

# Shellfish Industry Economic Impact Analysis

*New Marine Frontier Project  
Investment Attraction to Vancouver Island / Coast  
Phase 2- Marketing Plan Development*



**VANCOUVER ISLAND**

> THE NEW MARINE FRONTIER

By

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Ministry of Sustainable Resource Management

Rural Development Initiative

Vancouver Island Economic Developers Association

HRDC –Industrial Adjustment Services

Mid Island Science, Technology and Innovation Council

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## EXECUTIVE SUMMARY

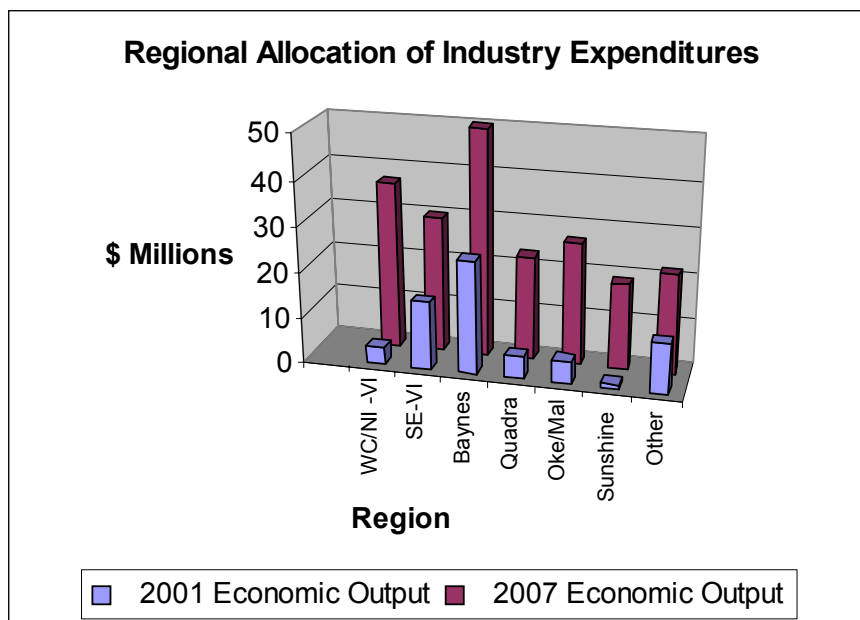
The shellfish industry on Vancouver Island and the BC coast, currently accounts for \$66 Million in economic output and 956 total jobs (direct, indirect and induced). Concentration of the industry occurs in the Baynes Sound area, roughly Comox to Nanaimo.

Much of the economic benefit and impact associated with the industry remains on Vancouver Island/Coast and in local communities. Industry technological developments have been local, and capital equipment and services associated with the industry are locally made or purchased. Analysis shows that 78 cents of every dollar spent in direct industry purchases remains in the local economy.

The industry has great potential to grow in the short term. The shellfish industry has set goals for growth that are considered realistic, and have the support of provincial and federal governments. These goals would result in economic expansion of the industry to \$206 Million dollars over a five-year period, resulting in an industry with 3700 total jobs, mostly in rural communities.

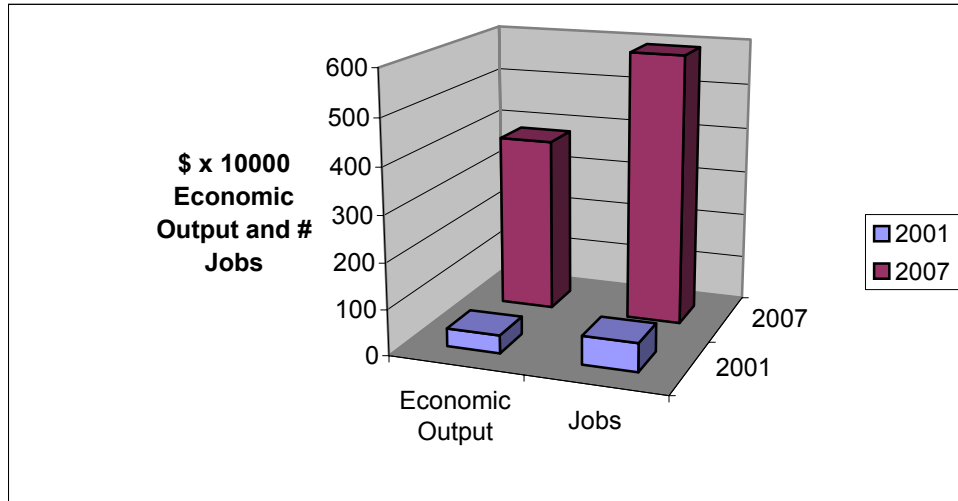
All regions of Vancouver Island/Coast would benefit from the growth, ranging from 100% increase and creating 250 jobs in the Baynes Sound area to a 900% increase and create 530 jobs on the West Coast and North of Vancouver Island.

Exhibit 1



**SECTION 1 – COMMUNITY JOB AND ECONOMIC ANALYSIS**

**WEST COAST VANCOUVER ISLAND AND NORTH ISLAND  
SHELLFISH INDUSTRY  
JOBS AND ECONOMIC OUTPUT  
2001 – 2007**



**West Coast Vancouver Island and North**

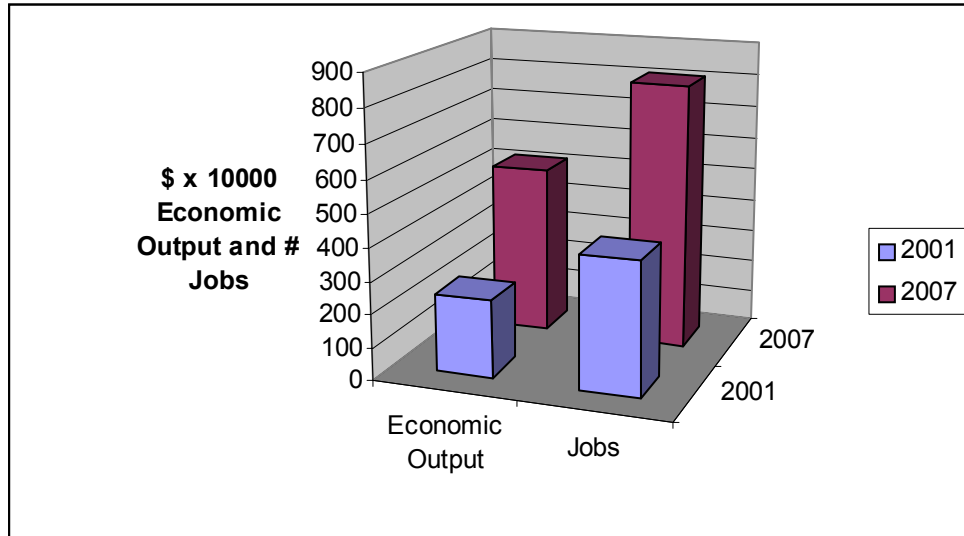
Including Port Alberni, Ucluelet, Tofino, Tahsis, Port Hardy/ Port McNeil

Industry Segment	2001 Industry Profile		2007 Industry Profile		Total Increase		Percentage Increase	
	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output	Total Jobs
Farm/Processing	2340	42	27900	441	25560	399	1192%	1050%
Suppliers	640	6	8400	122	7760	116	1313%	2033%
R&D/Gov't Services	1000	14	2000	29	1000	15	200%	207%
<b>Totals</b>	<b>3980</b>	<b>62</b>	<b>38300</b>	<b>592</b>	<b>34320</b>	<b>530</b>	<b>962%</b>	<b>955%</b>

**Economic output will grow from \$3.9 Million to \$38.3 Million over 5 years  
Industry jobs will grow from 62 to 592 over 5 years**



**BAYNES SOUND  
SHELLFISH INDUSTRY  
JOBS AND ECONOMIC OUTPUT  
2001 – 2007**



**Baynes Sound**

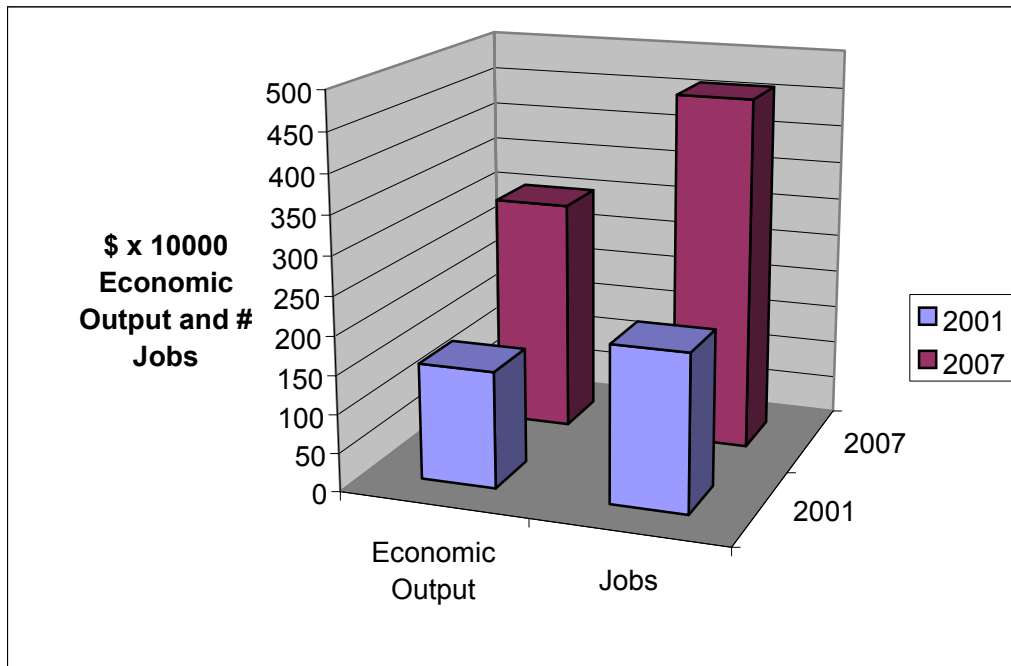
including Courtenay, Comox, Fanny Bay, Qualicum, Parksville

Industry Segment	2001 Industry Profile		2007 Industry Profile		Total Increase		Percentage Increase	
	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output	Total Jobs
Farm/Processing	18720	353	38500	612	19780	259	106%	73%
Suppliers	4020	38	11400	170	7380	132	184%	347%
R&D/Gov't Services	1000	14	2000	28	1000	14	100%	100%
<b>Totals</b>	<b>23740</b>	<b>405</b>	<b>51900</b>	<b>810</b>	<b>28160</b>	<b>405</b>	<b>119%</b>	<b>100%</b>

**Economic output will grow from \$23.7 Million to \$51.9 Million over 5 years  
Industry jobs will grow from 405 to 810 over 5 years**



**SOUTH EAST VANCOUVER ISLAND  
SHELLFISH INDUSTRY  
JOBS AND ECONOMIC OUTPUT  
2001 – 2007**



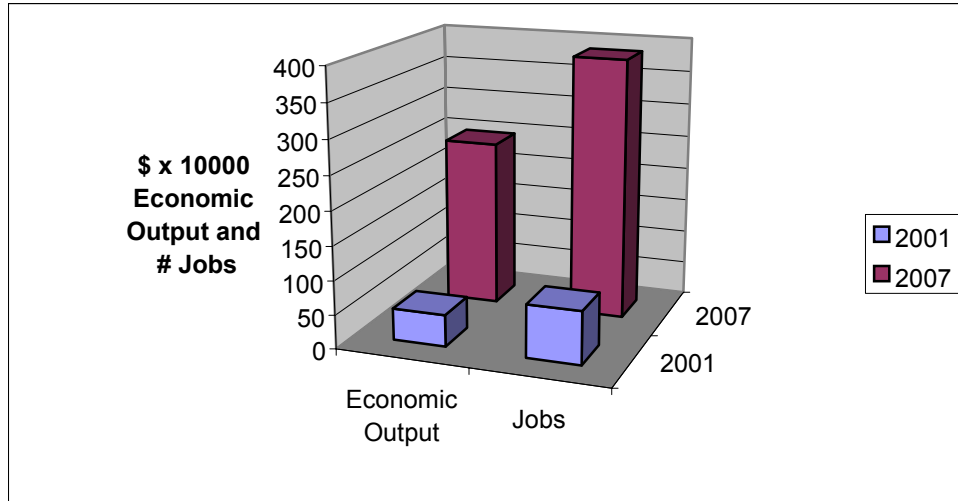
**South East - Vancouver Island**  
including Nanaimo, Ladysmith, Duncan,  
Victoria

Industry Segment	2001 Industry Profile		2007 Industry Profile		Total Increase		Percentage Increase	
	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output	Total Jobs
Farm/Processing	7180	84	14400	227	7220	143	101%	170%
Suppliers	2000	35	3900	65	1900	30	95%	86%
R&D/Gov't Services	6000	84	12000	168	6000	84	100%	100%
<b>Totals</b>	<b>15180</b>	<b>203</b>	<b>30300</b>	<b>460</b>	<b>15120</b>	<b>257</b>	<b>100%</b>	<b>127%</b>

**Economic output will grow from \$15.2 Million to \$30.3 Million over 5 years**  
**Industry jobs will grow from 203 to 460 over 5 years**



**QUADRA/CORTEZ  
SHELLFISH INDUSTRY  
JOBS AND ECONOMIC OUTPUT  
2001 – 2007**



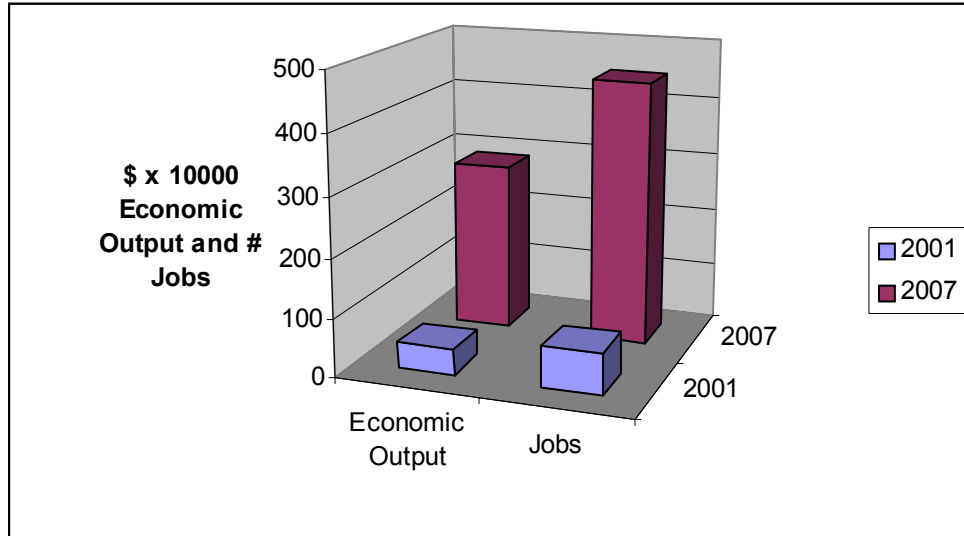
**Quadra /Cortez**  
including Campbell River, Sayward

Industry Segment	2001 Industry Profile		2007 Industry Profile		Total Increase		Percentage Increase	
	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output	Total Jobs
Farm/Processing	3900	68	19100	302	15200	234	390%	344%
Suppliers	800	10	5600	84	4800	74	600%	740%
<b>Totals</b>	<b>4700</b>	<b>78</b>	<b>24700</b>	<b>386</b>	<b>20000</b>	<b>308</b>	<b>426%</b>	<b>395%</b>

**Economic output will grow from \$4.7 Million to \$24.7 Million over 5 years**  
**Industry jobs will grow from 78 to 386 over 5 years**



**OKEOVER/MALASPINA  
SHELLFISH INDUSTRY  
JOBS AND ECONOMIC OUTPUT  
2001 – 2007**



**Okeover/Malaspina**

includes Powell River, Texada, Lund

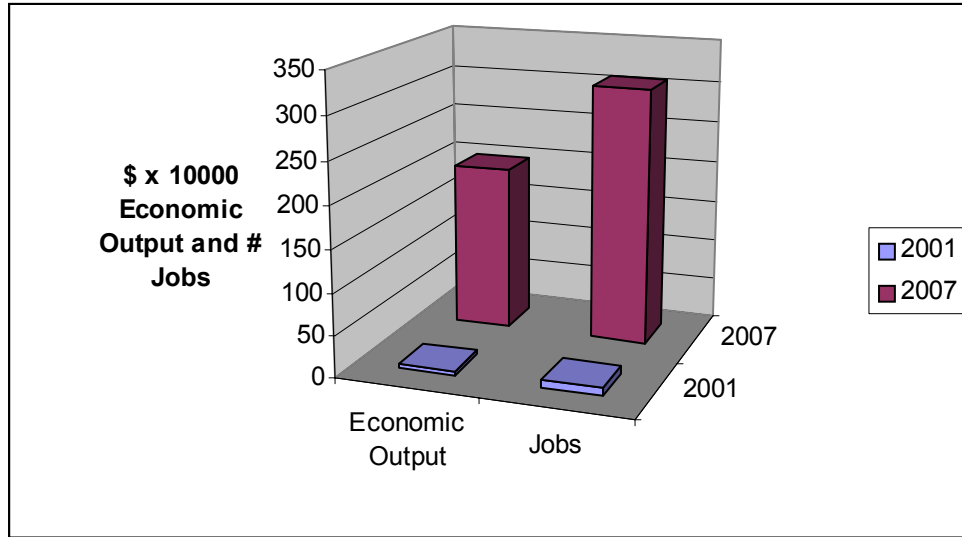
Industry Segment	2001 Industry Profile		2007 Industry Profile		Total Increase		Percentage Increase	
	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output	Total Jobs
Farm/Processing	3590	61	22200	353	18610	292	518%	479%
Suppliers	800	10	6600	98	5800	88	725%	880%
<b>Totals</b>	<b>4390</b>	<b>71</b>	<b>28800</b>	<b>451</b>	<b>24410</b>	<b>380</b>	<b>556%</b>	<b>535%</b>

**Economic output will grow from \$4.4 Million to \$28.8 Million over 5 years**

**Industry jobs will grow from 71 to 451 over 5 years**



## Sunshine Coast SHELLFISH INDUSTRY JOBS AND ECONOMIC OUTPUT 2001 – 2007



### Sunshine Coast

Includes Sechelt, PenderHarbour, Gibsons, Earls Cove

Industry Segment	2001 Industry Profile		2007 Industry Profile		Total Increase		Percentage Increase	
	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output	Total Jobs
Farm/Processing	470	10	15300	241	14830	231	3155%	2310%
Suppliers	30	0	4600	68	4570	68	15233%	N/A
<b>Totals</b>	<b>500</b>	<b>10</b>	<b>19900</b>	<b>309</b>	<b>19400</b>	<b>299</b>	<b>3880%</b>	<b>2990%</b>

**Economic output will grow from \$500 thousand to \$19.9 Million over 5 years**

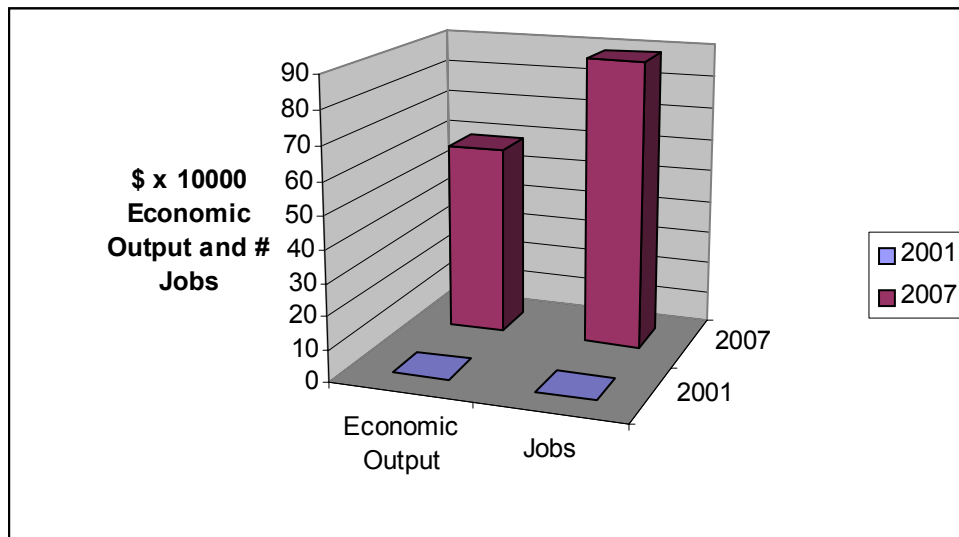
**Industry jobs will grow from 10 to 309 over 5 years**



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### NORTH COAST MAINLAND SHELLFISH INDUSTRY JOBS AND ECONOMIC OUTPUT 2001 – 2007



**North Coast Mainland**

includes Prince Rupert, Kitimat, Bella Bella, Bella Coola

Industry Segment	2001 Industry Profile		2007 Industry Profile		Total Increase		Percentage Increase	
	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output (\$000)	Total Jobs	Economic Output	Total Jobs
Farm/Processing			4500	70	4500	70	N/A	N/A
Suppliers			1400	19	1400	19	N/A	N/A
R&D/Gov't Services								
<b>Totals</b>	0	0	5900	89	5900	89	N/A	N/A

**Economic output will grow from 0 to \$6 Million over 5 years  
Industry jobs will grow from 0 to 89 over 5 years**



## SECTION 2 - APPROACH

### **Understand the economic impact of the shellfish industry on local economies and local jobs**

#### **PURPOSE**

The purpose of this analysis is to assist community partners in the Vancouver Island / Coast region to understand the potential of the shellfish industry to diversify local economies and create local jobs.

The document will:

- a) Estimate the economic impact that is currently being made by the shellfish industry on Vancouver Island / Coast and
- b) Estimate the economic impact that the industry could be making within 5 years
- c) Assess the economic impact on regional and local economies
- d) Assess the impact on local jobs

Economic impact includes an analysis of expenditures within the industry, where those expenditures are being made and the economic spin created by those expenditures. What is being bought by the industry? Where are those products and services being made or supplied from? And most importantly, what is the impact on local communities?

Jobs will also be an important consideration. What kinds of jobs are being created by the industry now, and what jobs are likely to be created over the next 5 years? It is important to identify the location of the jobs as well, in local communities, in British Columbia or outside of BC.



## METHODOLOGY

Methodology for the analysis includes original research and drawing upon previous work.

### a) 2001 Existing Industry Analysis

First, we will analysis the direct components of the industry. These direct components include core industries of growers and processors, ;plus the suppliers to these components.

Secondly, we look at average statistics for expenditures by the industry. These expenditures include wages, operations and maintenance, general and admin expenses and capital expenses. From this we can generalize as to average industry direct expenditures.

Thirdly, we investigate where those expenditures are being made. Are the monies being spent to import services and equipment to Vancouver Island / Coast? What percentage of expenditures stay in local communities? This work involves in depth analysis of suppliers and their products.

Once we understand what is being spent and where we can estimate the labour content in local purchases, we can compute job impacts in local communities.

Lastly, we apply economic and job multipliers to the direct numbers, to come up with total economic impacts. The multipliers come from previous work using the BC Input Output Model as developed by the Province, and applied to the shellfish industry by Coopers and Lybrant in their 1996 analysis of the shellfish industry.

### b) 2007 Industry Analysis

The shellfish industry steering committee, formed in 2002 by the industry, has developed a series of recommendations to grow the industry. Realistic and achievable goals have been set, and these goals have been incorporated into this document. An outline of the goals and assumptions is provided. It should be noted that a concerted effort by all levels of government, industry and academia is being made across BC to realize these goals.

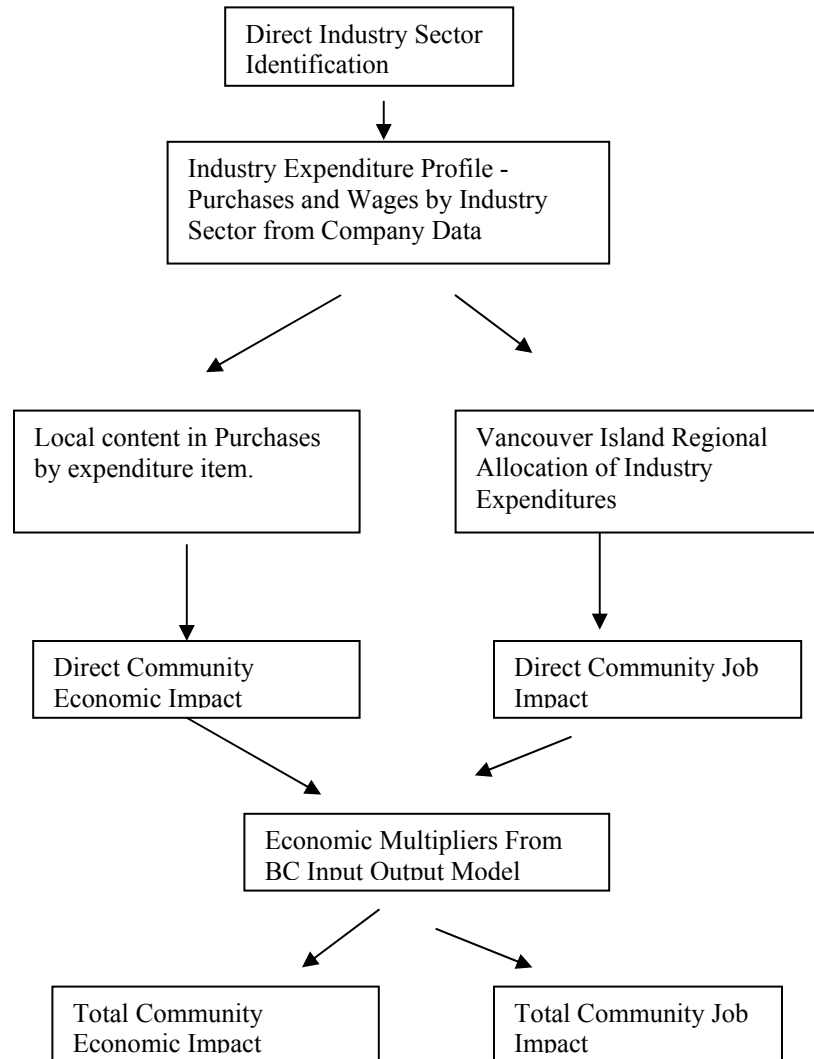


If these goals are achieved, what would be the impact on local communities, in terms of job creation and economic growth? Knowing the potential in each region for expansion of the industry, and knowing the percentage of local content in incremental industry expenditure; we can estimate how industry growth will impact local Island / Coast communities.

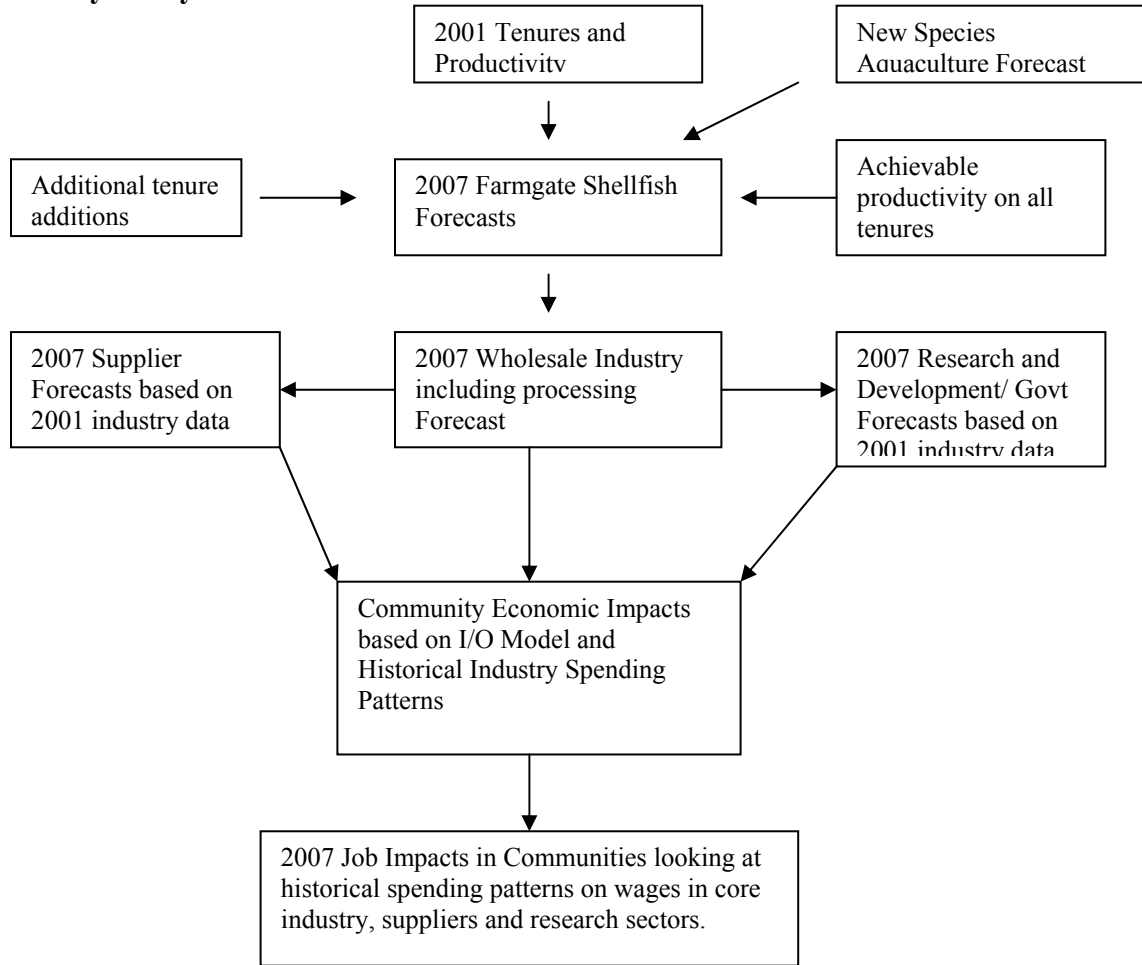
**2001 Industry Analysis**

**Exhibit 2**

**Methodology for Economic Impact Analysis**



### 2007 Industry Analysis



## **SHELLFISH INDUSTRY – DIRECT JOBS**

Exhibit 3 shows how the industry operates, and defines direct industry jobs. The core industry includes shellfish growers and processors. It does not include distributors or retailers, as these industries are market dependent and would exist in BC to distribute food, whether BC was in the shellfish production business or not.

Suppliers to the core industry are included in the analysis. These include suppliers to the operating side of the business, seed suppliers, hatchery services, packaging and vessel maintenance, to name a few. It also includes capital expenditure suppliers; grow out trays, rafts, anchors, upwelling systems, boats and refrigeration equipment. Other services include general and admin services; legal, accounting, insurance, travel, marketing, communication and other.

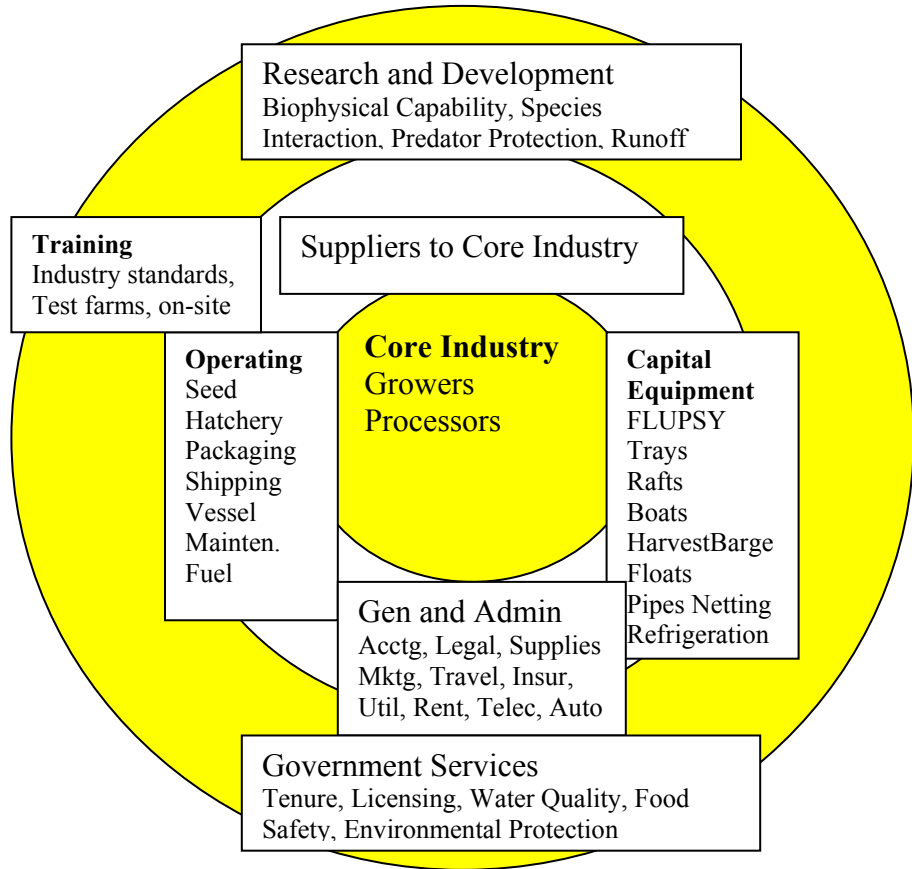
Another direct service taken into consideration is research/government services. There is large amount of direct government support to the industry that exists only because the industry exists. Research is being done on biophysical capability of the oceans and environment, species interaction and predator protection. BC has become a centre of excellence in shellfish industry development. As well, direct government agencies are developing industry standards, monitoring those standards and regulations and helping to grow the industry while protecting the environment.

This definition of direct industry components is consistent with definitions employed by Coopers and Lybrand in their 1997 study 'Economic Potential of the BC Aquaculture Industry', sponsored by Western Economic Diversification Canada.



### COMPONENTS OF THE SHELLFISH INDUSTRY Exhibit 3

Exhibit 3 shows how the industry operates, and defines direct industry jobs.



## SHELLFISH INDUSTRY – EXPENDITURE PROFILE

**Wages and benefits make up 46% of wholesale industry expenditures, and are the largest individual expense items.**

An expenditure profile for the shellfish industry is shown in Table 2 (A) for operating expenses. This profile was developed based upon interviews with 9 shellfish companies and processors in 1996. This data was then averaged with original research data from 2002 for a single processor and grower to derive average data that incorporates new technology and processes. The sample is still relatively small, but is considered to be reasonably accurate for the intended purposes.

From this data, wages and benefits make up 46% of wholesale industry expenditures and is the largest individual expense item. Seed is the next largest item at 12%, and can be acquired in a variety of finished states at varying prices.

It is interesting to note how much of the expenditure profile can be sourced locally. In fact the great majority of expenses are made in the region, if not the local community.

The base number used for industry wholesale revenues is \$20Million dollars (industry statistics show a range of \$20-26Million as estimated expenditure). From the average expenditure profile, the expenditure in each expense category can be estimated.



**TABLE 2 (A)**

<b>Shellfish Expenditure Profile</b>				
<b>Operations</b>				
Item	1996 Survey % of sales	2002 Company Survey % sales	Average % of sales	2001 Industry \$20M Wholesale
<b>Production Expenses</b>				
Wages and Benefits	52	40	46	\$ 9,200
Seed	7.5	17	12.25	\$ 2,450
Boat and fuel	2.4	2	2.2	\$ 440
Freight	1.3	3	2.15	\$ 430
Repairs and Maint	5.8	6	5.9	\$ 1,180
Utilities	5.2	5	5.1	\$ 1,020
Packaging	1	1	1	\$ 200
Misc	1.2	1	1.1	\$ 220
Subtotal	77	75	76	\$ 15,200
<b>General and Admin</b>				
Licence	0.9	1	0.95	\$ 190
Auto	0.7	1	0.85	\$ 170
Depreciation	0.2	5	2.6	\$ 520
Insurance, WCB	5.5	5	5.25	\$ 1,050
Bank	1.6	10	5.8	\$ 1,160
Lease fees	2.3	1	1.65	\$ 330
Legal, Acctg	1	1	1	\$ 200
Marketing	2.2	2	2.1	\$ 420
Office Rent	0.3	0.5	0.4	\$ 80
Office Supplies	0.6	1	0.8	\$ 160
Phone, fax	1	1	1	\$ 200
Travel	1.1	1	1.05	\$ 210
Subtotal	19.5	29.5	24.5	\$ 4,900
Profit	3.5	-4.5	-0.5	\$ (100)
Total	100	100	100	\$ 20,000



**Table 2 B** shows capital expenses, as well as direct industry expenditures in research and development, and government services.

Capital purchases originate from industry sources for 1996, and are adjusted to 2001 data based proportional increases in industry output. Capital expenditures are estimated to be \$7 Million for 2001.

R&D and government expenditures are estimates coming from confidential government sources. R&D and government expenditures bring total industry direct expenditures to an estimated \$33 million dollars.

**TABLE 2 (B)**

<b>Capital Purchases</b>	Farming	Process	Total '96	Total '01
Trays	2367		2367	\$ 3,148
Floats	988		988	\$ 1,314
Rafts	110		110	\$ 146
Pipes, Anchors, Netting, Misc	325		325	\$ 432
Boats	266		266	\$ 354
Harvest barge	260		260	\$ 346
Building	156	300	456	\$ 606
Truck	60	150	210	\$ 279
Equipment	115	260	375	\$ 499
<b>Total</b>	<b>4532</b>	<b>710</b>	<b>5242</b>	<b>\$ 6,972</b>
<b>R&amp;D, Government</b>				
Bamfield				\$ 500
Malaspina				\$ 500
UVic				\$ 500
UBC				\$ 500
Prov Govt, LAW, MAFF				\$ 1,000
Fed govt, DFO, ACAD				\$ 2,000
<b>R&amp;D Capital</b>				<b>\$ 1,000</b>

Total Industry Expenditures – Operations, Capital, R&D

**\$33 Million**



## LOCAL CONTENT IN PURCHASES BY EXPENDITURE ITEM

The next step is to try and define the amount of local content that is in the industry. This is done on an item-by-item basis in Table 3.

Four categories are used to define the local content:

- A) Local – meaning in the nearest community i.e. for Barkley Sound it would be Ucluelet/Port Alberni.
- B) On Island – meaning in the region and likely to be purchased on Vancouver Island / Coast rather than from the mainland or further away.
- C) BC – meaning purchased in BC but not necessarily from Vancouver Island/Coast
- D) Outside BC – meaning purchased from the US, other parts of Canada or abroad.

**Capital equipment comes mostly from Island manufacturers**

Each expenditure item is analyzed and discussed with industry personnel for reasonableness. Where do they purchase their labour, seed, accounting services, vessel maintenance, and so on? Where there are options to purchase locally or abroad, expenditures are allocated on the basis of competitive supply.

**78% of spending on operating and capital is done in the local community or in Vancouver Island communities.**

Suppliers of capital equipment come mostly from Island manufacturers. Grow out trays are the largest component of capital expenditure. BC is known as a world industry leader in the development of grow out tray technology and trays used in the BC industry are made in the province. Detailed analysis of capital expenditures appears in Table 3. Analysis recognizes that while trays are made in BC, the steel that goes into the wire mesh does not come from BC. Similarly, boats are made in BC, but the fiberglass and aluminum components come from offshore. Over 40% of the capital used in the industry comes from outside BC, although all is purchased locally and much is made locally. Most capital comes from the Baynes Sound and South Island areas.



**LOCAL CONTENT IN PURCHASES BY EXPENDITURE ITEM****TABLE 3**

<b>Operations</b>					
Item	2001 Industry \$20M Wholesale	Local	On Island	BC	Outside BC
Wages and Benefits	\$ 9,200	9,200			
Seed	\$ 2,450		2450		
Boat and fuel	\$ 440	440			
Freight	\$ 430	215	215		
Repairs and Maint	\$ 1,180	393	393	393	393
Utilities	\$ 1,020	340	340	340	
Packaging	\$ 200	70	70	60	
Misc	\$ 220	110	110		
Subtotal	\$ 15,200	10,768	3578	793	393
Licence	\$ 190		90	100	
Auto	\$ 170	85	85		
Depreciation	\$ 520	100	150	170	100
Insurance, WCB	\$ 1,050	260	260	260	260
Bank	\$ 1,160	290	290	290	290
Lease fees	\$ 330	330			
Legal, Acctg	\$ 200	100	100		
Marketing	\$ 420	100	100	100	120
Office Rent	\$ 80	80			
Office Supplies	\$ 160	160			
Phone, fax	\$ 200	50	50	50	50
Travel	\$ 210	30	30	50	100
Subtotal	\$ 4,900	1585	1155	1020	920
Profit	\$ (100)				
Total	\$ 20,000	12,353 62%	4,733 24%	1,813 9%	1,313 7%
<b>Capital Purchases</b>	Total '01				
Trays	\$ 3,148		1500	1148	500
Floats	\$ 1,314		1314		
Rafts	\$ 146	146			
Pipes, Anchors, Netting, Misc	\$ 432		200		200
Boats	\$ 354		150	100	104
Harvest barge	\$ 346		250	100	
Building	\$ 606	200	100	100	200
Truck	\$ 279	20	20	39	200
Equipment	\$ 499		200	100	200
Total	\$ 6,972	366	3734	1587	1404
	\$ 26,972	12,719 47%	8,467 31%	3,400 13%	2,717 10%



**SECTION 3 – SHELLFISH INDUSTRY IN 2001****VANCOUVER ISLAND / COAST REGIONAL ALLOCATION OF  
INDUSTRY EXPENDITURES 2001**

The total industry expenditure of \$33Million is now allocated to communities, so that the impact of these expenditures can be understood. See Table 4.

Industry data is collected by government on the shellfish industry by region. The farmgate value of the industry was \$15 Million in 2001. Incremental processing revenues were a further \$5Million. Statistics are also available on the size of processors from the industry manufacturing databanks. Processing revenues can be allocated to regional totals. It is estimated that 60% of BC's current shellfish processing is done in the Baynes Sound area, and a further 20% in the Lower Mainland.

R&D and government is focused in the South Island areas of Nanaimo and Victoria. Malaspina and UVic have shellfish research programs. Finfish, rather than shellfish, is the focus at North Island College. Bamfield Research Station is building a reputation in shellfish research and development. Provincial government programs are coordinated from Victoria, with regional offices in Nanaimo. Federal programs are based in Vancouver and Nanaimo.

Economic impacts by community are summarized in Table 4. Baynes Sound currently has 38% of the BC industry, and the South Island has 31% in terms of economic impact. The industry in 2001 is concentrated in the Comox to Nanaimo region, plus added government, research and manufacturing in Victoria.

**TABLE 4**

<b>Regional Allocation of Industry Expenditures</b>										
Region	2001		Total \$Millions	Capital Suppliers \$ Millions ***	R&D \$ Millions ****	Total \$ Millions	Percentage by Region	Total Economic Impacts (Direct, Indirect and induced)		
	Farmgate \$ Millions *	Processing \$ Millions **								
WC/NI -VI	1.3		1.3	0.2	0.5	2	6%	4		
SE-VI	2.2	0.4	2.6	2	3.5	8.1	24%	16.2		
Baynes	8	3	11	1	0.5	12.5	38%	25		
Quadra	1.8	0.3	2.1	0.4		2.5	8%	5		
Oke/Mal	1.6	0.3	1.9	0.4		2.3	7%	4.6		
Sunshine	0.3		0.3			0.3	1%	0.6		
N Coast										
Other		1	1	3	1.50	5.5	17%	11		
<b>Total</b>	<b>15.2</b>	<b>5</b>	<b>20.2</b>	<b>7</b>	<b>6</b>	<b>33.2</b>	<b>100%</b>	<b>66.4</b>		

\* Farmgate value from BC stats  
 \*\* Processing revenue allocated based on processor locations and sales data  
 \*\*\* 60% of capital purchased on-island, 75% in SE or Baines  
 \*\*\*\* R&D, government spent at actual office, university locations



## ECONOMIC IMPACTS IN VANCOUVER ISLAND / COAST COMMUNITIES

**Shellfish farming multipliers have been calculated as 1.75 for jobs, 2.0 for economic output.**

The economic impact of the shellfish industry on Island / Coast communities can now be estimated. See Table 5.

Total impacts take into account the indirect and induced jobs associated with the shellfish industry. Indirect jobs are jobs that are created when suppliers purchase goods and services, and further rounds of inter-industry purchases. Induced impacts come from re-spending of incomes, both directly and indirectly on household purchases, food, shelter, clothing, schools, hospitals and other services.

The BC Input Output Model looks at all elements of the BC economy and simulates how a dollar spend in a given sector rebounds through our economy to create wealth and jobs. Shellfish farming multipliers have been calculated as 1.75 for jobs, 2.0 for economic output and 2.5 for Gross Domestic Product. For community job analysis, we will use the more conservative economic output multiplier rather than GDP, which includes the economic impacts associated with interest payments, reinvestment of profits and all other impacts that may not occur in the community.

Out-of-region expenditures have been estimated at 17% for the Regional Allocation of Expenditures in Table 4. These are in off island processing, capital purchases, research and government services. Industry purchase analysis shows expenditures off island in the rest of BC and outside BC totaling 23%. These estimates are surprisingly close, considering they were generated independently. For purposes of this report, the out-of-region expenditure is estimated at 20%.

The full economic impact of the industry is \$66 million dollars. It has been estimated from Table 3, that 78% of the impact from capital and operating expenses is in Vancouver Island/Coast communities. Table 5 shows a conservative estimate of expenditures in the industry by community. This number includes revenues from capital and operating expenses from farming and processing, but does not include economic direct impacts from purchases in local communities, as this would be double accounting. This is included in the economic multiplier.



**TABLE 5**

<b>Economic Impacts in Communities</b>						
<b>Direct, Indirect and induced Economic Output</b>						
Region	Operating	Capital	Total DII Operating + Capital	Spent Locally 78% of Capital and Operating *	R&D	Total Local Spending **
WC/NI -VI	1.3	0.2	3	2.34	1	<b>3.3</b>
SE-VI	2.6	2	9.2	7.176	6	<b>13.2</b>
Baynes	11	1	24	18.72	1	<b>19.7</b>
Quadra	2.1	0.4	5	3.9		<b>3.9</b>
Oke/Mal	1.9	0.4	4.6	3.588		<b>3.6</b>
Sunshine	0.3	0	0.6	0.468		<b>0.5</b>
N Coast Mainland			0	0		<b>0.0</b>
Other	1	0.5	3	2.34	\$ 3.00	<b>5.3</b>
Total	\$20	\$7	54	42.12	\$12	<b>54.1</b>

\* ie Local economic impact is .78 x  
DII economic impact 2 x Oper,Cap  
\*\* represents the actual economic impact of spending in the local region

### Job Impacts on Local Communities

Job impacts can be calculated.

- a) The economic expenditures are known for each region in farmgate and processing revenues from industry statistics.
- b) Percentage of expenditures on wages and salaries is known from expenditure profile data collected from shellfish companies.
- c) Estimates are made for the average wage paid from each industry segment; \$25k for farming/processing, \$30k for suppliers and \$50k for research/government.

From this data, jobs can be calculated for each region.

Supplier jobs include both capital and outside service expense purchases. Only labour intensive suppliers have been included, including seed and hatchery services, repairs and maintenance expenses, freight and packaging. Labour is estimated as 40% of the cost of these services, based on industry data.

**42% of the jobs in the shellfish industry in 2001 are in Baynes Sound.**



**There are 956 total jobs created by the shellfish industry in British Columbia.**

Of the 522 direct jobs in the industry, 42% are in Baynes Sound and 21% are in South Island, Nanaimo to Victoria. Farm and processing jobs are often not full time jobs. Our assumption is that \$25k represents full time wages and benefits associated with a farm job. This figure may be high, as people in remote communities may exist on a lower average wage. If so, remote community jobs may be underestimated.

Job multipliers of 1.75 have been calculated by government using the BC Input Output economic model, for the shellfish industry. This factor is used to indicate the total number of jobs that are created by the industry, including jobs created by the spending of suppliers, and further rounds of job creation through payment of local taxes, in schools, hospitals and other facilities.

There are 956 total jobs created by the shellfish industry in British Columbia.



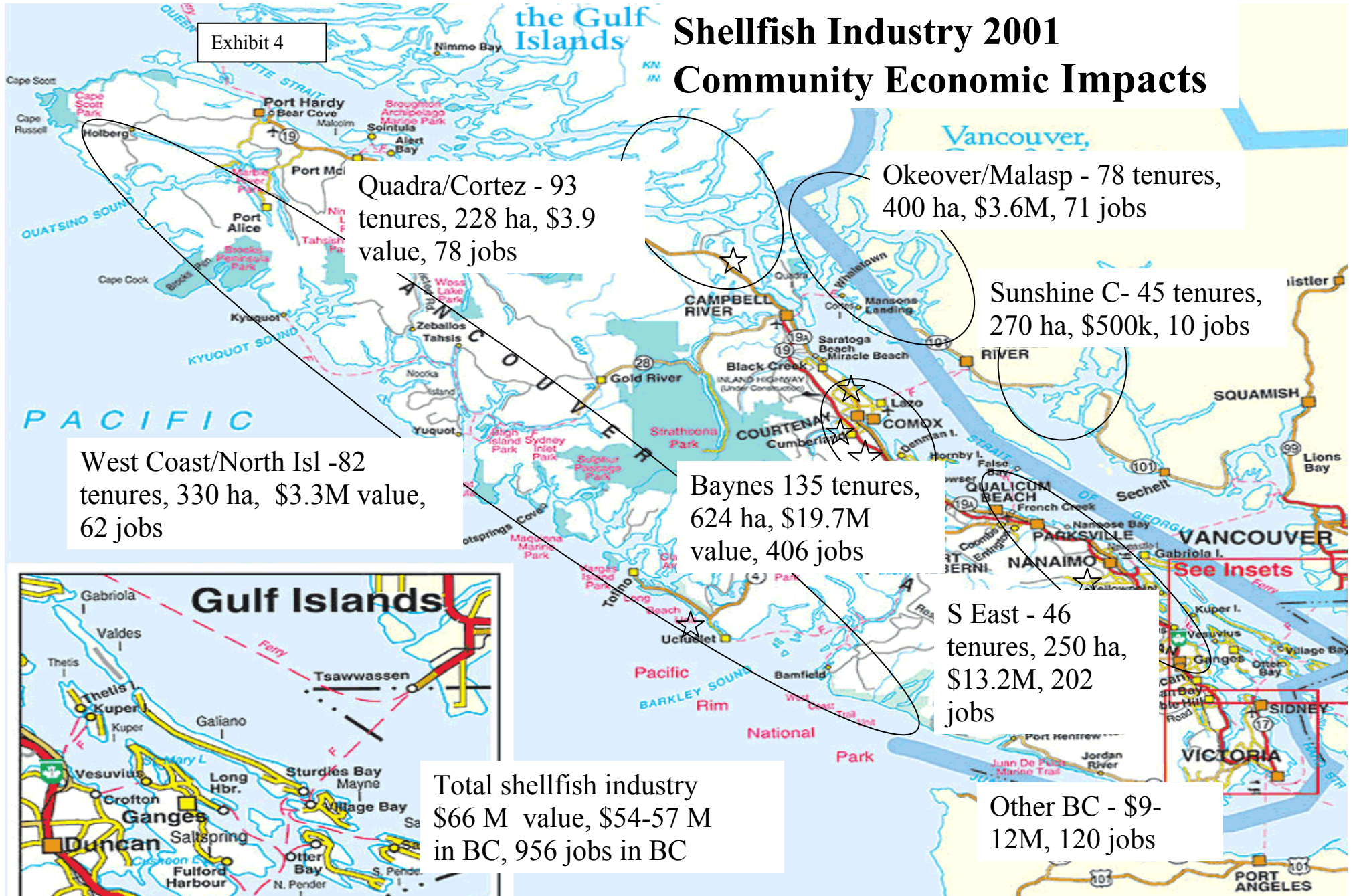
**TABLE 6 Regional Allocation of Jobs**

Regional Allocation of Jobs														
Region	Core Industry			Suppliers					R&D			Direct	Indirect	
	Total	Wages/Ben@.46	Jobs @\$25K	Local Services	Wages@.4	Jobs@ Capital \$30k	Capital Purchases	Wages@.25	Jobs@ \$30k	R&D	Wages@ 0.8	Jobs@\$ 50k	Total Jobs	Induced Jobs
WC/N-VI	1.3	\$ 598	<b>23.92</b>	119.6	47.84	<b>1.6</b>	0.2	50	<b>1.7</b>	\$0.5	400	<b>8</b>	<b>35</b>	<b>62</b>
SE-VI	2.6	\$ 1,196	<b>47.84</b>	239.2	95.68	<b>3.2</b>	2	500	<b>16.5</b>	\$3.0	2400	<b>48</b>	<b>115</b>	<b>202</b>
Baynes	11	\$ 5,060	<b>202.4</b>	1012	404.8	<b>13.4</b>	1	250	<b>8.3</b>	\$0.5	400	<b>8</b>	<b>232</b>	<b>406</b>
Quadra	2.1	\$ 966	<b>38.64</b>	193.2	77.28	<b>2.6</b>	0.4	100	<b>3.3</b>				<b>44</b>	<b>78</b>
Oke/Mal	1.9	\$ 874	<b>34.96</b>	174.8	69.92	<b>2.3</b>	0.4	100	<b>3.3</b>				<b>41</b>	<b>71</b>
Sunshine	0.3	\$ 138	<b>5.52</b>	27.6	11.04	<b>0.4</b>							<b>6</b>	<b>10</b>
Other	1	\$ 460	<b>18.4</b>	92	36.8	<b>1.2</b>	3	750	<b>24.8</b>	\$1.5	1200	<b>24</b>	<b>68</b>	<b>120</b>
<b>Total</b>	<b>20</b>	<b>\$ 9,200</b>	<b>368</b>	<b>1840</b>	<b>736</b>	<b>24.3</b>	<b>7</b>	<b>1750</b>	<b>57.8</b>	<b>\$6.0</b>	<b>4800</b>	<b>96</b>	<b>546</b>	<b>956</b>



Exhibit 4

# Shellfish Industry 2001 Community Economic Impacts



## SECTION 4 – SHELLFISH INDUSTRY IN 2007

### INDUSTRY VISION TO 2007

The British Columbia shellfish industry has been slow to develop over the last 15 years compared to other jurisdictions in Canada, the United States or overseas. Statistics show that in the same period, the industry in Washington state has grown to 6 times the size of the BC industry, the east coast Canadian shellfish industry is 4 times larger. New Zealand is a country of relatively the same size, coastline and population as BC with an industry of 6 times our size as well.

Recent political changes have taken place in BC that have caused momentum to be put toward growing the shellfish industry. Declines in traditional coastal economies in fishing, forestry and mining have produced a state of crisis. Shellfish is seen as a promising short-term solution to this economic problem.

Government, the shellfish industry and academia have compiled a strategic plan to move the industry forward. Key elements of this plan include:

- a) Focus on increasing the productivity of existing tenures by 100% by 2007.
- b) An increase in total tenures under lease by 20% over 5 years.
- c) Introduction of new species totaling \$20M in wholesale value by 2007.

Effects of these measures in total would be to grow the wholesale industry by \$50Million within 5 years, from \$20Million to \$70Million. The average growth rate for existing species would be 18%, and industry growth has averaged over 10% over the last 10 years in BC, without a supportive government initiative. These numbers are seen as realistic and achievable.

**These measures could grow the wholesale shellfish industry by \$50Million within 5 years**





## SHELLFISH ECONOMIC IMPACTS IN 2007

### Assumptions

To predict future economic and job impacts on communities, assumptions need to be made regarding future growth. Assumptions used in this analysis are consistent with the future vision for the industry as expressed by the shellfish industry steering group.

- a) **New tenure allocations will total 400 ha over the period.** These new tenures will be located as follows: 200 ha in West Coast area, 100 ha in Quadra/Cortez, 100 ha in North Coast. These numbers are likely very conservative. For instance, there are currently 340 ha of First Nations MOU sites in Barkley Sound that have not yet been converted to tenure, and a further 38 ha of non-native applications.

It is beyond the scope of this study to perform in depth analysis of all new tenure applications. It is reasonable to allocated the new tenure in non-urban areas with the most biophysical capacity.

- b) **New species aquaculture will take place in the same regions as current aquaculture,** and be spread over the regions in the same proportions as the current industry. New species would include abalone, geoduck, tilapia and a host of other species; each with varying potential in any given area. New species cultivation is most likely to happen with experienced operators. Those operators are located in areas with the least biophysical capacity, so an assumption of equal distribution over all regions seems reasonable.
- c) **The goal of \$20,000 per ha for wholesale value of tenures in the industry in 2007 will be split as \$16,000/ha for farmgate value and \$4,000/ha for processing value.** Current processing value added for 2001 is estimated at roughly 25% of the wholesale industry value of \$20 Million. It is felt that in an expanded industry with higher farm productivity, processing productivity will also improve. Processors currently indicate that they have extra capacity. It is reasonable to assume that processing will represent 20% of wholesale value in 2007.
- d) **Locations of new processors will track the locations of new and expanded farming.** Current processing is concentrated in the Baynes Sound and Lower Mainland areas. Discussions are underway to bring on new processing capacity in West Coast and Quadra/Cortez. This trend toward local processing will continue. Allocations of processing plants will be based on a minimum of \$1 Million in processing revenue in a region to attract an efficient processing plant.



## REGIONAL ECONOMIC IMPACTS IN 2007

### a) Shellfish Farm and Processing Revenues

The assumptions stated above are applied to the industry future vision as expressed by the Shellfish Steering Committee. The goals expressed in that vision are for an industry worth \$70 million by 2007, with farm productivity increases to \$20,000 per ha for existing species over 2500 ha of tenures and a further \$20 Million in new species aquaculture.

The first step is to allocate farmgate revenue by region. Existing tenures by region are known. These tenures are grossed up for future tenure allocations. Farmgate revenues of \$16,000 per ha are applied to each tenure for existing species totaling \$40 Million.

New species revenue is estimated at \$20 Million wholesale. Processing costs are estimated to be the same as for existing species at 20% of wholesale, leaving \$16 Million in new species farmgate value. This revenue is applied equally to the future tenure allocations by region, and has the same effect as increasing the tenure farmgate revenues by 16/40 or 40%. Total farmgate revenue is \$56 Million and processing revenue is \$14 Million.

Processing revenue is then allocated by region. Baynes Sound currently dominates BC shellfish processing. These processors will expand capacity in 2007, and their presence in the industry will still be significant. New regional processors will also enter the market. Processing revenue will grow from \$5 Million to \$14 Million dollars. All regions will have sufficient capacity to support at least one new processing plant with processing revenue in excess of \$1 Million dollars, except the North Coast Mainland.

### b) Capital Spending, Research, Government

Capital spending will occur at the current rate of 30% of annual industry sales. This figure is likely conservative as the industry moves towards increased productivity. Capital spending by region is allocated based on total wholesale value of the industry in that region.

While the industry as whole has increased from \$20 Million wholesale to \$70 Million, or by 3.5 times, it is assumed that the research and government increases will only be 2 times, from \$6 Million to \$12 Million. These increased revenues will be allocated using the same regional distribution as the current industry.



**TABLE 7 Shellfish Industry Value in 2007 - Wholesale**

Shellfish Industry Value in 2007							Wholesale Value (\$m) 2007 Total
Region	2001 Tenure ha	2007 Tenure ha	Farmgate @\$16k/ha	New Species +40%total		Processing @\$4k/ha	
WC/N-VI	329	529	8.4	3.36	11.8	2	13.76
SE-VI	249	249	4	1.6	5.6	1.5	7.1
Baines	624	624	10	4	14	5	19
Quadra	229	329	5.3	2.12	7.42	2	9.42
Oke/Mal	400	400	6.4	2.56	8.96	2	10.96
Sunshine	270	270	4.3	1.72	6.02	1.5	7.52
N Coast Mainland		100	1.6	0.64	2.24		2.24
Total	2100	2500	40	16	56	14	70

**TABLE 8 Shellfish Industry Value and Economic Output – Wholesale, Capital, R&D**

Region	Wholesale Value (\$m) 2007 Total	Capital @.3	R&D	Total \$M ##	Direct, Indirect and Induced Economic Output 2007
WC/N-VI	13.76		4.13	1 19	38
SE-VI	7.1		2.13	6 15	30
Baines	19		5.70	1 26	51
Quadra	9.42		2.83	12	24
Oke/Mal	10.96		3.29	14	28
Sunshine	7.52		2.26	10	20
N Coast Mainland	2.24		0.67	3	6
Other				3 3	6
Total	70		21	12 103	206



**c) Economic Impacts in Communities**

The economic impact of the industry is then estimated for each region, using the earlier analysis of spending provided by companies in the industry. Table 3. It is estimated that total local economic impact created by the industry in 2007 will be \$166 Million.

For example, it is estimated that the value of the wholesale industry on the West Coast/North Island will be \$13.8 Million, and the value of capital spending associated with the industry is a further \$4.1 Million. If 78% of that spending is done in the region, it represents a total of \$14 Million. Similar numbers can be calculated for spending 'Elsewhere in BC' (13%) and 'Outside of BC' (10%).

**Shellfish Job Impacts in 2007**

Job impacts in communities are calculated using the same process as used in estimating current jobs, applied to the estimated wholesale, supplier and research sector expenditures.

Total job impacts will be 2099 direct jobs, and total job impacts by the industry will be 3673, including indirect and induced jobs

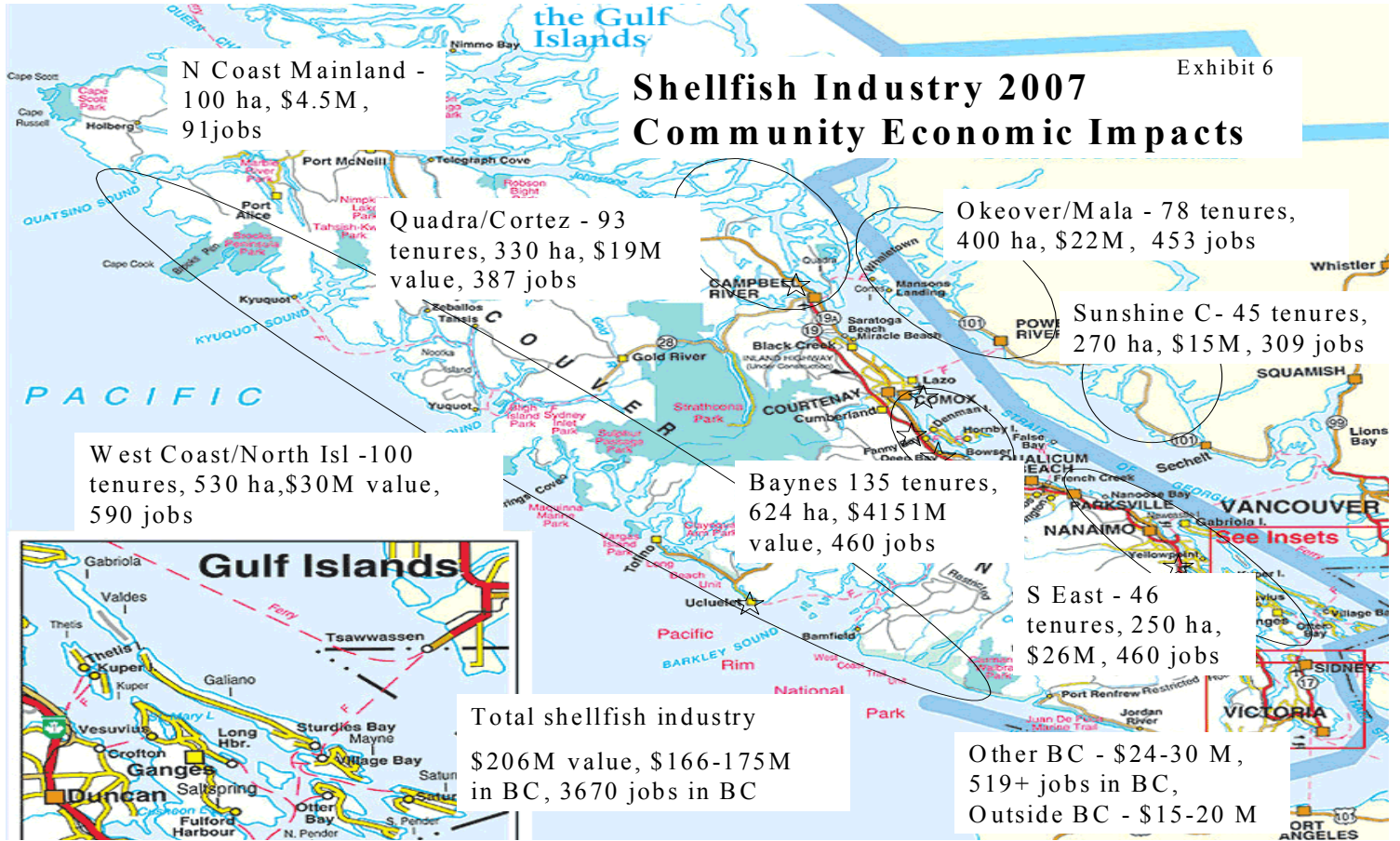


**TABLE 9**  
**Economic Impacts**  
**in Communities**

Region	Spent Locally 78% Capital, Operating	R&D	Total Local Spending	Spent in BC 13% of C&O,	Spent outside BC 10% of C&O
WC/N-VI	27.9	2	<b>29.9</b>	4.7	3.6
SE-VI	14.4	12	<b>26.4</b>	2.4	1.8
Baines	38.5	2	<b>40.5</b>	6.4	4.9
Quadra	19.1		<b>19.1</b>	3.2	2.4
Oke/Mal	22.2		<b>22.2</b>	3.7	2.8
Sunshine	15.3		<b>15.3</b>	2.5	2.0
N Coast	4.5		<b>4.5</b>	0.8	0.6
Mainland					
Other	0.0	6	<b>6.0</b>	0.0	0.0
<b>Total</b>	<b>142.0</b>	<b>24</b>	<b>166.0</b>	<b>23.7</b>	<b>18.2</b>

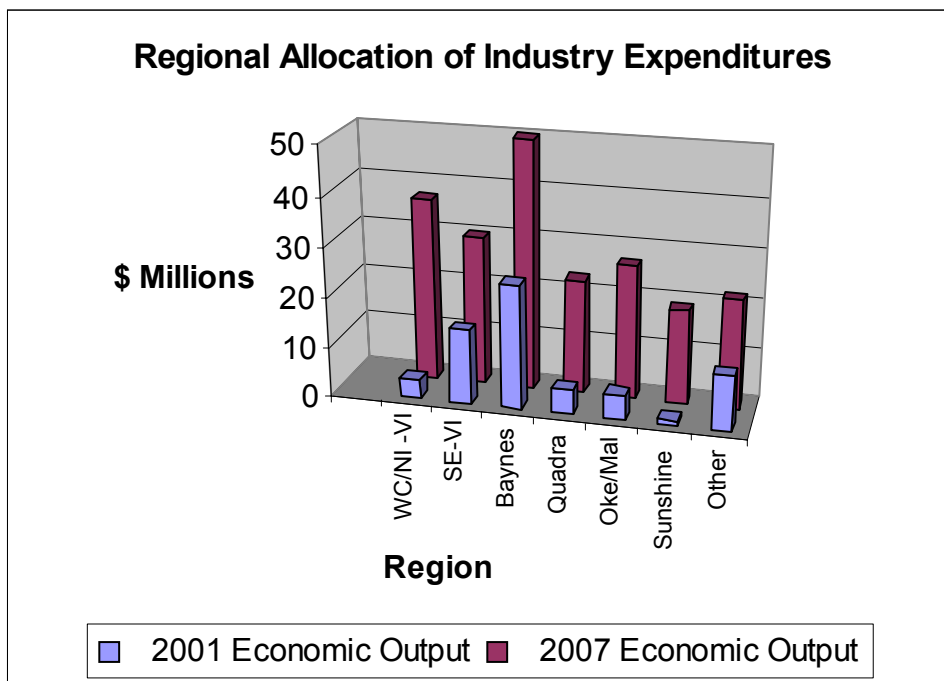
Job Impact in Communities													Direct, Indirect Induced	
Region	Core Industry			Suppliers						R&D			Direct	Total
	Farm, Processing		Jobs @\$25K	Wages@.4			Wages@.25			R&D	Wages @ 0.8	Jobs@ \$50k	Total Jobs	Jobs
	Total	Wages/Ben@.46		Local Services	Jobs@\$30k	Capital		Jobs@\$ 30k						
WC/N-VI	13.7	\$ 6,302	252.08	2.74	1.096	36.4968	4.1	1028	33.9	\$ 1.0	800	16	338	<b>592</b>
SE-VI	7.1	\$ 3,266	130.64	1.42	0.568	18.9144	2.1	533	17.6	\$ 6.0	4800	96	263	<b>460</b>
Baines	19	\$ 8,740	349.6	3.8	1.52	50.616	5.7	1425	47.0	\$ 1.0	800	16	463	<b>811</b>
Quadra	9.4	\$ 4,324	172.96	1.88	0.752	25.0416	2.8	705	23.3				221	<b>387</b>
Oke/Mal	11	\$ 5,060	202.4	2.2	0.88	29.304	3.3	825	27.2				259	<b>453</b>
Sunshine	7.5	\$ 3,450	138	1.5	0.6	19.98	2.3	563	18.6				177	<b>309</b>
N Coast	2.2	\$ 1,012	40.48	0.44	0.176	5.8608	0.7	165	5.4				52	<b>91</b>
Mainland														
Other	11.8	\$ 5,428	217.12	2.36	0.944	31.4352			0.0	\$ 3.0	2400	48	297	<b>519</b>
<b>Total</b>	<b>81.7</b>	<b>\$ 37,582</b>	<b>1503.28</b>	<b>16.34</b>	<b>6.536</b>	<b>217.6488</b>	<b>24.5</b>	<b>6128</b>	<b>202.2</b>	<b>\$ 11.0</b>	<b>8800</b>	<b>176</b>	<b>2099</b>	<b>3673</b>





## REGIONAL ALLOCATION OF INDUSTRY EXPENDITURES (\$Millions)

Region	2001 Economic Output	2007 Economic Output	Total Increase	Percent Increase
WC/N-VI	\$ 4	\$ 38	\$34	850%
SE-VI	\$ 15	\$ 30	\$15	100%
Baines	\$ 25	\$ 51	\$26	104%
Quadra	\$ 5	\$ 24	\$19	380%
Oke/Mal	\$ 5	\$ 28	\$23	460%
Sunshine	\$ 1	\$ 20	\$19	1900%
Other	\$ 11	\$ 22	\$11	100%



Economic Output is defined as direct, indirect and induced spending related to industry expenditures. This figure is more conservative than total GDP economic impact, which includes re-spending of interest, taxes, rents, profits; and operates at a more macro level in the provincial economy. GDP is best for provincial impact, Economic Output for community impact.

