic activity is referred to as the multiplier effect, or the ripple effect, as revenues and expenditures ripple throughout the regional economy.

Usually, to estimate indirect and induced ripple effects, ex-vessel revenues are multiplied by carefully calculated numbers called economic multipliers. While relevant economic multipliers exist (see Statistics Canada[j] or BC Stats[k], for instance), we chose instead to demonstrate the ripple effect of commercial ex-vessel revenues in a different, and relatively unique approach. Our analysis provides a preliminary understanding of the extent and locations where this economic activity is actually occurring as one way to illustrate how commercial fishing supports local economies.

We asked respondents about the activities they do to prepare for the fishing season and to specifically name the businesses and locations where their associated expenditures took place. A wide range of potential transactions were inquired about, including: gear purchases and storage; repair, mechanical, and electrical work; fuel, bait, and ice supplies; as well as monitoring, insurance, and book keeping services. From interview responses we created a flow map displaying the business locations mentioned by respondents (Figure 9). The thickness of each line represents the number of mentions each particular business received, with more mentions warranting greater thickness. We also show where fishermen made different categories of purchases in Table 4.

Our findings geographically illustrate a portion of the economic multiplier effect: the first round of indirect ripple effects as fishermen spend ex-vessel revenue to support their individual fishing seasons. Respondents made the overwhelming majority (57% of all businesses mentioned) of their purchases in Prince Rupert, but they also patronized businesses at a broader geographic scale from Japan, to the interior of B.C. and the coasts of southern B.C.,

[j] For more information on Statistics Canada economic multipliers, see:: http://www5.statcan.gc.ca/bsolc/olc-cel/olc-cel?catno=15F0046XDB&lang=eng

[k] For more information on BC Stats economic multipliers, see: http://www.bcstats.gov.bc.ca/StatisticsBySubject/Economy/BCInputOutputModel.aspx.

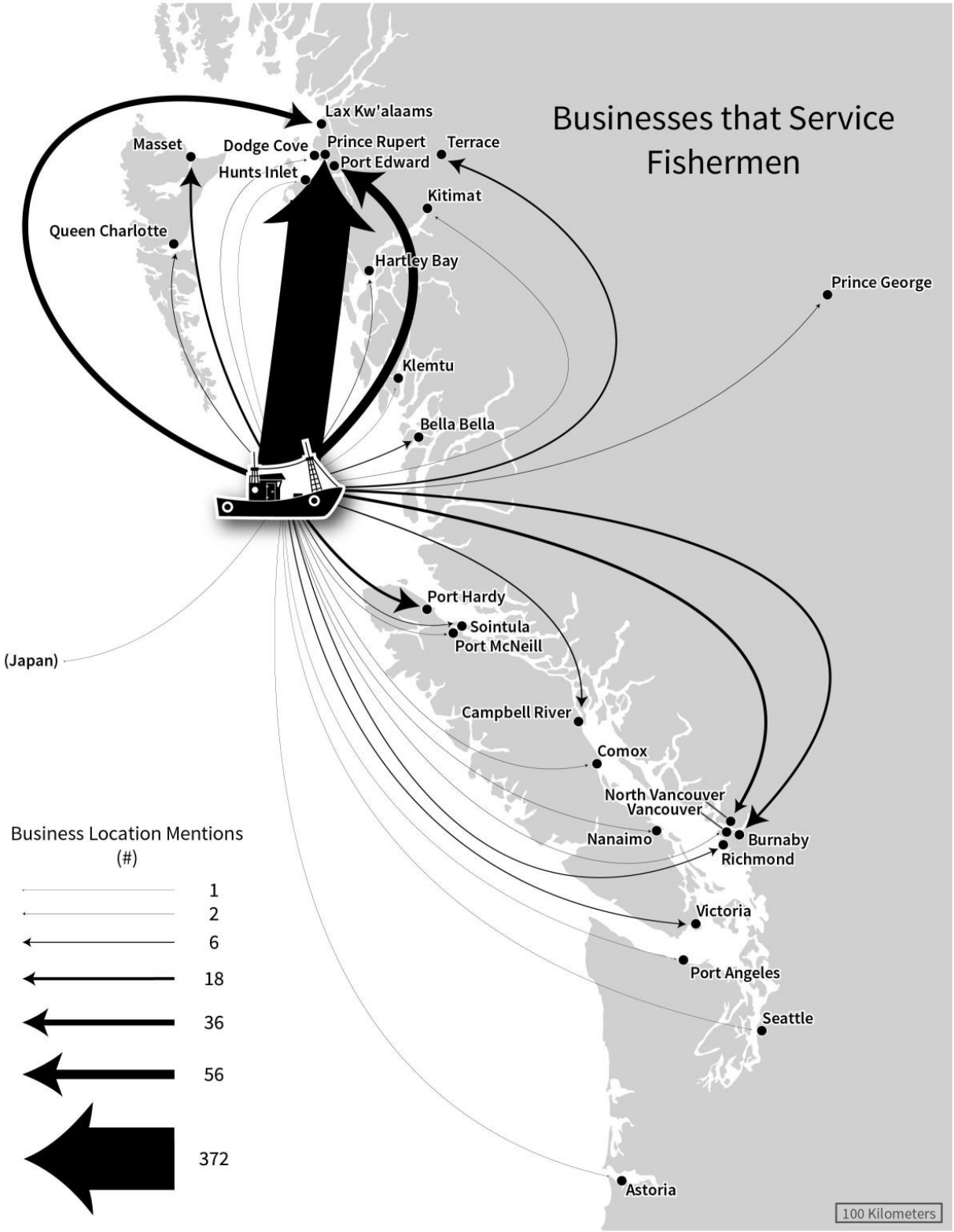
Washington, and Oregon. Altogether respondents supported more than 200 different individuals or businesses. Table 4 highlights the wide variety of services commercial fishermen rely on to run their business, especially in Prince Rupert.

It is important to note that Figure 9 represents only the expenditure flow of our 23 respondents, who are all based around the Prince Rupert case study area. It is likely that a similar such flow map particular to other PNCIMA communities would be similarly locally focused around each respective community, or the PNCIMA region as a whole, stimulating local economies.

TABLE 4: PURCHASES Frequency of types and locations of purchases made for commercial fishing-related activities reported by respondents. Number of responses: white = 0; light green = 1; dark green = 2 to 10; light blue = 11 to 20; medium blue = 21 to 30; dark blue = 31 to 40; black = 41 to 50.

Town name/Category of purchase	Bait	Boat	Book keeping	Dry dock	Electrician	Electronics	Fuel	Gear	Gear maintenance	Groceries	Ice	Insurance	License	Mechanic	Monitoring (company)	Moorage	Quota	Storage of gear	Vessel maintenance	Total
Astoria, Oregon																				1
Bella Bella																				6
Burnaby																				15
Campbell River																				8
Comox																				2
Dodge Cove																				2
Hartley Bay																				4
Hunt's Inlet																				1
Japan																				1
Kitimat																				2
Klemtu																				1
Lax Kw' alaams																				34
Lax Kw' alaams or Prince Rupert																				9
Masset																				14
Nanaimo																				2
North Vancouver																				2
Port Angeles, Washington																				1
Port Edward																				56
Port Hardy																				17
Port McNeill																				1
Prince George																				3
Prince Rupert																				362
Queen Charlotte City																				4
Richmond																				33
Seattle, Washington																				1
Sointula																				4
Steveston																				3
Terrace																				11
Vancouver																				18
Victoria																				6

FIGURE 9: BUSINESS LOCATION FLOW MAP Locations of businesses that service commercial fishermen in our study and the relative frequency with which locations were mentioned during interviews.



3B.2. Social Capital and the Gifting and Trading of Seafood

Throughout the interviews a strong recurring theme among our respondents was the existence and importance of social bonds and the sense of being part of a community, or social capital. Respondents talked at length about their relationships to their crew, fellow fishermen, ancestral fishermen (whether direct generational relatives or the overall sense of historical regional identity), and non-fishermen friends and family with whom they gift or trade seafood. Often the networks constituting social capital are intangible and difficult to trace within a community. However, exploring the gifting and trading of seafood by commercial fishermen throughout their communities can provide a preliminary outline of these important networks.

Commercial fishermen have unique skills, experience, and valuable access to boats and gear which can be beneficial to their communities. Among our interviews, a majority of respondents explained how their commercial fishing supports their community in terms of being able to gift and trade fish to friends, family, and acquaintances:

"One of the appeals for me getting into fishing was that I'd have fish to give to friends. It made a kind of food community. It lent itself to the kind of community that developed in this area. Being a fisherman was an easy way to contribute to the community."

"Even if you're not friends with someone, bringing people fish creates a strong bond."

Gifting and trading of seafood occurs among commercial fishermen in various ways on a spectrum from sharing fish there is no market for, to being paid by their First Nations Band to catch Food Social and Ceremonial fish for their whole community.

Respondents mentioned 40 different types of seafood caught for gifting and trading, with salmon and halibut comprising the bulk (20% and 14% respectively) of the responses. Figures

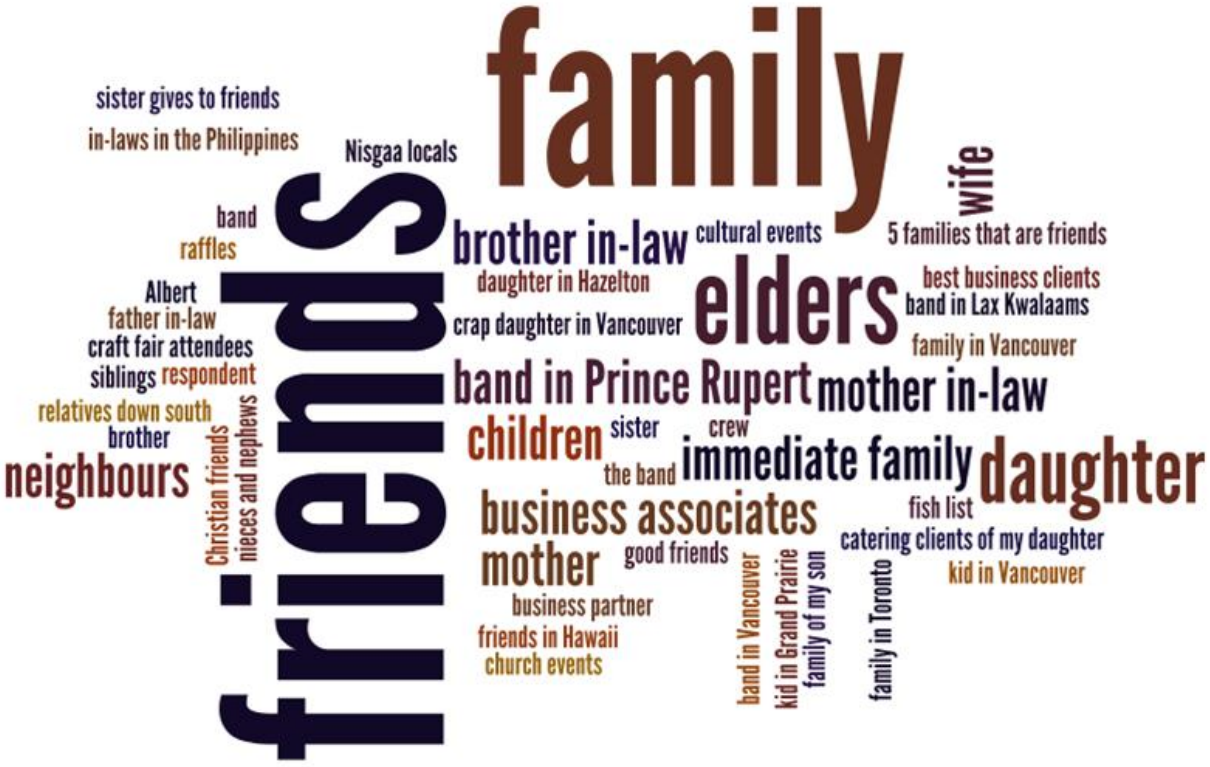
10 and 11 display the species caught and processing methods used by respondents to prepare food fish. It is important to note that the commercial vessel itself plays a key role in processing – half of the processing of fish for trade and barter was performed by respondents on their boat with the other half processing in their home. The processing of the food fish itself may involve anywhere from three to 25 additional people, fishermen and non-fishermen alike working together.

FIGURE 10: SPECIES OF GIFTED AND TRADED SEAFOOD Responses to which species are caught for gifting and trading, n = 132 responses from 23 respondents.

FIGURE 11: GIFTED AND TRADED SEAFOOD PROCESSING Responses to how gifted and traded seafood are processed, n = 76 responses from 23 respondents.

Figure 12 illustrates the dense network and relationships of the recipients of gifted and traded seafood. While most are described as friends and family, other recipients included neighbors, Elders, and business associates. The majority of the gifted and traded seafood was likely distributed locally, but some seafood traveled as far as Toronto, Hawaii, and the Philippines.

FIGURE 12: GIFTED AND TRADED SEAFOOD RECIPIENTS Responses to who receives gifted and traded seafood, n = 80 responses from 23 respondents.

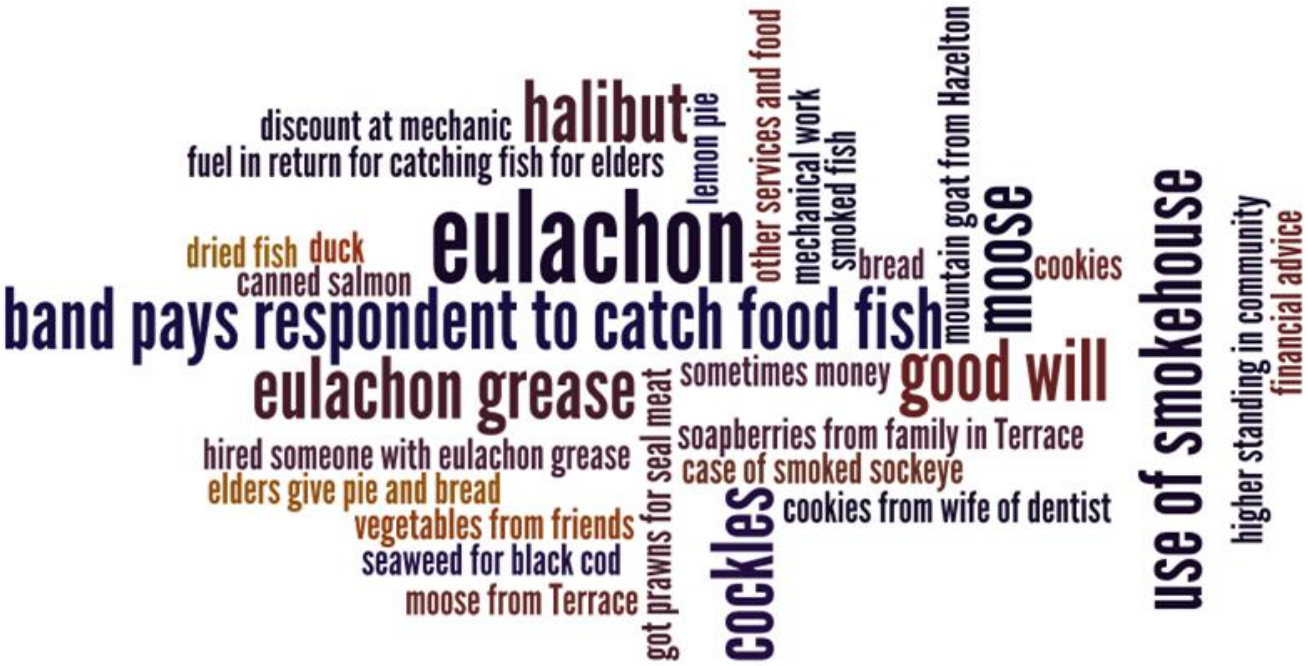


In addition to being a complex network, the number of recipients of gifted and traded seafood was also surprisingly large. The most commonly reported (six responses) annual number of people who received seafood from an individual respondent was 100, although the number of recipients varied from six to a 1,000 people. Thus it can be estimated that over 2,000 people receive seafood as a gift or in trade annually from the 20 respondents who answered this question. One respondent described how he kept a 'fish list' of potential recipients:

"I'll have people on what I call my 'fish list' – people who've been nice to me throughout the year and who love crab. At the end of the year I cook up the rejected crab that the buyers won't take and make up little bags and deliver them. I'll do my rounds. It's another excuse to go out and interact with all these other people. And then things come back…maybe it's a lady that makes really nice cookies or someone that's really skilled with computers that I might have to bug a few times a year. It's a nice little barter thing."

These interactions, transactions, and ties are an important foundation to our respondents and their communities. However, almost none of this value is recognized or accounted for in the formal economy as little to no monetary transactions take place. Even so, economic benefits are undoubtedly accruing to all involved, especially perhaps to commercial fishermen. Figure 13 displays a wide-ranging number of goods and services that our respondents received in trade for their fish transactions. Some fish is indeed traded for money, and other return goods and services can easily be monetarily valued, such as a 'discount at the mechanic' or 'fuel'. Others are more curious and far-reaching than one might have imagined as connected to commercial fishing at all; for example one respondent received a mountain goat in trade for seafood. Finally, respondents touched upon the nearly inexpressible and certainly immeasurable returns they received from gifted or traded seafood, summed up as 'good will' or a 'higher standing in the community'. These intangible returns are those at the core of social capital, serving not only the commercial fishermen himself, but also the community at large by strengthening relationships and enhancing trust.

FIGURE 13: TRADED SEAFOOD Responses to what do you receive in trade for seafood, n = 76 responses from 23 respondents.



In addition to gifting and trading seafood, respondents mentioned other important values that likely contribute to social capital, for example: membership in fishermen's association and similar types of collective action, participation in and provisioning for community events such as feasts, weddings, donations to Elders, and other such contributions to the community's strong sense of fishing identity. Through these types of social values, commercial fishermen gain a reputation in their communities:

> *"Fishing connects families and communities…your reputation as a fisherman lets other people know where you stand in the community."*

Among our interviews we discovered a particularly powerful example of how a fisherman's connections, social networks, and reputation can translate into economic benefits. One respondent explained how his reputation for being a good fisherman allowed him to buy a good house on his word:

"When I bought a house… I didn't have any collateral. Based just on knowing the bank manager, sheer knowing each other, [I got a loan]. He gave it to me based on who I was, on the value of my word."

3B.3. The Commercial Fishing Lifestyle

Being a commercial fisherman was important to respondents for reasons including but not limited to their ability to earn a livelihood. In fact, more respondents identified the following benefits of being a commercial fisherman than they did financial support: a sense of freedom and independence, positive feelings of satisfaction for their work, and the flexibility of their schedules. Then, following financial support, other values attributed to the commercial fishing lifestyle included: the ability to be out on the water, the social aspects of working with other fishermen, and the satisfaction received from provisioning food. It was clear throughout our interviews that being a fisherman was not just another job valued purely for its money-making capacity, but as a 'way of life'.

These values are significant in terms of a commercial fisherman's personal identity and as contributions to the overall sense of place and identity of his community. In fact, respondents noted this directly, said one fisherman:

"If we lose our fishing, we lose our identity."

Identity can affect economic outcomes; in fact, choosing what type of person to be, for example a commercial fisherman, may be one of the most important economic and cultural decisions that an individual makes[44]. This is due to how identity can be incorporated into a person's economic behavior, opportunity, and well-being.

These significant aspects of the commercial fishing lifestyle are best left described by our respondents themselves, and thus here we extrapolate the general sentiments expressed throughout our interviews and include some choice quotes relating to the top lifestyle values that emerged from our interviews:

1. **Freedom and independence**: Several respondents described how being a commercial fisherman is also being a business-owner or entrepreneur. Respondents enjoyed that they were their own boss; the mentality of being in charge and being the head decision-maker was important to them.

> *"Fishing teaches you how to fend for yourself."*

- *"Every morning I get up and I get to decide what I'm going to do that day."*
- *"You can give yourself work, you don't need someone to hire you."*

2. **Positive feelings**: Respondents displayed a love for their work, which they attributed to the positive feelings associated with commercial fishing. The job of fishing was described as "fun, exciting, dynamic, and enjoyable." In addition, respondents reported that commercial fishing provided an immense sense of satisfaction when the hard work they put in results in success; this success, in turn, builds self-esteem.

> *"The ocean brings me joy… it's a fascinating playground, a wonderland."*

- *"I'm still lucky enough to love my job, I love going to work every day."*
- *"I love everything about fishing, it's what I eat, sleep, and breathe."*

3. **Flexible schedule:** Respondents regarded the flexible working hours that commercial fishing affords them as important. It is a job that allows them to work hard when they need/want to and then take time off either to do other jobs/projects or spend time with family and friends.

"First starting [to fish] there are so many things…the work is really hard, it's hard on the body and hard mentally going away from people for a long period of time. But after a while you start to see the good things about fishing and develop a love for it. I really like fishing for the fact that you go out [for] three months [and] it's crazy; you're working 20 hour days, you go to town only for a couple hours just so you can get ready to leave again. But then once the season is done you have 7 or 8 months of total freedom. That's the thing I like most about fishing. That really appeals to me and makes me want to keep doing it. [That] time off allows me to…go after whatever dream I have at the time. [For example], I quit smoking a while ago. I made it really easy on myself. I took a couple of weeks of my life and [quit] and that was it. Having time off allows you to focus on one thing."

4. **Financial support**: This theme presented a double-edged sword: some respondents viewed commercial fishing as important as it allows them to make a decent living, and thus support their family and community; others lament that they used to be able to support themselves with fishing, but are no longer able to.

"If fishermen were making good money, we'd be paying higher taxes to the federal and provincial governments and that [money] would come back to our communities. If this happened, [places like] Prince Rupert would start to prosper like they used to in the olden days. The way the government has made it, fishermen are barely existing… they [the government] made the communities die with what they've been doing."

"[Commercial fishing] supports my family…it maintains my truck, lets us go on holiday, and it allows my daughter to dance"

"Right now, we [commercial fishermen] are existing. At my age, my boat and home are paid for so I can go out there and cover my expenses, but if I was younger and had to cover a house or a boat, I couldn't make it."

5. **Being on the water**: Fishermen view their office space as an important extension of their lives (and lifestyle). They reported enjoying the places they get to spend time in while fishing; being close to nature, and the scenery they witness during the course of their work were both listed as being important.

"My office has the most amazing view all day long… and it's constantly changing!"

"I'm lucky; my job allows me to spend time in the least explored places of our planet – the oceans."

6. **Social bonds/community identity**: Respondents talked at length about the tight bonds fishermen have with their crew, family, and fellow fishermen and the sense of camaraderie fishing provides them. They described similarities between farming and fishing communities in that both involve work that families do together that builds social ties. Finally, respondents found value in the community itself – being part of a community that is rooted in place and tradition, the rich fishing history of their region, was listed as important.

"Fishing keeps a strong interaction throughout the entire community. If [you had] a really good trip, or [if] something happens on the boat, everybody hears about it. This strengthens the community. Or sometimes the opposite: something really bad will happen, like someone will die. And even if you don't know the person, you feel connected and you feel really sad because it is part of your town."

"When you've worked with people on the boat for a couple years and you go through stuff that (is) really bad, like a bad storm…or really long shifts, you get a connection with the people you're working with. [These people become] more than just a person you work with when you get to town. You view that person like family, like a different kind of family and that's really cool."

I think it's really a shame if these fishing and cultural traditions go because I think they were so rich and provided so much opportunity to people. You should read the book Gumboot Girls[l]. It is like hand logging, which is gone now, and how much that was a family affair and supported little mills. Or like family farming, all those kinds of [industries] have a personal-ish aspect to them that's not like working for a factory or working for Jimmy Pattison. Those industries foster communities and a kind of community culture.

It [fishing] is our way of live, our traditions, we've been doing it for thousands of years…We invented trolling and everybody caught onto that and they turned it into a commercial fishery… We are fish people. Everything comes back to that. That's our way of life.

7. **Food provisioning**: Respondents reported that eating, preserving, and sharing seafood is an important part of the lifestyle of commercial fishing. (See S*ection 3B.2. Social Capital and the Gifting and Trading of Seafood* regarding the significant social networks and capital surrounding food fish.) At the individual level, having the ability to feed people was personally significant to many respondents.

> *"Feeding people, providing good, healthy nutrition… how much more important can you get than that?"*

When asked whether any of the categories of values we discussed were especially important, one respondent said, "Food for thousands of people is the main value, it outweighs by many magnitudes all the other values we talked about in this interview."

As this quote illustrates, fishermen respondents saw themselves as providers of good food for many people through their commercial fishery. Seafood that they gifted or traded had the added value of being a prestigious food that fishermen, their families, or other seafood recipients may not be able to afford in stores or restaurants otherwise.

[l] *Gumboot Girls: Adventure, love and survival on British Columbia's North Coast.* A collection of memoirs compiled by Jane Wilde and edited by Lou Allison. Muskeg Press: 2012. http://www.muskegpress.com/gumboot-girls

Said another respondent, because he fishes commercially he and his family can "eat the diet of a wealthy person."

8. **Fishing as personal identity:** For our respondents, being a commercial fisherman was clearly not a job that would be easily substituted for any other. The commercial fishing lifestyle greatly informs their self-identities, offers them valued opportunities unique to their chosen profession, and provides a high measure of well-being. One fisherman said:

"It (fishing) encompasses most things in my life. It takes up more of my time than anything else."

In fact, most cannot imagine doing anything else. One respondent articulated this shared sentiment particularly powerfully as he described why commercial fishing was important to him:

"It's who I am, it's what I do, it's what I know and enjoy… It's really hard for me to wrap my head around being anything else other than a fisherman, I just am. This is what I do. This is a conversation I have with a lot of other [fishermen] – we could do something else, but it probably wouldn't be long before we jumped off a bridge."

3B.4. Intergenerational

The intergenerational aspects of commercial fishing reach both into the past, as in sharing a common identity with ancestral fishermen and the rich fishing history characteristic to this region, as well as into the future, as in what respondents hoped their children and future generations would experience after them in commercial fishing. Values regarding past generations centered more along the lines of identity, culture, and tradition.

Of the 23 respondents, 87% (20 individuals) were generational fishermen, with the average number of generations back reaching three generations, and the furthest back being four generations. One respondent described his link to fishing history and fishing future:

"[My] family has fished commercially as far back as I can remember, my great grandfather, my grandfather, my dad. Our family has been in fishing the whole time. My son's out there too and my granddaughter now… My granddaughter's a little fishing woman. She just loves it. Even when we go in the mud up on the Skeena River to get Eulachon she's right there. This will be her third year, her third Eulachon season. She's nine now. She wanted to be there so badly the first year… she was in the water like 4-5 hours on the Skeena River and didn't tell me she had holes in her boots. It didn't bother her at all. That's how we grew up, in the water. We used to see who'd be the first one in spring to get in the water. So we'd run right from the field covered in 3-4 feet of snow right into the water."

Looking back and considering the history of commercial fishing in their communities, respondents often became nostalgic and reminisced how things used to be and how they had changed over time:

"The fishing industry built Rupert, but [now] people won't stay here. You're losing community when you lose the fishing industry."

"Fifty years ago there were more places fished, more ports visited, more people involved. Prince Rupert was a fishing town and used to be the halibut capital of the world. There were fish plants all up and down the coast and this created employment, people would come to Prince Rupert by train to work. There weren't enough boat builders to keep up with orders. You could pay $1 and go out and commercial fish anything you wanted [and fish all year], but then they created area licensing…and now 5-6 months of the year the boat is tied up at the dock."

As for future generations, responses closely echoed the positive aspects of the commercial fishing lifestyle described by respondents (see *Section 3B.3.The Commercial Fishing Lifestyle*)

and how respondents hoped future generations would also experience them. Major themes in responses, in descending order of number of mentions, included: being on the water, knowledge and skills transfer, traditional way of life, food security and traditions, positive feelings, stewardship, and work ethic.

Interestingly, a few respondents said they are discouraging their children from fishing as they worried about the future of the industry. One respondent noted regulatory issues and changes that he worried challenge the ability of younger people to enter the fisheries:

> *"[I don't] want them to get swallowed up by giants; they won't be able to make enough money to live on; they should get an education and see the world."*

On the other hand, many respondents provided a number of successful examples of passing commercial fishing on to youth including: participation in school programs; partaking in community clam and cockle digs; and personally mentoring and passing down other fishing knowledge such as how to make paddles, set crab traps, prepare, cook, and serve fish, etc., to their own children, grandchildren, and other youth.

Either way, the majority of respondents stressed the importance of passing on knowledge and transferable skills essential to surviving in fishing that could benefit youth in other career paths or in life overall. In other words, experience in commercial fishing was strongly believed to enhance human capital, providing benefits beyond the realm of the commercial fishing industry. Two respondents, for example, described the following:

> *"Commercial fishing is a great learning platform about who you are and what you're able to do and not do. It [commercial fishing] pulls at all bits of you… you've got to learn to be a business man, you've got to learn to be a worker, you've got to learn to be a leader, all this stuff."*

"[By] running your own fishing boat, you are running your own company, so you learn a lot of transferable skills… as a captain you develop a work ethic and learn how to manage deckhands, which is similar to being a foreman at a construction site."

Other examples of transferable skills mentioned included: navigation, mechanical work, reading the weather, detailed observation of nature, a strong work ethic, leadership, people management, and how to run a business. Overall, respondents upheld commercial fishing as a valuable learning ground for instilling a generally good work ethic in the next generation. One respondent reported that he wanted to teach his children how to work, which would in turn create more work opportunities and teach them to be self-reliant.

Knowledge of the commercial fishing industry itself was also listed as valuable, because, as one respondent put it:

"The next generation (needs) to know their territory, where resources are, how to acquire them and when they are available"

The above sentiment aligns closely to similar desires of respondents for future generations to know not only about the land, resources, and methods of acquiring fish, but also for youth to know their roots, culture, traditions, historical and current reliance on fish, and finally of course, the importance of protecting and conserving these traditions, areas, and fish. All of this, respondents believed, can be learned through the fishing trade.

"Fishing is so interconnected with other things. It isn't a specific thing I'm doing…it encompasses most things in my life. It takes up more of my time that anything else."

With regards to stewardship and conservation, respondents thought it important for future generations to have healthy respect for, and desire to protect, the environment and the ocean – the source of the fish they rely on to maintain both their jobs and their way of life. This included mentions of preventative action, such as keeping streams clean, as well as responsive action like cleaning up after events like a tsunami.

"It's important to pass on the idea of conservation - this means taking what you need and not extra, like take just enough sockeye for the winter."

On a more basic level, respondents hoped to share the experience of simply enjoying good fish. Additional hopes and experiences wished upon youth and future generations by respondents, in lists of their own words, included the following:

"Drifting, flat calm, whales, and birds gathered around the boat chirping at each other, beauty and the scenery that is second to none, the big sockeye in the Fraser River, Hecate Strait in bad weather, sea sickness, good fishing and nice weather."

"Peace and quiet, pride, fun, possibilities, the excitement and entertainment of fishing."

"The joy the ocean brings me, feeling scared, learning boundaries, an honest day's work, the fun of an aquarium of bycatch, bonfires on the beach, jigging for bullhead, beachcombing, digging for clams, phosphorescence, chasing salmon up the Nass River, seeing buildings in Butedale."

"…children to jump into a pile of fish and roll up (their) sleeves to get work done."

SECTION 4: CONNECTING PART 1 AND PART 2 OF THE STUDY

Our findings in Part 1 and Part 2 of the study together illustrate that the role commercial fisheries play in the formal economy is just the tip of the iceberg of the full suite of values that they bring to communities. We illustrate this magnification of values in Figure 14. As fish caught in PNCIMA are landed they garner a dollar value ($167 million in 2010). Once these fish are processed and sold, their value to the formal economy balloons (wholesale value in 2010 was $415 million). But the value of these fish and the work put into catching them doesn't stop here. It gets magnified as businesses are supported who supplied equipment and services to fishermen. Although the formal economy stops counting the value of the fish and fisheries here, values continue to accrue to families and communities. For example, interviews revealed that commercial vessels catch additional fish to gift and trade and in return a fisherman's family may receive other food or a myriad of additional bonuses from the large and dense network of relationships created by gifting and trading seafood. These networks of relationships, communication, and trust make up social capital, and strong social capital is thought to be linked to more productive formal economies[3].

FIGURE 14: MAGNIFICATION OF VALUES Landed value is just the tip of the iceberg of the full suite of values that commercial fisheries bring to PNCIMA's communities. Community values are, clockwise from top left: networks, spiritual, stewardship, lifestyle, fishing income, fishing expenses, gifting and trading seafood, culture and tradition, education, intergenerational, and transportation. Wholesale and landed values are for the year 2010.

Furthermore, strong social capital is also a key component required to successfully manage aquatic resources and secure the livelihoods of communities depending on them[5]. It seems then, that the culture, or the social/community structure, or social capital created by commercial fishing as described by respondents can build strong communities, which in turn support strong economies, and successful fisheries. All of these benefits of commercial fisheries should be considered during fishery management and integrated marine planning.

SECTION 5: SUMMARY OF KEY FINDINGS & IMPLICATIONS FOR MANAGEMENT AND PLANNING

5.1. Part 1 of the study

Despite the cyclic nature of fisheries and overall declines in landed weight and landed value in the PNCIMA region over recent years, wild-capture commercial fisheries contribute important economic input into the PNCIMA region and the Province of BC.

By mapping landed value at different scales, we have shown new information about the spatial patterns in landed value of wild-capture commercial fisheries.

At the coarsest scale, we found that PNCIMA has some of the most valuable fishing areas in the Province and the coasts of mainland Northern BC and Haida Gwaii are especially economically important for wild-capture commercial fisheries. But this pattern does not hold true for all fisheries or years: some fisheries do have areas offshore that yield consistently high landed values, and the most valuable fishing area in a given year can change over time.

Our assessment of the spatial variation in landed value in PNCIMA provides information useful for integrated marine planning. Evaluating which fishing areas are most economically valuable at different spatial scales revealed a complex pattern: depending on the spatial scale, we find different areas are most-to-least important for particular fisheries and/or particular years. This complexity suggests that decision-makers should consider the effects of planning options on a variety of spatial and temporal scales and combinations of fisheries to fully understand impacts.

5.2. Part 2 of the study

In addition to playing an important economic role in the formal economy, the wild-capture commercial fishing industry in PNCIMA contributed to both community wellbeing and social capital.

By mapping the reach of the ripple, or multiplier, effect of the commercial fishing industry in PNCIMA we highlighted how revenue from wild-capture commercial fisheries supported local formal economies. Revenue from fishing that fishermen spent on fishing supplies rippled

through hundreds of different businesses, especially in Prince Rupert, but also reached as far as Japan.

The commercial fishing industry in PNCIMA has the potential to build strong communities, which in turn support strong economies. Our results indicate that the commercial fishing industry in our PNCIMA case study communities of Prince Rupert and Lax Kw'alaams permeated the social, cultural, and economic interactions both among people and their environment. Participation in commercial fishing creates complex networks between fishermen, their families, and the community at large through joint activities including season preparations, fishing itself, vessel maintenance, fish processing, and the gifting and trading of fish at large. These commercial fishing associated networks of relationships, communication, and trust, establish social capital, can aid in sustainability aims, contribute to community and individual well-being, and provide an important sense of self and place[3–5]. Of course, undermining these complex networks can undermine the resilience and economic viability of related communities.

Our respondents identified many of the less tangible aspects of commercial fishing as the most important to them. The cultural connections inherent to their participation in the industry and the hope to share them with future generations were the strongest value associations. The provisioning of food was also important to respondents, as well as values found in stewardship, education, lifestyle, and income. During interviews fishermen talked at length about the key role played by commercial vessels in a surprisingly large and complex system of gifting and trading seafood. They told stories of important life skills and lessons learned through fishing and the culture that the tradition of the industry has created in people's daily lives and the lessons they pass down to their children.

Overwhelmingly, participation in the commercial fishing industry was not viewed solely as employment, but in fact, a great 'connector'; connecting people to each other, to their communities, to the physical space they occupy – to their place in the world.

This type of impact and influence, though largely based outside of the formal market economy, is undoubtedly important in planning and development processes.

Incorporating and protecting what matters most to commercial fishermen should be a priority in fishery management and integrated marine planning – for the PNCIMA planning process and other ongoing planning in the province. The less tangible types of values that were important to fishermen in our study need to be incorporated into decision-making because they are part of the social and economic objectives that fishery management and integrated marine planning aim to consider[15,16]. In addition, as was mentioned earlier, less tangible values can even affect the formal economy, with more social capital leading to more productive economies[3]. Ignoring the less tangible values during the decision-making process could result in an underestimate of

the full value of commercial fishing, resulting in management and policies poorly suited to social and economic realities.

Since many of these less tangible values do not lend themselves well to quantitative or spatial analysis[19], gathering information via interviews using a protocol like that created by Klain and Chan – which was the basis of our work as well – is an important step forward. Additional methods are needed to integrate less tangible values elicited during interviews into management decision-making processes. Klain and Chan[19] list a number of possible approaches, from beginning with deliberative discussions between stakeholders and policy-makers, to identifying gaps in existing information and maps to engaging in more structured decision analysis.

The information provided by this report, similar cultural/value studies [e.g. 1,19,45], and any ensuing discussions, will support leaders to better understand and protect commercial fishing interests, and at the same time give fishermen and their communities a voice, along with the hope of a strengthened commercial fishing industry in the future. Beyond PNCIMA, across fishing communities impacted by fishery declines globally, anecdotal information we have heard suggests the importance of commercial fishing as a 'connector' of people to each other and to their environment and therefore to social capital and well-being may be quite common. Beyond commercial fishing, the holistic view of tangible and less tangible values associated with an industry will be important to consider for any industry involved in planning. Tools to document less tangible values, developed by others and built on by this study, can be broadly applied to provide a more inclusive value of industries to communities.

SECTION 6: IMPLICATIONS FOR FUTURE RESEARCH

Our study serves as a starting point for further investigation into the social, cultural, and other intangible values that arise from marine industries along coastal communities. In our case study, fishermen from the PNCIMA communities of Prince Rupert and Lax Kw'alaams that we interviewed provided a wealth of previously undocumented information. Our preliminary study was not designed to extrapolate results to all PNCIMA communities; however, it is likely that similar findings regarding the value commercial fishing contributes beyond environmental impacts and economic benefits are applicable to other coastal communities in PNCIMA and beyond.

It is our hope that the data collection and analysis methods developed through this project provide a replicable process that can easily be applied to additional PNCIMA communities, a broader geographic sample, and/or other industries.

Our illustration of the multiplier effect of wild-capture commercial fisheries on PNCIMA local economies represented only the initial round of indirect effects from our respondents' business related expenditures. A more complete illustration of this multiplier effect would go on to include where the fishermen's suppliers procured their own supplies and then again the associated support system for those businesses as well as where all personal expenditures by all involved were made. Of course, visually following the multiplier effect so comprehensively would quickly lead to a map so connected it would be too difficult to read. We believe that our choice of demonstration revealed how the economic activity associated with commercial fishing is regional, perhaps even highly local, and economically significant beyond the ex-vessel revenue the fishermen receive at the dock. Still, economic multipliers developed for the industry could be applied to the landings and wholesale values for PNCIMA region, or even to each PNCIMA community respectively. These types of formal multiplier analyses are made routinely in the assessment of the BC commercial fishing industry [e.g. 24] and have been applied at a coarse scale to the PNCIMA region[27], but if applied at a finer scale (e.g. the community or fishing port) may reveal additional economic activity accruing to the PNCIMA region.

Other future studies might focus on understanding the magnitude of contribution commercial fisheries make to local economies. This could be done by interviewing businesses patronized by fishermen about the proportion of their business that comes from fishermen, or the importance of commercial fishing to the health of their business in general as has been done in other studies [e.g. 46]. The database we have developed listing these businesses could be a useful starting point for such a survey, or for any other work regarding marine-related businesses and infrastructure in the Prince Rupert area. Beyond the commercial fishing industry, it would also be interesting to understand if and how less tangible values occur for other industries

competing for access to marine resources in PNCIMA, and furthermore, how those values might compare with those associated with commercial fisheries.

Research that compares how different commercial fishing fleet structures (e.g. all owner-operator vs. all corporately owned) affect social capital, wellbeing, and strength of local economies would also be useful. A comparison between commercial fisheries in BC and Atlantic Canada may clarify if concentrated fisheries ownership is supportive for fishermen and their communities. The strong ties our respondents had to commercial fishing were apparent and well entrenched within their local communities. It is our suspicion that fisheries with more ties to a local community would have greater social capital, although such a theory is beyond the scope of this study. Therefore, future research could be useful regarding differences in links between fishing and social capital across a spectrum of fleet structures. In addition to understanding value that commercial fishing brings to communities beyond the value encompassed by typical economic measures (as we did in our study), it would also be helpful to understand the converse: costs to communities of losing commercial fishing that are missed by typical economic measures. Any of these questions could be looked at by comparing links between social capital and fisheries across communities or by studying the effects of a transition from one fleet structure to another in one community over time.

Finally, the findings of this report present an important opportunity to re-frame fisheries policy in a way that leads to a more integrated, coherent policy, resulting in better, triple-bottom line outcomes.

Until now, Canadian fisheries policy has mainly been confined to two unconnected policy spheres: the economic, usually measured by landed value of a fishery, and the biological, usually measured by the abundance of an individual species' stock[m]. While these are unquestionably important measures, they leave out so much of the wider value of fisheries that they have unnecessarily limited the scope and impact of fisheries policy. Most would agree that the resulting outcomes for Canada's fisheries have been less than optimum.

By identifying the wider social, economic and environmental value of fisheries, and showing how these values are interrelated, both to each other and to other policy spheres, this study opens the door to an important policy discussion that locates fisheries policy in a wider policy context. This would enable policy makers to see fisheries policy as an integral part of other major policy areas. These could include:

- Food security
- Population health
- Poverty reduction
- Rural development
- Small and medium size enterprise investment and support
- Social enterprise
- Aboriginal policy

[m] DFO's Sustainable Fisheries Framework continues this disconnected approach.

Recognizing that fisheries policy has a vital role in these and other policy areas will contribute to better overall policy coherence, while improving the efficacy of fisheries policy.

A useful next step in this direction might be the creation of an interdisciplinary policy forum that includes policy makers from all levels of government as well as representatives from First Nations, fishermen's organizations, and researchers. Such a forum could then lead to other policy development initiatives.

SECTION 7: CONCLUSIONS

The wild-capture commercial fishing industry plays an important role in the formal economy and beyond, contributing 100's of millions of dollars in economic output and a full suite of further less tangible values to fishermen and their communities.

In terms of landed value, PNCIMA had some of the most valuable fishing areas in the province. Ex-vessel landings revenue in the PNCIMA region reached $167 million in 2010, increasing to $415 million in wholesale value, representing a significant contribution to BC's (~50% of total landed value[n]) and Canada's (~10% of nation-wide landed value[o]) economy. Although it is not a finding of our work, it is also important to note that the total wholesale value of BC wild-capture fisheries continues to rise[24]. Moreover, as fish are harvested, processed, and sold, value multiplies throughout the regional economy, supporting not only the fishermen, processors, and retailers directly, but also their suppliers and other economic sectors.

Beyond the economic output which can be traced through market transactions, the commercial fishing industry also provides many less tangible benefits. Although these values are less apparent or measurable in the formal economy, they contribute significantly to social capital, well-being, and resilience of coastal communities. Through interviews with a variety of fishermen in the case study ports of Prince Rupert and Lax Kw'alaams in the PNCIMA region, our study highlights such values surrounding the commercial fisherman's lifestyle, the gifting and trading of seafood, and the intergenerational significance of the industry to a community. We found many of these values to be intertwined and overlapping, given the rich history of fishing within these communities. It was clear that commercial fishing was not solely a job to our respondents, but also a sense of identity, a way of life, and the foundation of dense social networks within their respective communities.

The commercial fishing industry provides both significant economic output and significant social networks within coastal communities which are important contributors to social capital and well-being. Such cultural, intangible, and non-monetary values associated with commercial fishing must be deliberatively included alongside ecological and economic components of fishery management integrated marine planning processes to truly achieve optimal outcomes for all stakeholders in the PNCIMA region.

[n] In 2010 BC's total wild-capture fisheries landed value was $330,000,000. Sourced from http://www.env.gov.bc.ca/omfd/reports/YIR-2010.pdf

[o] In 2010, Canada's total wild-capture fisheries landed value was $1,885,685,000. Sourced from http://www.dfo-mpo.gc.ca/fm-gp/sustainable-durable/fisheries-peches/stats2011/wild-sauvages-eng.htm

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SECTION 10: APPENDICES

Appendix 1: Ecosystem Based Management Framework

Appendix 2: PNCIMA & MaPP Background

Appendix 3: Mapping the top ten most economically valuable fishing areas in BC

Appendix 4: Species included for each fishery and category of fisheries in our analysis

Appendix 5: Fleet Structure

Appendix 6: Interview Protocol for Socioeconomic Assessment of Commercial Fisheries in PNCIMA

Appendix 1: Ecosystem-based Management Framework

This summary represents how the stakeholders of the PNCIMA process have agreed to describe the Ecosystem-based management framework.

Definition:

Ecosystem-based management is an adaptive approach to managing human activities that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities. The intent is to maintain those spatial and temporal characteristics of ecosystems such that component species and ecological processes can be sustained and human well-being supported and improved.

Assumptions:

1. Ecosystem goods and services underlie and support human societies and economies; such goods and services can be direct or indirect.
2. Humans and their communities are part of ecosystems, and they derive social, cultural and economic value from marine ecosystem goods and services.
3. Human activities have many direct and indirect effects on marine ecosystems.
4. EBM informs the management of human activities.
5. Marine ecosystems exist on multiple spatial and temporal scales, and are interconnected.
6. Marine ecosystems are dynamic and subject to ongoing and sometimes unpredictable
7. Marine ecosystem states have limits to their capacity to absorb 845 and recover from impacts.
8. Human understanding of marine ecosystems is limited.
9. Humans prefer some ecosystem states more than others.
10. Humans can manage some drivers of change better than others, and can adjust or respond to some changes better at the scale of PNCIMA planning.

Principles:

1. **The EBM approach seeks to ensure ecological integrity.**
2. **The EBM approach includes human well-being.**
3. **The EBM approach is precautionary.**
4. **The EBM approach is adaptive.**
5. **The EBM approach includes the assessment of cumulative effects.**
6. **The EBM approach is equitable, collaborative, inclusive and participatory.**
7. **The EBM approach respects aboriginal rights, aboriginal titles and treaty rights.**
8. **The EBM approach is area-based.**
9. **The EBM approach is integrated.**
10. **The EBM approach is based on science and on wise counsel**.

Goals:

PNCIMA's EBM goals are interconnected and cannot be taken as separate from one another. It is the purpose of the PNCIMA EBM framework to achieve:

1. integrity of the marine ecosystems in PNCIMA, primarily with respect to their structure, function and resilience;
2. human well-being supported through societal, economic, spiritual and cultural connections to marine ecosystems in PNCIMA;
3. collaborative, effective, transparent and integrated governance, management and public engagement; and
4. improved understanding of complex marine ecosystems and changing marine environments.

Appendix 2: PNCIMA & MaPP Background

Canada legislated an integrated approach to oceans management through its Oceans Act in 1997. As part of the implementation strategy Canada identified five large ocean management areas (LOMAs) to pilot integrated oceans management. In 2005, work started on Canada's Pacific Coast Integrated Management Area (PNCIMA). In December of 2008, a Memorandum of Understanding (MOU) on collaborative governance was signed by Canada and most First Nations in the region. A funding MOU with the Moore Foundation was also signed. Nanwakolas First Nations and the Province of BC were added to the MOUs in 2011.

These efforts were recognized internationally as leading edge – the National Geographic identified the PNCIMA as one of the 10 best ideas on the planet. The stakeholder process built the Ecosystem-based Management Framework described in Appendix 1.

The government of Canada, shortly after it received a majority mandate in May 2011, unilaterally restructured the PNCIMA process in September of 2011, possibly fearing that decision-making was being shifted away from Ottawa to the region. As a result, the concept of integrated management in the PNCIMA received a serious setback.

The province of BC and most First Nations in the region are making a noble effort to carry on the integrated planning under a new process called Marine Planning Partnership of the North Pacific (MaPP). These efforts have been complicated by jurisdictional, governance and stakeholder issues and aspirations. Without the federal government at the table, a truly collaborative and integrated process is difficult and the process has major hurdles to overcome. The fisheries sector, a key marine sector covered by federal jurisdiction, is divided on the MaPP process as the jurisdiction managing fisheries is outside the process. The challenge to the province and the First Nations is to produce robust products that the federal government cannot ignore.

Appendix 3: Mapping the top ten most economically valuable fishing areas in BC

To visualize how the economic value of fisheries was distributed spatially in one additional way, we summarized data already presented elsewhere in the report to highlight the 10 Pacific Fishery Management Areas (PFMAs) in B.C. that had the highest landed values.

Methods and analysis

Data selection and methodology in this analysis are the same as for all of our other map analyses (Section 2A.3 Data Analysis), including that the spatial scale of the data is Pacific Fishery Management Areas. We also present value in the same units as other analyses (dollar per hectare) to be able to compare values among areas of differing size. PFMA #1 is split into two sections, as we included Sablefish in our analysis. Sablefish data is collected at the Groundfish Management Area scale. While the Groundfish Management Areas match the boundaries of many PMFAs, Area #1 is split between Groundfish Management Area 5D and 5E.

We took two approaches to mapping landed value from commercial fisheries in BC.

First we summarized our data at its coarsest scale. We summed the landed value for all commercial fisheries and all years (1996-2010) included in our database for each PFMA in BC. Then we ranked areas by their landed value, highlighting those with the top ten values on the map (Figure A1). We call this analysis the *Top ten most economically valuable fishing areas (1996-2010).*

Second, we explored how spatial patterns may differ if we highlight annual changes. Here we noted which PFMAs had the top ten highest landed value in each year (1996 to 2010) and then summed the number of times each PFMA appeared in the top ten over the 15 year timeframe of our analysis. We call this analysis *Fishing areas with the highest annual landed values.*

Results

Top ten most economically valuable fishing areas (1996-2010)

The top ten areas with the highest landed value across 15 years ranged from $705 to $2,500 per hectare (Figure A1). The areas, in order from highest to lowest ranked as follows (Table A1):

Table A1.

Rank in top ten analysis	PFMA	Area
1	24	Clayoquot Sound
2	14	Northern Strait of Georgia
3	23	Barkley Sound
4	25	Nootka Sound
5	15	Desolation Sound
6	1 (part)	Haida Gwaii - Northwest
7	19	Central Salish Sea
8	1 (part)	Haida Gwaii - North Coast
9	7	Milbanke Sound
10	13	Southern Johnstone Strait

Fishing areas with the highest annual landed values

When we unpacked the data a bit more, we found that there is variability in which areas comprise the most valuable fishing areas across years (Figure A2). Some areas (e.g. on the West coast of the Vancouver Island – PFMA 24: Clayoquot Sound) consistently rank in the top ten – 15 out of 15 years. Other areas appear in the top ten only once or twice over the 15-year time span we looked at.

Discussion and conclusions

These two maps illustrate an important difference: when we examine annual differences in the most economically valuable fishing areas, more areas, especially on the North Coast, appear in the top ten. These are the areas that appear only occasionally, maybe 1 or 2 years during our 15-year time frame, and they do not appear in our first, coarser analysis.

Similar to the results of our other mapping (in the core of the report), the fact that the most economically valuable fishing areas can fluctuate over time suggests that decision-makers should consider the effects of planning options on a variety of spatial and temporal scales to fully understand impacts.

It is important to note that the relatively coarse spatial scale of the data available to us limits both of these analyses. We worked at the scale of Pacific Fishery Management Areas. Across a given PFMA species are not distributed homogenously and therefore neither are catches or dollar values. If finer-scale spatial data were available, perhaps directly from fishermen, about fishing grounds within PFMAs that are most important, the summary of which of these areas are most economically valuable may look quite different.

Finally, these illustrations of economic value are just one lens, and a coarse one at that, through which to characterize the value of fishing grounds. First, our metric of economic value, landed value, is an indicator that is affected by biological, policy, and market factors. Understanding how these underlying factors influence each other and economic value would provide more practical insight about spatial patterns that could be useful for decision-making. Second, as we have shown in Part 2 of our report, economic value is only one component of the large suite of values associated with commercial fishing. Therefore, a more complete view of the value of fishing grounds would include other aspects of value such as culturally important areas.

Figure A1. Top ten most economically valuable fishing areas (1996-2010). Circled and numbered areas rank Pacific Fishery Management Areas by the sum of their landed value for all fisheries in our study for all years 1996-2010.

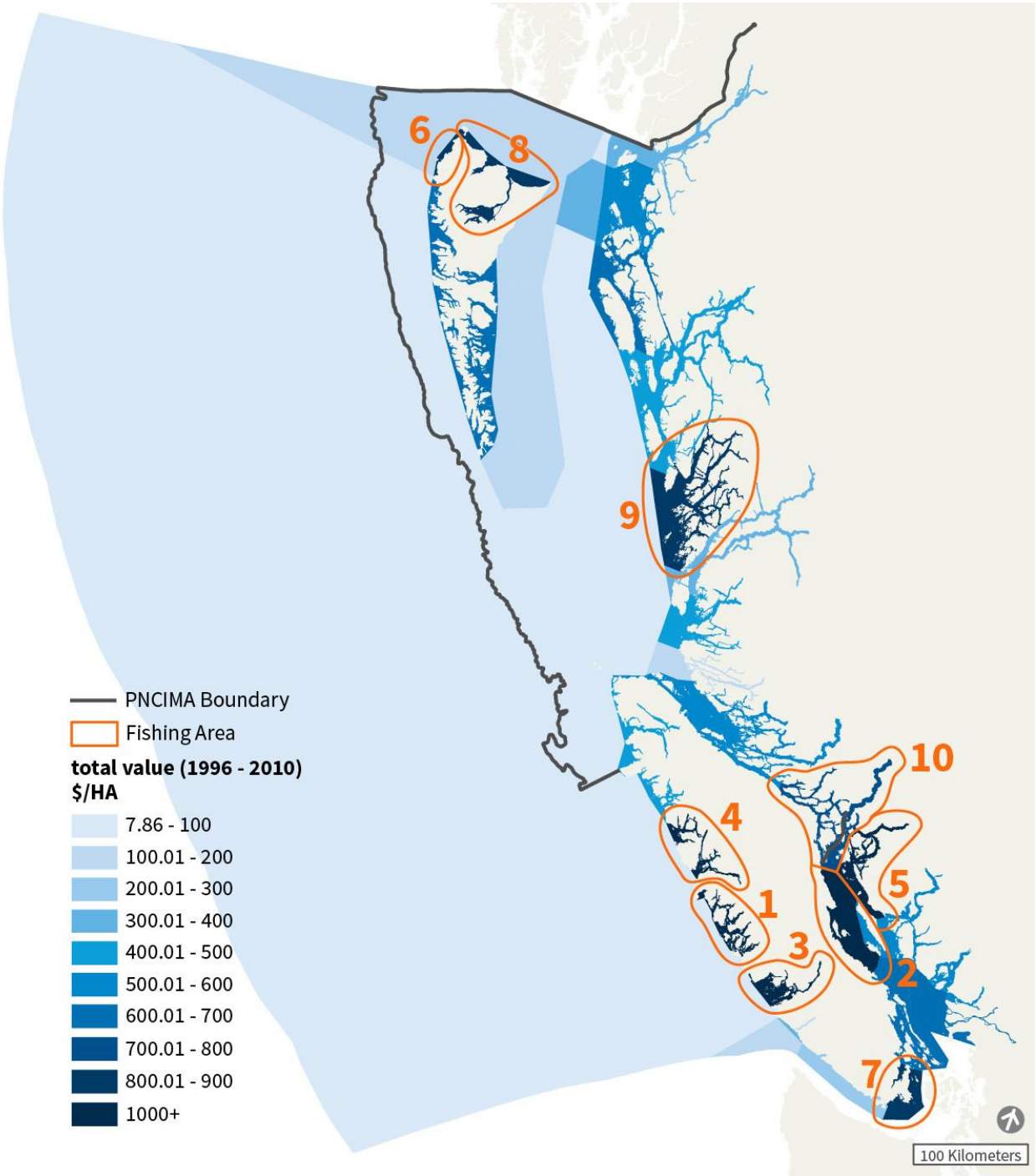
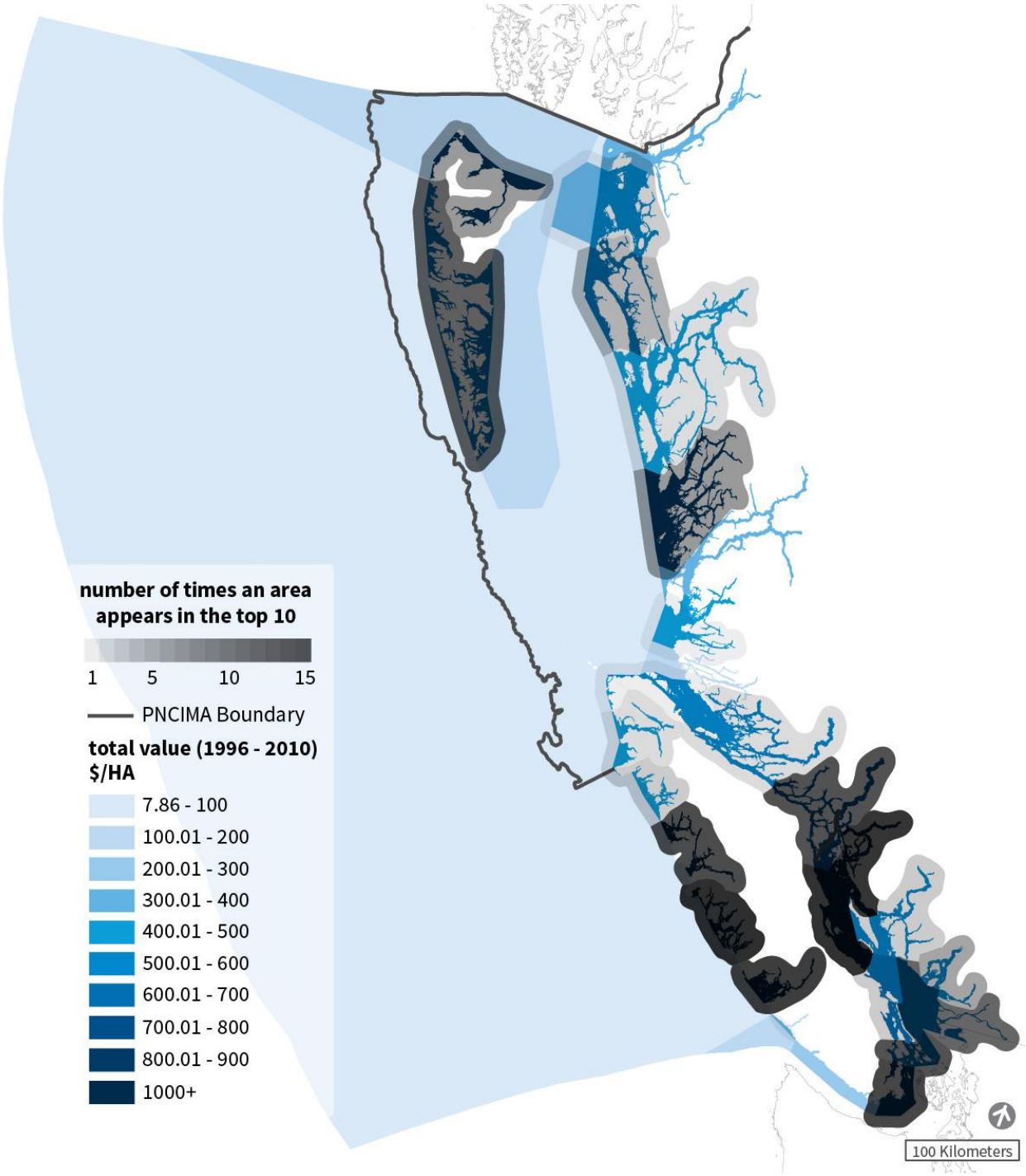


Figure A2. Fishing areas with the highest annual landed values. Grey areas represent the number of times during the 15 years of our dataset (1996-2010) that a given Pacific Fishery Management Area ranked in the top ten highest landed value areas for that year.



Appendix 4: Species included for each fishery and category of fisheries in our analysis

Category	Licence Type	Species	Category	Licence Type	Species
Crab	Crab	Dungeness Crab	Herring	Herring food, bait, pond and unspecified	Pacific herring
Groundfish	Halibut by Hook and Line	Arrowtooth flounder		Herring roe	Pacific herring
		Big skate		Herring Spawn on Kelp	Pacific herring
		Black rockfish	Salmon	Halibut by Hook and Line	Coho salmon
		Black skate		Salmon	Chinook
		Blackgill rockfish			Chum
		Blue rockfish			Coho
		Bocaccio			Pink
		Cabezon			Sockeye
		Canary rockfish			Steelhead
		China rockfish		Salmon by Gill Net	Chinook salmon
		Copper rockfish			Chinook salmon (Jacks)
		Darkblotched rockfish			Chum salmon
		Dover sole			Coho salmon
		Dusky rockfish			Pink salmon
		Greenlings			Sockeye salmon
		Greenstriped rockfish		Salmon by Seine	Chinook salmon
		Kelp greenling			Chinook salmon (Jacks)
		Lingcod			Chum salmon
		Longnose skate			Coho salmon
		Other rockfish			Pink salmon
		Pacific cod			Sockeye salmon
		Pacific halibut		Salmon by Troll	Chinook salmon
		Pacific ocean perch			Chinook salmon (Jacks)
		Perches			Chum salmon
		Petrale sole			Coho salmon
		Quillback rockfish			Pink salmon
		Red irish lord			Sockeye salmon
		Redbanded rockfish	Shellfish and I	Euphausiid	Euphausiids
		Redstripe rockfish		Geoduck	Geoduck clam
		Rosethorn rockfish		Green Sea Urchin	Green sea urchin
		Rougheye rockfish		Halibut by Hook and Line	Octopus
		Sablefish		Intertidal Clam	Clam, Butter
		Sand sole			Clam, Littleneck
		Sharpchin rockfish			Clam, Manila
		Shortraker rockfish			Clam, Razor
		Shortspine thornyhead			Clam, Unknown
		Silvergray rockfish		Octopus (multi-gears)	Octopus
		Skate		Prawn and Shrimp by Trap	Coonstripe shrimp
		Skilfish			Humpback shrimp
		Southern rock sole			Pink shrimp
		Spiny dogfish			Shrimp
		Tiger rockfish			Sidestripe shrimp
		Vermilion rockfish			Spot prawn
		Walleye pollock		Red Sea Urchin	Red sea urchin
		Widow rockfish		Salmon by Gill Net	Octopus
		Yelloweye rockfish		Scallop	Pink and Spiny scallops
		Yellowmouth rockfish		Sea Cucumber	Sea cucumber
		Yellowtail rockfish		Shrimp by Trawl	Coonstripe shrimp
	Sablefish	Sablefish			Humpback shrimp
	Salmon by Troll	Arrowtooth flounder			Pink shrimp
		Black rockfish			Prawn
		Bocaccio			Shrimp
		Canary rockfish			Sidestripe shrimp
		China rockfish	Tuna and othe	Halibut by Hook and Line	Blue shark
		Copper rockfish		Salmon by Gill Net	Rainbow trout
		Darkblotched rockfish		Salmon by Seine	Rainbow trout
		Dusky rockfish		Salmon by Troll	Rainbow trout
		Flatfishes		Sardine	Pacific sardine
		Greenstriped rockfish		Tuna (Schedule II)	Albacore tuna
		Kelp greenling			Skipjack tuna
		Pacific cod			Yellowfin tuna
		Pacific tomcod			
		Quillback rockfish			
		Redbanded rockfish			
		Redstripe rockfish			
		Rosethorn rockfish			
		Rougheye rockfish			
		Scorpionfish			
		Shortraker rockfish			
		Shortspine thornyhead			
		Silvergray rockfish			
		Southern rock sole			
		Tiger rockfish			
		Vermilion rockfish			
		Walleye pollock			
		Widow rockfish			
		Yelloweye rockfish			
		Yellowmouth rockfish			
		Yellowtail rockfish			

Appendix 4 (continued): Species included for each fishery and category of fisheries in our analysis

Category	Licence Type	Species common name	Species common name	Species common name	Species common name
N/A	Groundfish trawl	ALBACORE	EULACHON	QUILLBACK ROCKFISH	Snipe eels
		Aleutian Skate	FLATFISHES//UNSPECIFIED FLOUNDER	RAGFISH	SOCKEYE SALMON
		AMERICAN SHAD	FLATHEAD SOLE	RAGFISHES	SOUPFIN SHARK
		ANCHOVIES	GIANT WRYMOUTH	RAINBOW SMELT	SOUTHERN ROCK SOLE
		ANEMONE	GREAT SCULPIN	RED IRISH LORD	SPECKLED SANDDAB
		ARROWTOOTH FLOUNDER	GREEN STURGEON	RED KING CRAB	SPINY DOGFISH
		Ascidians and tunicates	GREENLINGS	RED SQUID (SCHOOLMASTER GONATE)	SPINY EEL
		BANK ROCKFISH	GREENSPOTTED ROCKFISH	REDBANDED ROCKFISH	SPLITNOSE ROCKFISH
		BASKET STAR	GREENSTRIPED ROCKFISH	REDSTRIPE ROCKFISH	Sponges
		BIG SKATE	GRENADIERS	REPTANTIA	SPOTTED RATFISH
		BIGEYE THRESHER	HAGFISHES	REQUIEM SHARK	SQUIDS
		BIGMOUTH SCULPIN	Harbour seal	REX SOLE	STARFISH
		Bivalve molluscs	HARLEQUIN ROCKFISH	RIVER LAMPREY	STARRY FLOUNDER
		Black eelpout	INANIMATE OBJECT	ROBUST CLUBHOOK SQUID	STARRY SKATE
		BLACK ROCKFISH	INVERTEBRATES	Rock snails	STRIPETAIL ROCKFISH
		BLACK ROCKFISH, BLACK BASS	JACK MACKEREL	ROCKFISH (UNSPECIFIED)	STURGEON
		BLACK SKATE (SANDPAPER)	JELLYFISH	ROSE STARFISH	Sturgeon poacher
		BLACKFIN SCULPIN	KELP GREENLING	ROSETHORN ROCKFISH	Sunflower starfish
		BLACKGILL ROCKFISH	KING-OF-THE-SALMON	ROUGHEYE ROCKFISH	SURFPERCHES
		BLACKTAIL SNAILFISH	LAMPREYS	Roughscale rattail	TANNER CRAB
		Blob sculpin	LINGCOD	ROUGHSCALE SOLE	THORNY SCULPIN
		BLUE ROCKFISH	LONGFIN BATFISH	ROUGHTAIL SKATE	THORNYHEADS
		BLUE SHARK	LONGNOSE LANCETFISH	SABLEFISH	THREADFIN SCULPIN
		BOCACCIO	LONGNOSE SKATE	SALMON SHARK	THRESHER SHARK
		BOCACCIO/ANDY GUMP/ROCK SALMON	LONGSPINE THORNYHEAD	SALMON TROUT	TIGER ROCKFISH
		Box crabs	MACKERELS AND TUNAS	SAND SOLE	TRUE CRAB
		BROWN CAT SHARK	MARBLED MURRELET	SANDDAB/LEFTEYE FLOUNDER	TWOLINE EELPOUT
		BROWN IRISH LORD	MOLLUSCS	SANDPAPER SKATE	Unidentified organic matter
		Buffalo sculpin	OCEAN SUNFISH	SCORPIONFISH	UNIDENTIFIED SHARK
		BUTTER CLAM	OCTOPUS	SCULPINS	UNKNOWN FISH
		BUTTER SOLE	Oregontriton	SCULPINS/BULLHEAD	UNKNOWN SPECIES
		C-O SOLE(POPEYES)	OTHER ROCKFISH	SEA CUCUMBER	VERMILION ROCKFISH
		CABEZON	PACIFIC COD	Sea pen	Vermillion starfish
		CANARY ROCKFISH	PACIFIC ELECTRIC RAY	Sea pens	VIPERFISHES
		CAT SHARK	PACIFIC FLATNOSE	SEA URCHIN, UNSPECIFIED	WALLEYE POLLOCK
		CHILIPEPPER ROCKFISH	PACIFIC HALIBUT	SHARPCHIN ROCKFISH	WATTLED EELPOUT
		CHINA ROCKFISH	PACIFIC HERRING	SHARPNOSE SCULPIN	WIDOW ROCKFISH
		CHINOOK SALMON	PACIFIC OCEAN PERCH	SHINER PERCH	WOLF EEL
		Chionoecetes bairdi	Pacific pomfret	Shore crab	WRYMOUTH
		CHUB MACKEREL	PACIFIC SAND LANCE	SHORTBELLY ROCKFISH	YELLOWEYE ROCKFISH
		CHUM SALMON	PACIFIC SANDDAB	SHORTRAKER ROCKFISH	YELLOWFIN SOLE
		COECLENTERATES	PACIFIC SARDINE	SHORTSPINE THORNYHEAD	YELLOWMOUTH ROCKFISH
		COHO SALMON	PACIFIC SLEEPER SHARK	SHORTSPINE THORNYHEAD ROCKFISH, IDIOT	YELLOWTAIL ROCKFISH
		COPPER ROCKFISH	Pacific staghorn sculpin	SHRIMP	
		CORALS AND SEA ANEMONES	PACIFIC TOMCOD	SHRIMP (ORDER)	
		CURLFIN SOLE	PETRALE SOLE	SIDESTRIPE SHRIMP	
		DARKBLOTCHED ROCKFISH	PILE PERCH	SILVERGRAY ROCKFISH	
		DEEPSEA SOLE	PINK SALMON	SIXGILL SHARK	
		DEEPSEA/ABYSSAL SKATE	PLAINFIN MIDSHIPMAN	SKATE	
		DOVER SOLE	POACHERS	SKILFISH	
		DUNGENESS CRAB	Polychaete worms	SKIPJACK TUNA	
		DUSKY ROCKFISH	POMFRETS	SLENDER SOLE	
		Dusky sculpin	PRAWN	SMELTS	
		EELPOUT	PROWFISH	SMOOTH ABYSSAL GRENADIER	
		EELPOUTS	PROWFISHES	SMOOTHHEAD SCULPIN	
		ELECTRIC RAYS	PYGMY POACHER	SNAILFISH/LUMPFISH	
		ENGLISH SOLE	PYGMY ROCKFISH	SNAILFISHES	

Appendix 4 (continued): Species included for each fishery and category of fisheries in our analysis

Category	Licence Type	Speices common name	Speices common name
N/A	Rockfish	Aleutian Skate	ROUGHEYE ROCKFISH
		ARROWTOOTH FLOUNDER	ROUGHTAIL SKATE
		BERING CISCO	SABLEFISH
		BIG SKATE	SAND SOLE
		BIGEYE THRESHER	SANDDAB/LEFTEYE FLOUNDER
		Bigfin eelpout	SCULPINS/BULLHEAD
		BLACK ROCKFISH, BLACK BASS	SHARPCHIN ROCKFISH
		BLACK SKATE (SANDPAPER)	SHORTRAKER ROCKFISH
		BLACKGILL ROCKFISH	SHORTSPINE THORNYHEAD ROCKFISH, IDIOT
		BLUE ROCKFISH	SILVERGRAY ROCKFISH
		BLUE SHARK	SIXGILL SHARK
		BOCACCIO/ANDY GUMP/ROCK SALMON	SKATE
		BROWN CAT SHARK	SKILFISH
		BROWN ROCKFISH	SLENDER SOLE
		BUTTER SOLE	SOUTHERN ROCK SOLE
		C-O SOLE(POPEYES)	SPINY DOGFISH
		CABEZON	SPLITNOSE ROCKFISH
		CANARY ROCKFISH	SPOTTED RATFISH
		CHILIPEPPER ROCKFISH	SQUIDS
		CHINA ROCKFISH	STARRY FLOUNDER
		COHO SALMON	STARRY SKATE
		COPPER ROCKFISH	STURGEON
		CURLFIN SOLE	SURFPERCHES
		DARKBLOTCHED ROCKFISH	THORNYHEADS
		DOVER SOLE	TIGER ROCKFISH
		DUSKY ROCKFISH	Unidentified organic matter
		EELPOUTS	UNKNOWN FISH
		ENGLISH SOLE	UNKNOWN SPECIES
		FLATFISHES//UNSPECIFIED FLOUNDER	VERMILION ROCKFISH
		FLATHEAD SOLE	WALLEYE POLLOCK
		GREENLINGS	WIDOW ROCKFISH
		GREENSTRIPED ROCKFISH	WOLF EEL
		GRENADIERS	WRYMOUTH
		HARLEQUIN ROCKFISH	YELLOWEYE ROCKFISH
		JACK MACKEREL	YELLOWFIN SOLE
		KELP GREENLING	YELLOWMOUTH ROCKFISH
		LINGCOD	YELLOWTAIL ROCKFISH
		LONGNOSE LANCETFISH	
		LONGNOSE SKATE	
		LONGSPINE THORNYHEAD	
		NORTHERN ROCKFISH	
		OCTOPUS	
		OTHER ROCKFISH	
		PACIFIC COD	
		PACIFIC HAKE	
		PACIFIC HALIBUT	
		PACIFIC OCEAN PERCH	
		PACIFIC SANDDAB	
		PACIFIC TOMCOD	
		PETRALE SOLE	
		PLAINFIN MIDSHIPMAN	
		POMFRETS	
		PROWFISH	
		QUILLBACK ROCKFISH	
		RED IRISH LORD	
		RED SQUID (SCHOOLMASTER GONATE)	
		REDBANDED ROCKFISH	
		REDSTRIPE ROCKFISH	
		REX SOLE	
		ROCKFISH (UNSPECIFIED)	
		ROSETHORN ROCKFISH	

Appendix 5: Fleet Profile

Note: *this is an excerpt from the UFAWU submission to the Enbridge Joint Review Panel available here: Accessed Sept 9 at: https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/624910/697824/783165/D203-5-1_-_United_Fishermen_and_Allied_Workers'_Union-CAW_-_UFAWU-CAW_2.5_Socio-Economic_Impacts_-_A2L1K4?nodeid=783268&vernum=0*

There are two general types of vessels in the BC fishery – 'small boats' and 'big boats':

791 'Small boats' are usually below 50 feet and are owner-operated. Gillnetters, trollers, Area B crab, small boat halibut, ZN rockfish, Schedule II and dive fishery tenders are all small-boats. Many times the boats will have just the owner on board; if there are deckhands, there will only be one or in a very few operations, two. Small boats are small and have limited living space.

792 The 'big boat fleet' is made up of seiners, trawlers, Area A crab, big boat halibut, sablefish, and the packing fleet. These vessels are from 50-100 feet long. Most will take from 3-5 crew and have to have highly ticketed engineers and mates as well as deckhands with the minimum qualifications.

793 Most of the big boats and all of the small boats are owned and operated by the fishermen. However, there is an increasing number of big boats and licenses that are being bought up by the processors in order to control the supply of fish to their plants and the prices paid. Well over 60% of the salmon seine fleet is fully or partially owned by the companies as are a large portion of the trawl and herring fleets.

794 Today, 50% of the north and central coast salmon gillnetters are aboriginal, over 70% of seine boat deckhands and skippers are aboriginal, and probably 10% of the trollers are First Nations. In the herring gillnet and seine fleet the percentage of aboriginal fishers is around 30% and the other fisheries will have smaller percentages. The north coast dive fishery and the sablefish fishery have the lowest percentage of First Nations fishermen. Clam fisheries are close to 100% First Nations people.

795 The balance of fishermen comes from a variety of national backgrounds. The fishing industry, like many remote natural resource operations, attracted new Canadians. Fifty years ago the non-native fleet had a large percentage of Yugoslav and Portuguese immigrants fishing with people with Japanese and UK backgrounds. The latest wave of new Canadians was the Vietnamese, who began gillnetting 30 years ago. Today, however, there are not many new entrants in the commercial fishery; most are indigenous or at least second generation Canadian.

796 The fleets that are least financially attractive (at present the salmon fishery) have the fewest new entrants that plan to make fishing a career. There are, however, many young people who intend to stay in the fishing industry working in the more lucrative fisheries such as

crab, halibut and the dive fisheries. The federal government now requires anyone working on the deck of a boat to have some training in safety, basic navigation and fishing practices, so trained deckhands are becoming an important commodity.

797 There are around 200-300 big boats that are licensed to fish the central and north coasts and around 800-1000 licensed small boats. The numbers of licenses does not equal the number of boats that actually fish. It is difficult to tell as some fishers with active licenses are not fishing – in the quota fisheries some have leased their quota out to other fishermen; fishermen in the less financially attractive sectors are just not fishing, and others fishers have two or three licensed fisheries on one vessel.

798 In order to fish in the commercial fishery, a person must purchase a personal license. There are 6,000 personal commercial fishing licenses sold every year. It is difficult to say how many of those licensed fishermen fish and/or reside on the central or north coasts. The Union believes that at least 500 fishermen live on the north coast and at least 2,500 BC fishers will have engaged in a central/north coast fishery.

Shoreworkers and Plant Profiles

799 Over 80% of shoreworkers on the north and central coasts are First Nations and around 75% are women. Plants are located in Lax Kw'alaams, Masset, Queen Charlotte, Prince Rupert, Port Edward, Terrace, Klemtu, Bella Bella and Bella Coola, although not all communities had plants in operation in 2011. Like fishing, shoreworking welcomed new Canadians and the plants are a mix of people from different national backgrounds. On average, one third of the plant are career shoreworkers and have more than 30 years seniority. The balance are long time shoreworkers who come in and out of the industry or move from plant to plant and don't accumulate much seniority but have years of experience. The bottom third has always been made up of students or transients who only work a summer or three.

800 Wages, benefits and the pension plan in the shore plants are attractive and the difficulty is, for most shoreworkers, the lack of work in the winter, forcing career shoreworkers onto Employment Insurance. However, some progress has been made with northern employers to find non-salmon season work to provide year around operations.

801 There is only one major cannery left in B.C. – the Canadian Fishing Company Oceanside Plant in Prince Rupert. It is deemed to be the largest cannery in North America. There is a crab cooking operation in Masset and one in Lax Kw'alaams. There is a smoke house in Terrace. The other plants are 'fresh fish' plants that unload, dress, portion or fillet fish and send them to market fresh or frozen. At present there are 10 plants that process and freeze fish in addition to the four 'thermal processing' plants and numerous unloading stations.

802 The majority of shoreworking jobs are in the summer for 6-12 weeks. Plants that process groundfish work during the winter months. Herring freezing and popping takes place for three weeks to a month in March-May. There are far fewer shoreworkers that work year around than

seasonally. However, the Union has been making headway in increasing the amount of work in our northern plants.

803 There are 5,000-7,300 shoreworking jobs in B.C. On the central and north coasts there are 1,200-1,800 shoreworkers, depending on the year's production. The rest of the shoreworkers live and work on Vancouver Island and the lower mainland; unfortunately, some of the fish caught on the north coast will be processed southern plants. The Union is working to remedy this.

Appendix 6: Interview Protocol for Socioeconomic Assessment of Commercial Fisheries in PNCIMA

BEFORE THE INTERVIEW STARTS

INSTRUCTIONS FOR INTERVIEWER

- **Introduce** yourselves
- Introduce the project and give respondent the **Project Description**
- **Get consent**
    - Explain confidentiality
    - Ask for signature
- Describe **3 parts of the interview**
    - ***"We'll start with getting a bit of your background, then we'll ask you to talk us through what you do during a commercial fishing season. Finally we'll finish up with some more general questions about the importance of commercial fishing to you."***
- Describe what **interviewers will be** doing during the interview:
    - ***"One person will be leading the interview, mostly interacting with you and the other person will sketch out a connection wheel or web as you go and helping the lead interviewer where necessary."***
- **Remind** the respondent that:
    - ***"This is an exploration and that there are no right or wrong answers.***
    - ***"Feel free to say 'I don't know', if you don't know."***
- **Thank** the participant in advance
- **Start the digital recording device**

SECTION 1: BACKGROUND

INSTRUCTIONS FOR INTERVIEWER

"Let's start with a bit of your background, and info about the boat/s you fish on recently (in a typical year within the past few years)'

Interviewer:		**Respondent's name:**	
Date:	dd / mm / yy	**Contact info (phone or email)**	
Location:			

SECTION 1: DEMOGRAPHIC AND FISHING INFORMATION (fill in white sections)

(1) Age		**(2) Sex**	M / F	**(3) First Nations**	Y / N	*(3a) If 'Yes', Band*	

(4) Where do you live throughout the year? (community name)	*(4b) # months/year*	*(4c) # years lived there*

(5) # of years fishing		**(6) # of boats typically work on in a year**		**If work on >1 boat fill out questions #7 - 15 for each boat on separate sheet*

(7) Name of boat primarily work on now	**(8) # of years on boat**	**(9) position on boat**

(10) Months of the year that fishing happens on this boat	**(11) Vessel length (feet)**		**(12) Do you own this boat?**	**Y / N**
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec				

(12a) If 'No' who owns the boat?	

(13) Does this boat fish only in PNCIMA?	**Y / N**	*(13a) If 'No' what % of time fish outside PNCIMA?*	**____% of the time**

**(14) What kind of fishing is done on this boat? ****Eliana also writes this info on post-it notes

Licence Type				
Licence Owner				
Gear Type				

Gear Owner				
Quota owner				

(15) how many other people work on this boat?		*(15a) Names and locations [contact info] for other crew members: (please write in space below)*

(16) Why did you get into fishing?:	
(16b) If generational, how many generations back?:	
(17) Is continuing to fish commercially important to you? If so, what are the top (most important) reasons why?: *make sure that at least the 'most important' reasons are described in detail in connection wheel	

SECTION 2: CONNECTIONS BETWEEN COMMERCIAL FISHING, FAMILIES & COMMUNITIES

INSTRUCTIONS FOR INTERVIEWER – Explain the connection wheel approach to the respondent:

"We want to draw out the connections between your fishing and your family and community in a kind of 'connection wheel' that will illustrate the web of how your fishing is linked/provides value/is important to businesses, people, organizations, cultural heritage, traditions. ***Key questions and themes include: How do you interact with the rest of the community? Who do you interact with? Where is money spent? Beyond money, how is fishing important and to whom?***

One way we can do that is to talk through your fishing season. ***Let's focus on what you typically did, where you did it and with whom in a season[p]/complete year over the past 3 to 5 years.*** *Later on, I'll ask you to compare, in general terms, this year with the past. While you tell me about your season, Eliana will start drawing out a 'connection wheel'. She'll focus on just getting the main ideas down. We'll draw out* ***what activities*** *you do,* ***where*** *those activities happen,* ***who*** *does them, and* ***finally*** *we'll talk about what* ***values those activities bring to you, your family and your community.*** *Feel free to use stories about your experiences if that helps."*

What? Who? Where?

18. What **activities** do you do to **prepare** for the commercial fishing season? Who owns it? Where do they live?

	Item/activity	Name (of owner/s or business/es)	Town where owner lives/business is
a	Boat	See section 1	
b	Gear	See section 1	
c	Licence	See section 1	
d	Quota	See section 1	
e	Crew	# of crew (don't need names here)	May be in section 1
f	Moorage		
g	Storage of gear		
h	Insurance		
i	Vessel maintenance		

[p] A 'complete season' includes the seasons for each fishery the boat engages in. Those seasons may cross over the calendar year and that's ok, we just want to cover the full, most recent year for the activity of the boat.

j Gear maintenance
k Book keeping
l Electrician
m Electronics
n Mechanic
o Dry Dock

p Fuel
q Bait
r Ice
s Groceries
t Monitoring (company)
u Monitoring (staff you interact with) Observers? Technicians?

19. What is a **typical commercial fishing day** like? We're most interested in your **interactions with other people** or aspects of fishing that are **really important** to you.
20. What do you do **between commercial fishing days**, typically? **Who** with? **Where**?
21. What **activities** do you do **at each** of the **ports** you land in? Which **businesses** do you visit?

	Item/activity	Name (of owner/s or business/es)	Town where owner lives/business is
Professionally			
a	Buy gear or supplies		
b	Buy groceries		
c	Lodging		
d	Land fish		
e	Process fish		
f	Truck/move fish		
g	Where does fish ultimately end up?		
Personally			
a	Eat at restaurant		
b	Entertainment (e.g. movie)		
c	Visit family/friends Relationship?		

22. What do you do when the commercial **fishing** season is **over**?

23. **<u>At home port</u>, name the top 5 businesses** where you spend commercial fishing income on personal items

MONETARY

24. Does the income from commercial fishing **support your family**? How so?
    a. **Who** does it benefit?
    b. **What** is it allowing you/them to do?
    c. **Without this income** from fishing, **what** would **change for your family**?

25. Have you **leveraged** this boat as an asset?

26. Does commercial fishing allow you **access to other employment**?

'Let's move on now to talking about other kinds of values or reasons that commercial fishing is important to you. We'll focus now on non-monetary and less tangible values'

NETWORKS

27. Do you **participate** in any **commercial fishing professional organizations** or **networks** that play an important role in your life?
    a. If so, **what role do they play**...
        i. For you?
        ii. For your family?
        iii. In your community?
    b. **Why** is this **role important**?

CULTURE/TRADITION

28. Are there aspects of **commercial fishing** that are important to your **culture or your family or community tradition**?
    a. If so, can you **describe how** it is linked and **why/whether** you feel it is important to **maintain** these **traditions**?

INTERGENERATIONAL

29. Are there particular **experiences associated with commercial fishing** that you hope your **kids** and/or **youth** in your community **will experience**?
    a. If, yes, can you **explain** what **these experiences** are?

30. **What makes these experiences important** to both the generations that have come before you and those that will follow?

31. **OR**…**Why** are these experiences **in particular important across generations**?

SPIRITUAL

32. I find spiritual **value connected to an activity is difficult to define**, but generally I associate it with an activity (like commercial fishing) that is **powerful** because the **activity inspires** me **to be aware** of forces **larger than myself**. This can be the basis for negative and positive **feelings like awe, reverence, humility, and even fear**. Can you **describe** or speak to me about **experiences** of this kind that might be associated with your commercial fishing?
    a. (Prompt: Remind people that their thoughts need not to be profound.)

ENVIRONMENTAL/STEWARDSHIP

33. As a commercial fisherman, would you **consider yourself a steward** of the marine environment?
    a. If so, **what activities** do you do to enact this role?

34. Does your commercial **fishing play a role in sustaining** fish populations or the marine environment more generally?
    a. How yes, **How so**?

LIFESTYLE

35. Are there aspects of **commercial fishing** that are **important** to you because they **give** you the kind of **lifestyle that you want**?
    a. If so, can you explain these to me and **why** they are **important**?

EDUCATION

36. Have you made observations while commercial fishing and **learned something new through those observations**?

37. **OR**...Have you ever had the experience of **fishing teaching you things**?

38. **OR**...Are there things you have learned while commercial fishing that you **apply to other aspects of your life**?

TRANSPORTATION

39. Does your commercial fishing **boat** provide **important transportation**?

a. If so, **why** is it important?
b. For example, what functions/activities would be **difficult without your boat**?

FOOD FISHING

40. (For **Non First Nations**) Do you fish recreationally for food off your commercial boat or do you take any commercial fish home for food from your catch?

    (For **First Nations**) Does the commercial fishing vessel you mentioned above **also do food fishing**? If so…

    a. What **species** do you catch?
    b. Is it **processed**? E.g. smoked?
        iv. **How many people** are involved?
        v. **Where** do they do it?
    c. **Who receives** the food fish?
        vi. **Just** your **family** members?
        vii. **Other** people?
    d. Roughly **how many** people **receive it**?
    e. Do you receive anything in return or **trade** from others for this fish?

SECTION 3: BIG PICTURE QUESTIONS

INSTRUCTIONS FOR INTERVIEWER

"To finish up we will summarize what we've been talking about. I want to make sure we haven't missed any connections between your commercial fishing and your family or community or any aspects of commercial fishing that are particularly important to you. Later, we will talk a little bit about the difference between today and the past."

FINAL QUESTIONS:

41. **Looking at the skeleton of the connection wheel** we've drawn out during the interview…
    a. Are there any **other ways** your fishing is linked to the community or reasons that it is valuable/important that you haven't already mentioned?
    b. Are you **surprised** by how this connection wheel looks in any way? **How so?**
    c. Are there any **branches you want to highlight or emphasize** as being especially important to you?
        i. Can you explain to me **why** you want to emphasize this one/these?

42. How would the **connection wheel look differently <u>in the past</u>**?
    a. Would there be…
        i. Different **number of branches/connections**?
        ii. Different **people**?
        iii. Different **places** where things are happening? Local vs. non-local?
    b. **What decade/time frame** are you describing in the past?

43. How would the **connection wheel look differently <u>if you couldn't fish anymore</u>**?
    a. Would there be…
        i. Different number of **branches/connections**?
        ii. Different **people**?
        iii. Different **places** where things are happening? Local vs. non-local?

END OF INTERVIEW

INSTRUCTIONS FOR INTERVIEWER

- *"Thank you very much for your time. If you think of any questions or things you want to add later our contact info is on the consent form."*
- *We will make up a clean version of your connection tree for you.* ***How is the best way to get it to you? Email? Mailing address?***

- *Can we use the information from your interview in the future? Yes___ No_____*
- *Is it ok to use quotes from your interview? Yes_____ No_____*
- *If we have brief follow-up questions, are you willing to answer them? If not, we respect that and won't contact you further.* ***Y / N***

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