Economic Impacts from a Reduced Groundfish Trawl Fishery in British Columbia

Prepared for:

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Oceans & Marine Fisheries
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Preface

The British Columbia Ministry of Environment (MOE) retained GSGislason & Associates Ltd. to conduct an economic analysis of the groundfish trawl industry and its importance to coastal communities, and to assess the community impacts from a reduced trawl fishery.

The consultants have benefited from discussions with industry and MOE. Notwithstanding this assistance, the consultants have final responsibility for the analyses and conclusions of the study.

Summary

Introduction

- the British Columbia trawl fishing industry operates year-round and delivers fish to a variety of locations along coastal BC, the last of BC fishing sectors to do so. The increased dependency of the economies of BC coastal communities on the trawl fishing sector is not well known.
- this study addresses the economic repercussions from the catch and processing of 32,400 tonnes of groundfish and 71,400 tonnes of hake caught by 55 active trawl vessels.

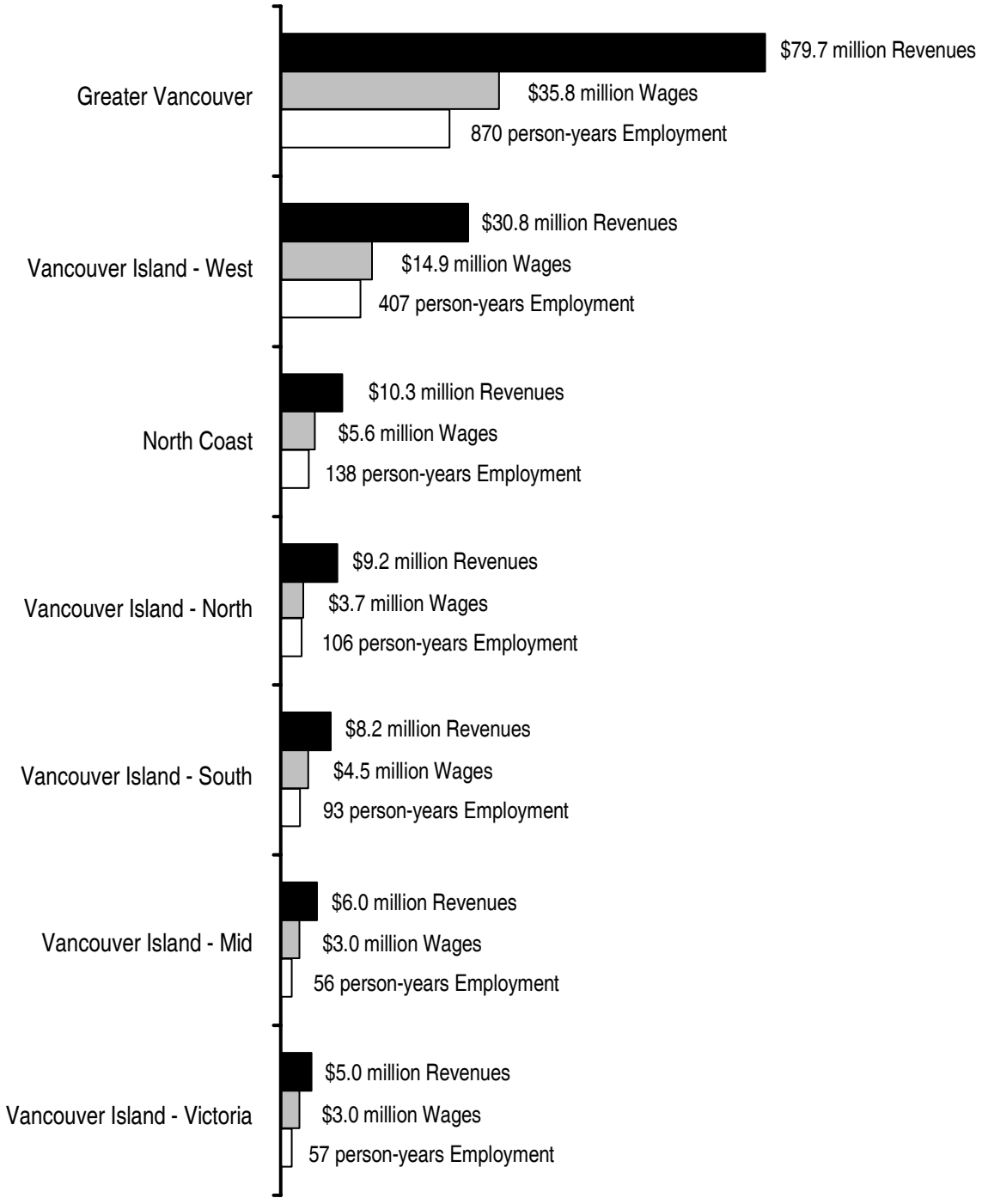
Importance to Regional Economies

- the industry directly generates $160 million in processed fish value - $149 million to BC interests from groundfish and hake and $11 million to foreign interests from hake - and generates significant amounts of foreign exchange from exports.
- the $149 million generates $70.5 million in direct wages and 1,725 person-years of employment to British Columbians - this makes the trawl sector by far the largest economic component of the BC fishing sector. Multiplier effects from indirect supplier activities and from the induced consumer respending of wages add 50% to these figures.
- significant wages and employment result not only from catching and processing fish, but also from offloading fish and transporting fish from remote offloading stations to processing plants and from processing plants to markets.
- Greater Vancouver reaps about half of this economic activity - but the trawl sector contributes significantly to the much smaller coastal regions of West Coast Vancouver Island (Ucluelet & Port Alberni), North Vancouver Island (Port Hardy), and the North Coast (Prince Rupert). See Exhibit A on next page.

Repercussions of a Reduced Trawl Sector

- the trawl sector is the major focus of the remaining fishing infrastructure along coastal BC - anything that affects or threatens the health of the trawl industry, in turn, would have significant repercussions on other users and interests.
- a significantly reduced trawl sector would have serious impacts: 1) many businesses in coastal communities would close, and 2) the service providers that would remain in business would reduce staff, reduce their operating season and/or service, and increase prices for services.
- in particular, custom offloaders of fish, custom processors of fish and trucking firms would be hurt immensely by the loss of trawl business since the majority of their business is the trawl sector.
- the sardine, dogfish, lingcod, halibut and West Coast Vancouver Island salmon troll fisheries are dependent on the same suppliers of goods & services and therefore would be hurt by a reduction in the trawl industry.
- and the communities of Ucluelet, Port Hardy, Prince Rupert and Port Alberni would be hurt the most economically from a decline in the trawl fishery.
- the loss of the trawl fishery would not only cause the loss of the substantial economic benefits from trawl activity, but also cause several millions of dollars more in losses from negative impacts on other fisheries.

Exhibit A: Direct Contribution of Trawl Industry to BC Regional Economies*



* *Total BC direct impacts of $149.2 million in revenues, $70.5 million in wages & benefits and 1,725 person-years of employment.*

Acronyms

AMR	-	Archipelago Marine Research
BC	-	British Columbia
CDN	-	Canadian
CFC	-	Canadian Fishing Co.
CGRCS	-	Canadian Groundfish Research and Conservation Society
CPI	-	Consumer Price Index
DFO	-	Canada Department of Fisheries and Oceans
DMP	-	Dockside Monitoring Program
DSTA	-	Deep Sea Trawlers Association
EI	-	Employment Insurance (a federal program)
EM	-	Electronic Monitoring
FOB	-	Freight on Board
GDA	-	Groundfish Development Authority
GDQ	-	Groundfish Development Quota
GTAC	-	Groundfish Trawl Advisory Committee
H&G	-	Headed & Gutted
H&G&T	-	Headed & Gutted & Tailed
IFMP	-	Integrated Fisheries Management Plan
IQMI	-	Integrated Quota Management Inc.
IVQ	-	Individual Vessel Quota
JSM	-	JSMcMillan Fisheries Ltd.
JV	-	Joint Venture (fishery for hake)
m	-	metre
MOE	-	BC Ministry of Environment
MSC	-	Marine Stewardship Council
PY	-	person year
R&M	-	Repairs & Maintenance
RD	-	Round (weight)
TAC	-	Total Allowable Catch
TAS	-	Tote at Sea
UFAWU	-	United Fishermen and Allied Workers' Union
UHS	-	Ucluelet Harbour Seafoods
US	-	United States of America
WCB	-	Workers' Compensation Board of BC (a provincial program)

Table of Contents

1.0 Introduction

The British Columbia (BC) groundfish trawl fishery operates year round and delivers fish to a variety of coastal BC regions where the fleet utilizes numerous shoreside suppliers of goods & services including: offloading services, processing services, fuel, trucking, totes, ice, repairs & maintenance, gear, and groceries.

Many other BC fishery components, such as salmon and herring, used to operate over an extended season and over an extended geographical area. Now these other fisheries concentrate their operations to a short time window and narrow geographic focus.

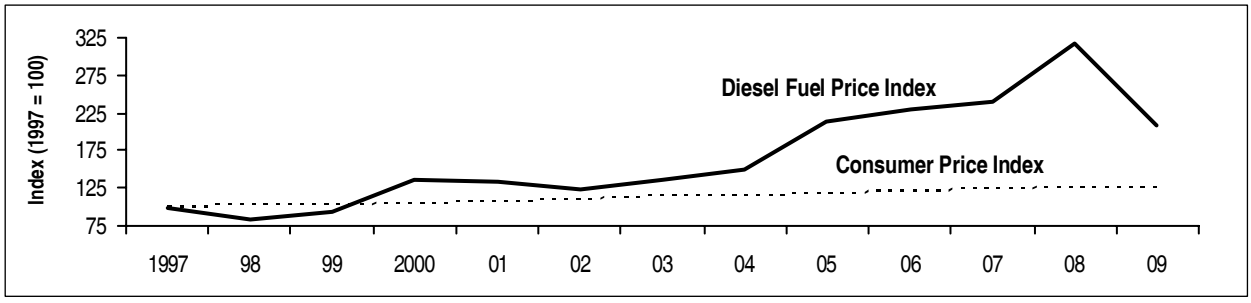
In short, the shoreside suppliers of goods & services to the fishery are much more dependent on groundfish trawl operations and much less dependent on other fishery operations than in the past.

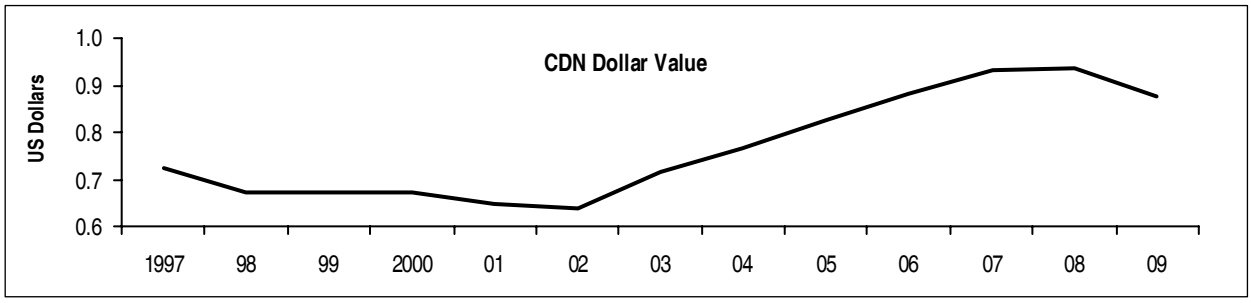
This increased dependency of coastal communities and the regional supply sector on trawl operations makes these interests more vulnerable to any decline in trawl activity. This vulnerability and associated financial risk, however, is not well known. This study identifies the level of supply purchases and community/regional economic activity at risk from a reduced, smaller groundfish trawl sector in BC.

1.1 A Challenging Economic Environment

The groundfish trawl fishery of British Columbia faces several challenges or threats which affect its business viability.

First, the increased world price of oil, and hence diesel fuel prices, over the past 10 years has increased industry operating costs significantly. Second, the appreciation of the Canadian dollar against the US dollar has decreased prices and revenues (since prices for Canadian exports are denominated in the currency of the importing country). In fact, these two events are connected as higher world oil prices tend to increase the value of the Canadian dollar.





In addition, there has been increased market competition from other whitefish species such as basa from Vietnam, catfish from the US and tilapia from around the world. The industry is also facing growing public demand for ecocertification, increased monitoring costs and increased costs associated with new safety requirements.

These changes are putting downward pressure on trawl fish prices and revenues, and upward pressure on trawl fish production costs. The trawl industry is a low value, high volume fishery which has limited capability to accommodate either lower prices or higher costs.

1.2 Study Objectives

The study has two main objectives:

- to develop a profile of the current groundfish trawl sector and its contribution to the regional economies along coastal BC
- to assess what would be the likely repercussions on the associated infrastructure and other commercial fisheries if the groundfish trawl fishery sector was significantly reduced

The intent is to elicit greater understanding of the economic importance of the trawl fishery to British Columbia and its coastal communities.

1.3 Work Plan

The work program included both primary (interview) and secondary (literature review) research activities:

- interviews with 43 individuals in total - 16 from the shoreside supply sector, 15 with the processing sector, 5 with trawl vessel owners and 7 with industry associations/community interests such as the Canadian Groundfish Research and Conservation Society or CGRCS
- review of several reports and publications (see Bibliography)

The information in the report is presented at an aggregate level to preserve confidentiality.

1.4 A Regional Focus

In the report, we present regional estimates of revenues/expenditures, wages and employment.

For study purposes, we utilize the following regions (see Map of BC coastline in Exhibit 1):

- North Coast - the Prince Rupert area
- North Vancouver Island - Port Hardy, Port McNeill, Sointula and Alert Bay
- Mid Vancouver Island - Campbell River south to Qualicum and Parksville
- South Vancouver Island - Greater Nanaimo south to Duncan and Cowichan Bay area
- West Vancouver Island - Ucluelet and Port Alberni
- the Victoria area on Vancouver Island
- Greater Vancouver & the Lower Mainland (including Interior BC)

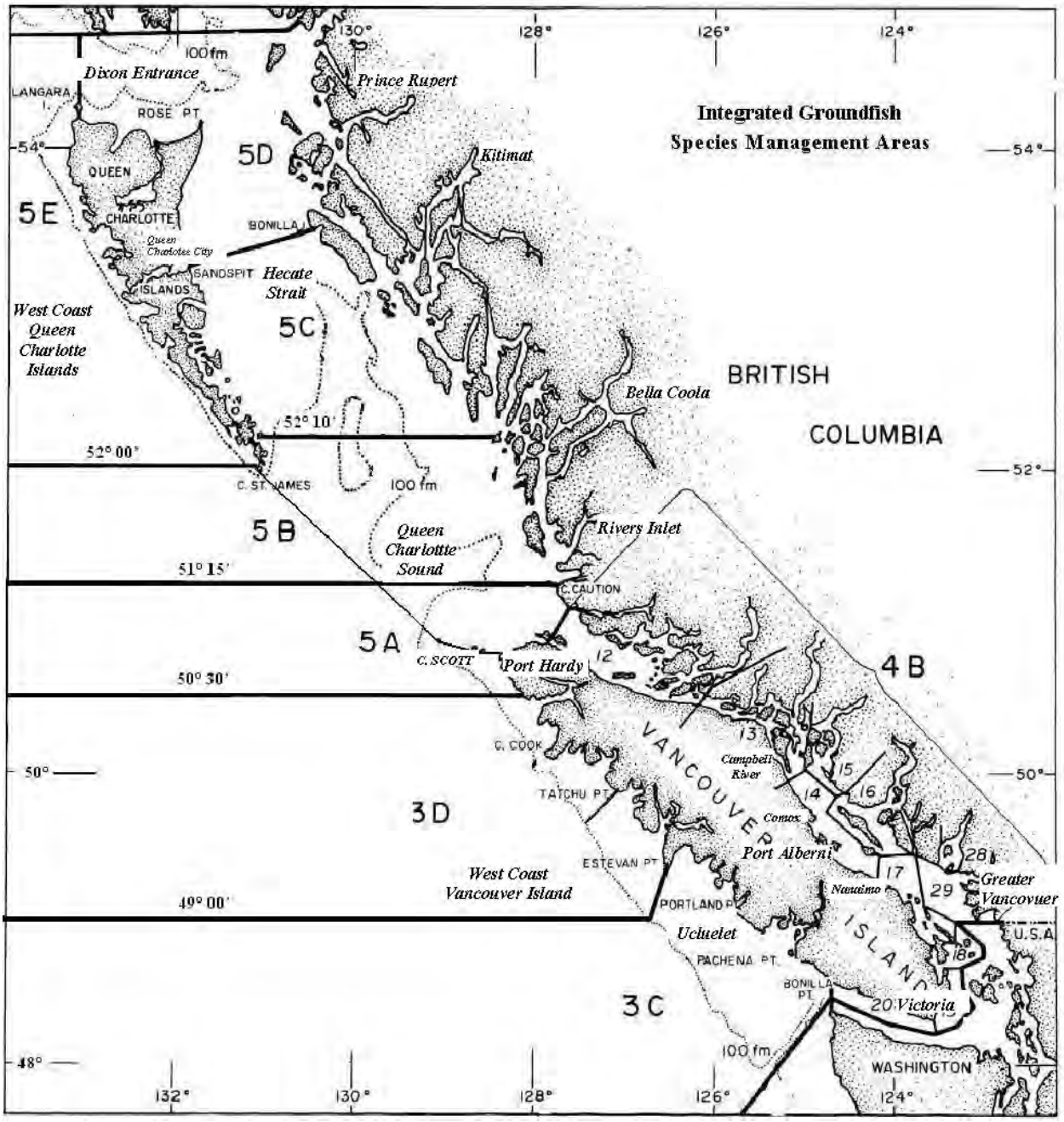
1.5 Report Outline

The next section presents a profile of the BC groundfish trawl industry, its activities, production, sales, wages and employment. It comprises the first of the remaining four sections of the report.

Section	Subject
2	Profile of the BC Groundfish Trawl Sector
3	Regional & Community Impacts
4	Repercussions of a Reduced Trawl Sector
5	Conclusions

Four appendices provide supplemental material - the List of Interviewees and two Interview Guides, the background Catch Monitoring Data, the Data, Parameters & Assumptions underlying the analysis, and the detailed Financial Projections.

Exhibit 1: MAP of BC Coastline



Source: DFO Groundfish Unit

2.0 BC Trawl Sector Profile

The groundfish trawl fishery in British Columbia is a multi-species fishery that harvests more than 31 different groundfish species and 68 separate stocks of groundfish. Species harvested include rockfish, cods, soles, flatfishes, lingcod, dogfish (a shark), hake, skate, arrowtooth flounder (turbot) and sablefish. The commercial fishery uses bottom trawl and midwater trawl gear from relatively large boats typically in the 20-25 m range.

Hake is the main species caught by midwater trawl gear. The hake fishery has two main parts - a "Shoreside" component in which Canadian vessels deliver fish to coastal processing plants and a "Joint Venture (JV)" component in which Canadian vessels deliver fish to foreign factory ships. The JV component does not operate each year[1].

The bottom trawl fishery for groundfish operates 12 months a year whereas the midwater trawl fishery for hake usually operates 5-6 months a year from May through October (hereafter we call the bottom trawl fishery the "groundfish fishery" and call the midwater trawl fishery for hake the "hake fishery"). The groundfish and hake are processed into a variety of products for domestic and export markets.

The BC trawl fleet has caught approximately 30,000 - 40,000 tonnes of groundfish and 55,000 to 90,000 tonnes of hake in recent years.

2.1 Fisheries Management

Canada Department of Fisheries & Oceans (DFO) has responsibility for management of all species within Canada's 200 mile limit of jurisdiction and sets an overall Total Allowable Catch or TAC, conducts stock assessment work, and enacts other regulatory measures.

Hake is a transboundary stock. There is an international hake treaty with the US under which an overall total TAC, and allocations for Canada and the US, are set. DFO manages the Canadian portion of the fishery. Canada and the US jointly sponsor stock assessment work and other scientific research on hake.

The IVQ Program

An Individual Vessel Quota (IVQ) system was introduced in 1997. Each limited entry groundfish trawl (Category "T") licence holder receives an IVQ representing a percentage of the species-specific TAC. The IVQ allocation formula is based on a combination of vessel catch history and vessel length.

The commercial TAC for each species is allocated in three different parcels:

- 80% of the TAC is allocated as IVQ
- 10% of the TAC is allocated as Groundfish Development Quota (GDQ) based on joint vessel owner-processor proposals evaluated by the Groundfish Development Authority (GDA) on the basis of regional development, employment, sustainable fishery practices and other criteria i.e., largely social objectives

[1] The JV hake fishery only occurs when the entire hake TAC can not be fully utilized by shoreside processors - in this case, foreign factory vessels are licensed to receive hake from Canadian fishing vessels for processing at sea.

- 10% is allocated annually to vessel owners in the same proportion as the first 80% unless there is evidence of unfair and inequitable treatment of crews.

The GDA makes recommendations on GDQ applications and any crew Code of Conduct complaints.

Each year the 142 Groundfish Trawl "T" licence holders are required to choose a fishing option:

- **Option A** - permitted to fish midwater trawl coastwide and bottom trawl in all areas except the Strait of Georgia (subject to IVQ holdings); subject to 100% at-sea observer coverage and 100% Dockside Monitoring Program coverage of offloads.
- **Option B** - not permitted to fish midwater trawl coastwide but bottom trawl only in the Strait of Georgia; limited number of deliveries and catch of certain species per month; 100% Dockside Monitoring Program coverage; 100% at-sea Electronic Monitoring since 2007.

Option B vessels typically are much smaller than Option A vessels and usually have only 1 or 2 crew (Option A vessels typically have a crew of 3 to 5).

Today there are about 55 active Option A vessels. There are only about 10 Option B vessels active each year with their total catch being under 200 tonnes or less than half of one percent of the total groundfish trawl catch (see Exhibit B.1, Appendix B).

The groundfish trawl industry engages in co-management with DFO through consultation with the industry Groundfish Trawl Advisory Committee (GTAC) and the two industry associations, the Canadian Groundfish Research and Conservation Society (CGRCS) and the Deep Sea Trawlers Association (DSTA). Industry pays for a variety of activities including a Dockside Monitoring Program (DMP) for all product offloads, 100% observer coverage on Option A bottom trawl operations, at-sea electronic monitoring on Option B and midwater trawl hake vessels, annual research surveys, biosampling, and stock assessments.

The Groundfish Integration Program

The Groundfish Integration Program introduced in 2006 brought all five groundfish fleets - halibut, sablefish, groundfish trawl, rockfish and lingcod/dogfish - under a single Integrated Fisheries Management Plan (IFMP) and common management principles including:

- IVQs for all sectors (previously rockfish and lingcod/dogfish were not managed under IVQs),
- 100% monitoring of all landings & releases (100% on-board observers for groundfish trawl, choice of an on-board observer or on-board electronic monitoring/camera system for hook & line and trap gears),
- a market-based "cap and trade" system of temporary transfers between participants to allow fishermen to access IVQ to cover their actual catch,
- mandatory retention of rockfish (a main species group of concern that has close to 100% mortality upon capture), and
- a mortality "hit" against the individual's IVQ for releases, based on assigned mortality rates derived from mortality research on released fish.

Prior to Groundfish Integration, the five different limited entry licensed fleets essentially operated independently. One fleet's directed catch could be another fleet's releases, there was no accounting program across all fleets for all bycatch, and mortality from releases was not deducted from TACs and IVQs.

Under Groundfish Integration, DFO can manage on a stock-specific basis, and superior catch data has improved TAC management and stock assessment. Additionally, under the IVQ program, individual catch responsibility and comprehensive catch monitoring have significantly reduced bycatch, releases and wastage.

2.2 Products and Markets

Groundfish

The primary processed product today from non-hake species such as rockfish, Pacific cod, and soles is fillets. Prior to the implementation of IVQs, an appreciable share of these fillets were frozen fillets due to supply gluts during the season and the inability to schedule boat deliveries to market requirements.

Today under IVQs much more of the fillets produced are sold to the premium fresh fillet market (fresh fillets reap a price premium over frozen fillets). In addition, some trawl-caught fish that used to be filleted now can meet the higher quality standards of the whole fresh market.

The majority of groundfish fillets are sold in the United States at prices denominated in US currency (mostly to cities along the I-5 Highway Corridor from the Canadian border south to Southern California). The recent strengthening of the Canadian dollar has negatively affected prices paid to Canadian processors and fishermen.

Hake

The hake market has always been a specialized market. First, there was primarily the JV fishery with a very small on-shore industry in the early 1980s. Then in the late 1980s, two plants in Ucluelet on Vancouver Island started to produce surimi for the Asian market from shoreside deliveries of hake.

In the past few years the market product has changed to headed & gutted (H&G) frozen whole fish produced from the shoreside plants (a small amount of fillets also are produced). In addition, recently two large Canadian freezer trawlers have started to H&G and freeze hake at sea. Much of the hake is sold to Eastern European customers. Today, nearly all of the hake is processed shoreside.

In 2009, the West Coast hake fishery received Marine Stewardship Council (MSC) certification.

2.3 Trawl Sector Activities

The trawl sector involves several activities from the catching of fish through processing and distribution to market - see Exhibit 2.

In some cases, the fish is landed at the processing plant from where it is offloaded and goes directly to the processing line. In other cases, the fish is custom offloaded by a third party who is paid by the buyer of the fish to offload, weigh, tote, ice and load the fish onto a truck for transport to the processing plant location. For example, it is increasingly common for fish to be custom offloaded in Port Hardy or Ucluelet on Vancouver Island for processing in Greater Vancouver (the practice reduces vessel fuel costs and can increase fish quality).

The majority of groundfish is processed into fillets, graded and boxed. The fillet work is labour intensive and done by hand.

Some groundfish such as thorneyheads are Headed & Gutted (H&G), frozen and shipped to specialty markets such as Japan.

The main hake processed product is H&G frozen product - the processing is done by machine. Some frozen fillets are produced as well. The hake products require cold storage.

In the majority of cases, the processed groundfish and hake products are sold at a price Freight on Board (FOB) destination i.e., the processor/seller is responsible for getting the product to the market destination. In the case of groundfish fillets, this involves hiring bonded trucks to travel to US destinations. In the case of frozen H&G hake, this involves arranging for marine transport to Eastern Europe or Asia.

Finally, the processing plant has to dispose of the non-useable fish portions, the offal. A few plants have reduction facilities to process fish waste into meal and oil. More commonly, the offal is trucked to an off-site reduction facility such as West Coast Reduction (with plants in Greater Vancouver and Nanaimo).

Hereafter, we call the activities encompassing offloading of fish at the dock through transport to the market area to be "processing".

2.4 The BC Trawl Sector - Revenues, Wages & Employment

For study purposes, we developed a scenario of Option A catch, deliveries and active boats - groundfish vs hake - to guide our analysis (given the small size of the Option B fleet catch, we do not address Option B fleet activity in our analysis).

	Option A Fleet		
	Groundfish	Hake**	Total
Catch tonnes	32,400	71,400	103,800
No. of Deliveries	810	840	1,650
No. of Active Vessels	45	35	55*

* *Total boats do not equal the sum of groundfish boats and hake boats since 25 boats fish both species groups.*

** *All of the hake catch is assumed to be shoreside as this volume can be accommodated by shoreside plants.*

These fleet parameters generally are consistent with recent experience (see Exhibit B.1, Appendix B).

Our interview program/survey with processors and individual vessel owners allowed us to identify the number of crew and crew positions for each active Option A vessel. The Option A fleet has:

- 55 active vessels
- 288 individuals filling 243 crew positions on these 55 vessels

The 45 extra individuals, in addition to the 243 crew positions, are rotational crew e.g., a vessel may have 5 individuals fill 4 crew positions to allow crew time away for family events, vacations etc. There can also be non-crew labour associated with fishing operations such as managing boat operations and gear maintenance in port, labour services which we call "shore labour/management".

The two large Canadian hake freezer trawlers had more than 20 crew each.

We then translated this Option A fleet scenario into trawl fishery activity measures of revenues/ expenditures, wages and employment for both the fishing and subsequent processing industry stages (see results in Exhibit D.1, Appendix D from the groundfish catch of 32,400 tonnes and the hake catch of 71,400 tonnes).

The assumptions or parameters were based on our interview program and some recent work in the trawl sector (Nelson Bros. Fisheries 2009) - see Exhibit C.2, Appendix C.

	Option A Trawl Fishery Activity		
	Groundfish	**Hake**	**Total**
Fishing			
Fleet Revenues $ millions	35.7	19.6	55.3
Wages $ millions*	18.5	7.7	26.2
Employment PYs*	355	150	505
Jobs*	385	220	605
Processing			
Processor Margin $ millions	41.3	63.6	104.9
Wages $ millions**	19.2	28.5	47.7
Employment PYs**	520	785	1,305
Jobs**	560	1,375	1,935
Total Sector			
Processed Value $ millions	77.0	83.2	160.2
Wages $ millions	37.7	36.2	73.9
Employment PYs	875	935	1,810
Jobs	945	1,595	2,540

Source: Appendix C and D.

* *Fishing Wages, Employment, Jobs - vessel crew, shore labour/mgt, vessel suppliers e.g., fuel, gear.*

** *Processing Wages, Employment, Jobs - processing & marketing, offloading, trucking/transport.*

The $160.2 million in trawl sector revenue, $73.9 million in wages, 1,810 person-years of employment and 2,540 jobs are significant at the total industry level and, as we shall see in Section 3 to follow, even more significant to particular regions and communities. The vast majority of direct economic activity - $149.2 million in revenue, $70.5 million in wages and 1,725 person-years in employment - accrue to BC interests.

The following economic features are noteworthy:

- the primary wage and employment engines for the industry are crew & skipper payments, offloading, processing, and trucking (gear purchases, vessel repairs & maintenance and other supply sectors also contribute).
- the overall average annual wages of $40,800 per person-year or PY employment is almost identical to the provincial average (according to Statistics Canada, the average weekly earnings in the Province for 2009 were $800).
- boat crew jobs/positions are higher paying than most other trawl industry jobs.
- much more revenue, wages, employment and jobs are created at the processing level, especially for hake, than at the fishing level.
- the number of jobs is 40% greater than person-years of employment, largely due to the seasonal hake fishery.

In the next section, we present the regional dimensions of trawl economic activity.

2.5 The BC Trawl Sector - Economic Impacts

The economic impacts of the trawl fishery on the provincial economy go beyond the direct impacts presented. Wages and employment are generated in businesses supplying goods and services to the trawl fleet, processing plants, custom offloaders, trucking firms and the like. And workers respend their wages on food, shelter, clothing and a myriad of other consumer items.

These subsequent "indirect" supplier and "induced" consumer respending impacts add approximately 50% to the direct wage bill and employment base (based on seafood sector multipliers in GSGislason 2007 Appendix M).

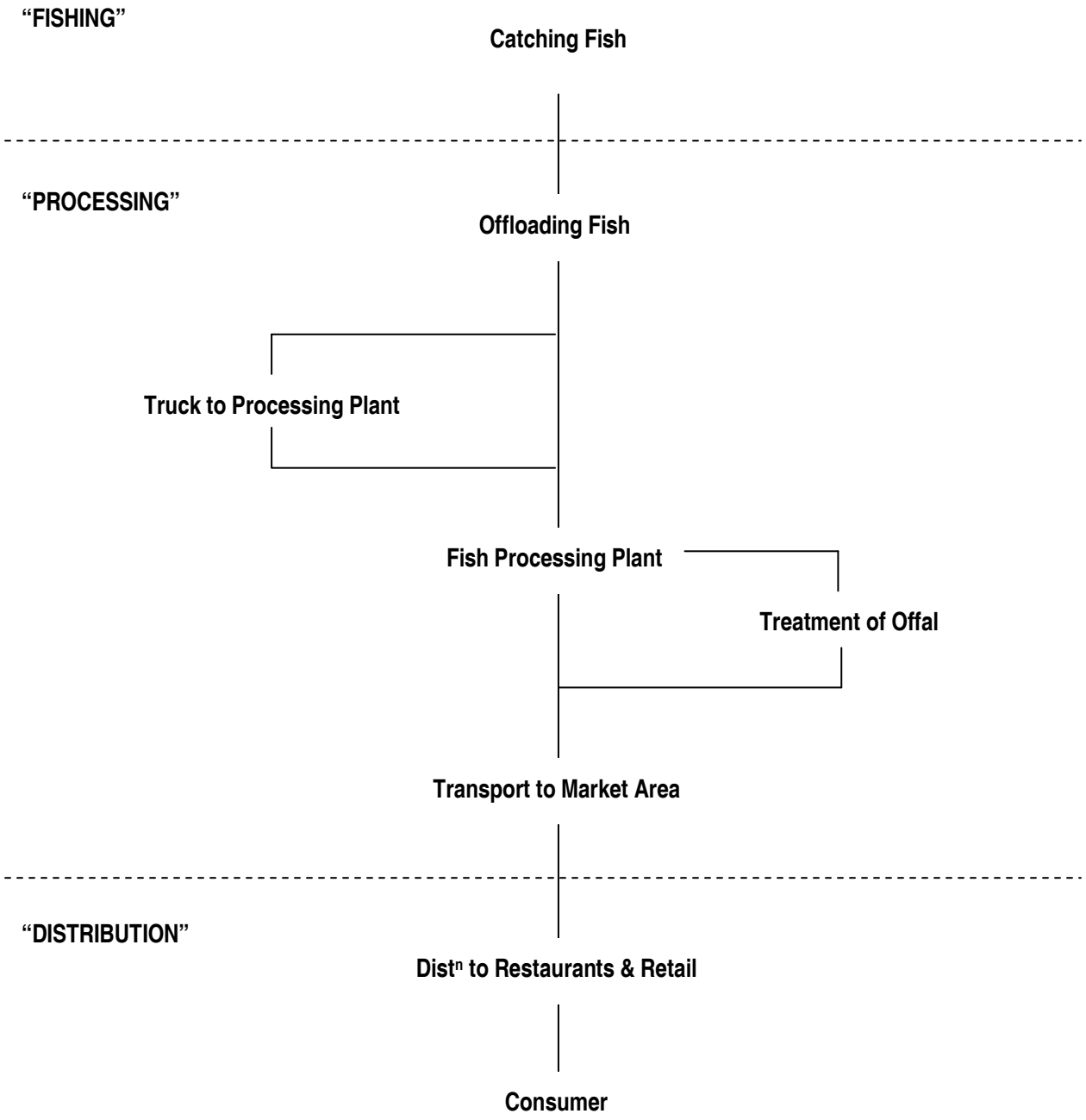
	BC Trawl Impacts		
Impact Indicators	**Direct***	**Indirect & Induced**	**Total**
Wages $ millions	70.5	35.2	105.7
Employment person-years	1,725	865	2,590

* *Excludes economic activity outside Canada from hake processing, includes first stage direct suppliers.*

The groundfish trawl fishery therefore contributes about $106 million in wages & benefits and 2,600 person-years of employment to the provincial economy from the $149 million in direct expenditures in British Columbia.

Finally, it is important to note that the trawl fishery is primarily an export-based business and, as such, the fishery generates significant amounts of foreign exchange.

Exhibit 2: The BC Trawl Fishing Industry From Ocean to Consumer



3.0 Trawl Regional & Community Impacts

The trawl fishery is especially important economically to several regions and communities along coastal BC. Several communities have lost significant employment in resource sectors, such as the forest sector and the salmon fishery, over the past 15 years. The year-round trawl fishery has assumed a greater importance to these communities.

This section addresses the regional dimensions of fishing activity, processing activity, suppliers of goods & services, and direct economic benefits in terms of revenues, wages and employment.

3.1 Boat Owners and Crew by Region

Our interview program allowed us to designate the location of trawl capital and labour interests - boat owners, boat home ports, skippers and crew - for each of the 55 active vessels in the fleet (see Exhibit C.1, Appendix C).

Not surprisingly Greater Vancouver has the largest geographic shares of trawl vessel capital and labour. However, there is a wide geographic dispersion, especially of labour interests, across regions and communities.

	North	Vancouver Island					Greater	
Trawl Crew	Coast	North	Mid	South	West	Victoria	Vancouver	Total
Skippers	8	4	9	7	8	1	18	55
Other Crew	27	6	18	33	33	21	95	233
Total	35	10	27	40	41	22	113	288*

* *Crew positions on the 55 boats is 243 (the extra 45 individuals represent rotational crew).*

Boat labour was drawn from more than 25 different communities - Prince Rupert, Terrace, Port Hardy, Alert Bay, Sointula, Campbell River, Comox, Courtenay, Cumberland, Bowser, Nanoose Bay, Qualicum Beach, Parksville, Nanaimo, Coombs, Ladysmith, Duncan, Cowichan Bay, Shawnigan Lake, Ucluelet, Port Alberni, Victoria, Sooke, Sidney, Kamloops etc - as well as Greater Vancouver.

The following features are noteworthy (see Exhibit C.1, Appendix C):

- Greater Vancouver is home to 69% of trawl vessel owners but a much smaller 39% of the overall crew and 33% of skippers.
- in contrast, the West Coast of Vancouver Island - Ucluelet and Port Alberni - is home to only 1% of boat owners but 14% of the overall crew, 15% of skippers and 16% of boat home ports i.e., where the boat will normally tie up when out of service.
- crew from the North Coast/Prince Rupert area are concentrated in groundfish operations rather than hake operations whereas crew from other regions are more evenly split between groundfish and hake operations.

The groundfish component of the trawl fishery operates year round along different regions of the coast drawing crew from a wide variety of communities.

3.2 Regional Processing Plants and Marketers

The companies that buy trawl fish and have it processed, either at their own plant or another plant, include:

Name	Species
Breakers Fish Co. Ltd.	groundfish & hake
Canadian Fishing Co.	hake
Fisher Bay Seafoods Ltd.	groundfish & hake
J.S. McMillan Fisheries Ltd.	groundfish
Lions Gate Fisheries Ltd.	groundfish & hake
North Delta Seafood Processors	hake
Ocean Fisheries Ltd.	groundfish
Osprey Marine	hake
Port Fish	groundfish & hake
S & S Seafoods	groundfish
Sea Drift Fish Co.	groundfish & hake
Sung Fish (Swanson Bros)	hake
Ucluelet Harbour Seafoods	hake

A small amount of hake is delivered by sea to the S & S Seafood plant in Westport Washington State. S & S Seafood also has an ownership interest in the UHS operation in Ucluelet.

3.3 Regional Suppliers of Goods & Services

There are hundreds of companies and businesses in coastal communities that provide goods & services to the trawl fleet and to trawl fish processors and marketers. Exhibit 3 provides a partial list.

Many of the custom offloading stations, marine fuel businesses and trucking firms are located outside the Greater Vancouver area close to where the fish is landed or delivered (Exhibits B.2 and B.3, Appendix B give the regional delivery patterns for groundfish and hake in recent years).

In particular, the Prince Rupert area of the North Coast for groundfish and the North Vancouver Island (Port Hardy) area, the West Coast of Vancouver Island area (Ucluelet and Port Alberni) and the Greater Vancouver area for both groundfish and hake are important delivery locations.

Several companies custom process, on a fee-for-service basis, fish bought and marketed by other companies i.e., custom processors do not take ownership of the fish. These companies include Delta Pacific, Keltic Seafoods, Orca Seafoods, and Scanner Enterprises.

3.4 The Trawl Contribution to Regional Economies

Exhibit 4 provides a summary of direct trawl economic activity measures - revenues, wages, employment - for seven coastal BC regions (the summary is drawn from Exhibit D.2, Appendix D).

The Greater Vancouver area realizes essentially half of total BC economic benefits from trawl activity - but there are also significant economic benefits accruing to the West Coast of Vancouver Island (Ucluelet and Port Alberni), Northern Vancouver Island (Port Hardy), and the North Coast (Prince Rupert area).

The trawl sector is very important to these regional economies as they are much smaller, less economically diverse areas than Greater Vancouver and Greater Victoria.

	Employment		
	2006 Census	Direct Trawl	% Trawl Cont[n]
Smaller Regions			
Prince Rupert & Area	6,300	138	2%
Port Hardy & Area	2,100	106	5%
Ucluelet & Area	1,000	~120	12%
Port Alberni & Area	9,900	~287	3%
Larger Regions			
Greater Victoria	182,600	57	<0.1%
Greater Vancouver	1,104,800	870	<0.1%

In particular, substantial benefits accrue to the Vancouver Island community of Ucluelet. The Ucluelet area which has an employment base of only 1,000, according to the 2006 Census, had about 120 person years of employment directly tied to the trawl sector - this makes the trawl industry the largest private sector employer in Ucluelet.

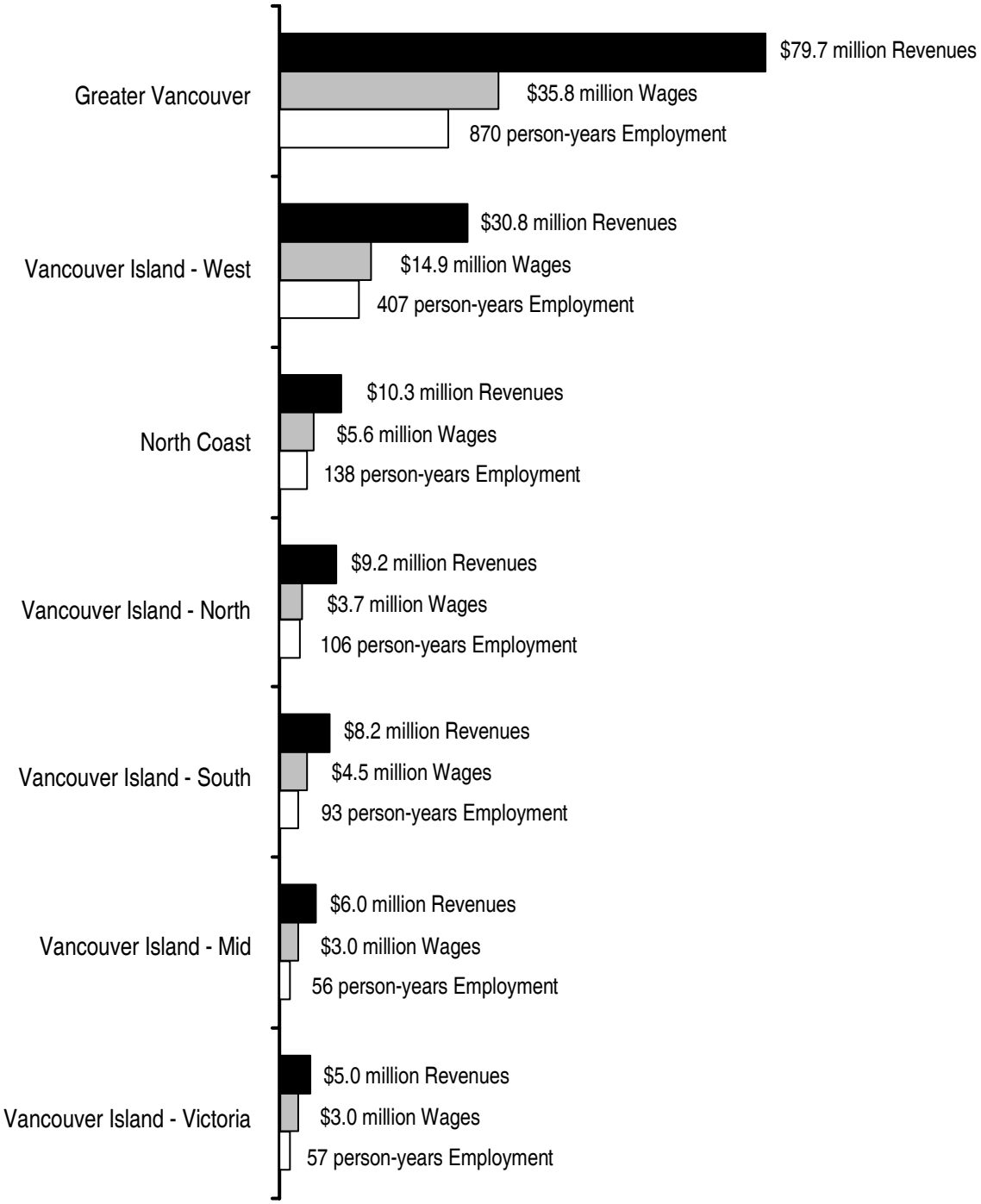
The 120 person-year employment count for Ucluelet excludes the substantial numbers of workers who live in Port Alberni, but who travel to Ucluelet to work in custom offloading or fish processing (the employment for these workers is credited to Port Alberni).

The multiplier effects from indirect supply purchases and induced consumer spending purchases would add about 15% to the trawl employment for Port Hardy and Ucluelet and about 25% to the trawl employment levels for Prince Rupert and Port Alberni.

Exhibit 3: Trawl Industry Suppliers of Goods & Services - Some Examples

Service Category	Company	Location
1. Custom Offloading of Fish	Bear Cove Ice	Port Hardy
	Bornstein's	Ucluelet
	Canadian Fishing Co.	Port Hardy & Prince Rupert
	Cove Fish	Port Hardy
	Keltic Seafoods	Port Hardy
	Neptune Fisheries	Ucluelet
	Steveston Auction	Greater Vancouver
	Ukee Ice Ltd.	Ucluelet
2. Custom Processing of Fish	Bella Coola Fisheries	Greater Vancouver
	Delta Pacific	"
	Grand Hale Marine	"
	Keltic Seafoods	Port Hardy
	Lions Gate	Greater Vancouver
	Scanner Enterprises	"
	Orca Seafoods	"
3. Marine Fuel	Chevron	Greater Vancouver
	Eagle Marine	Ucluelet
	Petro Canada	Port Hardy
	Wampler Esso	Prince Rupert
4. Boat Repairs & Maintenance	Allied Shipyards	Greater Vancouver
	Erik Larsen Diesel	Ucluelet
	McLeans Shipyards	Prince Rupert
5. Gear/Electronics	Kell's Marine	Prince Rupert
	Stryker Electronics	Port Hardy
	Wire Rope Industries	Greater Vancouver
6. Trucking	C Force Transport	Vancouver Island
	Brownline Trucking	Lower Mainland
7. Cold Storage	Versacold	Greater Vancouver
	Leader Cold Storage	Greater Vancouver
8. Catch Monitoring	Archipelago Marine Research	throughout coastal BC
9. Quota Mgt Services	IQMI	Greater Vancouver

Exhibit 4: Direct Contribution of Trawl Industry to BC Regional Economies*



** Total BC direct impacts of $149.2 million in revenues, $70.5 million in wages & benefits and 1,725 person-years of employment.*

Source: Exhibit D.2, Appendix D

4.0 Repercussions of a Reduced Trawl Sector

A significantly reduced trawl fishery would have serious impacts. First, many businesses in coastal communities would close as the trawl sector comprises the majority of their business income. Even a small loss in revenue can have a serious impact on business viability given the weakness in the economy today.

Second, the service providers that would remain would reduce staff, reduce the season and/or service, and increase unit rates or prices for services. Business overhead would have to be covered by a smaller customer base.

A reduced trawl fishery would affect service levels to, and hence landing patterns of other fisheries. For example, reduced custom offloading service and fewer service providers in Ucluelet and Port Hardy would cause more halibut to be landed or delivered in Vancouver at a higher cost.

The trawl sector is the major focus of much of the remaining fishing infrastructure along coastal BC. Anything that affects or threatens the health of the trawl industry, in turn, would have significant repercussions on other users and interests. This section explores the impact of a reduced trawl fishery, for whatever reason, on various business sectors, other fisheries and particular communities. The analysis is qualitative due to the complexity of the interrelationships between fisheries and business sectors.

4.1 Impacts on Service Sectors

The impacts of a reduced trawl fishery will vary by service sector type.

Custom Offloading. Several offloading services in Ucluelet and Port Hardy exist solely or primarily to serve the trawl industry (e.g., Ukee Ice Ltd. and Bornstein's in Ucluelet, Bear Cove Ice and the Canadian Fishing Co. in Port Hardy).

These businesses have 80% or more of their revenue base tied to the trawl industry. Without the trawl industry, most would close.

Custom Processing. Processing trawl fish on a fee-for-service basis is the backbone of the business model for several custom processing companies.

These companies do process other species on a seasonal basis such as salmon. But without the trawl business there would be a rationalization of service with fewer plants in business. Those custom processors that remain would have to increase rates to these other sectors and reduce service.

Custom processors of trawl fish have economies of scale and a cost of service that an individual buying and marketing company can not match. Many trawl fish buyers could only self-process the fish at a cost higher than the current custom rate.

Marine Fuel. Several communities, such as Ucluelet, have only a single fuel dock with a significant share of total fuel sales attributable to the trawl feet. Without the trawl business, some of these facilities would close leaving the community without fuel service.

Trucking & Transport. Several specialty trucking firms have arisen to move fish from fish delivery location, such as Ucluelet or Port Hardy, to processing location and from processing location to market destination such as the US west coast.

For example, C Force Transport of Vancouver Island, the main trucking firm for trawl fish on the Island, receives essentially all of its revenue from moving trawl fish. Without the trawl sector, it would not be in business.

Tote Suppliers. Tote containers for holding fish at delivery stations are provided by either the trucking firm or the buyer of the fish. Since the trawl industry comprises over half of total wild fish caught and landed in the province, well over half of all fisheries tote usage would be tied to the trawl industry.

The tote suppliers are concentrated in Greater Vancouver and are diversified to other food sectors.

Ice Suppliers. The supply of ice is closely tied to offloading stations. Ice for fishing vessels is usually supplied by the custom offloader or processing plant/buyer to which the fish is delivered. Ice for trucks moving totes of fish from remote delivery locations to central processing plants is provided by the custom offloader as part of their offload service.

If the custom offloader goes out of business, as is likely with the loss of trawl business, the traditional source of ice supply for other fisheries is lost as well. The result then is a higher cost of ice from an alternative supply source or the use of less ice the result of which is a reduction in fish quality.

Boat Repairs & Maintenance (R&M). The majority of boat repairs & maintenance (R&M), especially for the larger vessels, is done in Greater Vancouver. These Vancouver ship repair facilities have other non-fisheries customers.

However, some R&M work on trawl vessels is done in Ucluelet and Prince Rupert, for example, and these businesses would be dependent on the trawl sector for a significant portion of their business.

Given the tight economic times and the difficulty in attracting and retaining qualified staff, the loss of any business volume would create difficulties. For example, Erik Larson Diesel Co. Ltd. of Ucluelet told us:

> *…The groundfish trawl fishery is absolutely crucial to our survival. With changes in the forest and salmon troll industries, it is getting very difficult to maintain a staff with the necessary qualifications in today's economy. So if another resource sector is severely curtailed, our ability to survive will be compromised.*

Cold Storage Facilities. The major cold storage facilities for the trawl fishing industry are located in Greater Vancouver - hake, in particular, is a major user of cold storage. These Vancouver-area facilities store other fish, other food (e.g., fruits and vegetables), and other items.

Catch Monitoring Services. A single service provider provides third party catch monitoring services - dockside monitoring, at-sea observers, at-sea electronic monitoring - to all groundfish fishing sectors (trawl, halibut, sablefish, rockfish, lingcod/dogfish).

Trawl is the largest component of the company's domestic business. The loss of trawl business would force the company to reduce the number of regional staff, reduce service to these other fleets and increase rates.

Reduction Plants. West Coast Reduction operates two reduction plants, one in Nanaimo and one in Vancouver (the Nanaimo plant was built mainly to treat offal from processing of hake on the west coast of Vancouver Island). JSMcMillan Fisheries operates a reduction plant in Prince Rupert and Keltic Seafoods operates a reduction plant in Port Hardy.

A significant decline in the trawl fishery likely would cause the Prince Rupert plant, and perhaps the other two non-Vancouver plants, to close. This would necessitate the trucking of offal to more distant treatment facilities at a much higher cost.

4.2 Impacts on Other Fisheries

The impacts of a much reduced trawl sector on other fisheries will also vary depending on the size, seasonality and types of fish landed.

Exhibit 5 provides an annual timeline for trawl and several non-trawl fisheries.

Salmon. Much of the fisheries infrastructure in coastal communities originally was developed to serve the salmon and herring fisheries. However, the commercial salmon fishery is much smaller today than in the past (recent salmon catch has been less than 20% of catches in the late 1980s).

There still are short seasonal fisheries for net (seine and gillnet) and troll fleets. However, no shoreside supplier can build a business plan around solely serving the salmon fleet. The result is that the salmon troll fleet increasingly is reliant on offloading facilities and ice suppliers, fuel docks etc that are primarily used to serve the trawl fleet.

Without the trawl fleet, salmon fleet segments such as the West Coast of Vancouver Island troll fleet would not be able to use offloading stations, ice plants, and fuel docks in locations such as Ucluelet.

Herring. The herring fishery also has collapsed in terms of catch levels, values, and time duration over the past 20 years.

However, in contrast to salmon, the roe herring fishery is not dependent on shoreside services attributable to the trawl sector to the same extent (the fleet fuels up mainly in Vancouver, a major processing company provides an ice barge for the whole fleet in the Gulf of Georgia, large seine vessels pack the fish directly into Vancouver etc).

It is likely that the herring fishery would be disrupted minimally with a decline in the trawl fishery.

Halibut. The halibut fleet uses many of the same delivery locations as the trawl fleet i.e., the fleet delivers fresh halibut to Ucluelet, Port Hardy and Prince Rupert as well as Vancouver. The halibut fleet also uses the same monitoring service firm as the trawl fleet.

Therefore, as noted earlier, declines in trawl fleet activity likely would result in a decline in offload and monitoring service levels and an increase in deliveries to Greater Vancouver at a higher cost.

Sablefish. The vast majority of sablefish is produced by large 25m plus vessels that freeze the fish on-board during extended 10 day plus fishing trips. The vessels deliver primarily to Vancouver where the fish goes into cold storage or on marine transport to Japan i.e., little on-land processing is involved.

The major impact on the sablefish fishery from a reduction in the trawl fleet would be higher catch monitoring costs.

Tuna. Tuna is caught on extended multiweek trips and frozen on-board the hook & line vessels. Much of the tuna is caught in US waters and delivered to US ports.

Accordingly, we see a decline in the trawl sector affecting the tuna sector minimally.

Geoducks & Red Urchins. Geoducks and red urchins are captured by divers and transported live to Vancouver in specialty trucks.

There is little overlap with service providers between the dive fisheries and the trawl sector (but the geoduck fleet does use the same monitoring service provider as the trawl fleet).

Prawns. The prawn fishery lasts 8 weeks in May and June each year and is concentrated in the Strait of Georgia. Traditionally, much of the product was frozen onboard and shipped to Japan. Recently a North American market for live prawns has been developed.

We see little impact on the prawn industry from a decline in the trawl industry.

Hook & Line Rockfish. Under Groundfish Integration, the fishery has devolved into a small fishery targeting live rockfish. The fishery uses specialized trucks to transport the live fish from Port Hardy and East Vancouver Island locations to Greater Vancouver. The fishery uses different offload service providers and minimal amounts of ice and fuel, as compared to trawl.

The major impact from a reduction in the trawl fishery likely could be an increase in monitoring costs, a cost increase that this small scale, small boat fishery can not afford.

Hook & Line Lingcod. The fishery produces mainly live and fresh whole lingcod from small inshore vessels on short trips.

As with the hook & line rockfish fishery, the major impact likely will be an increase in monitoring costs. However, the lingcod fishery uses conventional offload stations and ice services to a greater extent than the rockfish fishery and, accordingly, a decline in offload service availability will impact the lingcod fishery.

Hook & Line Dogfish. Hook & line dogfish is a lower-valued fishery than hook & line rockfish or lingcod. Much of the dogfish is offloaded in Port Hardy and Ucluelet on Vancouver Island and then trucked to Greater Vancouver for processing.

Therefore, increases in monitoring and custom offloading costs will affect the viability of the dogfish fishery to a greater extent than the other two fisheries. The dogfish fleet can not afford to deliver all its catch to Greater Vancouver.

Sardines. The sardine fishery is a relatively low valued fishery that has recovered in recent years to an annual catch in the order of 10,000-12,000 tonnes. Many of the custom offloaders that serve the trawl sector also unload sardines in Port Hardy and Ucluelet - sardines and hake both are pumped directly from the vessel hold.

As a result, the loss of service providers to the trawl fishery would affect the sardine fishery sector to a significant degree. The regional landing patterns, offloading requirements etc are similar for the two fisheries.

Crab. Crabs are caught live in different regions of the coast throughout the year - the majority of the catch is taken in Northern BC waters in Hecate Strait or off the coast of the Queen Charlotte Islands.

The crab fishery produces live product which typically has different infrastructure requirements than the trawl sector. However, the crab fishery needs access to fuel dock facilities along the coast.

Two major self-processors of trawl fish, Ocean Fisheries and JSMcMillan Fisheries, also process salmon, herring and other fish on a seasonal basis. But the processing of trawl fish year round provides the major contribution to their overhead. Therefore, the loss of the trawl fishery may cause these companies to cease operations.

4.3 Impacts by Community

The major impacts of a reduced trawl fishery, in terms relative to the size of the local economy, would be felt in Ucluelet and to a lesser extent in Port Hardy, Prince Rupert, and Port Alberni.

This is due not only to the importance of the present trawl industry to these communities, but also due to the fact that several service sectors most at risk - custom offloading and trucking - are major components of these local economies.

Our interviews with community interests from Ucluelet and Port Hardy highlighted the importance of the trawl sector in maintaining the tax base and public service levels in these communities. These interviews also indicated that the loss of a community fuel station would severely affect aboriginal and sport fisheries and the tourism industry in the area.

In summary, the impacts of a decline in the trawl fishery will be felt in a wide variety of business sectors, fisheries, and coastal communities. Exhibit 6 summarizes our assessment as to relative degree of impact under three headings - "Major", "Moderate", and "Minor".

The "Major" impacts of a reduction in trawl activity would be felt in the following areas:

- business service providers - custom offloaders & ice suppliers, custom processors, trucking & transport, community fuel docks
- fisheries (other than trawl) - sardines, dogfish
- communities - Ucluelet

Many other business, fisheries and community interests, in addition to those above, would be disadvantaged.

Exhibit 5: BC Commercial Fishing Seasons - Trawl vs Other Fisheries

Fishery	Annual Harvest '000 tonnes	Main Season											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Trawl Fisheries													
Groundfish	30-35												
Hake	55-90												
Other Fisheries													
Salmon - Net	5-20												
- Troll	1-2												
Roe Herring	10-15												
Halibut	4-6												
Sablefish	3												
Rockfish Hook & Line	1												
Lingcod Hook & Line	1												
Dogfish Hook & Line	2-4												
Sardines	10												
Tuna	5-10												
Geoducks	2												
Red Urchins	2-4												
Prawns	2-3												
Crabs	4-8												

Exhibit 6: Summary of Impacts from a Reduced Trawl Fishery

A. BUSINESS SECTOR IMPACTS

Impact Magnitude	Business Sector
Major	custom offloaders & ice suppliers, custom processors, trucking & transport, community fuel docks
Moderate	reduction plants, catch monitoring service, boat repairs & maintenance
Minor	tote suppliers, cold storage

B. FISHING SECTOR IMPACTS*

Impact Magnitude	Fishing Sector
Major	sardines, dogfish
Moderate	salmon troll, halibut, lingcod
Minor	geoducks, red urchins, prawns, crabs, salmon net, sablefish, tuna, rockfish hook & line, roe herring

C. COMMUNITY IMPACTS

Impact Magnitude	Community
Major	Ucluelet
Moderate	Prince Rupert, Port Alberni, Port Hardy
Minor	Greater Victoria, Greater Vancouver

* *In addition to trawl fishery impacts.*

5.0 Conclusions

The trawl fishery for groundfish and hake is very significant to the economy of the province and in particular to the economies of Ucluelet, Port Hardy, Prince Rupert and Port Alberni. The trawl sector is by far the largest fishing sector in the province in terms of catches, revenues, and employment on boats and in plants.

The direct and multiplier economic contribution of the trawl fishery is $106 million in wages & benefits and 2,600 person-years of employment to the provincial economy from a direct BC expenditure level of $149 million.

The financial health of the trawl industry has declined in recent years due largely to factors outside its control, namely: the increased world price of oil and hence diesel fuel prices for boats, the strengthening of the Canadian dollar against the US dollar, and the increased market competition from other whitefish species such as tilapia and basa.

The result is a reduced revenue base, reduced net returns to industry, and reduced catches since some fish for which there is quota is uneconomic to catch.

In spite of its very significant economic footprint, the trawl fishery and its important impacts on the economy are not well understood. The sector is important not only in terms of its direct contribution to regional economies but also in terms of providing the year-round infrastructure platform that allows seasonal fisheries sectors, such as sardines, dogfish, lingcod, and halibut, to access needed shore services.

The loss of the trawl fishery would not only cause the loss of the substantial economic benefits from trawl activity, but also cause several millions of dollars more in losses from negative impacts on other fisheries.

This study has addressed these issues in a comprehensive manner for the first time. The analysis should engender greater understanding among fisheries managers, community leaders and the public as to the crucial role of the trawl fishery to the economies of coastal communities in British Columbia.

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Appendix A

Individuals Interviewed

Exhibit A.1: Interviews

Name	Activity/Affiliation	Location
A. SUPPLY & SERVICE		
Bear Cove Ice	custom offloader	Port Hardy
Bornstein's	"	Ucluelet
Canadian Fishing Co.	"	Port Hardy
C Force Transport	trucking	Vancouver Island
Eagle Marine	marine fuel	Ucluelet
Erik Larsen Diesel	boat repairs	Ucluelet
IQMI	quota mgt services	Greater Vancouver
Kell's Marine	marine mechanics	Prince Rupert
Keltic Seafoods	custom offloader	Port Hardy
McLeans Shipyards	boat repairs	Prince Rupert
Port Hardy Auto Parts	marine hardware	Port Hardy
Steveston Harbour Authority	moorage	Greater Vancouver
Stryker Electronics	gear & electronics	Port Hardy
Ucluelet Harbour Authority	moorage	Ucluelet
Ukee Ice Ltd.	custom offloader	Ucluelet
W. C. Fuels	marine fuel	Port Hardy
B. PROCESSING & MARKETING COMPANIES		
Breakers Fish Co.	groundfish & hake	Greater Vancouver
Canadian Fishing Co.	hake	Greater Vancouver
Delta Pacific	hake custom processor	Greater Vancouver
Fisher Bay Seafoods	groundfish & hake	Sidney
J.S.McMillan Fisheries	groundfish	Greater Vancouver
Keltic Seafoods	hake custom processor	Port Hardy
Lions Gate Fisheries	groundfish & hake	Greater Vancouver
North Delta Seafood Processors	hake	Greater Vancouver
Ocean Fisheries	groundfish	Greater Vancouver
Orca Seafoods	groundfish & hake custom processor	Greater Vancouver
Osprey Marine	hake	Greater Vancouver
Port Fish	groundfish & hake	Port Alberni
Scanner Enterprises	groundfish & hake customer processor	Greater Vancouver
Sea Drift Fish Co.	groundfish & hake	Nanaimo
Ucluelet Harbour Seafoods	hake	Ucluelet
C. VESSEL OWNERS		
Fiddler, David	MV "Knight Dragon"	Nanaimo
Morreau, Bob	MV "Tenacious"	Greater Vancouver
Mose, Brian	MV "Frosti"	Nanoose Bay
Radil, Albert	MV "Royal Canadian"	Greater Vancouver
Vaacher, Don	MV "Blue Waters"	Prince Rupert
D. OTHERS		
Figg, Irving	UFAWU	Greater Vancouver
McRae, Ken	Mayor	Port Alberni
Minns, Charlie	Groundfish Development Authority	Greater Vancouver
Mose, Brian	Deep Sea Trawlers Ass^{n}	Nanoose Bay
Mose, Harry	ex-Mayor	Port Hardy
St. Jacques, Dianne	ex-Mayor	Ucluelet
Turris, Bruce	CDN GF Res & Conservation Society	Greater Vancouver

Groundfish Trawl Custom Offloading - Interview Guide

Gordon Gislason and Archipelago Marine Research Ltd. have been retained by the BC Ministry of Environment to assess the dependence of coastal communities on the groundfish trawl fleet. Any information that you provide will be kept strictly confidential.

A. Your Operation

1. How many lbs of fish would you custom unload at this location in a typical year?

   _____ lbs of hake

   _____ lbs of other trawl groundfish

   _____ lbs of groundfish (non-trawl)

   _____ lbs of other fish/shellfish → which species? _____

   _____ LBS in TOTAL

2. How much employment & labour does this involve?

   _____ people for e.g., 2 people for 12 months plus

   _____ person-months 2 people for 4 months plus 1 person for 2 months

   = 5 people for 34 months

3. Approximately what share of this employment (or your annual revenue) is attributable to the groundfish trawl and hake trawl fisheries? _____ %.

B. Importance of Groundfish Trawl

4. How important is the groundfish trawl fishery to your overall business viability?

5. If your groundfish trawl business fell by 50% what impact would this have? If it fell by 100% i.e., disappeared altogether, what impact would it have? (what impact would it have on your ability to service other fisheries sectors?)

6. Do you have any other comments?

THANK YOU

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Groundfish Trawl Fishery Service Provider - Interview Guide

Gordon Gislason and Archipelago Marine Research Ltd. have been retained by the BC Ministry of Environment to assess the dependence of coastal communities on the groundfish trawl fleet. Any information that you provide will be kept strictly confidential.

A. Your Operation

1. Briefly describe the service that your business provides. (identify fisheries sectors which you serve)

   _____

   _____

   _____

2. How much employment & labour does this involve?

   _____ people for e.g., 2 people for 12 months plus

   _____ person-months 2 people for 4 months plus

   1 person for 2 months

   = 5 people for 34 months

3. Approximately what share of this employment (or your annual revenue) is attributable to the groundfish trawl and hake trawl fisheries? _____ %

B. Importance of Groundfish Trawl

4. How important is the groundfish trawl fishery to your overall business viability?

5. If your groundfish trawl business fell by 50% what impact would this have? If it fell by 100% i.e., disappeared altogether, what impact would it have? (What impact would it have on your ability to service other fisheries sectors?)

6. Do you have any other comments?

THANK YOU

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Appendix B

Catch Monitoring Data

Exhibit B.1: BC Groundfish Trawl Fleet Profile 2005/06 to 2009/10

	Year				
	2005/06	**2006/07**	**2007/08**	**2008/09[d]**	**2009/10**
1. Option A - Shoreside					
Catch tonnes[a]					
Groundfish	46,595	36,578	31,482	27,892	29,871
Hake	88,275	83,000	67,434	71,239	57,921
Total	134,870	119,578	98,916	99,131	87,792
No. of Deliveries					
Groundfish	989	800	862	648	760
Hake	1,196	933	790	880	667
Total	2,185	1,733	1,652	1,528	1,427
Active Boats					
Groundfish	50	43	45	44	43
Hake	41	34	35	38	33
Total[b]	62	56	56	56	54
2. Option A - JV Hake					
Catch tonnes[a,c,e]	15,178	13,716	6,781	3,592	0
Active Boats	29	23	15	6	0
3. Option B					
Catch tonnes[a]	185	163	136	98	130
No. of Deliveries	388	363	364	222	252
Active Boats	12	13	9	8	9

[a] *Catch is all fish landed (including bycatch).*

[b] *Many boats fish both groundfish and hake so total is not the sum of groundfish boats and hake boats.*

[c] *Joint Venture (JV) hake catch from DFO.*

[d] *The 2008/09 groundfish fishery was only 11 months long.*

[e] *A few of these boats would have fished shoreside hake or groundfish.*

Source: Trawl catch monitoring data.

Exhibit B.2: BC Trawl Option A Shoreside Delivery Patterns - Groundfish

	Year				
	2005/06	2006/07	2007/08	2008/09[b]	2009/10
Delivered Weight by Location tonnes[a]					
North Coast	13,644	8,603	7,130	6,728	6,325
Vancouver Island - North	14,770	13,812	11,098	7,672	9,660
- Mid	0	0	4	0	0
- South	0	0	0	0	0
- West	10,940	7,751	8,960	8,168	8,142
- Victoria	1	0	0	0	0
Greater Vancouver	7,178	6,412	4,290	5,324	5,744
US	62	0	0	0	0
All	46,595	36,578	31,482	27,892	29,871
No. of Deliveries by Location					
North Coast	279	196	180	173	167
Vancouver Island - North	315	285	266	209	259
- Mid	0	0	1	0	0
- South	0	0	0	0	0
- West	287	250	350	221	277
- Victoria	1	0	0	0	0
Greater Vancouver	106	69	65	45	57
US	1	0	0	0	0
All	989	800	862	648	760

[a] *Catch is all fish landed (including bycatch).*

[b] *2008/09 fishing year was only 11 months long.*

Source: Trawl catch monitoring data.

Exhibit B.3: BC Trawl Option A Shoreside Delivery Patterns - Hake

	Year				
	2005/06	2006/07	2007/08	2008/09	2009/10
Delivered Weight by Location tonnes[a,b]					
North Coast	0	0	267	1,412	1,136
Vancouver Island - North	1,049	27,628	18,323	13,833	4,229
- Mid	0	0	272	0	844
- South	0	0	0	0	0
- West	58,803	26,385	21,673	29,633	25,027
- Victoria	0	0	0	0	0
Greater Vancouver	23,975	26,415	25,186	24,822	21,874
US	4,448	2,572	1,713	1,539	4,811
All	88,275	83,000	67,434	71,239	57,921
No. of Deliveries by Location[b]					
North Coast	0	0	7	22	14
Vancouver Island - North	6	363	295	216	66
- Mid	0	0	3	0	10
- South	0	0	0	0	0
- West	967	402	328	480	413
- Victoria	0	0	0	0	0
Greater Vancouver	190	155	147	148	116
US	33	13	10	14	48
All	1,196	933	790	880	667

[a] *Catch is all fish landed (including bycatch).*

[b] *The landing location of offshore hake depends on the stock location - in years in which the stock is located near the north end of Vancouver Island, more hake is delivered to Port Hardy and less hake delivered to Ucluelet further south on the West Coast of Vancouver Island (in 2005 and 2009 the hake biomass was concentrated off the West Coast of Vancouver Island and therefore Ucluelet had the bulk of hake deliveries/in 2006 to 2008 much of the hake stock was located further north and this accounts for the increased deliveries to Port Hardy in these years).*

Source: Trawl catch monitoring data.

Appendix C

Trawl Data, Parameters & Assumptions

Exhibit C.1: BC Trawl Boat and Crew Locations

	North Coast	Vancouver Island					Greater Vancouver	Total
		North	Mid	South	West	Victoria		
1. GROUNDFISH								
Active Boats								
Owners	4	1	4.75	2.25	-	3.5	29.5	45
Home Ports	7	5	3	1	9	1	19	45
No. Boat Crew								
Skippers	8	4	9	7	6	1	10	45
Other	27	5	13	22	30	15	46	158
All	35	9	22	29	36	16	56	203
2. HAKE								
Active Boats								
Owners	0.5	1	3.5	1	0.5	3.5	25	35
Home Ports	-	2	3	-	7	2	21	35
No. Boat Crew								
Skippers	1	1	7	4	7	1	14	35
Other	2	3	11	20	23	19	73	151
All	3	4	18	24	30	20	87	186
3. GROUNDFISH & HAKE								
Active Boats*								
Owners	4	1	4.75	2.25	0.5	4.5	38	55
Home Ports	7	5	3	1	9	2	28	55
No. Boat Crew								
Skippers	8	4	9	7	8	1	18	55
Other	27	6	18	33	33	21	95	233
All	35	10	27	40	41	22	113	288

** 25 of the 55 boats fish both groundfish and hake.*

Source: Interviews with processing companies and vessel owners.

Exhibit C.2: BC Trawl Industry Parameters & Assumptions

	Revenues/Expenses			% to Wages	Wages per PY Employment
	Groundfish	Hake	Total		
A. INDUSTRY PARAMETERS					
No. of Boats*	45	35	55		
Deliveries	810	840	1,650		
Catch Tonnes round RD	32,400	71,400	103,800		
Price - Landed	$1.10 per kg	$.275 per kg			
" - Processed**	$2.376 per kg	$1.166 per kg			
B. FISHING ACTIVITY					
Fuel	$6,000 per delivery	$3,500 per delivery		10%	$40,000
Consumables	$400 per delivery	$250 per delivery		10%	$40,000
Ice	$1,400 per delivery	$1,400 per delivery		20%	$27,500
Monitoring - DMP & EM	$500 per delivery	$475 per delivery		60%	$37,500
- Observers	$2,000 per delivery	$50 per delivery		100%	$37,500
Fees - DFO Quota	$.015 per kg	$.004 per kg		0	0
- CGRCS	$.010 per kg	$.001 per kg		80%	$75,000
Lease Price	$.176 per kg	$.099 per kg		0	0
Catch for which Lease Paid	30%	30%			
Food	$1,200 per delivery	$750 per delivery		30%	$25,000
Other Crew Costs	$1,000 per delivery	$600 per delivery		30%	$25,000
Crew Share Gross	50% Net Stock***	45% Net Stock***			
Boat Share Gross	50% Net Stock***	55% Net Stock***			
Crew Share Net	Gross - Food & Other	Gross - Food & Other		100%	$60,000
Skipper Bonus	10% Boat Share	10% Boat Share		100%	$60,000
DFO Licence Fees			$500 per boat	0	0
Insurance			$15,000 per boat	15%	$50,000
Gear			$30,000 per boat	20%	$30,000
Repairs & Maintenance			$150,000 per boat	50%	$60,000
Shore Labour/Mgt			$30,000 per boat	100%	$60,000
Moorage			$3,000 per boat	40%	$35,000
Accounting/Legal			$5,000 per boat	60%	$60,000
Vehicle & Other			$20,000 per boat	40%	$30,000
C. PROCESSING ACTIVITY					
Burden on Fish Purchases	8% Net Crew Wages	8% Net Crew Wages		100%	$60,000
Offloading	$.132 per kg	$.066 per kg		70%	$27,500
Trucking to Plant	$.198 per kg	$.110 per kg		25%	$40,000
Processing inc. Packaging	$.594 per kg	$.440 per kg		55%	$35,000
Transport to Market	$.154 per kg	$.198 per kg		25%	$40,000
Marketing & Sales	4% Revenues	4% Revenues		60%	$80,000

* *25 of the 55 boats fish both groundfish and hake.*

** *The processed prices include adjustment for the value of fish meal & oil from offal.*

*** *Net Stock is Gross Stock/Boat Revenue less Certain Expenses.*

Note: Insurance, Repairs & Maintenance, Moorage, Accounting & Legal and Vehicle & Other were reduced by 20% to adjust for non-trawl use of boats e.g., fishing salmon, herring, sablefish etc.

Source: GSGislason estimates based on Nelson Bros (2009) and interviews.

Exhibit C.3: Regional Allocation Assumptions

	North Coast	Vancouver Island					Greater Vancouver	USA/ Other	Total
		North	Mid	South	West	Victoria			
GROUNDFISH									
Deliveries - Number*	23%	33%	0%	0%	36%	0%	8%	0%	100%
" - Fish Weight*	23%	33%	0%	0%	27%	0%	17%	0%	100%
Boat Owners**	9%	2%	11%	5%	0%	8%	65%	0%	100%
Boat Home Port**	16%	11%	7%	2%	20%	2%	42%	0%	100%
Boat Skipper**	18%	9%	20%	16%	13%	2%	22%	0%	100%
Boat Crew inc. Skipper**	17%	4%	11%	14%	18%	8%	28%	0%	100%
DFO Quota Fees	0%	0%	0%	0%	0%	0%	100%	0%	100%
CGRCS Fees	0%	0%	0%	0%	0%	0%	100%	0%	100%
Monitoring - DMP/EM***	21%	30%	0%	0%	27%	5%	17%	0%	100%
Monitoring - Observers***	6%	2%	5%	11%	10%	50%	16%	0%	100%
Boat Costs - DFO Licence	0%	0%	0%	0%	0%	0%	100%	0%	100%
Boat Costs - Insurance	0%	0%	0%	0%	0%	0%	100%	0%	100%
Boat Costs - R&M	8%	6%	3%	1%	10%	1%	71%	0%	100%
Processing Activity****	16%	0%	0%	4%	5%	0%	75%	0%	100%
Processing Ownership****	0%	0%	0%	5%	0%	5%	90%	0%	100%
Transport to Plant****	5%	10%	10%	10%	20%	0%	45%	0%	100%
Transport to Market****	12%	0%	0%	6%	7%	0%	75%	0%	100%
HAKE									
Deliveries - Number*	0%	12%	0%	0%	68%	0%	18%	2%	100%
" - Fish Weight*	0%	10%	0%	0%	50%	0%	36%	4%	100%
Boat Owners**	2%	3%	10%	3%	1%	10%	71%	0%	100%
Boat Home Port**	0%	6%	8%	0%	20%	6%	60%	0%	100%
Boat Skipper**	3%	3%	20%	11%	20%	3%	40%	0%	100%
Boat Crew inc. Skipper**	2%	2%	9%	13%	16%	11%	47%	0%	100%
DFO Quota Fees	0%	0%	0%	0%	0%	0%	100%	0%	100%
CGRCS Fees	0%	0%	0%	0%	0%	0%	100%	0%	100%
Monitoring - DMP/EM***	21%	30%	0%	0%	27%	5%	17%	0%	100%
Monitoring - Observers***	6%	2%	5%	11%	10%	50%	16%	0%	100%
Boat Costs - DFO Licence	0%	0%	0%	0%	0%	0%	100%	0%	100%
Boat Costs - Insurance	0%	0%	0%	0%	0%	0%	100%	0%	100%
Boat Costs - R&M	0%	3%	4%	0%	10%	3%	80%	0%	100%
Processing Activity****	0%	2%	0%	3%	36%	0%	55%	4%	100%
Processing Ownership****	0%	0%	0%	10%	0%	20%	50%	20%	100%
Transport to Plant****	0%	10%	20%	20%	15%	0%	35%	0%	100%
Transport to Market****	0%	1%	0%	1%	8%	0%	30%	60%	100%

* *Estimates based on recent delivery patterns i.e., Exhibits B.2 and B.3, Appendix B.*

** *Estimates based on interview program with processors and vessel owners i.e., Exhibit C.1, Appendix C.*

*** *Estimates provided by Archipelago Marine Research Ltd.*

**** *Estimates based on 2009/10 catch allocations.*

Appendix D

Trawl Financial Projections

Exhibit D.1: BC Trawl Industry Profiles - Revenues, Wages & Employment

	Revenues/Expenses $000			$000 Wages	Person-Years Employment	Jobs
	Groundfish	Hake	Total			
A. INDUSTRY PARAMETERS						
No. of Boats*	45	35	55	NA	NA	NA
Deliveries	810	840	1,650	NA	NA	NA
Catch Tonnes RD	32,400	71,400	103,800	NA	NA	NA
Price - Landed $ per kg RD	1.10	.275	NA	NA	NA	NA
" - Processed $ per kg RD*	2.376	1.166	NA	NA	NA	NA
B. FISHING ACTIVITY						
Boat Revenues	35,640	19,635	55,275	NA	NA	NA
Less: Fuel, Consumables & Ice	6,320	4,325	10,645	1,295	38	50
Monitoring	2,025	440	2,465	2,145	57	90
DFO & CGRCS Fees	810	360	1,170	315	4	5
Quota Lease Paid	1,710	2,120	3,830	0	0	0
Food & Other Crew Costs	1,780	1,135	2,915	875	35	40
Crew & Skipper Payments	11,215	4,410	15,625	15,625	261	305
Boat Licence Fees	45	25	70	0	0	0
Insurance	425	235	660	100	2	2
Gear, Repairs & Maintenance	5,320	2,930	8,250	3,630	66	70
Shore Labour/Mgt	1,065	585	1,650	1,650	28	28
Moorage, Vehicle & Other**	795	440	1,235	545	15	15
Equals: Boat Return	4,130	2,630	6,760	0	0	0
C. PROCESSING ACTIVITY						
Plant Revenues	76,980	83,255	160,235	NA	NA	NA
Less: Fish Purchases***	35,640	19,635	55,275	26,180	506	605
WCB/EI on Fish Purchases	945	395	1,340	1,340	22	25
Offloading	4,280	4,710	8,990	6,290	229	350
Trucking to Plant	6,415	7,855	14,270	3,565	89	135
Processing inc. Packaging	19,245	31,415	50,660	27,865	796	1,190
Transport to Market	4,990	14,135	19,125	4,780	120	175
Marketing & Sales	3,080	3,330	6,410	3,845	48	60
Equals: Processing Return	2,385	1,780	4,165	0	0	0
D. TOTAL ACTIVITY	76,980	83,255	160,235	73,865	1,810	2,540

* *25 of the 55 boats fish both groundfish and hake.*

** *Other includes accounting/legal services, transaction costs for licensing quota, home office etc.*

*** *Sum of entries under Fishing Activity.*

Source: GSGislason estimates (based on data/assumptions in Appendix C).

Exhibit D.2: The BC Trawl Industry - Regional Distribution of Economic Activity

	North Coast	Vancouver Island					Greater Vancouver	US/ Other	Total
		North	Mid	South	West	Victoria			
REVENUES/EXPENSES $000									
Fishing - Fuel, Consumables, Ice	1,455	2,605	0	0	5,215	0	1,285	85	10,645
- Crew, Skipper & Shore Labour	2,120	640	1,980	2,225	2,695	1,405	6,210	0	17,275
- Other Fishing Services	1,270	1,495	575	290	2,825	1,140	9,140	30	16,765
- Boat & Quota Return	330	300	1,075	355	90	1,025	7,415	0	10,590
Processing - Burden on Fish Purchases	170	45	140	185	230	120	450	0	1,340
- Offloading	985	1,880	0	0	3,510	0	2,425	190	8,990
- Processing & Marketing	3,080	630	0	2,200	12,270	820	36,150	1,920	57,070
- Trucking/Transport	920	1,570	2,210	2,655	3,940	0	13,620	8,480	33,395
- Processor Return	0	0	0	295	0	475	3,040	355	4,165
Total	10,330	9,165	5,980	8,205	30,775	4,985	79,735	11,060	160,235
WAGES $000									
Fishing - Fuel, Consumables, Ice	170	310	0	0	645	0	160	10	1,295
- Crew, Skipper & Shore Labour	2,120	640	1,980	2,225	2,695	1,405	6,210	0	17,275
- Other Fishing Services	565	600	285	225	1,135	970	3,820	10	7,610
- Boat & Quota Return	0	0	0	0	0	0	0	0	0
Processing - Burden on Fish Purchases	170	45	140	185	230	120	450	0	1,340
- Offloading	690	1,320	0	0	2,455	0	1,695	130	6,290
- Processing & Marketing	1,695	345	0	1,235	6,750	490	20,105	1,090	31,710
- Trucking/Transport	230	390	550	665	985	0	3,405	2,120	8,345
- Processor Return	0	0	0	0	0	0	0	0	0
Total	5,640	3,650	2,955	4,535	14,895	2,985	35,845	3,360	73,865
EMPLOYMENT person years or PYs									
Fishing - Fuel, Consumables, Ice	5	9	0	0	19	0	5	0	38
- Crew, Skipper & Shore Labour	35	11	33	37	45	24	104	0	289
- Other Fishing Services	16	17	7	6	32	25	76	0	179
- Boat & Quota Return	0	0	0	0	0	0	0	0	0
Processing - WCB/EI on Fish Purchases	3	1	2	3	4	2	7	0	22
- Offloading	25	48	0	0	89	0	62	5	229
- Processing & Marketing	48	10	0	31	193	6	531	25	844
- Trucking/Transport	6	10	14	16	25	0	85	53	209
- Processor Return	0	0	0	0	0	0	0	0	0
Total	138	106	56	93	407	57	870	83	1,810

Source: GSGislason estimates (based on data/assumptions in Appendix C).