
Pacific Commercial Fishing Fleet: **FINANCIAL PROFILES FOR 2007**

Estimated revenues, expenses, and earnings using a financial modeling approach

Prepared for Fisheries and Oceans Canada, Pacific Region

Prepared by Stuart Nelson, Nelson Bros Fisheries Ltd

December, 2008 (Revised Feb 25, 2009)



Introduction	1
Methodology.....	1
Presentation of Results.....	4
Salmon Seine (AS).....	5
Roe Herring Seine (HS)	17
Salmon Gillnet (AG)	21
Salmon Troll (AT).....	34
Tuna (USA 68)	45
Halibut (L)	50
Sablefish (K)	65
Groundfish Trawl (T).....	79
Prawn (W)	88
Crab (R)	95
Shrimp (S).....	104
Geoduck (G)	110
Red Sea Urchin (ZC)	116
Sea Cucumber (ZD).....	122
Summary.....	128

Introduction

This report, prepared for Fisheries and Oceans Canada, Pacific Region by Stuart Nelson of Nelson Bros Fisheries Ltd, provides estimates of commercial fishing fleet financial performance for vessels operating in the major West Coast commercial fisheries for the year 2007.

The purpose of the report is to provide Fisheries and Oceans Canada (DFO) with both a snapshot of the financial performance and viability of the BC commercial fleet, and an understanding of the factors that influence financial results.

This information may be useful to DFO on a variety of fronts, including:

- Assessing potential socio-economic impacts of SARA listings on the commercial fishing industry.
- Serving as an information resource for the PICFI initiative.
- Comprising a partial replacement for the Cost & Earnings Surveys performed in the past.

Results are included for most of the West Coast fisheries (a few small or data limited fisheries are excluded), with sub-profiles for each fishery provided to allow a deeper understanding of fleet structure, behaviour, and performance than is revealed through use of simple fleet averages.

Profiles are based on the best information available, combining DFO catch statistics and landed value data with revenue and expense intelligence gained through consultations with participants in each fishery. While results are deemed to be generally reflective of fleet performance, the following provisos are offered:

- The actual number of profiles within each fleet is almost as great as the number of vessels itself, as individual operators execute unique strategies (for fishing, marketing, leasing vs. owning, etc), possess a variety of vessel and equipment types (big boats, small boats, fast, slow, new, old, steel, wood, etc), and feature unique capitalization circumstances (asset costs, book values, debt levels, payment structures, equity arrangements, etc.).
- Given the diversity of fleet arrangements and a limited sample-size of industry participants consulted, revenue and cost information presented is deemed representative, but is not presented as precise or definitive.

Overall, the report seeks to strike a balance between excessive detail and complexity (describing individual vessel performance) and undue generalization (presenting simple fleet averages). The intent is to present meaningful insights on the financial performance and viability of the Pacific fleet.

Methodology

The general methodology used in developing this report, arrived at after consultation with industry and DFO representatives, and peer-reviewed by economic consultants closely familiar with the BC fishery, is summarized as follows:

- The study period is calendar 2007. This period was chosen because it represented the most recent full season at the time this report was commissioned. Use of a calendar year presents challenges for fisheries whose seasons straddle two years; for these fisheries, results are adjusted to reflect a full season of activity (either 2006/2007 or 2007/2008).
- A data request was made to DFO for licensing and landings information for each vessel in the BC commercial fleet (vessels to be assigned an anonymous identifier) for 2007. This data was central to developing fleet profiles. Filling this request was problematic, since licensing and catch statistics databases are not routinely merged, so a customized database was developed. The resultant database imposed some constraints on the project, though satisfactory work-arounds were crafted. Although source data was imperfect, the best available data was used in the study.
- The consultant collected revenue (fish price, landings) and expense (variable, fixed) information through interviews and/or correspondence with fishermen in each of the subject fisheries. The premise of these consultations was that individual confidentiality would be preserved. The number of persons/businesses consulted by fishery, and the quality of the data offered, varied – in some cases, financial settlements were viewed (best information), in other cases detailed information was conveyed, and in others, only general recollections were offered.
- In addition to quantitative data, qualitative information was gathered, wherein participants weighed-in with their insights and opinions on causes-and-effects in the fishery in 2007.
- The data was “mined” and licence and production profiles for each fishery were defined.
- A financial model was developed, and calculations of revenue, expenses, and profitability were made. For some fisheries, sensitivity analysis was performed.
- The general measure of profitability used is “Earnings before Interest, Taxes, Depreciation and Amortization (EBITDA); this equates to cash flow from operations. EBITDA includes revenues and expenses directly related to fishing, but excludes non-cash items such as depreciation, and capital charges such as interest and principal payments. The reasons for excluding capital items from financial schedules are two-fold:
 - Participants were more apt to divulge income statement (operating revenue and expense) information than balance sheet information, which is viewed as more-sensitive.
 - Given the diversity of capitalization arrangements, inclusion of financing profiles would add another layer of complexity to the analysis; capturing and reflecting the diversity of operating arrangements provides enough challenge for this project.

While capital charges are not explicitly included in the financial schedules, a table is included for each fishery estimating replacement cost for assets, and debt load and annual financing obligations if assets were purchased in 2007.

The data collection methodology is summarized in the following table:

Revenue/Expense Category	Information Source(s)
Landings (lbs)	DFO catch stats; individual vessel production sorted into production tiers. Landings are in round pounds unless stated otherwise.
Vessel Price (per lb)	Ex vessel average price per pound primary source = industry research; secondary source = DFO landed value stats
Gross Revenue (Gross Stock)	Calculation: landings x price
Less: Fishery Specific Expenses	Industry research - interviews, settlements, etc.
Fuel	
At sea monitoring	
Offload Monitor	
Licence / Co-management Fees	
Stacked licence lease	
Bait	
Gear maintenance/replacement	
Total Fishery Specific Expenses	Calculation: Sum of fishery specific expenses
Net Revenue (Net Stock)	Calculation: Gross Revenue less fishery specific expenses
<i>Less:</i>	A percentage of gross stock or net stock; percentage and basis varies by fishery (and within fishery).
Crew, Captain, Gear Shares	
Fishery Contribution	Calculation: Net stock less crew, captain, gear shares
Vessel Fixed Expenses	Industry research - interviews, settlements, etc.
Insurance	
Repairs & Maintenance	
Moorage	
Miscellaneous	
Total Vessel Expenses	Calculation: Sum of vessel fixed expenses
Earnings (EBITDA)	Calculation: Fishery contribution less total vessel expenses

In collecting, analyzing, and presenting by-fishery information, greater effort was expended for the larger fisheries (those having the highest landed values) than for fisheries with a lesser financial stature. This prioritization reflects the budget and timetable for this project, and does not minimize the importance of smaller fisheries.

While many fisheries include an “F” class of licence (commercial communal licenses held by First Nations), these licences represent a small minority of licences in most fisheries, and possess different

regulatory characteristics (for example, all categories are party based), so analysis is focused on non-F licences. Throughout this report, “F licences” is the terminology to denote commercial communal licences, except when specific reference is made to northern troll salmon licences (designated FATF).

Effort was also made to utilize a similar methodology for each fishery analyzed, though data limitations or unique fleet organization sometimes precluded parallel treatment of all fisheries.

Presentation of Results

Application of the above-described methodology resulted in production of a host of tables and financial schedules for each fishery (licence category). The following information is included for each fishery covered in the report:

- **Fishery Overview** – a brief encapsulation of the fishery (management-type, gear-type, general description of prevailing resource and business conditions).
- **Licensing Profile** – tables showing license diversification for vessels in the fishery (licences other than the subject fishery).
- **Landings Profile** – tables showing the stratification of landings in the fishery. In most cases, landings are stratified, first into active vs. inactive vessels, then, for active vessels, into “thirds” – that is, landings for the top 1/3 of vessels, the middle 1/3, and the bottom 1/3. For virtually every fishery, landings are highly skewed; top-tier vessels garner far more than 1/3 of landings, while bottom tier vessels harvest significantly less than their pro-rata share.
- **Key Assumptions** – a listing of the key financial assumptions underlying the financial schedules for each fishery (for example, crew sharing arrangements).
- **Financial Profiles** – schedules and summary tables showing operating profitability for individual vessels by production tier, as well as aggregate (fleet) results. Results for the subject fishery are shown in detail. Each fishery includes a schedule estimating the financial contribution, at the fleet level, from fishery diversification.
- **Capital Considerations** – a table is shown for each fishery estimating replacement cost, amortization, and principal & interest payments assuming a given percentage of debt-load. Licence and quota values are drawn from the report “An Analysis of Commercial Fishing Licence, Quota, and Vessel Values as at March 31, 2008 - West Coast Fishing Fleet” (Stuart Nelson, 2008). Vessel replacements costs are estimates assuming used vessels of reasonable quality.
- **Keys/Challenges to Success** – a listing of factors mentioned by those consulted regarding the key challenges and opportunities facing each fishery during the 2007 year.

The information included in this report, and the format in which it is presented, is intended to provide a representative snapshot of activity for the Pacific commercial fishing fleet for 2007.

Significant changes in fish prices, quotas/TACs, and operating costs will no doubt arise in subsequent years, so readers should not use these statements as a forecasting tool without engaging in appropriate due diligence to update and confirm values.

Salmon Seine (AS)

Fishery Overview

The salmon seine fishery is a competitive fishery operating under an area licensing program, with the coast divided into two areas, A (north coast) and B (south coast), for management purposes. Licence stacking is allowed; licences are vessel-based, meaning stringent vessel replacement rules apply.

Within the salmon fishery, seines are the “big boat” fleet, with vessels in the 50-80’ range and generally crewed by four persons. Fortunes in the seine fishery have declined dramatically over the years, as both access to stocks and fish prices have eroded from levels seen in the 1980s and early 1990s. Fleet restructuring initiatives (“Mifflin Plan,” PFAR) have been insufficient to restore viability. The need for further reform in the salmon fishery is widely recognized, but industry and government have so far been unable to devise and implement a turnaround strategy.

While a single year glimpse is not the ideal timeframe for describing financial results in the salmon fishery (since runs are highly cyclical), the 2007 results shown in this snapshot are reasonably typical of recent poor performance.

Licensing Profile

The salmon seine fleet is reasonably diversified, as measured by the number of fishing opportunities (licences) aboard the vessels. The primary diversification activities are 2nd salmon licences and roe herring seine (HS) licences.

There are 243 AS licences on 169 vessels (F licences excluded): 95 vessels are single licensed, and 74 are “stacked.”

The following table shows the number and type of non-salmon licences held by the salmon seine fleet:

Other Fishery Licences	# Licences
AS	243
Herring Seine	178
Trawl	23
Halibut	21
Others	32
Non AS licences	254

The next two tables provide more-detailed licensing breakdown for the single and double-licensed salmon seine fleets.

Single AS Licence	# Vessels	# AS Licences	# HS Licences	# Other Licences
One AS only	37	37	0	0
One AS plus one lic	10	10	3	7
One AS plus two lic	26	26	40	12
One AS plus three lic	18	18	34	20
One AS plus four lic	4	4	6	10
Total AS Vessels	95	95	83	49

Only 37 vessels in the 169-vessel seine fleet possess a single salmon licence as its only fishing opportunity. The bulk of the single-licence fleet utilizes two or three additional licences, with the bulk of these made up of roe herring seine (HS) licences.

An additional 20 vessels in the double-licensed fleet are involved only in the salmon seine fishery. The most common configuration for double-licensed vessels is A and B salmon licences plus two or three other licences. Again, roe herring seine licences predominate the diversification mix.

Double AS Licence	# Vessels	# AS Licences	# HS Licences	# Other Licences
Two AS only	20	40	0	0
Two AS plus one lic	7	14	2	5
Two AS plus two lic	28	56	55	1
Two AS plus three lic	17	34	35	16
Two AS plus four lic	2	4	3	5
Total Doubles	74	148	95	27

Though few vessels in the seine fleet are reliant on a single salmon licence area, the nature of diversification in the seine fleet – predominantly 2nd salmon licences and roe herring licences – has failed to provide satisfactory profitability because of poor economics in both of these fisheries.

Landings Profile¹

Given poor past results and prospects in the salmon seine fishery, a significant number of vessels declined participation in the 2007 fishery. Single-licensed vessels were far more likely to tie-up than double licensed ones, as shown in the table below.

Activity Level	# Vessels	# Active	% Active	# Inactive
Single AS	95	54	57%	41
Double AS	74	69	93%	5
AS licences	169	123	73%	46

Twenty seven percent of the fleet, or 46 vessels, were inactive in 2007.

¹ The analysis in this section relates to single or double licensing... not specific areas (A or B). This is because the data utilized did not specifically link licence-area to area of capture.

The salmon catch breakdown of single vs. double licensed salmon seine vessels is shown below²:

Active AS Vessels	# Vessels	Value of Catch \$	Catch (lbs)	% of Catch Value	% of Catch Lbs	Catch Value/ Vessel (\$)	Catch Lbs/ Vessel
Single AS Vessel	54	2,106,077	6,840,147	27%	25%	39,001	126,669
Double AS Vessel	69	5,778,014	20,770,599	73%	75%	83,739	301,023
Total	123	7,884,091	27,610,746	100%	100%	122,741	427,693

The average salmon catch value - \$39,000 for single, \$84,000 for double – is very low relative to the scale of a seine vessel operation. The reasonably high landings volume confirms that the species mix is weighted to low value species – predominantly pinks in 2007.

Information sources suggest that the greater productivity of double-licensed vessels is less related to a theoretical doubling of fishing opportunities accompanying “stacking” than it is to the fact that the double licensed fleet is composed of the most competitive vessels and operators.

The next two tables divide the single and double fleets into production tiers (top third, middle third, bottom third).

Single Licence Vessels	# Vessels	Value of Catch \$	Catch (lbs)	% of Catch Value	% of Catch Lbs	Catch Value/ Vessel (\$)	Catch Lbs/ Vessel
Top 1/3	18	1,346,175	4,970,290	64%	73%	74,787	276,127
Middle 1/3	18	544,375	1,308,335	26%	19%	30,243	72,685
Bottom 1/3	18	215,526	561,522	10%	8%	11,974	31,196
	54	2,106,077	6,840,147	100%	100%	39,001	126,669

Production is highly skewed, with 18 vessels (33% of the single-licensed fleet) garnering 64% of catch volume and 73% of catch value. The skimpy landings and landed values for the bottom 18 vessels likely reflect only partial participation, more so than a low level of competitiveness.

Double Licence Vessels	# Vessels	Value of Catch \$	Catch (lbs)	% of Catch Value	% of Catch Lbs	Catch Value/ Vessel (\$)	Catch Lbs/ Vessel
Top 1/3	23	3,074,278	11,445,076	53%	55%	133,664	497,612
Middle 1/3	23	1,846,237	6,619,173	32%	32%	80,271	287,790
Bottom 1/3	23	857,499	2,706,350	15%	13%	37,283	117,667
	69	5,778,014	20,770,599	100%	100%	83,739	301,023

In the double-licensed fleet landings are less skewed, supporting the notion that this is a highly competitive fleet, with less separation between participants.

² Landings are per catch statistics, landed values use the fish prices researched in this study.

For both the single and double-licensed segments, catch values for the top 1/3 approach satisfactory levels (though they are a fraction of levels earned by top-performers in “historic” times), while values for the bulk of the fleet are poor.

Financial Profiles

Key Assumptions

- Landings by production tier are from DFO stats. The 2007 season featured reasonable opportunities for pink and chum salmon in Area A, but virtually no fishery in the south coast with the exception of limited fall chum fisheries. The sockeye component of the harvest – the “money fish” for seines - was slight in 2007.
- Fish prices are derived through research. The by-species prices used are the same across all profiles. The effective prices vary by profile because the species mix differs.
- Crew, captain and seine net shares are based on industry settlement protocols.
- Fixed vessel expenses are the same across all profiles.
- Repairs and maintenance includes both vessel and fishing gear. The levels assumed are very low – less than the long term average levels to properly maintain equipment in safe and efficient working order – but reflective of 2007’s economic realities.

Single Licensed Vessels

Individual Vessel Profiles

Salmon Seine - Single Licence Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	276,127	72,685	31,196	126,669
Vessel Price (per lb)	\$0.29	\$0.48	\$0.46	\$0.34
Gross Revenue (Gross Stock)	\$ 80,733	\$ 35,078	\$ 14,343	\$ 43,385
Less: Fishery Specific Expenses				
Fuel	7,500	5,000	4,000	5,500
At sea monitoring	3,700	3,700	3,700	3,700
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	11,200	8,700	7,700	9,200
Net Revenue (Net Stock)	69,533	26,378	6,643	34,185
<i>Less:</i>				
Crew, Captain, Gear Shares	39,634	15,035	3,787	19,485
Fishery Contribution	29,899	11,342	2,857	14,699
Vessel Fixed Expenses				
Insurance	9,000	9,000	9,000	9,000
Repairs & Maintenance	15,000	15,000	15,000	15,000
Moorage	2,000	2,000	2,000	2,000
Miscellaneous	1,500	1,500	1,500	1,500
Total Vessel Expenses	27,500	27,500	27,500	27,500
Earnings (EBITDA)	\$2,399	-\$16,158	-\$24,643	-\$12,801

- With 2007 being a poor year, especially in the south coast (Area B), it is not surprising that results for single-licensed salmon seiners are poor.
- Note that the top 1/3 tier has a far lower effective price/lb (\$0.29) and a dramatically higher production volume than the other tiers; this reflects a high level of participation in pink salmon fisheries.

Double Licensed Vessels*Individual Vessel Profiles*

Salmon Seine - Double Licence Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	497,612	287,790	117,667	301,023
Vessel Price (per lb)	\$0.29	\$0.30	\$0.36	\$0.30
Gross Revenue (Gross Stock)	\$ 142,898	\$ 87,071	\$ 41,950	\$ 90,639
Less: Fishery Specific Expenses				
Fuel	12,000	8,000	6,400	8,800
At sea monitoring	7,400	7,400	7,400	7,400
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	19,400	15,400	13,800	16,200
Net Revenue (Net Stock)	123,498	71,671	28,150	74,439
<i>Less:</i>				
Crew, Captain, Gear Shares	74,099	43,002	16,890	44,664
Fishery Contribution	49,399	28,668	11,260	29,776
Vessel Fixed Expenses				
Insurance	9,000	9,000	9,000	9,000
Repairs & Maintenance	15,000	15,000	15,000	15,000
Moorage	2,000	2,000	2,000	2,000
Miscellaneous	1,500	1,500	1,500	1,500
Total Vessel Expenses	27,500	27,500	27,500	27,500
Earnings (EBITDA)	\$21,899	\$1,168	-\$16,240	\$2,276

- Financial performance is enhanced vs. single licensed vessels, but still insufficient to earn reasonable returns.
- The effective price is even lower for this tier, and drops as production levels increase. Again this reflects the only strategy available to seines in 2007 to enhance revenues – participate fully in pink salmon fisheries.

Single Licensed Vessels

Aggregate Vessel Profiles

Number of Vessels:	18	18	18	54
Salmon Seine - Single Licence Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	4,970,286	1,308,330	561,528	6,840,144
Vessel Price (per lb)	\$0.29	\$0.48	\$0.46	\$0.34
Gross Revenue (Gross Stock)	\$ 1,453,187	\$ 631,398	\$ 258,181	\$ 2,342,767
Less: Fishery Specific Expenses				
Fuel	135,000	90,000	72,000	297,000
At sea monitoring	66,600	66,600	66,600	199,800
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	201,600	156,600	138,600	496,800
Net Revenue (Net Stock)	1,251,587	474,798	119,581	1,845,967
<i>Less:</i>				
Crew, Captain, Gear Shares	713,405	270,635	68,161	1,052,201
Fishery Contribution	538,182	204,163	51,420	793,766
Vessel Fixed Expenses				
Insurance	162,000	162,000	162,000	486,000
Repairs & Maintenance	270,000	270,000	270,000	810,000
Moorage	36,000	36,000	36,000	108,000
Miscellaneous	27,000	27,000	27,000	81,000
Total Vessel Expenses	495,000	495,000	495,000	1,485,000
Earnings (EBITDA)	\$43,182	-\$290,837	-\$443,580	-\$691,234

- The 54 active vessel single licensed segment was financially untenable in 2007 (as it has been for most seasons over the last several years).

Double Licensed Vessels*Aggregate Vessel Profiles*

Number of Vessels:	23	23	23	69
Salmon Seine - Double Licence Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	11,445,076	6,619,170	2,706,341	20,770,587
Vessel Price (per lb)	\$0.29	\$0.30	\$0.36	\$0.30
Gross Revenue (Gross Stock)	\$ 3,286,648	\$ 2,002,622	\$ 964,853	\$ 6,254,123
Less: Fishery Specific Expenses				
Fuel	276,000	184,000	147,200	607,200
At sea monitoring	170,200	170,200	170,200	510,600
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	446,200	354,200	317,400	1,117,800
Net Revenue (Net Stock)	2,840,448	1,648,422	647,453	5,136,323
<i>Less:</i>				
Crew, Captain, Gear Shares	1,704,269	989,053	388,472	3,081,794
Fishery Contribution	1,136,179	659,369	258,981	2,054,529
Vessel Fixed Expenses				
Insurance	207,000	207,000	207,000	621,000
Repairs & Maintenance	345,000	345,000	345,000	1,035,000
Moorage	46,000	46,000	46,000	138,000
Miscellaneous	34,500	34,500	34,500	103,500
Total Vessel Expenses	632,500	632,500	632,500	1,897,500
Earnings (EBITDA)	\$503,679	\$26,869	-\$373,519	\$157,029

- The 69 double-licensed vessels collectively were marginally above break-even for the season. A \$157,000 return on almost 21 million pounds of salmon represents very poor economics for this segment.

All Seine Vessels

Number of Vessels:	54	69	123
Salmon Seine Fleet Totals	Single	Double	Total
Landings (lbs)	6,840,144	20,770,587	27,610,731
Vessel Price (per lb)	\$0.34	\$0.30	\$0.31
Gross Revenue (Gross Stock)	\$ 2,342,767	\$ 6,254,123	\$ 8,596,889
Less: Fishery Specific Expenses			
Fuel	297,000	607,200	904,200
At sea monitoring	199,800	510,600	710,400
Offload Monitor			
Licence / Co-management Fees			
Licence/ Quota Lease	-	-	-
Bait	-	-	-
Gear maintenance/replacement	-	-	-
Total Fishery Specific Expenses	496,800	1,117,800	1,614,600
Net Revenue (Net Stock)	1,845,967	5,136,323	6,982,289
<i>Less:</i>			
Crew, Captain, Gear Shares	1,052,201	3,081,794	4,133,995
Fishery Contribution	793,766	2,054,529	2,848,295
Vessel Fixed Expenses			
Insurance	486,000	621,000	1,107,000
Repairs & Maintenance	810,000	1,035,000	1,845,000
Moorage	108,000	138,000	246,000
Miscellaneous	81,000	103,500	184,500
Total Vessel Expenses	1,485,000	1,897,500	3,382,500
Earnings (EBITDA)	-\$691,234	\$157,029	-\$534,205

- The 123 vessel active seine fleet was “in the hole” for the 2007 season. A lack of sockeye opportunities is the primary cause.

Other Fishery Diversification

The following table provides a snapshot estimate of how the active salmon seine fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

The primary diversification fishery is roe herring seine. A few vessels actively fish halibut and groundfish trawl. The table shows, for the active seine salmon fleet, the approximate number of vessels engaged in the roe herring, halibut, and groundfish trawl fisheries, applying average per-vessel results for each of these fisheries.

Number of Vessels	123	65	10	10	
Salmon Seine Fleet Include Other Fisheries	Salmon Seine	Roe Herring Seine	Halibut	Groundfish Trawl	Total
Landings (lbs)	27,610,731	8,143,980	638,124	15,391,027	51,783,862
Vessel Price (per lb)	\$0.31	\$0.46	\$4.27	\$0.48	\$0.43
Gross Revenue (Gross Stock)	\$ 8,596,889	\$ 3,766,591	\$ 2,725,748	\$ 7,387,693	\$ 22,476,921
Less: Fishery Specific Expenses					
Fuel	904,200	390,000	68,543	1,783,333	3,146,076
At sea monitoring	710,400	556,400	148,231	522,204	1,937,235
Offload Monitor					
Licence / Co-management Fees					
Stacked licence/quota lease	-	162,500	474,290	277,038	913,829
Bait	-	-	49,863	-	49,863
Gear maintenance/replacement	-	-	9,972	-	9,972
Total Fishery Specific Expenses	1,614,600	1,108,900	750,900	2,582,575	6,056,975
Net Revenue (Net Stock)	6,982,289	2,657,691	1,974,848	4,805,117	16,419,945
Less:					
Crew and Captain Shares	4,133,995	1,694,966	789,939	2,402,559	9,021,458
Fishery Contribution	2,848,295	962,725	1,184,909	2,402,559	7,398,487
Vessel Fixed Expenses					
Insurance					1,107,000
Repairs & Maintenance			50,000	850,000	2,745,000
Moorage					246,000
Miscellaneous					184,500
Total Vessel Expenses					4,282,500
Earnings (EBITDA)					\$3,115,987

- Roe herring seine failed to provide much of a contribution in 2007, given an extremely low landings level.
- A very few vessels fishing halibut and groundfish accrue substantial contributions relative to salmon and herring; the contribution from 20 vessels fishing halibut/groundfish is roughly equivalent to that from the entire salmon/roe herring fleet.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, licences, and quotas required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets, assuming for both single and double licensed vessels. The vessel cost includes fishing gear, and assumes purchase of a reasonable-quality used vessel.
- An amortization calculation based on newly purchased assets.
- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Salmon Seine Replacement Cost of Assets	Single Licence	Double Licence
Licence Cost	320,000	640,000
Vessel Cost	400,000	500,000
Replacement cost	720,000	1,140,000
Amortization (annual) @ 5%	36,000	57,000
Loan Considerations if 50% borrowed:		
Loan amount	360,000	570,000
Interest (1st year)	28,800	45,600
Principal (1st year, 15 yr amort)	24,000	38,000
1st year pmt (principal + interest):	52,800	83,600

Observations on the above schedule:

- Cash flows (EBITDA) for the salmon seine fleet are generally insufficient to cover amortization and financing charges.
- The majority of salmon seine vessel owners have written-off their investments (most vessels/licences were purchased twenty years ago or more). If this was not the case, the incidence of business failure and forfeiture would be far higher in the seine fleet.

Keys/Challenges to Success

The following points emerged through consultations with participants in this fishery:

Financial Factors

- An extremely limited number of sockeye openings curbs landings and therefore, revenues.
- The species mix is of increasingly low value – access to chinook and coho has been limited for many years, and sockeye opportunities are increasingly rare, meaning a predominance of pink and chum in the mix. The relatively large volume of seine-caught salmon generates little landed value.
- The primary allure of Area B, the south coast, is Fraser River sockeye, but entire seasons pass without sockeye openings (including 2007). Note that the 2006 season saw reasonably strong sockeye fishing opportunities.
- Fuel is a growing cost factor that influences fishing patterns. 2007 fuel prices (around 70 cents/litre) were historically high. “Throttling back” when travelling to save fuel was widespread. Running to find fish during an opening was curbed. Fuel cost was a factor in deciding whether or not to attend openings.

- Vessel maintenance expenditures are the bare minimum to keep the vessel operating. Major projects are delayed as long as possible; no upgrades. The current low level of expenditure is not sustainable.

Other Factors

- Concern about lack of enforcement presence during sockeye migration; illegal activity.
- Need for fleet rationalization and fishery reform to allow viable operations even in years of low catch.
- Current economics drive a return to past practices: “fish where you live.”

Roe Herring Seine (HS)

Fishery Overview

The roe herring seine fishery targets herring just prior to spawning for the purpose of maximizing roe content. Licenses are party-based, placed on a vessel designated by the licence owner each season. The roe herring fishery is managed by areas (there are five areas and a licence allows operation in one) and organized into pools to preclude overages and eliminate the competitive element from the fishery. A maximum of two licenses per vessel are allowed to curb excessive fleet rationalization, although a few vessels have “grandfather” provisions allowing three or more.

Long a highly lucrative fishery featuring healthy stocks and fuelled by strong Japanese demand for gift market roe products, the fishery has experienced a dramatic downturn during the 2000s. The fishery is increasingly centered in the Strait of Georgia, where stocks are strongest but roe content and quality is poorest. HS licenses, trading for \$850,000 in the early 2000s, are now valued in the \$150,000 range.

Most roe herring seine vessels are also licensed in the salmon seine fishery. The salmon/herring combination long provided strong returns to vessel owners and their crews, but for several years has yielded marginal returns at best. The actual organization of roe herring pools – which boats catch the fish and how the proceeds are divided – may be quite different than the apparent organization of the fishery (for DFO management and licensing purposes).

Licensing Profile

Roe herring seine licenses are virtually all placed on salmon seine vessels. There are 248 licenses aboard 133 vessels (F licenses excluded). The following table shows non-herring licenses held on the 2007 HS fleet:

Other Fishery Licences	# Licences
HS	248
Seine Salmon	144
Trawl	30
Halibut	24
Others	31
Non HS Lic's	229

The breakdown of the HS fleet by number of licenses per vessel is as follows:

# HS Licences	# Vessels	# HS Lic's	# AS Lic's
One HS	21	21	18
Two HS	109	218	123
Three HS	3	9	3
Total	133	248	144

The vast majority of vessels hold two HS licenses (109 out of 133 vessels, or 82%). As mentioned, the division of fishery proceeds may be very different than the licensing organization within the roe herring seine fishery.

Landings Profile

The following table sheds some light on how the roe herring fishery is organized. Some vessels are active “catcher” vessels, others are on the grounds to pack, and others make a token appearance with no intent to engage in the fishery. Thirty eight vessels registered landings in 2007.

Catch Distribution	# Vessels	# Vessels with Landings	Landings Lbs	Landings/ Active Vessel
One HS	21	2	582,960	291,480
Two HS	109	34	8,261,225	242,977
Three HS	3	2	552,715	276,358
Total	133	38	9,396,900	247,287

Landings profiles are not particularly relevant for this fishery, since there is little relationship between who harvests the fish and how the proceeds are distributed.

Financial Profiles

Key Assumptions

- Landings by-vessel per DFO catch stats. Note that the landings level in 2007 was extremely low, strongly influencing fleet economics.
- Prices and settlement approach per research.
- It is assumed that 75 vessels share in the proceeds of the 246-licence harvest, and therefore, that 58 of the 133 licensed vessels are not truly participating in the fishery.
- Because the roe herring seine fleet is effectively a sub-set of the salmon seine fleet, it is the *contribution* of the fishery that is relevant (revenues less fishery direct expenses). Vessel overhead expenses are excluded from the analysis, since roe herring as a stand-alone fishery supports few if any vessels.

Individual Vessel Profile

Roe Herring Individual Vessel	Roe Herring Seine 3.3 Licences
Landings (lbs)	125,292
Vessel Price (per lb)	\$0.46
Gross Revenue (Gross Stock)	\$ 57,948
Less: Fishery Specific Expenses	
Fuel	6,000
At sea monitoring	8,560
Offload Monitor	
Licence / Co-management Fees	
Licence Lease	2,500
Bait	-
Gear maintenance/replacement	-
Total Fishery Specific Expenses	17,060
Net Revenue (Net Stock)	40,888
<i>Less:</i>	
Crew, Captain, Gear Shares	26,076
Fishery Contribution	14,811

- It is assumed that the average vessel shares in the proceeds of 3.3 licences-worth of catch.

Aggregate Vessel Profiles

Number of Vessels	75
Roe Herring All Vessels	Roe Herring Seine
Landings (lbs)	9,396,900
Vessel Price (per lb)	\$0.46
Gross Revenue (Gross Stock)	\$ 4,346,066
Less: Fishery Specific Expenses	
Fuel	450,000
At sea monitoring	642,000
Offload Monitor	
Licence / Co-management Fees	
Licence lease	187,500
Bait	-
Gear maintenance/replacement	-
Total Fishery Specific Expenses	1,279,500
Net Revenue (Net Stock)	3,066,566
<i>Less:</i>	
Crew, Captain, Gear Shares	1,955,730
Fishery Contribution	1,110,836

Other Fishery Diversification

No diversification table is shown for the roe herring seine fishery; the bulk of the fleet is captured in the seine salmon section (roe herring seine effectively a diversification activity for salmon seiners).

Capital Considerations

The cost to purchase a roe herring seine licence was approximately \$150,000 in 2007. This price, down sharply from levels in prior years, reflects the poor earnings levels seen in 2007. Vessels are those used in the salmon seine fishery.

Keys/Challenges to Success

The following points emerged through consultations with participants in this fishery:

Financial Factors

- Low roe herring TACs coupled with diminished pricing means that current revenues are a fraction of past levels.
- Industry maintaining a prudent lease rate is an ongoing determinant of profitability.

Other Factors

- The two-licence restriction per vessel is not realistic given the economics of the fishery. Settlement practices do not necessarily mesh with licensing arrangements.

Salmon Gillnet (AG)

Fishery Overview

The salmon gillnet fishery is a competitive fishery operating under an area licensing program, with the coast divided into three areas: C (north coast), D (Areas 11-15 and 23-27), and E (Areas 16-22, 28, and 29) for management purposes. Licence stacking is allowed; licences are vessel-based, meaning stringent vessel replacement rules apply.

Gillnet vessels are generally in the 30-40' range, and most vessels are crewed by a single person (earnings have been insufficient to support deckhands in recent years). Fortunes in the gillnet fishery have declined dramatically over the years, as both access to stocks and fish prices have eroded from levels seen in the 1980s and early 1990s. Fleet restructuring initiatives ("Mifflin Plan," PFAR) have been insufficient to restore viability. The need for further reform in the salmon fishery is widely recognized, but industry and government have so far been unable to devise and implement a turnaround strategy.

While a single year glimpse is not the ideal timeframe for describing financial results in the salmon fishery (since runs are highly cyclical), the 2007 results shown in this snapshot are reasonably typical of recent poor performance.

Licensing Profile

There are 829 gillnet salmon vessels holding 1,030 AG licences (F and Northern Native Fishing Association (N) licences excluded). In stark contrast to the seine fleet, where the number of non-salmon licences exceeds the number of salmon licences, the salmon gillnet fleet features little other-fishery diversification. Only 214 non-AG licences are held on 829 salmon gillnet vessels.

Other Fishery Licences	# Licences
AG	1,030
Halibut	56
Shrimp	48
ZN	25
N Gillnet salmon	20
F Gillnet salmon	15
Others	50
Non AG Lic's	214

An important proviso to these figures is that many gillnet roe herring licences, which are not associated with a particular vessel (for DFO licensing purposes), are in fact operated by gillnet salmon fishermen. Roe herring is an important diversification activity for gillnet salmon fishermen, though there is no way of linking gillnet roe herring landings with gillnet salmon landings.

The following three tables show gillnet salmon fleet diversification broken down by the number of salmon licences per vessel (single, double, or triple).

Single AG Licence	# Vessels	# AG Licences	# Other Licences
One AG only	515	515	0
One AG plus one lic	109	109	109
One AG plus two lic	14	14	28
One AG plus three or more lic	2	2	11
Total AG Vessels	640	640	148

Over 78% of gillnet salmon vessels (640 out of 829) are single-licensed. The vast majority of these vessels (515, or 80%) possess no other fishing opportunities. Only 16 vessels (2.5%) hold two or more other licences.

Double AG Licence	# Vessels	# AG Licences	# Other Licences
Two AG only	142	284	0
Two AG plus one lic	23	46	23
Two AG plus two lic	8	16	16
Two AG plus three or more lic	4	8	18
Total AG Vessels	177	354	57

Eighty percent of double-licensed gillnet vessels hold no other licences. Non-salmon diversification, while marginally higher than for the single-licensed fleet, is still minor.

Very few vessels – only 12 – are fully-subscribed in the gillnet salmon fishery. The licence profile for the triple-licence segment is as follows:

Triple AG Licence	# Vessels	# AG Licences	# Other Licences
Three AG only	5	15	0
Three AG plus one lic	5	15	5
Three AG plus two lic	2	6	4
Three AG plus three or more lic	0	0	0
Total AG Vessels	12	36	9

The following table summarizes gillnet salmon fleet diversification. This fleet is highly reliant on the salmon fishery.

All AG Licences	# Vessels	# AG Licences	# Other Licences
AG(s) only	662	814	0
AG(s) plus one lic	137	170	137
AG(s) plus two lic	24	36	48
AG(s) plus three or more lic	6	10	29
Total AG Vessels	829	1030	214

Landings Profile³

As seen in the seine fleet, a significant number of gillnet salmon vessels were inactive in 2007. The extent of inactivity is most acute in the single-license segment (213, or 33% idle), with triple-licensed vessels fully engaged in the fishery.

Activity Level	# Vessels	# Active	% Active	# Inactive
Single GN	640	427	67%	213
Double GN	177	152	86%	25
Triple GN	12	12	100%	0
AG Licences	829	591	71%	238

Salmon landings and landed value for single, double, and triple-licensed vessels are shown below⁴:

Active AG Vessels	# Vessels	Value of Catch \$	Catch (lbs)	% of Catch Value	% of Catch Lbs	Catch Value/ Vessel (\$)	Catch Lbs/ Vessel
Single AG Vessel	427	4,154,424	5,423,451	60%	60%	9,729	12,701
Double AG Vessel	152	2,551,404	3,286,601	37%	36%	16,786	21,622
Triple AG Vessel	12	257,033	361,775	4%	4%	21,419	30,148
Total	591	6,962,861	9,071,827	100%	100%	11,781	15,350

Salmon landings and landed value per vessel rise, as expected, with the number of licenses held on the vessel. A similar breakdown is provided below for production tiers in each of the gillnet fleet segments (single, double, and triple).

Single Licence Vessels	# Vessels	Value of Catch \$	Catch (lbs)	% of Catch Value	% of Catch Lbs	Catch Value/ Vessel	Catch Lbs/ Vessel
Top 1/3	142	2,819,207	3,497,509	68%	64%	\$19,854	24,630
Middle 1/3	142	1,145,197	1,540,412	28%	28%	\$8,065	10,848
Bottom 1/3	143	190,020	385,530	5%	7%	\$1,329	2,696
	427	4,154,424	5,423,451	100%	100%	\$9,729	12,701

Double Licence Vessels	# Vessels	Value of Catch \$	Catch (lbs)	% of Catch Value	% of Catch Lbs	Catch Value/ Vessel	Catch Lbs/ Vessel
Top 1/3	51	1,481,547	1,841,829	58%	56%	\$29,050	36,114
Middle 1/3	51	791,854	1,001,039	31%	30%	\$15,527	19,628
Bottom 1/3	50	278,003	443,733	11%	14%	\$5,560	8,875
	152	2,551,404	3,286,601	100%	100%	\$16,786	21,622

³ The analysis in this section relates to single, double, or triple licensing... not specific areas (C, D or E). This is because the data utilized did not specifically link licence-area to area of capture.

⁴ Landings are per catch statistics, landed values use the fish prices researched in this study.

Triple Licence Vessels	# Vessels	Value of Catch \$	Catch (lbs)	% of Catch Value	% of Catch Lbs	Catch Value/Vessel	Catch Lbs/Vessel
Top 1/3	4	140,717	164,355	55%	45%	\$35,179	41,089
Middle 1/3	4	83,955	136,619	33%	38%	\$20,989	34,155
Bottom 1/3	4	32,360	60,800	13%	17%	\$8,090	15,200
	12	257,033	361,775	100%	100%	\$21,419	30,148

Observations flowing from these tables:

- Landings for the bottom 1/3 in each segment are miniscule; effectively, this portion of the fleet (a total of 197 vessels) is only slightly-active.
- The landings distribution is less skewed as the number of gillnet salmon licences per vessel rises (same pattern seen in the seine fishery). Seemingly, those vessels with more licences feature the most competitive equipment and operators.
- Revenues for the top producing tiers are modest; for the lower tiers, paltry.

Financial Profiles

Key Assumptions

- Landings by production tier are from DFO stats. The 2007 season saw reasonable fishing opportunities in the north coast, though sockeye fishing was below average, and very limited fisheries in the south coast (Area D had some chum and chinook fishing, while Area E featured only a fall chum fishery).
- Fish prices are derived through research. The by-species prices used are the same across all profiles. The effective prices vary by profile because the species mix differs.
- It is assumed that gillnet vessels operate with only a captain and no deckhand(s), a situation that is now the norm in the gillnet fishery. Taking a deckhand is a luxury increasingly few operators can afford.
- Fixed vessel expenses are the same across all profiles.
- Repairs and maintenance includes both vessel and fishing gear. The levels assumed are very low – less than the long term average levels to properly maintain equipment in safe and efficient working order – but reflective of 2007's economic realities.
- As gillnet salmon is predominantly an owner/operator fleet, earnings equate to personal income for the owner/operator.

Single Licensed Vessels

Individual Vessel Profiles

Salmon Gillnet - Single Licence Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	24,630	10,848	2,696	12,701
Vessel Price (per lb)	\$0.86	\$0.81	\$0.59	\$0.83
Gross Revenue (Gross Stock)	\$ 21,294	\$ 8,793	\$ 1,601	\$ 10,541
Less: Fishery Specific Expenses				
Fuel	4,500	4,500	2,500	3,830
At sea monitoring				
Offload Monitor	770	770	770	770
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	5,270	5,270	3,270	4,600
Net Revenue (Net Stock)	16,024	3,523	(1,669)	5,941
Less:				
Deckhand shares	-	-	-	-
Fishery Contribution	16,024	3,523	(1,669)	5,941
Vessel Fixed Expenses				
Insurance	1,500	1,500	1,500	1,500
Repairs & Maintenance	5,000	5,000	5,000	5,000
Moorage	1,250	1,250	1,250	1,250
Miscellaneous	500	500	500	500
Total Vessel Expenses	8,250	8,250	8,250	8,250
Earnings (EBITDA)	\$7,774	-\$4,727	-\$9,919	-\$2,309

- Results, predictably, given the nature of the 2007 season, were very poor for single-licensed vessels.
- Production is so low for the bottom tier that it is unlikely that these vessels fully participated; thus, it is possible that some fishery and vessel expenses were lower than levels shown.

Double Licensed Vessels*Individual Vessel Profiles*

Salmon Gillnet - Double Licence Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	36,114	19,628	8,875	21,622
Vessel Price (per lb)	\$0.87	\$0.86	\$0.71	\$0.84
Gross Revenue (Gross Stock)	\$ 31,265	\$ 16,808	\$ 6,296	\$ 18,201
Less: Fishery Specific Expenses				
Fuel	7,200	7,200	4,000	6,147
At sea monitoring	1,540	1,540	1,540	1,540
Offload Monitor				
Licence / Co-management Fees	-	-	-	-
Licence/ Quota Lease				
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	8,740	8,740	5,540	7,687
Net Revenue (Net Stock)	22,525	8,068	756	10,514
<i>Less:</i>				
Deckhand Share	-	-	-	-
Fishery Contribution	22,525	8,068	756	10,514
Vessel Fixed Expenses				
Insurance	1,500	1,500	1,500	1,500
Repairs & Maintenance	5,000	5,000	5,000	5,000
Moorage	1,250	1,250	1,250	1,250
Miscellaneous	500	500	500	500
Total Vessel Expenses	8,250	8,250	8,250	8,250
Earnings (EBITDA)	\$14,275	-\$182	-\$7,494	\$2,264

- Results are better than for the single licence sector, but still at non-viable levels for 2/3 of the segment.
- Part of the reason for enhanced results may be that operators that elect to stack tend to be more competitive fishers than those content to opt for a single area.
- Since two of the three areas had very poor seasons (D and E), it is not surprising that licence stacking failed to turn-around results.

Triple Licensed Vessels

Individual Vessel Profiles

Salmon Gillnet - Triple Licence Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	41,089	34,155	15,200	30,148
Vessel Price (per lb)	\$0.91	\$0.70	\$0.58	\$0.78
Gross Revenue (Gross Stock)	\$ 37,463	\$ 24,021	\$ 8,784	\$ 23,423
Less: Fishery Specific Expenses				
Fuel	8,640	8,640	4,800	7,360
At sea monitoring	2,310	2,310	2,310	2,310
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	10,950	10,950	7,110	9,670
Net Revenue (Net Stock)	26,513	13,071	1,674	13,753
Less:				
Deckhand Share	-	-	-	-
Fishery Contribution	26,513	13,071	1,674	13,753
Vessel Fixed Expenses				
Insurance	1,500	1,500	1,500	1,500
Repairs & Maintenance	5,000	5,000	5,000	5,000
Moorage	1,250	1,250	1,250	1,250
Miscellaneous	500	500	500	500
Total Vessel Expenses	8,250	8,250	8,250	8,250
Earnings (EBITDA)	\$18,263	\$4,821	-\$6,576	\$5,503

- Results are better than for the single and double licence sectors, but not dramatically so.
- Part of the reason for enhanced results may be that operators that elect to stack tend to be more competitive fishers than those content to opt for a single area.
- Since two of the three areas had very poor seasons, it is not surprising that licence stacking failed to turn around results.

Single Licensed Vessels

Aggregate Vessel Profiles

Number of Vessels:	142	142	143	427
Salmon Gillnet - Single Licence Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	3,497,460	1,540,416	385,528	5,423,404
Vessel Price (per lb)	\$0.86	\$0.81	\$0.59	\$0.83
Gross Revenue (Gross Stock)	\$ 3,023,694	\$ 1,248,569	\$ 228,900	\$ 4,501,162
Less: Fishery Specific Expenses				
Fuel	639,000	639,000	357,500	1,635,500
At sea monitoring				
Offload Monitor	109,340	109,340	110,110	328,790
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	748,340	748,340	467,610	1,964,290
Net Revenue (Net Stock)	2,275,354	500,229	(238,710)	2,536,872
Less:				
Deckhand Share	-	-	-	-
Fishery Contribution	2,275,354	500,229	(238,710)	2,536,872
Vessel Fixed Expenses				
Insurance	213,000	213,000	214,500	640,500
Repairs & Maintenance	710,000	710,000	715,000	2,135,000
Moorage	177,500	177,500	178,750	533,750
Miscellaneous	71,000	71,000	71,500	213,500
Total Vessel Expenses	1,171,500	1,171,500	1,179,750	3,522,750
Earnings (EBITDA)	\$1,103,854	-\$671,271	-\$1,418,460	-\$985,878

- The 427 active vessel single licensed segment was financially untenable in 2007 (as it has been for most seasons over the last several years).

Double Licensed Vessels*Aggregate Vessel Profiles*

Number of Vessels:	51	51	50	152
Salmon Gillnet - Double Licence Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	1,841,814	1,001,028	443,750	3,286,592
Vessel Price (per lb)	\$0.87	\$0.86	\$0.71	\$0.84
Gross Revenue (Gross Stock)	\$ 1,594,532	\$ 857,230	\$ 314,792	\$ 2,766,554
Less: Fishery Specific Expenses				
Fuel	367,200	367,200	200,000	934,400
At sea monitoring	78,540	78,540	77,000	234,080
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	445,740	445,740	277,000	1,168,480
Net Revenue (Net Stock)	1,148,792	411,490	37,792	1,598,074
<i>Less:</i>				
Deckhand Share	-	-	-	-
Fishery Contribution	1,148,792	411,490	37,792	1,598,074
Vessel Fixed Expenses				
Insurance	76,500	76,500	75,000	228,000
Repairs & Maintenance	255,000	255,000	250,000	760,000
Moorage	63,750	63,750	62,500	190,000
Miscellaneous	25,500	25,500	25,000	76,000
Total Vessel Expenses	420,750	420,750	412,500	1,254,000
Earnings (EBITDA)	\$728,042	-\$9,260	-\$374,708	\$344,074

- The 152 vessels with double licenses gained a slight profit in aggregate, though only the top tier was “in the black” for the season.

Triple Licensed Vessels*Aggregate Vessel Profiles*

Number of Vessels:	4	4	4	12
Salmon Gillnet - Triple Licence Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	164,356	136,620	60,800	361,776
Vessel Price (per lb)	\$0.91	\$0.70	\$0.58	\$0.78
Gross Revenue (Gross Stock)	\$ 149,852	\$ 96,083	\$ 35,137	\$ 281,072
Less: Fishery Specific Expenses				
Fuel	34,560	34,560	19,200	88,320
At sea monitoring	9,240	9,240	9,240	27,720
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	43,800	43,800	28,440	116,040
Net Revenue (Net Stock)	106,052	52,283	6,697	165,032
<i>Less:</i>				
Deckhand Share	-	-	-	-
Fishery Contribution	106,052	52,283	6,697	165,032
Vessel Fixed Expenses				
Insurance	6,000	6,000	6,000	18,000
Repairs & Maintenance	20,000	20,000	20,000	60,000
Moorage	5,000	5,000	5,000	15,000
Miscellaneous	2,000	2,000	2,000	6,000
Total Vessel Expenses	33,000	33,000	33,000	99,000
Earnings (EBITDA)	\$73,052	\$19,283	-\$26,303	\$66,032

- With only 12 vessels fully-subscribed in the gillnet salmon fishery, it is apparent that, without strong fisheries in all areas, this strategy is of limited utility.

All Gillnet Vessels

Number of Vessels:	427	152	12	591
Salmon Gillnet Fleet Totals	Single	Double	Triple	Total
Landings (lbs)	5,423,404	3,286,592	361,776	9,071,772
Vessel Price (per lb)	\$0.83	\$0.84	\$0.78	\$0.83
Gross Revenue (Gross Stock)	\$ 4,501,162	\$ 2,766,554	\$ 281,072	\$ 7,548,789
Less: Fishery Specific Expenses				
Fuel	1,635,500	934,400	88,320	2,658,220
At sea monitoring	328,790	234,080	27,720	590,590
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	1,964,290	1,168,480	116,040	3,248,810
Net Revenue (Net Stock)	2,536,872	1,598,074	165,032	4,299,979
<i>Less:</i>				
Deckhand Share	-	-	-	-
Fishery Contribution	2,536,872	1,598,074	165,032	4,299,979
Vessel Fixed Expenses				
Insurance	640,500	228,000	18,000	886,500
Repairs & Maintenance	2,135,000	760,000	60,000	2,955,000
Moorage	533,750	190,000	15,000	738,750
Miscellaneous	213,500	76,000	6,000	295,500
Total Vessel Expenses	3,522,750	1,254,000	99,000	4,875,750
Earnings (EBITDA)	-\$985,878	\$344,074	\$66,032	-\$575,771

- Like the seine fleet, the 591 vessel active gillnet fleet was “in the hole” for the 2007 season. A lack of sockeye opportunities is the primary cause.
- Revenues are simply insufficient, in a season such as 2007, to sustain a fleet of this size. Note that a large number of vessels (238) are inactive.

Other fishery Diversification

The following table provides a snapshot estimate of how the active salmon gillnet fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

Halibut, shrimp, and crab are the primary non-salmon activities. The table shows, for the active gillnet salmon fleet, the approximate number of vessels engaged in the halibut, shrimp, and crab fisheries, applying average per-vessel results for each of these fisheries. As has been mentioned, gillnet roe

herring is also a contributor to the gillnet salmon fleet, but linking herring production to salmon vessels is not possible.

Number of Vessels	591	30	25	5	
Salmon Gillnet Fleet Include Other Fisheries	Gillnet Salmon	Halibut	Shrimp	Crab	Total
Landings (lbs)	9,071,772	1,914,372	426,733	175,000	11,587,877
Vessel Price (per lb)	\$0.83	\$4.27	\$1.50	\$2.75	\$1.45
Gross Revenue (Gross Stock)	\$ 7,548,789	\$ 8,177,243	\$ 640,100	\$ 481,250	\$ 16,847,382
Less: Fishery Specific Expenses					
Fuel	2,658,220	205,628	125,000	60,000	3,048,848
At sea monitoring	590,590	444,694	62,500	15,450	1,113,234
Offload Monitor					
Licence / Co-management Fees					
Stacked licence/quota lease	-	1,422,871	-	-	1,422,871
Bait	-	149,590	-	21,667	171,256
Gear maintenance/replacement	-	29,917	-	16,667	46,584
Total Fishery Specific Expenses	3,248,810	2,252,700	187,500	113,783	5,802,794
Net Revenue (Net Stock)	4,299,979	5,924,543	452,600	367,467	11,044,588
Less:					
Crew and Captain Shares	-	2,369,817	64,010	120,313	2,554,140
Fishery Contribution	4,299,979	3,554,726	388,590	247,154	8,490,449
Vessel Fixed Expenses					
Insurance					886,500
Repairs & Maintenance					300,000 62,500 25,000 3,342,500
Moorage					738,750
Miscellaneous					295,500
Total Vessel Expenses					5,263,250
Earnings (EBITDA)					\$3,227,199

- Though a very few active gillnet salmon fishermen engage in other activities, the contribution from these activities can be substantial.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, licences, and quotas required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets depending on the number of gillnet salmon licences held. The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.
- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Salmon Gillnet Replacement Cost of Assets	Single Licence	Double Licence	Triple Licence
Licence Cost	65,000	130,000	195,000
Vessel Cost	125,000	150,000	150,000
Replacement cost	190,000	280,000	345,000
Amortization (annual) @ 5%	9,500	14,000	17,250
Loan Considerations if 50% borrowed:			
Loan amount	95,000	140,000	172,500
Interest (1st year)	7,600	11,200	13,800
Principal (1st year, 15 yr amort)	6,333	9,333	11,500
1st year pmt (principal + interest):	13,933	20,533	25,300

Observations on the above schedule:

- Cash flows (EBITDA) for the salmon gillnet fleet are generally insufficient to cover amortization and financing charges.
- The majority of salmon seine vessel owners have written-off their investments (most vessels/licences were purchased twenty years ago or more). If this was not the case, the incidence of business failure and forfeiture would be far higher in the gillnet fleet.

Keys/Challenges to Success

The following points emerged through consultations with participants in this fishery:

Financial Factors

- Limited access to stocks is key factor limiting revenues.
- Fuel cost is a major consideration influencing which fisheries to attend, travelling speed, and fishing practices.
- Maintenance expenditures are unreasonably low as an economic necessity; major repairs are delayed as long as possible, upgrades are forgone.

Other Factors

- “Pocket” opportunities (small-scale fisheries) are increasingly important. Small fisheries conducted by a few boats can make significant contributions to the season.
- Fishery reform and fleet rationalization are critical to restoring viability.
- Gillnet salmon is increasingly opportunistic – other businesses or jobs are the primary activity, with salmon fishing “fit-in” around the primary activity.

Salmon Troll (AT)

Fishery Overview

The salmon troll fishery is a competitive fishery operating under an area licensing program, with the coast divided into three areas: F (north coast), G (West Coast Vancouver Island), and H (Areas 12-19, 28, and 29) for management purposes. Licence stacking is allowed; licences are vessel-based, meaning stringent vessel replacement rules apply.

In the troll fishery vessels range between 35-50' and are generally crewed by 2-3 persons.

While the troll fleet has seen a reduction in access to stocks, particularly coho and sockeye, and has experienced poor results as seen in the seine and gillnet sectors, it has restored a north and west coast chinook fishery, and has benefited from an escalation in fish prices related to high demand for these fish. While a portion of the fleet is performing satisfactorily, however, the need for reform remains, but industry and government have so far been unable to devise and implement an agreeable strategy.

While a single year glimpse is not the ideal timeframe for describing financial results in the salmon fishery (since runs are highly cyclical), the 2007 results shown in this snapshot are reasonably typical of recent performance.

Licensing Profile

The salmon troll fleet comprises 441 vessels with 515 AT licences (excludes F licences). Held on these 441 vessels are 360 non-salmon licenses from a variety of fishery categories.

Other Fishery Licences	# Licences
AT	515
Halibut	99
Tuna	90
ZN	61
Shrimp	37
Prawn	36
Others	37
Non AT Lic's	360

The following three tables show troll salmon fleet diversification broken down by the number of salmon licences per vessel (single, double, or triple).

Single AT Licence	# Vessels	# AT Licences	# Other Licences
One AT only	199	199	0
One AT plus one lic	121	121	121
One AT plus two lic	35	35	70
One AT plus three or more lic	17	17	54
Total AT Vessels	372	372	245

About 84% of troll salmon vessels (372 out of 441) hold a single AT licences. Over half of these (199, or 53%) hold no other licences, providing them with no diversification. Licence stacking is far less prevalent in the troll fleet than in the seine and gillnets fleets.

Double AT Licence	# Vessels	# AT Licences	# Other Licences
One AT only	12	24	0
One AT plus one lic	19	38	19
One AT plus two lic	20	40	40
One AT plus three or more lic	13	26	45
Total AT Vessels	64	128	104

Triple AT Licence	# Vessels	# AT Licences	# Other Licences
One AT only	0	0	0
One AT plus one lic	0	0	0
One AT plus two lic	4	12	8
One AT plus three or more lic	1	3	3
Total AT Vessels	5	15	11

Licence holdings in the troll fleet are summarized below. Troll vessels are more likely to diversify outside the salmon fishery than other salmon gear types. A relatively small segment of the troll fleet holds two or more non-troll licenses (90 vessels holding 220 licenses).

All AT Licences	# Vessels	# AT Licences	# Other Licences
AT(s) only	211	223	0
AT(s) plus one lic	140	159	140
AT(s) plus two lic	59	87	118
AT(s) plus three or more lic	31	46	102
Total AT Vessels	441	515	360

Landings Profile⁵

The troll sector features the lowest level of active participation within the salmon fleet, with 37% of vessels idle in 2007.

Activity Level	# Vessels	# Active	% Active	# Inactive
Single Troll	372	232	62%	140
Double Troll	64	42	66%	22
Triple Troll	5	3	60%	2
Total	441	277	63%	164

Likely reasons for this low participation rate are threefold:

⁵ The analysis in this section relates to single, double, or triple licensing... not specific areas (F, G or H). This is because the data utilized did not specifically link licence-area to area of capture.

- The troll fleet features a higher level of diversification in non-salmon/herring fisheries than seines and gillnets, so other meaningful opportunities are available.
- The ITQ program in the north (Area F) allows vessels to lease chinook allocations, obviating the need for those fishermen “on the fence” to go fishing in order to earn income.
- The winter chinook fishery in Area G, featuring small surpluses during poor-weather months, is unattractive to many vessels not based in the west coast of Vancouver Island.

The catch breakdown for the troll salmon fleet, by number of licenses per vessel, is shown below:

Active AT Licences	# Vessels	Value of Catch \$	Catch (lbs)	% of Catch Value	% of Catch Lbs	Catch Value/Vessel	Catch Lbs/Vessel
Single AT	232	7,943,249	2,830,102	74%	73%	\$34,238	12,199
Double AT	42	2,621,235	982,209	24%	25%	\$62,410	23,386
Triple AT	3	142,106	40,604	1%	1%	\$47,369	13,535
Total AT	277	10,706,589	3,852,915	100%	100%	\$38,652	13,909

Despite low catch levels, attractive pricing and a high value mix composed mostly of chinook with some coho, allows reasonable catch values per vessel. A breakdown by production tier for single and double licensed vessels is provided below (the triple-licence table is excluded for confidentiality reasons since it features a single vessel per tier).

Single Licence Vessels	# Vessels	Value of Catch \$	Catch (lbs)	% of Catch Value	% of Catch Lbs	Catch Value/Vessel	Catch Lbs/Vessel
Top 1/3	77	\$4,997,460	1,659,960	63%	59%	\$64,902	21,558
Middle 1/3	77	\$2,241,106	701,761	28%	25%	\$29,105	9,114
Bottom 1/3	78	\$704,683	468,381	9%	17%	\$9,034	6,005
	232	\$7,943,249	2,830,102	100%	100%	\$34,238	12,199

Double Licence Vessels	# Vessels	Value of Catch \$	Catch (lbs)	% of Catch Value	% of Catch Lbs	Catch Value/Vessel	Catch Lbs/Vessel
Top 1/3	14	1,489,884	524,945	57%	53%	\$106,420	37,496
Middle 1/3	14	860,568	346,646	33%	35%	\$61,469	24,760
Bottom 1/3	14	270,783	110,618	10%	11%	\$19,342	7,901
	42	\$2,621,235	982,209	100%	100%	\$62,410	23,386

As with the other salmon categories, landings for bottom tier are low, implying that these vessels (92) are only “semi-active.” Also, the production pattern is less skewed for double licensed vessels than singles.

Financial Profiles

Key Assumptions

- Landings by production tier are from DFO stats. The 2007 season saw chinook catches in Areas F and G that were lower than levels in the preceding seasons, with opportunities crimped by bycatch/weak stock constraints. Area F also enjoyed modest coho and pink catches. Area H was limited to a small chum harvest (42,000 pieces) in 2007. The economics of the troll fishery are now largely driven by chinook earnings.
- Fish prices are derived through research. The by-species prices used are the same across all profiles. The effective prices vary by profile because the species mix differs.
- A quota lease charge of \$5,000 is assumed for all scenarios. This reflects the Area F fishery, where vessels may lease chinook on or off at a rate of about \$20 per fish. Clearly for some vessels (those only in Areas G or H) there will be no lease expense, while for others (those only in Area F choosing to lease fish) the cost will be higher. The \$5,000 figure is deemed an average.
- A deckhand expense of 20% of the gross stock for single licence vessels and 15% for double licensed vessels.
- Fixed vessel expenses are the same regardless of production level.

Single Licensed Vessels

Individual Vessel Profiles

Salmon Troll - Single Licence Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	21,558	9,114	6,005	12,199
Vessel Price (per lb)	\$2.95	\$3.14	\$1.23	\$2.71
Gross Revenue (Gross Stock)	\$ 63,543	\$ 28,647	\$ 7,373	\$ 33,077
Less: Fishery Specific Expenses				
Fuel	6,500	6,500	3,500	5,491
At sea monitoring				
Offload Monitor	770	770	770	770
Licence / Co-management Fees				
Licence/ Quota Lease	5,000	5,000	5,000	5,000
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	12,270	12,270	9,270	11,261
Net Revenue (Net Stock)	51,273	16,377	(1,897)	21,815
<i>Less:</i>				
Deckhand Share	12,709	5,729	1,475	6,615
Fishery Contribution	38,564	10,648	(3,372)	15,200
Vessel Fixed Expenses				
Insurance	1,750	1,750	1,750	1,750
Repairs & Maintenance	7,500	7,500	7,500	7,500
Moorage	1,500	1,500	1,500	1,500
Miscellaneous	750	750	750	750
Total Vessel Expenses	11,500	11,500	11,500	11,500
Earnings (EBITDA)	\$27,064	-\$852	-\$14,872	\$3,700

- In comparison to the salmon net fisheries, the troll fishery is a low volume, high value fishery. Returns for the top tier of vessel are satisfactory. This tier likely represents the top fishermen in Areas F and G (again, in reality, Area F fishermen may have a higher quota lease, while Area G will have none).
- The bottom tier is more representative of Area H results (as evidenced by the lower effective price arising from a high proportion of chum in the mix).

Double Licensed Vessels*Individual Vessel Profiles*

Salmon Troll - Double Licence Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	37,496	24,760	7,901	23,386
Vessel Price (per lb)	\$2.76	\$2.37	\$2.31	\$2.57
Gross Revenue (Gross Stock)	\$ 103,407	\$ 58,715	\$ 18,267	\$ 60,130
Less: Fishery Specific Expenses				
Fuel	9,100	9,100	4,900	7,700
At sea monitoring				
Offload Monitor	1,540	1,540	1,540	1,540
Licence / Co-management Fees				
Licence/ Quota Lease	5,000	5,000	5,000	5,000
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	15,640	15,640	11,440	14,240
Net Revenue (Net Stock)	87,767	43,075	6,827	45,890
Less:				
Deckhand Share	15,511	8,807	2,740	9,019
Fishery Contribution	72,256	34,268	4,087	36,870
Vessel Fixed Expenses				
Insurance	1,750	1,750	1,750	1,750
Repairs & Maintenance	7,500	7,500	7,500	7,500
Moorage	1,500	1,500	1,500	1,500
Miscellaneous	750	750	750	750
Total Vessel Expenses	11,500	11,500	11,500	11,500
Earnings (EBITDA)	\$60,756	\$22,768	-\$7,413	\$25,370

- Double licensed troll vessels (top two tiers) showed reasonable earnings in 2007. This likely represents Area F and G combinations.
- The bottom 1/3 represents “part-time” fishermen, or those focussing on Area H.

Triple Licensed Vessels

This profile is not shown for individual vessels for confidentiality reasons, since there are only three active vessels (one per tier).

Single Licensed Vessels

Aggregate Vessel Profiles

Number of Vessels:	77	77	78	232
Salmon Troll - Single Licence Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	1,659,966	701,778	468,390	2,830,134
Vessel Price (per lb)	\$2.95	\$3.14	\$1.23	\$2.71
Gross Revenue (Gross Stock)	\$ 4,892,800	\$ 2,205,857	\$ 575,103	\$ 7,673,760
Less: Fishery Specific Expenses				
Fuel	500,500	500,500	273,000	1,274,000
At sea monitoring	59,290	59,290	60,060	178,640
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	385,000	385,000	390,000	1,160,000
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	944,790	944,790	723,060	2,612,640
Net Revenue (Net Stock)	3,948,010	1,261,067	(147,957)	5,061,120
Less:				
Deckhand Share	978,560	441,171	115,021	1,534,752
Fishery Contribution	2,969,450	819,895	(262,977)	3,526,368
Vessel Fixed Expenses				
Insurance	134,750	134,750	136,500	406,000
Repairs & Maintenance	577,500	577,500	585,000	1,740,000
Moorage	115,500	115,500	117,000	348,000
Miscellaneous	57,750	57,750	58,500	174,000
Total Vessel Expenses	885,500	885,500	897,000	2,668,000
Earnings (EBITDA)	\$2,083,950	-\$65,605	-\$1,159,977	\$858,368

- The vast majority of the active troll fleet (232 out of 277) is single licensed. Only vessels in the top production tier earn satisfactory results (given the assumptions used in this model).

Double Licensed Vessels*Aggregate Vessel Profiles*

Number of Vessels:	14	14	14	42
Salmon Troll - Double Licence Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	524,944	346,640	110,614	982,198
Vessel Price (per lb)	\$2.76	\$2.37	\$2.31	\$2.57
Gross Revenue (Gross Stock)	\$ 1,447,696	\$ 822,012	\$ 255,735	\$ 2,525,443
Less: Fishery Specific Expenses				
Fuel	127,400	127,400	68,600	323,400
At sea monitoring	21,560	21,560	21,560	64,680
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	70,000	70,000	70,000	210,000
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	218,960	218,960	160,160	598,080
Net Revenue (Net Stock)	1,228,736	603,052	95,575	1,927,363
Less:				
Deckhand Share	217,154	123,302	38,360	378,816
Fishery Contribution	1,011,581	479,750	57,215	1,548,546
Vessel Fixed Expenses				
Insurance	24,500	24,500	24,500	73,500
Repairs & Maintenance	105,000	105,000	105,000	315,000
Moorage	21,000	21,000	21,000	63,000
Miscellaneous	10,500	10,500	10,500	31,500
Total Vessel Expenses	161,000	161,000	161,000	483,000
Earnings (EBITDA)	\$850,581	\$318,750	-\$103,785	\$1,065,546

- Although the low number of vessels opting to stack troll licenses suggests limited effectiveness for this strategy, the top production tier shows strong results. Results for the middle and bottom tiers are marginal.

All Troll Vessels

The triple licensed vessels are included in this schedule in aggregate form to yield a full picture of troll fleet performance.

Number of Vessels:	232	42	3	277
Salmon Troll Fleet Totals	Single	Double	Triple	Total
Landings (lbs)	2,830,134	982,198	40,605	3,852,937
Vessel Price (per lb)	\$2.71	\$2.57	\$3.48	\$2.68
Gross Revenue (Gross Stock)	\$ 7,673,760	\$ 2,525,443	\$ 141,219	\$ 10,340,421
Less: Fishery Specific Expenses				
Fuel	1,274,000	323,400	32,760	1,630,160
At sea monitoring	178,640	64,680	6,930	250,250
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	1,160,000	210,000	15,000	1,385,000
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	2,612,640	598,080	54,690	3,265,410
Net Revenue (Net Stock)	5,061,120	1,927,363	86,529	7,075,011
Less:				
Deckhand Share	1,534,752	378,816	21,183	1,934,751
Fishery Contribution	3,526,368	1,548,546	65,346	5,140,260
Vessel Fixed Expenses				
Insurance	406,000	73,500	5,250	484,750
Repairs & Maintenance	1,740,000	315,000	22,500	2,077,500
Moorage	348,000	63,000	4,500	415,500
Miscellaneous	174,000	31,500	2,250	207,750
Total Vessel Expenses	2,668,000	483,000	34,500	3,185,500
Earnings (EBITDA)	\$858,368	\$1,065,546	\$30,846	\$1,954,760

- Overall, the financial performance of the troll fleet was positive in 2007. The high-price, low-volume dynamic is in stark contrast to the net fleet. However, profitability is enjoyed primarily by the top producers in the fleet.

Other Fishery Diversification

The following table provides a snapshot estimate of how the active salmon troll fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

The troll fleet is more diversified than the net fleet, participating in other longline fisheries, particularly halibut and tuna. The table shows, for the active troll salmon fleet, the approximate number of vessels

engaged in the halibut, tuna, and prawn fisheries, applying average per-vessel results for each of these fisheries.

Number of Vessels	277	70	90	15	
Salmon Troll Fleet Include Other Fisheries	Troll Salmon	Halibut	Tuna	Prawn	Total
Landings (lbs)	3,852,937	4,466,868	6,931,800	384,697	15,636,302
Vessel Price (per lb)	\$2.68	\$4.27	\$1.55	\$5.50	\$2.70
Gross Revenue (Gross Stock)	\$ 10,340,421	\$ 19,080,235	\$ 10,744,290	\$ 2,115,833	\$ 42,280,779
Less: Fishery Specific Expenses					
Fuel	1,630,160	479,800	1,362,013	131,326	3,603,298
At sea monitoring	250,250	1,037,620	45,000	55,250	1,388,120
Offload Monitor					
Licence / Co-management Fees					
Stacked licence/quota lease	1,385,000	3,320,032	-	52,273	4,757,305
Bait	-	349,042	-	118,030	467,073
Gear maintenance/replacement	-	69,807	142,500	54,242	266,549
Total Fishery Specific Expenses	3,265,410	5,256,301	1,549,513	411,121	10,482,345
Net Revenue (Net Stock)	7,075,011	13,823,934	9,194,777	1,704,712	31,798,435
<i>Less:</i>					
Crew and Captain Shares	1,934,751	5,529,574	4,137,650	740,542	12,342,516
Fishery Contribution	5,140,260	8,294,360	5,057,127	964,170	19,455,918
Vessel Fixed Expenses					
Insurance					484,750
Repairs & Maintenance					2,915,000
Moorage					415,500
Miscellaneous					207,750
Total Vessel Expenses					4,023,000
Earnings (EBITDA)					\$15,432,918

- Troll revenues and profitability are greatly enhanced by participation in other fisheries, much more so than in the net fleet.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, licences, and quotas required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets for depending on the number of licences held. The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.
- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Salmon Troll Replacement Cost of Assets	Single Licence	Double Licence	Triple Licence
Licence Cost	100,000	200,000	300,000
Vessel Cost	150,000	200,000	200,000
Replacement cost	250,000	400,000	500,000
Amortization (annual) @ 5%	12,500	20,000	25,000
Loan Considerations if 50% borrowed:			
Loan amount	125,000	200,000	250,000
Interest (1st year)	10,000	16,000	20,000
Principal (1st year, 15 yr amort)	8,333	13,333	16,667
1st year pmt (principal + interest):	18,333	29,333	36,667

Observations on the above schedule:

- Although earnings (EBITDA) for the salmon troll fleet are stronger than those seen in the net fleet, they are still insufficient to cover amortization and financing charges, other than for the top 1/3 of the fleet.
- The majority of salmon troll vessel owners have written-off their investments (most vessels/licences were purchased twenty years ago or more). If this was not the case, the incidence of business failure and forfeiture would be far higher in the troll fleet.
- Participation in other fisheries is an important contributor for many individuals in the fleet.

Keys/Challenges to Success

The following points emerged through consultations with participants in this fishery:

Financial Factors

- As with the net fleet, limited access to stocks curbs revenues.
- Chinook prices are very strong, particularly when catch volumes are low. The chinook fishery provides the basis for a profitable fishery. Maintenance of a chinook troll TAC (relative to the recreational allocation) is critical.

Other Factors

- ITQ pilots provide the opportunity to enhance catch for some, and earn revenues without fishing for others. This is highly positive for some, contentious for others.
- The winter/spring west coast Vancouver island fishery is a boon for local vessels, marginal for outside vessels, who often opt not to attend.
- There is a widely held need for fishery reform and fleet rationalization.

Tuna (USA 68)

Fishery Overview

The BC tuna fishery is an offshore jig fishery, targeting highly migratory albacore tuna. Fishing effort ranges from the northern tip of Vancouver Island to southern Oregon. A limited entry Albacore Tuna USA Section 68 licence is required for all vessels fishing in the waters of the USA.

Fishing activity is dependent on price, ocean and weather conditions, albacore availability, the strength of other fisheries, particularly the salmon fishery, and fuel costs. Effort in the coastal fishery normally peaks in August and September, after the salmon season for trollers has wound down. Catch from the coastal fleet is sold into both the canned and the blast bled frozen tuna markets.⁶

Licensing Profile

The distribution of licences on the albacore tuna fleet is as follows:

Number of Licences	# Licences
USA 68	178
Troll salmon	124
Halibut	64
ZN	33
Shrimp	24
Prawn	24
Schedule II	18
Trawl	16
Sablefish	16
Other	25
Non Tuna licences	344

Tuna vessels are most often involved in other hook and line fisheries, particularly troll salmon and halibut. Tuna fishing was historically an activity undertaken by salmon trollers on the shoulders of the salmon season, or, more recently, as a replacement activity as the salmon fishery has diminished.

The tuna fleet is broken down, by number of licences per vessel and activity level, as follows:

Licences/Vessel	# Vessels	# Active Vessels
USA 68	12	6
USA 68 + one lic	77	53
USA 68 + two lic	36	25
USA 68 + three or more lic	53	36
Total Tuna Vessels	178	120

⁶ This paragraph is an excerpt from the Tuna IFMP.

About 2/3's (120 vessels) are active; this percentage is similar for vessels having one, two, or three or more licences in addition to a tuna licence.

Landings Profile

Tuna landings by number of licences per vessel are shown below.

Licences/Vessel	# Vessels	% Vessels	Catch	% Catch	Catch/ Vessel
USA 68	12	7%	892,022	10%	74,335
USA 68 + one lic	77	43%	4,039,473	44%	52,461
USA 68 + two lic	36	20%	1,923,457	21%	53,429
USA 68 + three or more lic	53	30%	2,387,433	26%	45,046
Total Tuna Vessels	178	100%	9,242,385	100%	51,924

There appears to be an inverse relationship between the number of licences on a vessel and the catch per vessel. It appears that tuna is truly a diversification activity, and that the more opportunities a vessel owner possesses, the less tuna fishing he will do. Landings by production tier are shown below:

Tier	Catch (lbs)	% Catch	Catch/ Vessel	# Vessels
Top 1/3	6,029,012	65%	150,725	40
Middle 1/3	2,482,391	27%	62,060	40
Bottom 1/3	730,982	8%	18,275	40
	9,242,385	100%	77,020	120

As with many fishery categories, the bottom 1/3 appears to be part-time, engaging in only a tuna trip or two for the 2007 season.

Financial Profiles

Key Assumptions

- Landings per DFO stats.
- Prices per research.
- Crew earnings @ 45% of the net stock.
- Vessel expenses identical for all production tiers.

Individual Vessel Profiles

Tuna Fleet Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	150,725	62,060	18,275	77,020
Vessel Price (per lb)	\$1.55	\$1.55	\$1.55	\$1.55
Gross Revenue (Gross Stock)	\$ 233,624	\$ 96,193	\$ 28,326	\$ 119,381
Less: Fishery Specific Expenses				
Fuel	27,912	12,412	5,076	15,133
At sea monitoring	500	500	500	500
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	2,500	1,250	1,000	1,583
Total Fishery Specific Expenses	30,912	14,162	6,576	17,217
Net Revenue (Net Stock)	202,712	82,031	21,750	102,164
<i>Less:</i>				
Crew and Captain Shares	91,220	36,914	9,787	45,974
Fishery Contribution	111,491	45,117	11,962	56,190
Vessel Fixed Expenses				
Insurance	3,500	3,500	3,500	3,500
Repairs & Maintenance	15,000	15,000	15,000	15,000
Moorage	1,500	1,500	1,500	1,500
Miscellaneous	2,500	2,500	2,500	2,500
Total Vessel Expenses	22,500	22,500	22,500	22,500
Earnings (EBITDA)	\$88,991	\$22,617	-\$10,538	\$33,690

Aggregate Vessel Profiles

Number of Vessels:	40	40	40	120
Tuna Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	6,029,000	2,482,400	731,000	9,242,400
Vessel Price (per lb)	\$1.55	\$1.55	\$1.55	\$1.55
Gross Revenue (Gross Stock)	\$ 9,344,950	\$ 3,847,720	\$ 1,133,050	\$ 14,325,720
Less: Fishery Specific Expenses				
Fuel	1,116,481	496,480	203,056	1,816,017
At sea monitoring				
Offload Monitor	20,000	20,000	20,000	60,000
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	100,000	50,000	40,000	190,000
Total Fishery Specific Expenses	1,236,481	566,480	263,056	2,066,017
Net Revenue (Net Stock)	8,108,469	3,281,240	869,994	12,259,703
<i>Less:</i>				
Crew and Captain Shares	3,648,811	1,476,558	391,498	5,516,866
Fishery Contribution	4,459,658	1,804,682	478,497	6,742,837
Vessel Fixed Expenses				
Insurance	140,000	140,000	140,000	420,000
Repairs & Maintenance	600,000	600,000	600,000	1,800,000
Moorage	60,000	60,000	60,000	180,000
Miscellaneous	100,000	100,000	100,000	300,000
Total Vessel Expenses	900,000	900,000	900,000	2,700,000
Earnings (EBITDA)	\$3,559,658	\$904,682	-\$421,503	\$4,042,837

Other Fishery Diversification

Because the tuna fishery is largely a diversification activity for operators in other fisheries (troll salmon and halibut predominantly) no schedule is offered.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, licences, and quotas required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets in the tuna fishery. The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.
- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Tuna Replacement Cost of Assets	Tuna Vessel & Licence
Licence Cost	150,000
Vessel Cost	225,000
Replacement cost	375,000
Amortization (annual) @ 5%	18,750
Loan Considerations if 50% borrowed:	
Loan amount	187,500
Interest (1st year)	15,000
Principal (1st year, 15 yr amort)	12,500
1st year pmt (principal + interest):	27,500

Keys to Success

Financial Factors

- As with all fisheries, prices and fish volumes are the drivers of financial performance.
- Tuna distribution and timing in BC/lower 48 waters is key to fish catch-ability.

Other Factors

- Tuna fishing effort is somewhat determined by the quality and profitability of fishing opportunities in other fisheries (for example, salmon and halibut).

Halibut (L)

Fishery Overview

The BC halibut fishery is managed under an Individual Vessel Quota management (IVQ) program. Individual quotas are expressed as a percentage of the overall TAC and issued annually in pounds. Quotas were initially endowed using a formula combining vessel length and production history. Since then there have been significant reallocations of IVQ amongst the fleet.

Halibut has for several years been one of BC's most coveted fisheries, with strong market demand for fresh halibut translating into high asset values and attractive returns to fishermen. A buoyant lease market also prevails.

The halibut (L licence category) fishery features 100% electronic at-sea monitoring and landings validation, and is part of the pilot integrated groundfish program. Canada operates under a Treaty with the USA with respect to halibut management (under the IPHC), since halibut are a trans-boundary stock. The fishery also features an explicit sharing arrangement with the recreational sector, with the commercial/sport split pegged at 88%/12%. The fishing season extends from March to November each year.

Halibut is perhaps the most in-demand fishery category for First Nations seeking expansion or diversification in BC fisheries.

Licensing Profile

A key feature of the halibut fleet is rationalization that has occurred since implementation of the IVQ system. While there are 428 licences issued (including 396 L and 32 FL), only 181 vessels recorded landings during 2007. The L fleet also possesses significant licence holdings in other fisheries. The following table provides a breakdown of other categories of licence held upon L-licensed vessels, separated by the active fleet (vessels registering halibut landings in 2007) and the inactive fleet (no halibut landings during the period).

Number of Licences	# Licences	Active L Fleet	Inactive L Fleet
L	396	168	228
Troll salmon	138	72	66
ZN	135	100	35
Gillnet salmon	86	30	56
Albacore	65	40	25
Seine herring	46	30	16
Seine salmon	33	20	13
Sablefish	33	25	8
Prawn	31	17	14
Non L licences	567	334	233

The halibut fleet is reasonably well diversified, with the average active vessel holding 2 licences in addition to its L (most often a troll salmon and ZN), and the inactive fleet holding one additional licence.

Halibut fleet diversification is further examined as follows:

Licences/ Vessel	# Halibut Vessels	Active Halibut Vessels	% of Active Vessels	Inactive Halibut Vessels	% of Inactive Vessels
L only	92	10	6%	82	36%
L + one lic	128	54	32%	74	32%
L + two lic	77	37	22%	40	18%
L + three lic	53	33	20%	20	9%
L + four or more	46	34	20%	12	5%
Total L Vessels	396	168	100%	228	100%

The preceding figure shows a dramatically different distribution of licences amongst active and inactive halibut vessels. Only 6% of vessels landing halibut in 2007 have a single licence, while the figure for inactive vessels is 36%. For the active fleet, 62% of vessels possess three or more licences (including their L), while only 32% of inactive vessels hold this many.

Landings Profile

Halibut landings amongst the 181 active vessels are highly skewed, with a relatively few vessels recording a high level of landings, and a large percentage of vessels showing substantially lower landings⁷.

Tier	Catch (lbs)	% Catch	Catch/ Vessel	# Vessels
Top 1/3	5,513,736	59%	91,896	60
Middle 1/3	2,881,710	31%	48,029	60
Bottom 1/3	951,032	10%	15,591	61
	9,346,478	100%	51,638	181

The distribution of landings for 2007, sorting by the number of licences per vessels (a measure of diversification) is as follows (FL vessels excluded):

⁷ This landings analysis includes F (commercial communal) licences because of the nature of the data used. Therefore, there are 181 active vessels, including Fs vs. 168 excluding Fs.

Licences/Vessel	# Vessels	% Vessels	Catch	% Catch	Catch/ Vessel
L only	10	6%	388,986	4%	38,899
L + one lic	54	32%	2,502,615	28%	46,345
L + two lic	37	22%	1,840,181	21%	49,735
L + three lic	33	20%	2,047,275	23%	62,039
L + four or more	34	20%	2,112,602	24%	62,135
Total L Vessels	168	100%	8,891,659	100%	52,927

The catch per vessel rises along with the number of licences per vessel, providing the picture of a working fleet involved heavily in halibut and other fisheries as well.

The halibut fleet has clearly seen a high level of quota redistribution and fleet rationalization, featuring:

- The majority of vessels not actively fishing halibut (228 out of 396). This is not to say that all of these L-licensed vessels have shed their quota permanently, however. A portion of the inactive vessel owners maintain quota for leasing to the active fleet.
- Within the active L fleet (168 out of 396 vessels) landings are highly skewed, with the top 33% of vessels harvesting 59% of the fish and the bottom 33% landing only 10%. Underlying this landings pattern is the acquisition of quota by these vessels, either via purchase or through annual or long term leases. Quota acquisition brings a financial burden (examples are shown in the following section).

The data available for this study did not include the permanent quota holdings of L-licensed vessels, so only inferences can be drawn about the ownership, and annual flow of quota, amongst licence holders.

Financial Profiles

Key Assumptions

The following assumptions influence the results shown:

- Halibut landings in dressed pounds are derived from DFO stats; the amount of non-halibut groundfish per vessel is a fleet-wide percentage applied against all profiles.
- Prices are gained through research. The price for non-halibut groundfish is a weighted average of the prices for sablefish, rockfish, lingcod, and dogfish.
- Variable fishing costs are best estimations based on data collected.
- 30% of the halibut landed by each vessel is assumed to be leased fish, for which a fee of \$3.00 per pound was paid. Other groundfish is leased in the same percentage at an average of \$0.30 per lb. In practice, the amount of fish leased by harvesters ranges from 0-100%.
- Crews receive 40% of the net value of the catch (after variable expenses are deducted).
- Vessel overhead costs are the same regardless of production level.

There is enormous variation in costs and sharing arrangements amongst the halibut fleet – particularly in leasing arrangements and crew settlements - so that the financial schedules could change dramatically under different assumptions.

Top Production Tier

Individual Vessel Profiles

Top Tier (1/3)	Halibut	Other Groundfish	Total
Landings (lbs)	90,000	21,595	111,595
Vessel Price (per lb)	\$5.00	\$1.24	\$4.27
Gross Revenue (Gross Stock)	\$ 450,000	\$ 26,677	\$ 476,677
Less: Fishery Specific Expenses			
Fuel	11,250	-	11,250
At sea monitoring	7,875	-	7,875
Offload Monitor	1,800	432	2,232
Licence / Co-management Fees	15,300	-	15,300
Quota lease	81,000	1,944	82,944
Bait	7,500		7,500
Gear Maintenance/replace	1,500	-	1,500
Total Fishery Specific Expenses	126,225	2,375	128,601
Net Revenue (Net Stock)	323,775	24,301	348,076
Less:			
Crew and Captain Shares	129,510	9,721	139,230
Fishery Contribution	194,265	14,581	208,846
Vessel Fixed Expenses			
Insurance			4,000
Repairs & Maintenance			12,000
Moorage			1,200
Miscellaneous			2,000
Total Vessel Expenses			19,200
Earnings (EBITDA)			\$189,646

- The halibut fish price (\$5.00/lb) was one of the highest on record, earned in spite of a strong Canadian dollar relative to the USA currency; the USA is the primary market for BC halibut. This contributed strongly to results.
- While the bulk of revenues and fishery specific expenses derive from halibut, other groundfish make a contribution.

Middle Production Tier*Individual Vessel Profiles*

Middle Tier (1/3)	Halibut	Other Groundfish	Total
Landings (lbs)	50,000	11,997	61,997
Vessel Price (per lb)	\$5.00	\$1.24	\$4.27
Gross Revenue (Gross Stock)	\$ 250,000	\$ 14,820	\$ 264,820
Fishery Specific Expenses			
Fuel	6,250	-	6,250
At sea monitoring	4,375	-	4,375
Offload Monitor	1,000	240	1,240
Licence / Co-management Fees	8,500	-	8,500
Quota Leases	45,000	1,080	46,080
Bait	5,000	-	5,000
Gear Maintenance/replace	1,000	-	1,000
Total Fishery Specific Expenses	71,125	1,320	72,445
Net Revenue (Net Stock)	178,875	13,501	192,376
<i>Less:</i>			
Crew and Captain Shares	71,550	5,400	76,950
Fishery Contribution	107,325	8,100	115,425
Vessel Fixed Expenses			
Insurance			4,000
Repairs & Maintenance			12,000
Moorage			1,200
Misc.			2,000
Total Vessel Expenses			19,200
Earnings (EBITDA)			\$96,225

- Results are satisfactory even for mid-level production.

Bottom Production Tier*Individual Vessel Profiles*

Bottom Tier (1/3)	Halibut	Other Groundfish	Total
Landings (lbs)	15,000	3,599	18,599
Vessel Price (per lb)	\$5.00	\$1.24	\$4.27
Gross Revenue (Gross Stock)	\$ 75,000	\$ 4,446	\$ 79,446
Fishery Specific Expenses			
Fuel	3,125	-	3,125
At sea monitoring	2,188	-	2,188
Offload Monitor	300	72	372
Licence / Co-management Fees	2,550	-	2,550
Quota Leases	13,500	324	13,824
Bait	2,500		2,500
Gear Maintenance/replace	500	-	500
Total Fishery Specific Expenses	24,663	396	25,058
Net Revenue (Net Stock)	50,338	4,050	54,388
<i>Less:</i>			
Crew and Captain Shares	20,135	1,620	21,755
Fishery Contribution	30,203	2,430	32,633
Vessel Fixed Expenses			
Insurance			4,000
Repairs & Maintenance			12,000
Moorage			1,200
Misc.			2,000
Total Vessel Expenses			19,200
Earnings (EBITDA)			\$13,433

- Income is very modest for a vessel in the lower production tier.

Summary of Production Tiers – Individual Vessels

Halibut and other groundfish aggregated

Halibut Fleet Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	111,595	61,997	18,599	63,812
Vessel Price (per lb)	\$4.27	\$4.27	\$4.27	\$4.27
Gross Revenue (Gross Stock)	\$ 476,677	\$ 264,820	\$ 79,446	\$ 272,575
Less: Fishery Specific Expenses				
Fuel	11,250	6,250	3,125	6,854
At sea monitoring	7,875	4,375	2,188	4,798
Offload Monitor	2,232	1,240	372	1,276
Licence / Co-management Fees	15,300	8,500	2,550	8,749
Licence/ Quota Lease	82,944	46,080	13,824	47,429
Bait	7,500	5,000	2,500	4,986
Gear maintenance/replacement	1,500	1,000	500	997
Total Fishery Specific Expenses	128,601	72,445	25,058	75,090
Net Revenue (Net Stock)	348,076	192,376	54,388	197,485
<i>Less:</i>				
Crew and Captain Shares	139,230	76,950	21,755	78,994
Fishery Contribution	208,846	115,425	32,633	118,491
Vessel Fixed Expenses				
Insurance	4,000	4,000	4,000	4,000
Repairs & Maintenance	12,000	12,000	12,000	12,000
Moorage	1,200	1,200	1,200	1,200
Miscellaneous	2,000	2,000	2,000	2,000
Total Vessel Expenses	19,200	19,200	19,200	19,200
Earnings (EBITDA)	\$189,646	\$96,225	\$13,433	\$99,291

Top Production Tier*Aggregate Vessel Profiles*

Number of Vessels	60		
Top Tier (1/3)	Halibut	Other Groundfish	Total
Landings (lbs)	5,400,000	1,295,678	6,695,678
Vessel Price (per lb)	\$5.00	\$1.24	\$4.27
Gross Revenue (Gross Stock)	\$ 27,000,000	\$ 1,600,600	\$ 28,600,600
Less: Fishery Specific Expenses			
Fuel	675,000	-	675,000
At sea monitoring	472,500	-	472,500
Offload Monitor	108,000	25,914	133,914
Licence / Co-management Fees	918,000	-	918,000
Quota lease	4,860,000	116,611	4,976,611
Bait	450,024	-	450,024
Gear Maintenance/replace	90,000	-	90,000
Total Fishery Specific Expenses	7,573,524	142,525	7,716,049
Net Revenue (Net Stock)	19,426,476	1,458,076	20,884,552
<i>Less:</i>			
Crew and Captain Shares	7,770,590	583,230	8,353,821
Fishery Contribution	11,655,886	874,845	12,530,731
Vessel Fixed Expenses			
Insurance			240,000
Repairs & Maintenance			720,000
Moorage			72,000
Miscellaneous			120,000
Total Vessel Expenses			1,152,000
Earnings (EBITDA)			\$11,378,731

Middle Production Tier*Aggregate Vessel Profiles*

Number of Vessels	60		
Middle Tier (1/3)	Halibut	Other Groundfish	Total
Landings (lbs)	3,000,000	719,821	3,719,821
Vessel Price (per lb)	\$5.00	\$1.24	\$4.27
Gross Revenue (Gross Stock)	\$ 15,000,000	\$ 889,222	\$ 15,889,222
Less: Fishery Specific Expenses			
Fuel	375,000	-	375,000
At sea monitoring	262,500	-	262,500
Offload Monitor	60,000	14,396	74,396
Licence / Co-management Fees	510,000	-	510,000
Quota lease	2,700,000	64,784	2,764,784
Bait	300,000	-	300,000
Gear Maintenance/replace	60,000	-	60,000
Total Fishery Specific Expenses	4,267,500	79,180	4,346,680
Net Revenue (Net Stock)	10,732,500	810,042	11,542,542
<i>Less:</i>			
Crew and Captain Shares	4,293,000	324,017	4,617,017
Fishery Contribution	6,439,500	486,025	6,925,525
Vessel Fixed Expenses			
Insurance			240,000
Repairs & Maintenance			720,000
Moorage			72,000
Miscellaneous			120,000
Total Vessel Expenses			1,152,000
Earnings (EBITDA)			\$5,773,525

Bottom Production Tier*Aggregate Vessel Profiles*

Number of Vessels	61		
Bottom Tier (1/3)	Halibut	Other Groundfish	Total
Landings (lbs)	915,000	219,545	1,134,545
Vessel Price (per lb)	\$5.00	\$1.24	\$4.27
Gross Revenue (Gross Stock)	\$ 4,575,000	\$ 271,213	\$ 4,846,213
Less: Fishery Specific Expenses			
Fuel	190,625	-	190,625
At sea monitoring	133,438	-	133,438
Offload Monitor	18,300	4,391	22,691
Licence / Co-management Fees	155,550	-	155,550
Quota lease	823,500	19,759	843,259
Bait	152,500	-	152,500
Gear Maintenance/replace	30,500	-	30,500
Total Fishery Specific Expenses	1,504,413	24,150	1,528,562
Net Revenue (Net Stock)	3,070,588	247,063	3,317,650
<i>Less:</i>			
Crew and Captain Shares	1,228,235	98,825	1,327,060
Fishery Contribution	1,842,353	148,238	1,990,590
Vessel Fixed Expenses			
Insurance			244,000
Repairs & Maintenance			732,000
Moorage			73,200
Miscellaneous			122,000
Total Vessel Expenses			1,171,200
Earnings (EBITDA)			\$819,390

Summary of Three Production Tiers – Aggregate*Halibut and other groundfish aggregated*

Number of Vessels:	60	60	61	181
Halibut Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	6,695,678	3,719,821	1,134,545	11,550,044
Vessel Price (per lb)	\$4.27	\$4.27	\$4.27	\$4.27
Gross Revenue (Gross Stock)	\$ 28,600,600	\$ 15,889,222	\$ 4,846,213	\$ 49,336,035
Less: Fishery Specific Expenses				
Fuel	675,000	375,000	190,625	1,240,625
At sea monitoring	472,500	262,500	133,438	868,438
Offload Monitor	133,914	74,396	22,691	231,001
Licence / Co-management Fees	918,000	510,000	155,550	1,583,550
Licence/ Quota Lease	4,976,611	2,764,784	843,259	8,584,654
Bait	450,024	300,000	152,500	902,524
Gear maintenance/replacement	90,000	60,000	30,500	180,500
Total Fishery Specific Expenses	7,716,049	4,346,680	1,528,562	13,591,291
Net Revenue (Net Stock)	20,884,552	11,542,542	3,317,650	35,744,744
<i>Less:</i>				
Crew and Captain Shares	8,353,821	4,617,017	1,327,060	14,297,898
Fishery Contribution	12,530,731	6,925,525	1,990,590	21,446,846
Vessel Fixed Expenses				
Insurance	240,000	240,000	244,000	724,000
Repairs & Maintenance	720,000	720,000	732,000	2,172,000
Moorage	72,000	72,000	73,200	217,200
Miscellaneous	120,000	120,000	122,000	362,000
Total Vessel Expenses	1,152,000	1,152,000	1,171,200	3,475,200
Earnings (EBITDA)	\$11,378,731	\$5,773,525	\$819,390	\$17,971,646

Summary & Sensitivities

Results for individual vessels are summarized as follows:

Summary - 30% Leased Quota	Top	Mid	Bottom
Landings (lbs)	111,595	61,997	18,599
Revenue	\$ 476,677	\$ 264,820	\$ 79,446
Variable Expenses	267,831	149,395	46,813
Fixed Expenses	19,200	19,200	19,200
EBITDA	189,646	96,225	13,433

Results are most sensitive to the assumption regarding the leasing of quota. Two variations are summarized below:

Summary - 60% Leased Quota	Top	Mid	Bottom
Landings (lbs)	111,595	61,997	18,599
Revenue	\$ 476,677	\$ 264,820	\$ 79,446
Variable Expenses	317,597	177,043	55,108
Fixed Expenses	19,200	19,200	19,200
EBITDA	139,879	68,578	5,138

A higher portion of leased fish has a significant negative impact on profitability.

Summary - No Leased Quota	Top	Mid	Bottom
Landings (lbs)	111,595	61,997	18,599
Revenue	\$ 476,677	\$ 264,820	\$ 79,446
Variable Expenses	218,065	121,747	38,519
Fixed Expenses	19,200	19,200	19,200
EBITDA	239,412	123,873	21,727

The “no lease” scenario reveals a dilemma associated with halibut quota ownership and fishing – that it is difficult to earn the same returns through fishing as it is through leasing (profit for an individual leasing out 90,000 pounds of halibut quota could receive \$270,000 in payment, more than the \$239,000 bottom line from fishing). If the owner and/or family members are operators, sharing in the crew earnings, however, total returns from actively fishing are enhanced and may exceed those from leasing.

Other Fishery Diversification

The following table provides a snapshot estimate of how the active halibut fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

The primary other activities conducted by active halibut vessels are troll salmon, tuna, and gillnet salmon. The table shows, for the active halibut fleet, the approximate number of vessels engaged in the troll salmon, tuna, and gillnet salmon fisheries, applying average per-vessel results for each of these fisheries.

Number of Vessels	181	30	25	15	
Halibut Fleet Include Other Fisheries	Halibut	Troll Salmon	Tuna	Gillnet Salmon	Total
Landings (lbs)	11,550,044	417,286	1,925,500	230,248	14,123,078
Vessel Price (per lb)	\$4.27	\$2.68	\$1.55	\$0.83	\$3.80
Gross Revenue (Gross Stock)	\$ 49,336,035	\$ 1,119,901	\$ 2,984,525	\$ 191,594	\$ 53,632,055
Less: Fishery Specific Expenses					
Fuel	1,240,625	176,552	378,337	67,468	1,862,981
At sea monitoring	2,682,988	27,103	12,500	14,990	2,737,581
Offload Monitor					
Licence / Co-management Fees					
Stacked licence/quota lease	8,584,654	150,000	-	-	8,734,654
Bait	902,524	-	-	-	902,524
Gear maintenance/replacement	180,500	-	39,583	-	220,083
Total Fishery Specific Expenses	13,591,291	353,655	430,420	82,457	14,457,823
Net Revenue (Net Stock)	35,744,744	766,247	2,554,105	109,137	39,174,232
<i>Less:</i>					
Crew and Captain Shares	14,297,898	209,540	1,149,347	-	15,656,785
Fishery Contribution	21,446,846	556,707	1,404,758	109,137	23,517,447
Vessel Fixed Expenses					
Insurance					724,000
Repairs & Maintenance					2,282,000
Moorage					217,200
Miscellaneous					362,000
Total Vessel Expenses					3,585,200
Earnings (EBITDA)					\$19,932,247

- Halibut is very much the core fishery, contributing the brunt of earnings. Other fisheries provide a relatively small contribution.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

1. The capital costs to acquire the vessel, gear, licences, and quotas required to mount the fishing operation.
2. The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets for vessels in each "tier." This assumes that assets are purchased/owned outright (that is, all quota is owned, none is leased). The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.

- An amortization calculation based on newly purchased assets.
- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Halibut Replacement Cost of Assets	90,000 lb Halibut Quota	50,000 lb Halibut Quota	15,000 lb Halibut Quota
Licence Cost	53,000	53,000	53,000
Quota	3,150,000	1,750,000	525,000
Vessel Cost	200,000	200,000	150,000
Replacement cost	3,403,000	2,003,000	728,000
Amortization (annual) @ 5%	170,150	100,150	36,400
Loan Considerations if 50% borrowed:			
Loan amount	1,701,500	1,001,500	364,000
Interest (1st year)	136,120	80,120	29,120
Principal (1st year, 15 yr amort)	113,433	66,767	24,267
1st year pmt (principal + interest):	249,553	146,887	53,387

Observations on the above schedule:

- Although earnings appear strong in the halibut fleet, they are not sufficient to support purchase and finance of 100% of the quota fished. This explains why many fishermen own a portion of their quota and supplement their holdings by leasing. Many active fishers' portfolio includes:
 - Quota received as an initial allocation (no cost).
 - Quota purchased since the initial allocation (substantial cost, but perhaps partially written-down).
 - Quota leased annually.
- Quota values are very high in the halibut fishery (assumed to be \$35/lb), with this valuation justified more by incremental returns for existing participants than by expected returns for new entrants.

Keys/Challenges to Success

Discussions with industry participants coupled with financial analysis yields the following factors that are important to ongoing commercial halibut fishery viability:

Financial Factors

- The volume of halibut fished has a large bearing on profitability. Since fixed costs are similar regardless of volume, more fish means higher profits.
- Optimizing the quantity and mix of other groundfish species is also important. As experience with the integrated groundfish program is gained, astute operators can bolster results significantly by exploiting the full range of opportunities.
- Learning to fish within trip limits and caps is critical to optimizing results.
- The amount of fish leased, and the lease rate, exerts a strong impact on results.

- Fuel costs for 2007 were substantially higher than prior years. Rates rose further in 2008, after which they eased (for what duration is unknown).
- The bottom line – operating cash flow less amortization and debt service payments – varies widely according to individual circumstances.

Other Factors

- The recreational/commercial fishery allocation arrangement is of grave concern to the commercial halibut fleet. Halibut fishermen feel strongly that the recreational sector must be held closely accountable for its catch, and annual overages must be addressed to ensure long term sustainable fisheries.
- The method for determining TACs for the BC fishery applied by the IHPC, particularly a new apportionment formula, is critically important to the industry. Marked reductions in the TAC, particularly in 2008, are linked to the new apportionment approach. BC fishermen are concerned that the approach must be fair and consistently applied.

Sablefish (K)

Fishery Overview

The BC sablefish fishery is managed under an Individual Vessel Quota management (IVQ) program. Individual quotas are expressed as a percentage of the overall TAC and issued annually in pounds. Individual quotas were initially endowed using a formula combining vessel length and production history. Since then there have been significant reallocations of IVQ amongst the fleet. Quota is divisible into one pound increments and is freely transferable, but a vessel must hold a K licence to hold quota or harvest sablefish.

Sablefish, a closely held category with only 48 licences (including 2 FKs), has for several years been one of BC's most lucrative fisheries, with strong market demand for frozen sablefish in Japan translating into high asset values and attractive returns to fishermen. A buoyant lease market also prevails.

The sablefish (K licence category) fishery features 100% electronic at-sea monitoring and landings validation, and is part of the pilot integrated groundfish program. The bulk of sablefish TAC is harvested by a relatively few large vessels using trap gear. Under groundfish integration, a growing number of vessels are utilizing longline gear and engaging in combination fishing (including sablefish, halibut, and rockfish).

Licensing Profile

Unlike fisheries like salmon, sablefish fishing may comprise a stand-alone activity that sustains a vessel and its crew. However, sablefish vessels hold many other licences, particularly in other groundfish categories (halibut and ZN). Sablefish vessels hold 2.6 other licences on average.

Other Fishery Licences	# Licences
K	46
Halibut	33
ZN	21
Tuna	16
Troll salmon	12
Trawl	11
Other	26
Non K licences	119

The following table confirms a high degree of diversification amongst the sablefish fleet – 33 vessels (72%) hold two or more other licences.

Licences/Vessel	# Vessels	% Vessels	# Other Licences
K only	2	4%	0
K + one lic	11	24%	11
K + two lic	10	22%	20
K + three or more lic	23	50%	88
Total K Vessels	46	100%	119

Landings Profile

Of the 46 K-licensed vessels, 33 recorded landings in 2007, though the landings pattern is highly skewed to a relatively few vessels in the top production tier:

Tier	Catch (lbs)	% Catch	Catch/ Vessel	# Vessels
Top 1/3	5,063,778	77%	460,343	11
Middle 1/3	1,174,046	18%	106,731	11
Bottom 1/3	338,085	5%	30,735	11
	6,575,909	100%	199,270	33

Vessels in the bottom tier are apparently those engaging in combination fishing with other groundfish categories (such as halibut and rockfish).

Financial Profiles

Key Assumptions

The following assumptions influence the results shown:

- Sablefish landings in j-cut pounds are derived from DFO stats; the amount of non-sablefish groundfish per vessel is a fleet-wide percentage applied against all profiles.
- A 2007 landings level of about 6.5 million pounds is assumed. Although the fishing season under the IFMP runs from August 1 through July 31, a 12-month landings level is attributed to calendar 2007.
- Prices are gained through research. The price for non-sablefish groundfish is a weighted average of the prices for halibut, rockfish, lingcod, and dogfish.
- Variable fishing costs are best estimations based on data collected.
- 30% of the sablefish landed by each vessel is assumed to be leased fish, for which a fee of \$2.50 per pound is levied. Other groundfish is leased in the same percentage at an average of \$0.30 per lb. In practice, the amount of fish leased by harvesters ranges from 0-100%.
- Crews receive 40% of the net value of the catch (after variable expenses are deducted).
- The type of vessel involved with sablefish is assumed to vary by production tier:
 - The top tier (11 vessels) is assumed to be large trap vessels that garner the majority of the TAC.
 - The middle 11 vessels are smaller trap/longline vessels.

- The bottom 11 vessels are longline vessels typically involved in other groundfish fisheries (eg halibut).

Thus, vessel overhead costs vary with production level.

There is no standard practice for leasing arrangements and crew settlements in the sablefish fishery, so the financial schedules shown could change dramatically with different assumptions.

Top Production Tier

Individual Vessel Profiles

Top Tier (1/3) Individual Vessel	Sablefish (K)	Other Groundfish	Total
Landings (lbs)	460,343	55,513	515,856
Vessel Price (per lb)	\$4.50	\$1.24	\$4.15
Gross Revenue (Gross Stock)	\$ 2,071,546	\$ 68,631	\$ 2,140,177
Less: Fishery Specific Expenses			
Fuel	131,527	-	131,527
At sea monitoring	18,414	-	18,414
Offload Monitor	3,453	416	3,869
Licence / Co-management Fees	161,120	-	161,120
Quota lease	345,258	4,996	350,254
Bait	92,069	-	92,069
Gear Maintenance/replace	11,200	-	11,200
Total Fishery Specific Expenses	763,040	5,412	768,452
Net Revenue (Net Stock)	1,308,506	63,219	1,371,724
<i>Less:</i>			
Crew and Captain Shares	523,402	25,287	548,690
Fishery Contribution	785,103	37,931	823,034
Vessel Fixed Expenses			
Insurance			15,000
Repairs & Maintenance			125,000
Moorage			2,000
Miscellaneous			10,000
Total Vessel Expenses			152,000
Earnings (EBITDA)			\$671,034

- The sablefish price was down somewhat in 2007. Price has a major impact on performance.
- Under assumptions used, "other groundfish" is a lower proportion of catch/contribution than in the halibut fleet. The sablefish fleet has been slower to embrace integration than some other groundfish fleets.
- Low catch rates in 2007 had a negative effect on fuel and monitoring costs (more fishing days to catch the quota means more fuel burned and higher overall electronic monitoring cost).

Middle Production Tier*Individual Vessel Profiles*

Middle Tier (1/3) Individual Vessel	Sablefish (K)	Other Groundfish	Total
Landings (lbs)	106,731	12,871	119,602
Vessel Price (per lb)	\$4.50	\$1.24	\$4.15
Gross Revenue (Gross Stock)	\$ 480,292	\$ 15,912	\$ 496,204
Fishery Specific Expenses			
Fuel	26,683	-	26,683
At sea monitoring	6,226	-	6,226
Offload Monitor	1,334	161	1,495
Licence / Co-management Fees	37,356	-	37,356
Quota Leases	80,049	1,158	81,207
Bait	21,346	-	21,346
Gear Maintenance/replace	11,200	-	11,200
Total Fishery Specific Expenses	184,194	1,319	185,513
Net Revenue (Net Stock)	296,098	14,593	310,691
<i>Less:</i>			
Crew and Captain Shares	118,439	5,837	124,276
Fishery Contribution	177,659	8,756	186,414
Vessel Fixed Expenses			
Insurance			8,000
Repairs & Maintenance			25,000
Moorage			1,200
Misc.			2,000
Total Vessel Expenses			36,200
Earnings (EBITDA)			\$150,214

- The sablefish price was down somewhat in 207. Price has a major impact on performance.
- Vessels in the middle production tier average less than ¼ of the landings in the top tier.

Bottom Production Tier*Individual Vessel Profiles*

Bottom Tier (1/3) Individual Vessel	Sablefish (K)	Other Groundfish	Total
Landings (lbs)	30,735	3,706	34,441
Vessel Price (per lb)	\$4.50	\$1.24	\$4.15
Gross Revenue (Gross Stock)	\$ 138,308	\$ 4,582	\$ 142,890
Fishery Specific Expenses			
Fuel	10,245	-	10,245
At sea monitoring	2,869	-	2,869
Offload Monitor	615	74	689
Licence / Co-management Fees	10,757	-	10,757
Quota Leases	23,051	334	23,385
Bait	6,147	-	6,147
Gear Maintenance/replace	11,200	-	11,200
Total Fishery Specific Expenses	64,884	408	65,291
Net Revenue (Net Stock)	73,424	4,174	77,598
<i>Less:</i>			
Crew and Captain Shares	29,369	1,670	31,039
Fishery Contribution	44,054	2,505	46,559
Vessel Fixed Expenses			
Insurance			4,000
Repairs & Maintenance			12,000
Moorage			1,200
Misc.			2,000
Total Vessel Expenses			19,200
Earnings (EBITDA)			\$27,359

Summary of Production Tiers – Individual Vessels*Sablefish and other groundfish aggregated*

Sablefish Fleet Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	515,856	119,602	34,441	223,300
Vessel Price (per lb)	\$4.15	\$4.15	\$4.15	\$4.15
Gross Revenue (Gross Stock)	\$ 2,140,177	\$ 496,204	\$ 142,890	\$ 926,423
Less: Fishery Specific Expenses				
Fuel	131,527	26,683	10,245	56,152
At sea monitoring	18,414	6,226	2,869	9,169
Offload Monitor	3,869	1,495	689	2,018
Licence / Co-management Fees	161,120	37,356	10,757	69,744
Licence/ Quota Lease	350,254	81,207	23,385	151,615
Bait	92,069	21,346	6,147	39,854
Gear maintenance/replacement	11,200	11,200	11,200	11,200
Total Fishery Specific Expenses	768,452	185,513	65,291	339,752
Net Revenue (Net Stock)	1,371,724	310,691	77,598	586,671
<i>Less:</i>				
Crew and Captain Shares	548,690	124,276	31,039	223,737
Fishery Contribution	823,034	186,414	46,559	362,934
Vessel Fixed Expenses				
Insurance	15,000	8,000	4,000	9,000
Repairs & Maintenance	125,000	25,000	12,000	54,000
Moorage	2,000	1,200	1,200	1,467
Miscellaneous	10,000	2,000	2,000	4,667
Total Vessel Expenses	152,000	36,200	19,200	69,133
Earnings (EBITDA)	\$671,034	\$150,214	\$27,359	\$293,801

- The sablefish fleet is composed of very distinct tiers.

Top Production Tier*Aggregate Vessel Profiles*

Number of Vessels	11		
Top Tier (1/3) Aggregate	Sablefish (K)	Other Groundfish	Total
Landings (lbs)	5,063,778	610,639	5,674,417
Vessel Price (per lb)	\$4.50	\$1.24	\$4.15
Gross Revenue (Gross Stock)	\$ 22,787,001	\$ 754,941	\$ 23,541,942
Less: Fishery Specific Expenses			
Fuel	1,446,794	-	1,446,794
At sea monitoring	202,551	-	202,551
Offload Monitor	37,978	4,580	42,558
Licence / Co-management Fees	1,772,322	-	1,772,322
Quota lease	3,797,834	54,958	3,852,791
Bait	1,012,760	-	1,012,760
Gear Maintenance/replace	123,200	-	123,200
Total Fishery Specific Expenses	8,393,439	59,537	8,452,976
Net Revenue (Net Stock)	14,393,562	695,404	15,088,966
Less:			
Crew and Captain Shares	5,757,425	-	5,757,425
Fishery Contribution	8,636,137	695,404	9,331,541
Vessel Fixed Expenses			
Insurance			165,000
Repairs & Maintenance			1,375,000
Moorage			22,000
Miscellaneous			110,000
Total Vessel Expenses			1,672,000
Earnings (EBITDA)			\$7,659,541

Middle Production Tier*Aggregate Vessel Profiles*

Number of Vessels	11		
Middle Tier (1/3) Aggregate	Sablefish (K)	Other Groundfish	Total
Landings (lbs)	1,174,046	141,578	1,315,624
Vessel Price (per lb)	\$4.50	\$1.24	\$4.15
Gross Revenue (Gross Stock)	\$ 5,283,207	\$ 175,034	\$ 5,458,241
Less: Fishery Specific Expenses			
Fuel	293,512	-	293,512
At sea monitoring	68,486	-	68,486
Offload Monitor	14,676	1,770	16,445
Licence / Co-management Fees	410,916	-	410,916
Quota lease	880,535	12,742	893,277
Bait	234,809	-	234,809
Gear Maintenance/replace	123,200	-	123,200
Total Fishery Specific Expenses	2,026,133	14,512	2,040,645
Net Revenue (Net Stock)	3,257,074	160,523	3,417,597
<i>Less:</i>			
Crew and Captain Shares	1,302,830	-	1,302,830
Fishery Contribution	1,954,244	160,523	2,114,767
Vessel Fixed Expenses			
Insurance			88,000
Repairs & Maintenance			275,000
Moorage			13,200
Miscellaneous			22,000
Total Vessel Expenses			398,200
Earnings (EBITDA)			\$1,716,567

Bottom Production Tier*Aggregate Vessel Profiles*

Number of Vessels	11		
Bottom Tier (1/3) Aggregate	Sablefish (K)	Other Groundfish	Total
Landings (lbs)	338,085	40,770	378,855
Vessel Price (per lb)	\$4.50	\$1.24	\$4.15
Gross Revenue (Gross Stock)	\$ 1,521,383	\$ 50,404	\$ 1,571,786
Less: Fishery Specific Expenses			
Fuel	112,695	-	112,695
At sea monitoring	31,555	-	31,555
Offload Monitor	6,762	815	7,577
Licence / Co-management Fees	118,330	-	118,330
Quota lease	253,564	3,669	257,233
Bait	67,617	-	67,617
Gear Maintenance/replace	123,200	-	123,200
Total Fishery Specific Expenses	713,722	4,485	718,206
Net Revenue (Net Stock)	807,661	45,919	853,580
<i>Less:</i>			
Crew and Captain Shares	323,064	-	323,064
Fishery Contribution	484,596	45,919	530,516
Vessel Fixed Expenses			
Insurance			44,000
Repairs & Maintenance			132,000
Moorage			13,200
Miscellaneous			22,000
Total Vessel Expenses			211,200
Earnings (EBITDA)			\$319,316

Summary of Three Production Tiers – Aggregate*Sablefish and other groundfish aggregated*

Number of Vessels:	11	11	11	33
Sablefish Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	5,674,417	1,315,624	378,855	7,368,896
Vessel Price (per lb)	\$4.15	\$4.15	\$4.15	\$4.15
Gross Revenue (Gross Stock)	\$ 23,541,942	\$ 5,458,241	\$ 1,571,786	\$ 30,571,970
Less: Fishery Specific Expenses				
Fuel	1,446,794	293,512	112,695	1,853,000
At sea monitoring	202,551	68,486	31,555	302,592
Offload Monitor	42,558	16,445	7,577	66,581
Licence / Co-management Fees	1,772,322	410,916	118,330	2,301,568
Licence/ Quota Lease	3,852,791	893,277	257,233	5,003,301
Bait	1,012,760	234,809	67,617	1,315,186
Gear maintenance/replacement	123,200	123,200	123,200	369,600
Total Fishery Specific Expenses	8,452,976	2,040,645	718,206	11,211,827
Net Revenue (Net Stock)	15,088,966	3,417,597	853,580	19,360,142
<i>Less:</i>				
Crew and Captain Shares	5,757,425	1,302,830	323,064	7,383,319
Fishery Contribution	9,331,541	2,114,767	530,516	11,976,824
Vessel Fixed Expenses				
Insurance	165,000	88,000	44,000	297,000
Repairs & Maintenance	1,375,000	275,000	132,000	1,782,000
Moorage	22,000	13,200	13,200	48,400
Miscellaneous	110,000	22,000	22,000	154,000
Total Vessel Expenses	1,672,000	398,200	211,200	2,281,400
Earnings (EBITDA)	\$7,659,541	\$1,716,567	\$319,316	\$9,695,424

Summary & Sensitivities

Results for individual vessels are summarized as follows:

Summary - 30% Leased Quota	Top	Mid	Bottom
Landings (lbs)	515,856	119,602	34,441
Revenue	\$ 2,140,177	\$ 496,204	\$ 142,890
Variable Expenses	1,317,142	309,789	96,331
Fixed Expenses	152,000	36,200	19,200
Cash Flow	671,034	150,214	27,359

Results are very sensitive to the assumption regarding the leasing of quota. Two variations are summarized below:

Summary - 60% Leased Quota	Top	Mid	Bottom
Landings (lbs)	515,856	119,602	34,441
Revenue	\$ 2,140,177	\$ 496,204	\$ 142,890
Variable Expenses	1,527,294	358,514	110,362
Fixed Expenses	152,000	36,200	19,200
Cash Flow	460,882	101,490	13,328

A higher portion of leased fish has a significant impact on profitability.

Summary - No Leased Quota	Top	Mid	Bottom
Landings (lbs)	515,856	119,602	34,441
Revenue	\$ 2,140,177	\$ 496,204	\$ 142,890
Variable Expenses	1,106,990	261,065	82,300
Fixed Expenses	152,000	36,200	19,200
Cash Flow	881,187	198,939	41,390

Note that the financial impact of a higher/lower percentage of leased fish is mitigated somewhat by the crew sharing assumption (40% of the net stock); the crew absorbs a portion of cost increases, and shares the benefit of cost reductions. Again, the crew sharing assumption used does not necessarily apply to the majority of the sablefish fleet.

Other Fishery Diversification

The following table provides a snapshot estimate of how the active sablefish fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

Halibut and tuna are the primary diversification activities. The table shows, for the active sablefish fleet, the approximate number of vessels engaged in the halibut, and tuna fisheries, applying average per-vessel results for each of these fisheries.

Number of Vessels	33	20	10	
Sablefish Fleet Include Other Fisheries	Sablefish	Halibut	Tuna	Total
Landings (lbs)	7,368,896	1,276,248	770,200	9,415,344
Vessel Price (per lb)	\$4.15	\$4.27	\$1.55	\$3.95
Gross Revenue (Gross Stock)	\$ 30,571,970	\$ 5,451,496	\$ 1,193,810	\$ 37,217,275
Less: Fishery Specific Expenses				
Fuel	1,853,000	137,086	151,335	2,141,421
At sea monitoring	2,670,740	296,463	5,000	2,972,203
Offload Monitor				
Licence / Co-management Fees				
Stacked licence/quota lease	5,003,301	948,581	-	5,951,881
Bait	1,315,186	99,726	-	1,414,913
Gear maintenance/replacement	369,600	19,945	15,833	405,378
Total Fishery Specific Expenses	11,211,827	1,501,800	172,168	12,885,796
Net Revenue (Net Stock)	19,360,142	3,949,695	1,021,642	24,331,480
Less:				
Crew and Captain Shares	7,383,319	1,579,878	459,739	9,422,936
Fishery Contribution	11,976,824	2,369,817	561,903	14,908,544
Vessel Fixed Expenses				
Insurance				297,000
Repairs & Maintenance		50,000	20,000	1,852,000
Moorage				48,400
Miscellaneous				154,000
Total Vessel Expenses				2,351,400
Earnings (EBITDA)				\$12,557,144

- The bulk of earnings for the sablefish fleet come from the core fishery, although a relatively high percentage (most likely the lower production tiers in the sablefish fleet) participate in other fisheries.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, licences, and quotas required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets for vessels in each "tier." This assumes that assets are purchased/owned outright (that is, all quota is owned, none is leased). The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.

- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Sablefish Replacement Cost of Assets	460,343 lb Sablefish Quota	106,731 lb Sablefish Quota	30,735 lb Sablefish Quota
Licence Cost	250,000	250,000	250,000
Quota	11,508,586	2,668,286	768,375
Vessel Cost	1,000,000	500,000	250,000
Replacement cost	12,758,586	3,418,286	1,268,375
Amortization (annual) @ 5%	637,929	170,914	63,419
Loan Considerations if 50% borrowed:			
Loan amount	6,379,293	1,709,143	634,188
Interest (1st year)	510,343	136,731	50,735
Principal (1st year, 15 yr amort)	425,286	113,943	42,279
1st year pmt (principal + interest):	935,630	250,674	93,014

Observations on the above schedule:

- Although earnings appear strong in the sablefish fleet, they are not sufficient to support purchase and finance of 100% of the quota fished. This explains why many fishermen own a portion of their quota and supplement their holdings by leasing. Many active fishers' portfolio includes:
 - Quota received as an initial allocation (no cost).
 - Quota purchased since the initial allocation (substantial cost, but perhaps partially written-down).
 - Quota leased annually.
- Quota values are high in the sablefish fishery (assumed to be \$25/lb), with this valuation justified more by incremental returns for existing participants than by expected returns for new entrants.

Keys/Challenges to Success

The following points emerged through consultations with participants in this fishery:

Financial Factors

- Fish price is a critical factor in profitability – the 2007 price was lower than prices seen previously (and since).
- The catch rate is an important factor – low daily catch rates mean that costs such as fuel and electronic monitoring rise on a per/lb basis. Catch rates seen in 2007 were on the low end of the range.
- The treatment of leases and crew settlement has a large bearing on the bottom line for vessel operations. There are a wide variety of practices in industry; the lease/crew settlement treatment assumed in the preceding financial schedules may be “generous” to the crews.

Other Factors

- The status of the sablefish stock has been a concern, as TACs have trended downward. Subsequently (late-2008) some positive signs, in ocean conditions and recruitment of young sablefish, have been reported.

Groundfish Trawl (T)

Fishery Overview

The BC groundfish trawl fishery is managed under an Individual Vessel Quota/Groundfish Development Authority (IVQ/GDA) program. Eighty percent of the quota is allocated directly to vessels (the initial formula combined production history with vessel length), while 20% flows to vessels based on “fit” with GDA criteria (a host of goals including community economic development and industry stability).

An array of species coupled with several management areas means that each T licence receives around 50 individual quotas. Quota is divisible into one pound increments and is freely transferable (subject to holdings caps), but a vessel must hold a T licence to hold groundfish quota or harvest groundfish trawl TACs. The fishery features 100% at-sea observer coverage and 100% offload monitoring.

The groundfish trawl comprises two reasonably distinct fisheries – groundfish (a host of bottom-fish species including rockfish, soles, and cod) and hake. Vessels tend to specialize in one fishery or another, though there is some overlap. Following several years of prosperity after IVQ/GDA plan implementation in 1997, the groundfish sector has experienced challenging times in recent years, strongly related to a strengthening Canadian dollar and rising fuel prices. Conversely, the hake sector, which struggled in the early 2000s, is experiencing good results driven by strong markets for white fish, and particularly, demand in Russia and China.

Participants in the groundfish trawl fishery pursue a wide range of strategies, with variety in:

- Size of vessels.
- Duration of trips.
- Frozen at sea or fresh.
- Round, headed & gutted, or filleted.
- Hake or groundfish.
- Areas fished – north/central/west coast/gulf.
- Target species - quota groundfish or non-quota groundfish; mix of species.

Because there are almost as many profiles as there are vessels in the groundfish trawl fleet, this analysis would bog down if it attempted to capture the variety of strategies in the fleet, and will therefore focus on showing average results for the groundfish trawl fleet, meaning fewer, more general, profiles.

Licensing Profile

Other categories of licence found on the T fleet are shown as follows:

Other Fishery Licences	# Licences
T	141
Roe herring seine	53
Shrimp	43
Salmon seine	26
Halibut	21
Tuna	16
Sablefish	11
Other	37
Non T licences	207

While trawling may provide a year-round opportunity, the trawl fleet also holds licences in a host of other fisheries. The majority of vessels (97, or 69%) hold at least one other fishing opportunity (below). However, few of the 43 shrimp licences aboard T-licensed vessels are active.

Licences/Vessel	# Vessels	Other Licences	% Vessels
T only	44	0	31%
T + one lic	36	36	26%
T + two lic	33	66	23%
T + three or more lic	28	105	20%
Total T Vessels	141	207	100%

Landings Profile

Out of 141 vessels, 48 were active in groundfish in 2007, and 38 in hake. As with other fisheries, the landings distribution is highly skewed, as shown in the two tables below:

Groundfish	Catch (lbs)	% Catch	Catch/ Vessel	# Vessels
Top 1/3	44,192,412	60%	2,762,026	16
Middle 1/3	22,376,041	30%	1,398,503	16
Bottom 1/3	7,308,468	10%	456,779	16
Total	73,876,922	100%	1,539,103	48

Hake	Catch (lbs)	% Catch	Catch/ Vessel	# Vessels
Top 1/3	92,019,682	63%	7,668,307	12
Middle 1/3	44,682,868	30%	3,437,144	13
Bottom 1/3	10,255,474	7%	788,883	13
Total	146,958,024	100%	42,999	38

Financial Profiles

Key Assumptions

- Landings are per DFO stats. Although the fishing season under the IFMP runs from April 1 through March 31, a 12-month landings level is attributed to calendar 2007.
- The groundfish trawl price (\$0.48/lb) is a weighted average of the estimated prices for each groundfish species (considering the species mix). The groundfish trawl species mix is composed of some high-value species, such as sablefish and thornyheads (idiots), and low value species such as arrowtooth flounder and pollock. The bulk of production comes from the core species groups of rockfish, soles, and cod.
- Hake fishery prices and costs are for the shore-based fishery, not the Joint Venture fishery (the JV fishery was small in 2007, and features a different price and cost structure for capturing vessels).
- 30% of the fish is assumed to be leased at a rate of 6 cents/lb. The rate is the same for groundfish and hake, representing a historic low for groundfish and a high for hake. In practice, the amount of fish leased by harvesters ranges from 0-100%.
- Crew and captain shares are 50% of the net stock for groundfish, 45% for hake. In fact, there are a wide variety of settlement arrangements used in the fishery.
- Vessel fixed expenses are linked to the level of landings; it is assumed that the top tier boats are larger and fish more trips (thus incurring higher maintenance expenditures) than the middle and bottom tier craft.

Groundfish

Individual Vessel Profiles

Groundfish Trawl Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	2,762,026	1,398,503	456,779	1,539,103
Vessel Price (per lb)	\$0.48	\$0.48	\$0.48	\$0.48
Gross Revenue (Gross Stock)	\$ 1,325,772	\$ 671,281	\$ 219,254	\$ 738,769
Less: Fishery Specific Expenses				
Fuel	300,000	175,000	60,000	178,333
At sea monitoring	51,788	26,222	8,565	28,858
Offload Monitor	13,810	6,993	2,284	7,696
Licence / Co-management Fees	28,000	14,000	5,000	15,667
Licence/ Quota Lease	49,716	25,173	8,222	27,704
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	443,315	247,388	84,071	258,258
Net Revenue (Net Stock)	882,458	423,894	135,183	480,512
<i>Less:</i>				0
Crew and Captain Shares	441,229	211,947	67,592	240,256
Fishery Contribution	441,229	211,947	67,592	240,256
Vessel Fixed Expenses				0
Insurance	15,000	15,000	15,000	15,000
Repairs & Maintenance	150,000	125,000	50,000	108,333
Moorage	2,000	2,000	2,000	2,000
Miscellaneous	5,000	5,000	5,000	5,000
Total Vessel Expenses	172,000	147,000	72,000	130,333
Earnings (EBITDA)	\$269,229	\$64,947	-\$4,408	\$109,923

- With high fuel prices and low fish prices, 2007 was a challenging year for groundfish trawlers. Financial returns, considering the high volume of fish, year round fishery, and wear-and-tear on vessels and equipment, were marginal.

Hake*Individual Vessel Profiles*

Hake Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	7,668,307	3,437,144	788,883	3,867,317
Vessel Price (per lb)	\$0.16	\$0.16	\$0.16	\$0.16
Gross Revenue (Gross Stock)	\$ 1,226,929	\$ 549,943	\$ 126,221	\$ 618,771
Less: Fishery Specific Expenses				
Fuel	281,171	166,947	47,333	162,097
At sea monitoring	7,668	5,892	1,893	5,085
Offload Monitor	38,342	17,186	3,944	19,337
Licence / Co-management Fees	15,000	7,500	2,000	7,987
Licence/ Quota Lease	138,030	61,869	14,200	69,612
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	480,211	259,394	69,371	264,117
Net Revenue (Net Stock)	746,718	290,549	56,851	354,653
<i>Less:</i>				0
Crew and Captain Shares	336,023	130,747	25,583	159,594
Fishery Contribution	410,695	159,802	31,268	195,059
Vessel Fixed Expenses				0
Insurance	15,000	15,000	15,000	15,000
Repairs & Maintenance	150,000	125,000	50,000	107,237
Moorage	2,000	2,000	2,000	2,000
Miscellaneous	5,000	5,000	5,000	5,000
Total Vessel Expenses	172,000	147,000	72,000	129,237
Earnings (EBITDA)	\$238,695	\$12,802	-\$40,732	\$65,822

- The 2007 fishery had the promise of strong profitability, as prices were at historic levels. Fish catch-ability was challenging, however, meaning vessels had to travel further to find suitable fish densities.
- Vessels in the bottom production tier are likely involved in other fisheries, usually trawling for bottom-fish.

Groundfish*Aggregate Vessel Profiles*

Number of Vessels:	16	16	16	48
Groundfish Trawl Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	44,192,416	22,376,048	7,308,464	73,876,928
Vessel Price (per lb)	\$0.48	\$0.48	\$0.48	\$0.48
Gross Revenue (Gross Stock)	\$ 21,212,360	\$ 10,740,503	\$ 3,508,063	\$ 35,460,925
Less: Fishery Specific Expenses				
Fuel	4,800,000	2,800,000	960,000	8,560,000
At sea monitoring	828,608	419,551	137,034	1,385,192
Offload Monitor	220,962	111,880	36,542	369,385
Licence / Co-management Fees	448,000	224,000	80,000	752,000
Licence/ Quota Lease	795,463	402,769	131,552	1,329,785
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	7,093,033	3,958,200	1,345,128	12,396,362
Net Revenue (Net Stock)	14,119,326	6,782,303	2,162,934	23,064,564
<i>Less:</i>				
Crew and Captain Shares	7,059,663	3,391,152	1,081,467	11,532,282
Fishery Contribution	7,059,663	3,391,152	1,081,467	11,532,282
Vessel Fixed Expenses				
Insurance	240,000	240,000	240,000	720,000
Repairs & Maintenance	2,400,000	2,000,000	800,000	5,200,000
Moorage	32,000	32,000	32,000	96,000
Miscellaneous	80,000	80,000	80,000	240,000
Total Vessel Expenses	2,752,000	2,352,000	1,152,000	6,256,000
Earnings (EBITDA)	\$4,307,663	\$1,039,152	-\$70,533	\$5,276,282

Hake*Aggregate Vessel Profiles*

Number of Vessels:	12	13	13	38
Hake Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	92,019,684	44,682,872	10,255,479	146,958,035
Vessel Price (per lb)	\$0.16	\$0.16	\$0.16	\$0.16
Gross Revenue (Gross Stock)	\$ 14,723,149	\$ 7,149,260	\$ 1,640,877	\$ 23,513,286
Less: Fishery Specific Expenses				
Fuel	3,374,055	2,170,311	615,329	6,159,695
At sea monitoring	92,020	76,599	24,613	193,232
Offload Monitor	460,098	223,414	51,277	734,790
Licence / Co-management Fees	180,000	97,500	26,000	303,500
Licence/ Quota Lease	1,656,354	804,292	184,599	2,645,245
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	5,762,527	3,372,116	901,818	10,036,462
Net Revenue (Net Stock)	8,960,622	3,777,143	739,059	13,476,824
<i>Less:</i>				
Crew and Captain Shares	4,032,280	1,699,714	332,576	6,064,571
Fishery Contribution	4,928,342	2,077,429	406,482	7,412,253
Vessel Fixed Expenses				
Insurance	180,000	195,000	195,000	570,000
Repairs & Maintenance	1,800,000	1,625,000	650,000	4,075,000
Moorage	24,000	26,000	26,000	76,000
Miscellaneous	60,000	65,000	65,000	190,000
Total Vessel Expenses	2,064,000	1,911,000	936,000	4,911,000
Earnings (EBITDA)	\$2,864,342	\$166,429	-\$529,518	\$2,501,253

Other Fishery Diversification

The dedicated groundfish trawl and hake fleets – those in the top and middle production tiers - tend to focus exclusively on their core fisheries. It is primarily vessels in the bottom production tier that participate in other fisheries to supplement income and offset expenses. In some cases, these groundfish vessels also participate in hake, and vice versa.

The primary non-groundfish/hake fisheries conducted by the T-licence fleet are salmon seine and roe herring seine. In the case of the roe herring fishery, T-licensed vessels may be licensed in the fishery, but not actively participating (except, perhaps, in packing).

Because of the large number of combinations & permutations, and low impact, trawl diversification is not explicitly shown in this analysis.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, licences, and quotas required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets in both groundfish and hake. This assumes that assets are purchased/owned outright (that is, all quota is owned, none is leased). The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.
- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Groundfish Trawl Replacement Cost of Assets	2,762,026 lb Groundfish Quota	1,398,503 lb Groundfish Quota	456,779 lb Groundfish Quota
Licence Cost	90,000	90,000	90,000
Quota	3,866,836	1,957,904	639,491
Vessel Cost	1,000,000	500,000	500,000
Replacement cost	4,956,836	2,547,904	1,229,491
Amortization (annual) @ 5%	247,842	127,395	61,475
Loan Considerations if 50% borrowed:			
Loan amount	2,478,418	1,273,952	614,745
Interest (1st year)	198,273	101,916	49,180
Principal (1st year, 15 yr amort)	165,228	84,930	40,983
1st year pmt (principal + interest):	363,501	186,846	90,163

Hake Replacement Cost of Assets	7,668,307 lb Hake Quota	3,437,144 lb Hake Quota	788,883 lb Hake Quota
Licence Cost	90,000	90,000	90,000
Quota	4,600,984	2,062,286	473,330
Vessel Cost	1,000,000	500,000	500,000
Replacement cost	5,690,984	2,652,286	1,063,330
Amortization (annual) @ 5%	284,549	132,614	53,166
Loan Considerations if 50% borrowed:			
Loan amount	2,845,492	1,326,143	531,665
Interest (1st year)	227,639	106,091	42,533
Principal (1st year, 15 yr amort)	189,699	88,410	35,444
1st year pmt (principal + interest):	417,339	194,501	77,978

Observations on the above schedule:

- Although earnings are modest in the trawl fleet, they are not sufficient to support purchase and finance of 100% of the quota fished. This explains why many fishermen own a portion of their quota and supplement their holdings by leasing. Many active fishers' portfolio includes:
 - Quota received as an initial allocation (no cost).
 - Quota purchased since the initial allocation (substantial cost, but perhaps partially written-down).
 - Quota leased annually.
- Quota values have dropped in the groundfish sector in recent years by 50% - from over \$3.00/lb to about \$1.50, reflecting the low-revenue/high-cost operating environment prevailing in 2007.

Keys/Challenges to Success

Financial Factors

Groundfish

- With most product exported to the west coast of the USA (known as the I5 Corridor), the Canada-USA currency exchange rate is a key factor driving prices. The escalation in Canadian dollar value hurt BC groundfish prices significantly in 2007.
- Rising fuel costs also have a large bearing on costs.
- With quota actively leased amongst active vessels, it is important that lease rates be meshed with the current economics of the fishery. In 2007, the lease rate for groundfish was reasonable.
- Crew sharing arrangements have a strong influence on returns to both crew members and vessel owners.

Hake

- The price of hake is a key determinant of profitability. 2007 saw very high prices for the shore-based trawl fleet, resulting from strong demand in the Eastern Bloc and China.
- The location of hake stocks, and the timing of their arrival in BC waters, is also key. The "traditional" location off the coast of San Juan/Ucluelet with arrival in May allows highly economic operations (a 4-5 month season, and minimal travel time to an offloading port). In 2007 the fish did not arrive in the preferred location until early fall, necessitating "scratch" fisheries in Queen Charlotte Sound, with resultant lower efficiency and higher cost for much of the season.
- Fuel is a major expense in the hake fishery.

Other Factors

- Certain stocks targeted or encountered by the groundfish fleet (for example, bocaccio) are in the COSEWIC/SARA listing process. That a thorough and objective scientific and socio-economic review be conducted for each potential listing is critical to this fishery.

Prawn (W)

Fishery Overview

The BC prawn fishery is a competitive trap fishery, managed using time and area closures along with trap limits and other measures. “W” licenses are vessel based, subject to strict vessel replacement regulations. In-season trap stacking is allowed in the fishery, with vessels stacking allowed 200 traps in addition to the standard 300 trap limit.

BC spot prawns have traditionally commanded high prices in Japan, where the bulk of the BC catch is marketed in whole frozen form. The BC spot prawn resource is considered healthy, and catches have been on a gradually rising trend. This has translated into strong returns for BC prawn fishermen. As catches have risen, however, the length of the season has declined. The majority of the harvest takes place in the first four weeks of the season; this hampers development of live or fresh markets. The Japanese market in 2007 was soft, also, with prices earned by BC fishermen down from prior-year levels.

Short seasons, softening markets, and other issues have caused the prawn industry to consider initiatives such as fishery reform and new marketing approaches to assure continued sustainability and viability of the fishery.

Although now facing some significant challenges, asset values in the prawn fishery are high relative to other licence categories, with licences averaging about \$500,000 each.

Licensing Profile

The following table shows the non-prawn licence categories found on the W fleet:

Number of Licences	# Licences
W	243
Troll salmon	47
Halibut	31
Tuna	24
Shrimp	19
Crab	18
ZN	17
Other	46
Non W licences	202

Over half of prawn-licensed vessels actively fishing have only a W licence (58%), and only 21% hold two or more additional fishery categories:

Licences/Vessel	# Vessels	% Vessels
W only	114	58%
W + one lic	44	22%
W + two lic	17	9%
W + three or more lic	23	12%
Total W Vessels	198	100%

The number of active vessels in the prawn fleet (excluding Fs) is 198 vessels. The majority of vessels recording no landings are those that leased-out their licences for the purposes of trap stacking. The prawn sector has become rather specialized, with many prawn purpose-built vessels commissioned in the last few years.

Landings Profile

The following table shows prawn landings according to the number/category of licences on vessels:

Licences/Vessel	# Vessels	% Vessels	Catch	% Catch	Catch/ Vessel
W only	114	58%	2,719,478	53%	23,855
W + one lic	44	22%	1,106,421	22%	25,146
W + two lic	17	9%	480,298	9%	28,253
W + three or more lic	23	12%	787,613	15%	34,244
Total W Vessels	198	100%	5,093,810	100%	25,726

The catch per vessel rises along with the number of licences on the vessel, suggesting:

- Other fishery opportunities do not crimp prawn fishing, as the prawn season is relatively short, and, occurring in the late spring, seldom overlaps with other fisheries.
- Multi-licensed vessels/fishermen tend to be the most productive, perhaps reflecting high-quality equipment, large investment in the industry, and a strong work ethic.

The next table shows the breakdown of catch between vessels fishing 300 traps and those stacking an additional licence (200 traps).

Prawn Fleet	Catch (lbs)	% Catch	Catch/ Vessel	# Vessels
300 Traps	4,003,304	79%	22,876	175
500 Traps	1,090,506	21%	47,413	23
Prawn Total	5,093,810	100%	25,726	198

A relatively few vessels opt for 500 traps, and these vessels are disproportionately productive. The breakdown (by production tier) of both the 300-trap and 500-trap segments are shown in the following two tables:

300 Traps	Catch (lbs)	% Catch	Catch/ Vessel	# Vessels
Top 1/3	1,919,068	48%	33,087	58
Middle 1/3	1,346,479	34%	23,215	58
Bottom 1/3	737,757	18%	12,504	59
300 Traps	4,003,304	100%	22,876	175

500 Traps	Catch (lbs)	% Catch	Catch/ Vessel	# Vessels
Top 1/3	479,132	44%	68,447	7
Middle 1/3	374,539	34%	46,817	8
Bottom 1/3	236,835	22%	29,604	8
500 Traps	1,090,506	100%	47,413	23

The catch distribution in the prawn fleet is less skewed than in other fisheries examined thus-far.

Possible causes for this tighter distribution are:

- The vessels in the bottom tier are less “part-time” than may be the case for marginal fisheries such as salmon. A higher proportion of vessels in this fleet tend to fully engage in the fishery.
- The fishery has attracted professional fishermen; as the general skill and investment level of the fleet rises, there is less differentiation between the top and the bottom. This is evidenced in the 500-trap segment, where the catch distribution is least-skewed.

Financial Profiles

Key Assumptions

- Prawn landings per DFO stats; prices per research. The 2007 price/lb was down substantially from levels enjoyed in the preceding seasons. In practice prices may vary according to market outlet (live, frozen) and timing of sales.
- In the 500 trap scenario, it is assumed that the stacked licence is leased at a charge of \$30,000.
- Crew/captain shares at 35% of the gross stock. There is no standard settlement practice so a host of assumptions could apply.
- Vessel fixed expenses are the same regardless of production level.

Individual Vessel Profiles

Prawn Fleet Individual Vessels	300 Traps Top 1/3	300 Traps Middle 1/3	300 Traps Bottom 1/3	500 Traps Average	Fleet Average
Landings (lbs)	33,000	23,000	12,500	47,500	25,646
Vessel Price (per lb)	\$5.50	\$5.50	\$5.50	\$5.50	\$5.50
Gross Revenue (Gross Stock)	\$ 181,500	\$ 126,500	\$ 68,750	\$ 261,250	\$ 141,056
Less: Fishery Specific Expenses					
Fuel	10,000	7,500	7,500	12,000	8,755
At sea monitoring	3,300	3,300	3,300	6,600	3,683
Offload Monitor					
Licence / Co-management Fees					
Stacked licence lease	-	-	-	30,000	3,485
Bait	8,000	8,000	6,000	12,000	7,869
Gear maintenance/replacement	3,500	3,500	3,500	4,500	3,616
Total Fishery Specific Expenses	24,800	22,300	20,300	65,100	27,408
Net Revenue (Net Stock)	156,700	104,200	48,450	196,150	113,647
Less:					
Crew and Captain Shares	63,525	44,275	24,063	91,438	49,369
Fishery Contribution	93,175	59,925	24,388	104,713	64,278
Vessel Fixed Expenses					
Insurance	5,000	5,000	5,000	5,000	5,000
Repairs & Maintenance	12,000	12,000	12,000	12,000	12,000
Moorage	1,200	1,200	1,200	1,200	1,200
Miscellaneous	2,000	2,000	2,000	2,000	2,000
Total Vessel Expenses	20,200	20,200	20,200	20,200	20,200
Earnings (EBITDA)	\$72,975	\$39,725	\$4,188	\$84,513	\$44,078

- While still profitable, the decline in ex-vessel price moderated results in 2007. Prices in prior years were in the \$7.00-\$9.00 range.
- Fuel and bait charges vary widely according to fishing strategies – some operators bait much more heavily than other, some run their vessels faster/more frequently than others. Values used are deemed reflective of averages for the tier.

Aggregate Vessel Profiles

Number of Vessels:	58	58	59	23	198
Prawn Fleet Totals	300 Traps Top 1/3	300 Traps Middle 1/3	300 Traps Bottom 1/3	500 Traps Average	Total
Landings (lbs)	1,914,000	1,334,000	737,500	1,092,500	5,078,000
Vessel Price (per lb)	\$5.50	\$5.50	\$5.50	\$5.50	\$5.50
Gross Revenue (Gross Stock)	\$ 10,527,000	\$ 7,337,000	\$ 4,056,250	\$ 6,008,750	\$ 27,929,000
Less: Fishery Specific Expenses					
Fuel	580,000	435,000	442,500	276,000	1,733,500
At sea monitoring	191,400	191,400	194,700	151,800	729,300
Offload Monitor					
Licence / Co-management Fees					
Stacked licence lease	-	-	-	690,000	690,000
Bait	464,000	464,000	354,000	276,000	1,558,000
Gear maintenance/replacement	203,000	203,000	206,500	103,500	716,000
Total Fishery Specific Expenses	1,438,400	1,293,400	1,197,700	1,497,300	5,426,800
Net Revenue (Net Stock)	9,088,600	6,043,600	2,858,550	4,511,450	22,502,200
<i>Less:</i>					
Crew and Captain Shares	3,684,450	2,567,950	1,419,688	2,103,063	9,775,150
Fishery Contribution	5,404,150	3,475,650	1,438,863	2,408,388	12,727,050
Vessel Fixed Expenses					
Insurance	290,000	290,000	295,000	115,000	990,000
Repairs & Maintenance	696,000	696,000	708,000	276,000	2,376,000
Moorage	69,600	69,600	70,800	27,600	237,600
Miscellaneous	116,000	116,000	118,000	46,000	396,000
Total Vessel Expenses	1,171,600	1,171,600	1,191,800	464,600	3,999,600
Earnings (EBITDA)	\$4,232,550	\$2,304,050	\$247,063	\$1,943,788	\$8,727,450

Other Fishery Diversification

The following table provides a snapshot estimate of how the active prawn fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

Troll salmon, halibut, and tuna are key diversification activities, for a relatively few prawn vessels. The table shows, for the active prawn fleet, the approximate number of vessels engaged in the troll salmon, halibut, and tuna fisheries, applying average per-vessel results for each of these fisheries.

Number of Vessels	198	15	15	15	
Prawn Fleet Include Other Fisheries	Prawn	Troll Salmon	Halibut	Tuna	Total
Landings (lbs)	5,078,000	208,643	957,186	1,155,300	7,399,129
Vessel Price (per lb)	\$5.50	\$2.68	\$4.27	\$1.55	\$4.64
Gross Revenue (Gross Stock)	\$ 27,929,000	\$ 559,951	\$ 4,088,622	\$ 1,790,715	\$ 34,368,287
Less: Fishery Specific Expenses					
Fuel	1,733,500	88,276	102,814	227,002	2,151,592
At sea monitoring	729,300	13,551	222,347	7,500	972,699
Offload Monitor					
Licence / Co-management Fees					
Stacked licence/quota lease	690,000	75,000	711,435	-	1,476,435
Bait	1,558,000	-	74,795	-	1,632,795
Gear maintenance/replacement	716,000	-	14,959	23,750	754,709
Total Fishery Specific Expenses	5,426,800	176,827	1,126,350	258,252	6,988,229
Net Revenue (Net Stock)	22,502,200	383,123	2,962,272	1,532,463	27,380,058
Less:					
Crew and Captain Shares	9,775,150	104,770	1,184,909	689,608	11,754,437
Fishery Contribution	12,727,050	278,353	1,777,363	842,855	15,625,621
Vessel Fixed Expenses					
Insurance					990,000
Repairs & Maintenance					2,481,000
Moorage					237,600
Miscellaneous					396,000
Total Vessel Expenses					4,104,600
Earnings (EBITDA)					\$11,521,021

- The prawn industry generally was chagrined with results in 2007. A sharp drop in fish price strongly impacted results.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, and licences required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets in the prawn fishery. The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.

- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Prawn Replacement Cost of Assets	Prawn Vessel & Licence
Licence Cost	511,000
Vessel Cost	275,000
Replacement cost	786,000
Amortization (annual) @ 5%	39,300
Loan Considerations if 50% borrowed:	
Loan amount	393,000
Interest (1st year)	31,440
Principal (1st year, 15 yr amort)	26,200
1st year pmt (principal + interest):	57,640

Observations on the above schedule:

- The highest-producing prawn fishermen could service a new investment in licence and equipment according to the assumptions used, but the bulk of the fleet could not. Financial performance for the fleet in 2007 was down appreciably from prior years' results.
- Most prawn fishermen have substantially written down their investments, though a significant number of newer vessels are in operation.

Keys/Challenges to Success

Financial Factors

- Fish price is a key, with the 2007 price haven fallen from prior years' levels (note: the 2008 price failed to rebound).
- Fuel is an important cost factor.

Other Factors

- The prawn sector is exploring means of improving quality, lengthening the season, and improving marketability of the product. This could include fishery reform and a cooperative marketing program.

Crab (R)

Fishery Overview

The BC crab fishery is a competitive trap fishery managed under an area licensing regime. The coast is divided into seven areas, and each licence can operate in a single area. There is no licence stacking permitted. Periodic area re-selection is allowed (generally every three years); this allows a measure of flexibility for fishermen, but also undermines stability and long term planning, since the number of licences in a given area may vary substantially.

The Hecate Strait fishery – Area A – is the predominant area in terms of landings, and is characterized by larger vessels and higher trap limits than Areas B through J. The other areas feature much lower landing levels in aggregate and per vessel, but may provide fishermen with more lucrative marketing opportunities (access to local live markets).

Dungeness crab is marketed mostly live, but also in frozen and cooked/section form. Economics in the crab fishery have been generally strong, though periodic dips in production (crab catches are cyclical) and in market prices influence results.

Licensing Profile

Crab is perhaps the least diversified licence category, with only 52 non-crab licences aboard the 205 crab-licensed vessels (F licences excluded).

Other Fishery Licences	# Licences
R	205
Prawn	18
Halibut	11
ZN	8
Troll salmon	4
Gillnet salmon	3
Shrimp	3
Other	5
Non R licences	52

The breakdown of vessels according to the number of licences per vessel is as follows:

Licences/Vessel	# Vessels	% Vessels
R only	164	80%
R + one lic	32	16%
R + two lic	7	3%
R + three lic	2	1%
Total R Vessels	205	100%

Likely reasons for the low degree of diversification in the crab fleet are that the fishery tends to occur over several months, and vessels are often built specifically for crab fishing (not suited to other

fisheries). Additionally, crab fishery incomes have often been sufficient to sustain vessels and operators for an entire year. The participation level is very high, with virtually all of the licences in the R fleet active during the 2007 season.

Landings Profile

For the purposes of this analysis, the crab fleet is divided into two segments: Area A, and all other areas. The landings stratification for these segments is as follows:

Area A	# Vessels	Catch (lbs)	Catch/Vessel	% Catch
Top 1/3	17	4,823,501	283,735	59%
Middle 1/3	17	2,261,652	133,038	28%
Bottom 1/3	17	1,102,083	64,828	13%
	51	8,187,236	160,534	100%

Areas B-J	# Vessels	Catch (lbs)	Catch/Vessel	% Catch
Top 1/3	52	3,347,216	64,370	61%
Middle 1/3	52	1,444,529	27,779	26%
Bottom 1/3	52	686,136	13,195	13%
	156	5,477,881	35,115	100%

The average catch in the Area A segment is 160,000 pounds for 2007, while the Areas B-J tally is 35,000 pounds. The Area A fleet, composed of about 25% of the coastal crab fleet, produced 60% of the harvest. The catch is quite highly skewed within both segments, suggesting some fishermen at the low end of the production scale are part-time. At the high end, operators who work hard (and effectively) over a long season tend to distinguish themselves from the pack.

Financial Profiles

Key Assumptions

- Landings per DFO stats.
- Fish prices per research.
- Crew shares @ 45% of the net stock for Area A, and 25% of the gross stock for Areas B-J. There are a wide variety of settlement arrangements in the fishery.
- The Area A top and middle production tiers are the “big boats” in the crab fleet and have the same fixed cost structure. The bottom tier of Area A and the Areas B-J fleet are assumed to have a similar (lower) cost structure.

Area A

Individual Vessel Profiles

Area A Crab Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	285,000	133,000	65,000	161,000
Vessel Price (per lb)	\$2.25	\$2.25	\$2.25	\$2.25
Gross Revenue (Gross Stock)	\$ 641,250	\$ 299,250	\$ 146,250	\$ 362,250
Less: Fishery Specific Expenses				
Fuel	105,000	78,750	35,000	72,917
At sea monitoring	5,500	5,000	3,500	4,667
Offload Monitor				
Licence / Co-management Fees	590	590	590	590
Licence/ Quota Lease	-	-	-	-
Bait	70,000	52,500	35,000	52,500
Gear maintenance/replacement	20,000	15,000	7,500	14,167
Total Fishery Specific Expenses	201,090	151,840	81,590	144,840
Net Revenue (Net Stock)	440,160	147,410	64,660	217,410
Less:				
Crew and Captain Shares	198,072	66,335	29,097	97,835
Fishery Contribution	242,088	81,076	35,563	119,576
Vessel Fixed Expenses				
Insurance	10,000	10,000	5,000	8,333
Repairs & Maintenance	50,000	50,000	20,000	40,000
Moorage	2,000	2,000	1,200	1,733
Miscellaneous	5,000	3,000	2,500	3,500
Total Vessel Expenses	67,000	65,000	28,700	53,567
Earnings (EBITDA)	\$175,088	\$16,076	\$6,863	\$66,009

Areas B-J

Individual Vessel Profiles

Areas B-J Crab Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	64,000	28,000	13,000	35,000
Vessel Price (per lb)	\$2.75	\$2.75	\$2.75	\$2.75
Gross Revenue (Gross Stock)	\$ 176,000	\$ 77,000	\$ 35,750	\$ 96,250
Less: Fishery Specific Expenses				
Fuel	14,000	14,000	8,000	12,000
At sea monitoring	2,500	2,500	2,500	2,500
Offload Monitor				
Licence / Co-management Fees	590	590	590	590
Licence/ Quota Lease	-	-	-	-
Bait	5,000	5,000	3,000	4,333
Gear maintenance/replacement	4,000	4,000	2,000	3,333
Total Fishery Specific Expenses	26,090	26,090	16,090	22,757
Net Revenue (Net Stock)	149,910	50,910	19,660	73,493
Less:				
Crew and Captain Shares	44,000	19,250	8,938	24,063
Fishery Contribution	105,910	31,660	10,723	49,431
Vessel Fixed Expenses				
Insurance	5,000	5,000	5,000	5,000
Repairs & Maintenance	10,000	10,000	10,000	10,000
Moorage	1,200	1,200	1,200	1,200
Miscellaneous	2,500	2,500	2,500	2,500
Total Vessel Expenses	18,700	18,700	18,700	18,700
Earnings (EBITDA)	\$87,210	\$12,960	-\$7,978	\$30,731

Area A

Aggregate Vessel Profiles

Number of Vessels	17	17	17	51
Area A Crab Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	4,845,000	2,261,000	1,105,000	8,211,000
Vessel Price (per lb)	\$2.25	\$2.25	\$2.25	\$2.25
Gross Revenue (Gross Stock)	\$ 10,901,250	\$ 5,087,250	\$ 2,486,250	\$ 18,474,750
Less: Fishery Specific Expenses				
Fuel	1,785,000	1,338,750	595,000	3,718,750
At sea monitoring	93,500	85,000	59,500	238,000
Offload Monitor				
Licence / Co-management Fees	10,030	10,030	10,030	30,090
Licence/ Quota Lease	-	-	-	-
Bait	1,190,000	892,500	595,000	2,677,500
Gear maintenance/replacement	340,000	255,000	127,500	722,500
Total Fishery Specific Expenses	3,418,530	2,581,280	1,387,030	7,386,840
Net Revenue (Net Stock)	7,482,720	2,505,970	1,099,220	11,087,910
Less:				
Crew and Captain Shares	3,367,224	1,127,687	494,649	4,989,560
Fishery Contribution	4,115,496	1,378,284	604,571	6,098,351
Vessel Fixed Expenses				
Insurance	170,000	170,000	85,000	425,000
Repairs & Maintenance	850,000	850,000	340,000	2,040,000
Moorage	34,000	34,000	20,400	88,400
Miscellaneous	85,000	51,000	42,500	178,500
Total Vessel Expenses	1,139,000	1,105,000	487,900	2,731,900
Earnings (EBITDA)	\$2,976,496	\$273,284	\$116,671	\$3,366,451

Areas B-J

Aggregate Vessel Profiles

Number of Vessels:	52	52	52	156
Areas B-J Crab Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	3,328,000	1,456,000	676,000	5,460,000
Vessel Price (per lb)	\$2.75	\$2.75	\$2.75	\$2.75
Gross Revenue (Gross Stock)	\$ 9,152,000	\$ 4,004,000	\$ 1,859,000	\$ 15,015,000
Less: Fishery Specific Expenses				
Fuel	728,000	728,000	416,000	1,872,000
At sea monitoring	130,000	130,000	130,000	390,000
Offload Monitor				
Licence / Co-management Fees	30,680	30,680	30,680	92,040
Licence/ Quota Lease	-	-	-	-
Bait	260,000	260,000	156,000	676,000
Gear maintenance/replacement	208,000	208,000	104,000	520,000
Total Fishery Specific Expenses	1,356,680	1,356,680	836,680	3,550,040
Net Revenue (Net Stock)	7,795,320	2,647,320	1,022,320	11,464,960
Less:				
Crew and Captain Shares	2,288,000	1,001,000	464,750	3,753,750
Fishery Contribution	5,507,320	1,646,320	557,570	7,711,210
Vessel Fixed Expenses				
Insurance	260,000	260,000	260,000	780,000
Repairs & Maintenance	520,000	520,000	520,000	1,560,000
Moorage	62,400	62,400	62,400	187,200
Miscellaneous	130,000	130,000	130,000	390,000
Total Vessel Expenses	972,400	972,400	972,400	2,917,200
Earnings (EBITDA)	\$4,534,920	\$673,920	-\$414,830	\$4,794,010

Crab Total*Aggregate Vessel Profiles*

Number of Vessels:	51	156	207
Crab Fleet Totals	Area A	Areas B-J	Total
Landings (lbs)	8,211,000	5,460,000	13,671,000
Vessel Price (per lb)	\$2.25	\$2.75	\$2.45
Gross Revenue (Gross Stock)	\$ 18,474,750	\$ 15,015,000	\$ 33,489,750
Less: Fishery Specific Expenses			
Fuel	3,718,750	1,872,000	5,590,750
At sea monitoring	238,000	390,000	628,000
Offload Monitor			
Licence / Co-management Fees	30,090	92,040	122,130
Licence/ Quota Lease	-	-	-
Bait	2,677,500	676,000	3,353,500
Gear maintenance/replacement	722,500	520,000	1,242,500
Total Fishery Specific Expenses	7,386,840	3,550,040	10,936,880
Net Revenue (Net Stock)	11,087,910	11,464,960	22,552,870
Less:			
Crew and Captain Shares	4,989,560	3,753,750	8,743,310
Fishery Contribution	6,098,351	7,711,210	13,809,561
Vessel Fixed Expenses			
Insurance	425,000	780,000	1,205,000
Repairs & Maintenance	2,040,000	1,560,000	3,600,000
Moorage	88,400	187,200	275,600
Miscellaneous	178,500	390,000	568,500
Total Vessel Expenses	2,731,900	2,917,200	5,649,100
Earnings (EBITDA)	\$3,366,451	\$4,794,010	\$8,160,461

Other Fishery Diversification

The following table provides a snapshot estimate of how the active crab fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

Prawn and halibut are the most common diversification activities, though diversification in the crab fleet is actually very slight. The table shows, for the active crab fleet, the approximate number of vessels engaged in the prawn and halibut fisheries, applying average per-vessel results for each of these fisheries.

Number of Vessels	207	8	7	
Crab Fleet Include Other Fisheries	Crab	Prawn	Halibut	Total
Landings (lbs)	13,671,000	205,172	446,687	15,478,159
Vessel Price (per lb)	\$2.45	\$5.50	\$4.27	\$2.48
Gross Revenue (Gross Stock)	\$ 33,489,750	\$ 1,128,444	\$ 1,908,023	\$ 38,316,933
Less: Fishery Specific Expenses				
Fuel	5,590,750	70,040	47,980	5,935,773
At sea monitoring	628,000	29,467	103,762	768,729
Offload Monitor				
Licence / Co-management Fees				
Stacked licence/quota lease	-	27,879	332,003	359,882
Bait	3,353,500	62,949	34,904	3,451,354
Gear maintenance/replacement	1,242,500	28,929	6,981	1,302,160
Total Fishery Specific Expenses	10,936,880	219,265	525,630	11,940,027
Net Revenue (Net Stock)	22,552,870	909,180	1,382,393	26,376,906
<i>Less:</i>				
Crew and Captain Shares	8,743,310	394,956	552,957	10,380,831
Fishery Contribution	13,809,561	514,224	829,436	15,996,075
Vessel Fixed Expenses				
Insurance				1,205,000
Repairs & Maintenance		20,000	35,000	3,685,000
Moorage				275,600
Miscellaneous				568,500
Total Vessel Expenses				5,734,100
Earnings (EBITDA)				\$10,261,975

Capital Considerations

The earnings shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, and licences required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets in the crab fishery. The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.

- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Area A Crab Replacement Cost of Assets	Area A Crab Vessel & Licence	Areas B-J Crab Vessel & Licence
Licence Cost	900,000	448,000
Vessel Cost	500,000	175,000
Replacement cost	1,400,000	623,000
Amortization (annual) @ 5%	70,000	31,150
Loan Considerations if 50% borrowed:		
Loan amount	700,000	311,500
Interest (1st year)	56,000	24,920
Principal (1st year, 15 yr amort)	46,667	20,767
1st year pmt (principal + interest):	102,667	45,687

Observations on the above schedule:

- The highest-producing crab fishermen could service a new investment in licence and equipment according to the assumptions used, but the bulk of the fleet could not. Financial performance for the fleet in 2007 was reasonably typical of recent results.
- Most crab fishermen have substantially written down their investments.

Keys/Challenges to Success

Financial Factors

- As with every fishery, results are driven by prices and volumes. The 2007 season was quite strong from a landings perspective, especially in Area A. Prices were typical of recent years.
- High fuel prices in 2007 impacted results.
- Crew sharing arrangements impact the bottom line for the vessel owner.

Other Factors

- DFO and industry are considering various issues in the crab fishery, including harvesting practices, and recreational and First Nations access.
- The crab industry has recently formed an all-areas association to try to deal cohesively with commercial crab fishery issues.

Shrimp (S)

Fishery Overview

The BC shrimp fishery is a competitive trawl fishery. Licences are vessel based, meaning strict vessel replacement restrictions apply. While pink shrimp (for peeling) is the highest volume species, other, higher value species, such as side-stripe and coon-stripe, are also harvested.

Most vessels in the BC shrimp fleet are small – gillnet-sized craft – and fish day-trips for modest catch volumes. Of the larger vessels in the BC fleet, often groundfish trawlers, virtually all are inactive. This fleet structure contrasts to global competition, particularly from the east coast of Canada, where factory trawlers engage in an industrial scale fishery. The BC industry, with low volumes and high production costs, is not competitive with large-scale shrimp fisheries. Thus, the majority of the BC fleet is tied-up because operations are non-economic. While high-value species in BC afford opportunities for live or direct-to-public sales, the TACs for these species are low.

The shrimp industry, much like the salmon sector, has explored means of reforming the fishery to improve viability, but has been unable to reach an agreeable alternative approach. Asset values in the fishery are extremely depressed.

Licensing Profile

Other licences held on S-licensed vessels are shown in the following table. The number of gillnet salmon/shrimp combinations was much higher prior to PFAR; over 100 AG licences “married” to S licences were retired in the 1998-2000 period.

Number of Licences	# Licences
S	234
Gillnet Salmon	59
Troll Salmon	43
Trawl	43
Tuna	24
Halibut	22
Prawn	19
Other	40
Non S licences	250

The breakdown of shrimp vessels by number of licences held is shown below.

Licences/Vessel	# Vessels	% Vessels
S only	84	36%
S + one lic	94	40%
S + two lic	31	13%
S + three or more lic	25	11%
Total S Vessels	234	100%

Landings Profile

The most noteworthy feature of the shrimp fleet is the low participation level. Only 78 vessels (33%) registered landings in 2007. The percentage of vessels participating in the shrimp fishery declines as the number of other categories of license rises; those that have other activities (likely more lucrative ones) are less likely to utilize their shrimp licence.

Licences/Vessel	# Vessels	# Active Vessels	# Inactive Vessels	% Inactive
S only	84	37	47	56%
S + one lic	94	30	64	68%
S + two lic	31	7	24	77%
S + three or more lic	25	4	21	84%
Total S Vessels	234	78	156	67%

Of the 78 vessels fishing in 2007, the bottom 1/3 had only token activity (table below). Twenty-six vessels – the top 1/3 of active boats – caught 69% of the harvest.

Tier	Catch (lbs)	% Catch	Catch/ Vessel	# Vessels
Top 1/3	917,951	69%	35,306	26
Middle 1/3	342,000	26%	13,154	26
Bottom 1/3	71,442	5%	2,748	26
	1,331,393	100%	42,999	78

Under current competitive conditions and fishery organization, only a small portion of the fleet is achieving economic viability.

Financial Profiles

Key Assumptions

- A weighted average shrimp price of \$1.50 is used. In reality, some vessels that target high-value species have a higher average price (and some that target pink shrimp a lower price), but introducing price stratifications would make the analysis unduly complex.
- Active vessels in the shrimp industry support co-management financial obligations; a total amount of \$195,000 is apportioned amongst active vessels.
- A single deckhand per vessel is assumed, with the deckhand earning 10% of the gross stock.
- Vessel fixed expenses are the same regardless of production level.

Individual Vessel Profiles

Shrimp Fleet Individual Vessels	Top 1/3	Middle 1/3	Bottom 1/3	Fleet Average
Landings (lbs)	35,306	13,154	2,748	17,069
Vessel Price (per lb)	\$1.50	\$1.50	\$1.50	\$1.50
Gross Revenue (Gross Stock)	\$ 52,959	\$ 19,731	\$ 4,122	\$ 25,604
Less: Fishery Specific Expenses				
Fuel	7,500	5,000	2,500	5,000
At sea monitoring	2,500	2,500	2,500	2,500
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	10,000	7,500	5,000	7,500
Net Revenue (Net Stock)	42,959	12,231	(878)	18,104
Less:				
Deckhand	5,296	1,973	412	2,560
Fishery Contribution	37,663	10,258	(1,290)	15,544
Vessel Fixed Expenses				
Insurance	3,500	3,500	3,500	3,500
Repairs & Maintenance	10,000	10,000	10,000	10,000
Moorage	1,500	1,500	1,500	1,500
Miscellaneous	2,500	2,500	2,500	2,500
Total Vessel Expenses	17,500	17,500	17,500	17,500
Earnings (EBITDA)	\$20,163	-\$7,242	-\$18,790	-\$1,956

- Positive results are earned only by the top tier of vessels.

Aggregate Vessel Profiles

Number of Vessels:	26	26	26	78
Shrimp Fleet Totals	Top 1/3	Middle 1/3	Bottom 1/3	Total
Landings (lbs)	917,956	342,004	71,448	1,331,408
Vessel Price (per lb)	\$1.50	\$1.50	\$1.50	\$1.50
Gross Revenue (Gross Stock)	\$ 1,376,934	\$ 513,006	\$ 107,172	\$ 1,997,112
Less: Fishery Specific Expenses				
Fuel	195,000	130,000	65,000	390,000
At sea monitoring	65,000	65,000	65,000	195,000
Offload Monitor				
Licence / Co-management Fees				
Licence/ Quota Lease	-	-	-	-
Bait	-	-	-	-
Gear maintenance/replacement	-	-	-	-
Total Fishery Specific Expenses	260,000	195,000	130,000	585,000
Net Revenue (Net Stock)	1,116,934	318,006	(22,828)	1,412,112
<i>Less:</i>				
Deckhand	137,693	51,301	10,717	199,711
Fishery Contribution	979,241	266,705	(33,545)	1,212,401
Vessel Fixed Expenses				
Insurance	91,000	91,000	91,000	273,000
Repairs & Maintenance	260,000	260,000	260,000	780,000
Moorage	39,000	39,000	39,000	117,000
Miscellaneous	65,000	65,000	65,000	195,000
Total Vessel Expenses	455,000	455,000	455,000	1,365,000
Earnings (EBITDA)	\$524,241	-\$188,295	-\$488,545	-\$152,599

- In aggregate, the shrimp fleet is “in the hole.” This is despite the fact that only a fraction of the fleet is active (78 vessels out of 234).

Other Fishery Diversification

The following table provides a snapshot estimate of how the active shrimp fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

The table shows, for the active shrimp fleet, the approximate number of vessels engaged in the gillnet salmon, troll salmon, and tuna fisheries, applying average per-vessel results for each of these fisheries.

Number of Vessels	78	30	25	8	
Shrimp Fleet Include Other Fisheries	Shrimp	Gillnet Salmon	Troll Salmon	Tuna	Total
Landings (lbs)	1,331,408	383,747	347,738	616,160	2,679,053
Vessel Price (per lb)	\$1.50	\$0.83	\$2.68	\$1.55	\$1.57
Gross Revenue (Gross Stock)	\$ 1,997,112	\$ 319,323	\$ 933,251	\$ 955,048	\$ 4,204,734
Less: Fishery Specific Expenses					
Fuel	390,000	112,446	129,235	121,068	752,748
At sea monitoring	195,000	24,983	22,586	4,000	246,568
Offload Monitor					
Licence / Co-management Fees					
Stacked licence/quota lease	-	-	125,000	-	125,000
Bait	-	-	-	-	-
Gear maintenance/replacement	-	-	-	12,667	12,667
Total Fishery Specific Expenses	585,000	137,429	276,820	137,734	1,136,983
Net Revenue (Net Stock)	1,412,112	181,894	656,431	817,314	3,067,750
<i>Less:</i>					
Crew and Captain Shares	199,711	-	174,617	367,791	742,119
Fishery Contribution	1,212,401	181,894	481,814	449,522	2,325,632
Vessel Fixed Expenses					
Insurance					273,000
Repairs & Maintenance					933,500
Moorage					117,000
Miscellaneous					195,000
Total Vessel Expenses					1,518,500
Earnings (EBITDA)					\$807,132

- The poor results seen for the middle and bottom tiers of the shrimp fleet necessitates other activities to cover fixed costs.

Capital Considerations

The earnings shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, and licences required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets in the shrimp fishery. The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.

- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Shrimp Replacement Cost of Assets	Shrimp Vessel & Licence
Licence Cost	36,900
Vessel Cost	125,000
Replacement cost	161,900
Amortization (annual) @ 5%	8,095
Loan Considerations if 50% borrowed:	
Loan amount	80,950
Interest (1st year)	6,476
Principal (1st year, 15 yr amort)	5,397
1st year pmt (principal + interest):	11,873

Observations on the above schedule:

- Shrimp licence values are extremely low. Although assets are highly affordable in an absolute sense, returns are still insufficient to service the entry cost.

Keys to Success

Financial Factors

- Pink shrimp prices are low and marketability poor for the most abundant shrimp species. This is the primary cause of limited participation by S licence holders.
- The BC shrimp fleet, comprised of very small vessels, is not competitive with industrial scale operations in other jurisdictions.

Other Factors

- The shrimp industry has been unable to restructure/reform itself to meet the competitive realities facing it.

Geoduck (G)

Fishery Overview

The BC geoduck fishery is a dive fishery operating under a quota management and area licensing (3 areas) program. Each licence receives an equal share of the annual TAC. The quotas on each licence are not divisible, but licence stacking is allowed, with a maximum of three licences per vessel. G licences are vessel based, though certain accommodations are made for this category of licence.

Geoduck is a closely-held fishery, with only 55 commercial licences issued. The resource is considered well managed, with licence holders contributing heavily to research, and entirely funding a comprehensive monitoring program. Geoduck beds are harvested on a rotational basis – a bed harvested one year will be left fallow for several more before the next harvest.

Geoduck is a high-priced delicacy in Asia, and strong demand has translated into attractive returns and high asset values for G licence holders. Recent increases in production from other jurisdictions, however, including farmed product, has caused prices to soften in recent years.

Licensing Profile

The number and type of non-G licences held on geoduck vessels is shown below:

Other Fishery Licences	# Licences
G	55
Sea Cucumber	22
Red Sea Urchins	21
Schedule II (C)	14
Other	7
Non G licences	64

Geoduck vessels are generally involved solely in dive fisheries, with sea cucumbers and red sea urchins predominating. Of the active fleet of 39 vessels, the most common configuration is one geoduck licence along with several other licences (21 single-G vessels hold 60 other licences).

Licences/Vessel	# Vessels	# G Licences	# Other Licences
One G only	7	7	0
One G plus other lic's	21	21	60
Two G only	4	8	0
Two G plus other lic's	2	4	2
Three G only	3	9	0
Three G plus other lic's	2	6	2
Total G Vessels	39	55	64

Eleven vessels utilize two or three geoduck licences. These vessels are unlikely to hold other categories of licence, since multi-licence geoduck participation constitutes a sizeable financial operation.

Landings Profile

Since each licence is entitled to the same quantity of catch (about 62,500 pounds in 2007), and the harvest is fully subscribed (virtually every licence attains its quota), the appropriate production stratification is the number of licences per vessel. The breakdown for the geoduck fleet is shown below:

Tier	# Vessels	% Vessels	Catch/ Vessel	Catch (lbs)	% Catch
One G lic	28	72%	62,526	1,750,718	51%
Two G lic	6	15%	125,051	750,308	22%
Three G lic	5	13%	187,577	937,885	27%
	39	100%	88,177	3,438,910	100%

Financial Profiles

Key Assumptions

- Landings per DFO stats; fish price per research.
- It is assumed that 2nd and 3rd licences are leased at a rate equating to 55% of the gross stock; there are a range of lease arrangements used in this sector.
- Crew shares are 20% of the gross stock; in reality the settlement arrangements vary widely amongst vessels.
- Vessel fixed expenses are the same regardless of production level.

Individual Vessel Profiles

Geoduck Fleet Individual Vessels	One Licence	Two Licences	Three Licences	Fleet Average
Landings (lbs)	62,526	125,052	187,578	88,178
Vessel Price (per lb)	\$7.50	\$7.50	\$7.50	\$7.50
Gross Revenue (Gross Stock)	\$ 468,945	\$ 937,890	\$ 1,406,835	\$ 661,333
Less: Fishery Specific Expenses				
Fuel	7,500	15,000	22,500	10,577
At sea monitoring	50,000	100,000	150,000	70,513
Offload Monitor				
Licence / Co-management Fees				
Stacked licence lease	-	257,920	515,840	105,813
Bait	-	-	-	-
Gear maintenance/replacement	2,000	4,000	6,000	2,821
Total Fishery Specific Expenses	59,500	376,920	694,340	189,723
Net Revenue (Net Stock)	409,445	560,970	712,496	471,609
<i>Less:</i>				
Crew and Captain Shares	93,789	187,578	281,367	132,267
Fishery Contribution	315,656	373,392	431,129	339,343
Vessel Fixed Expenses				
Insurance	5,000	5,000	5,000	5,000
Repairs & Maintenance	25,000	25,000	25,000	25,000
Moorage	1,500	1,500	1,500	1,500
Miscellaneous	10,000	10,000	10,000	10,000
Total Vessel Expenses	41,500	41,500	41,500	41,500
Earnings (EBITDA)	\$274,156	\$331,892	\$389,629	\$297,843

- Margins in the geoduck fishery are reasonably strong, in spite of the fact that prices have dropped in the last couple of years (from about \$10/lb). Harvesting costs in this fishery are low relative to the landed value of the product.

Aggregate Vessel Profiles

Number of Vessels:	28	6	5	39
Geoduck Fleet Totals	One Licence	Two Licences	Three Licences	Total
Landings (lbs)	1,750,728	750,312	937,890	3,438,930
Vessel Price (per lb)	\$7.50	\$7.50	\$7.50	\$7.50
Gross Revenue (Gross Stock)	\$ 13,130,460	\$ 5,627,340	\$ 7,034,175	\$ 25,791,975
Less: Fishery Specific Expenses				
Fuel	210,000	90,000	112,500	412,500
At sea monitoring	1,400,000	600,000	750,000	2,750,000
Offload Monitor				
Licence / Co-management Fees				
Stacked licence lease	-	1,547,519	2,579,198	4,126,716
Bait	-	-	-	-
Gear maintenance/replacement	56,000	24,000	30,000	110,000
Total Fishery Specific Expenses	1,666,000	2,261,519	3,471,698	7,399,216
Net Revenue (Net Stock)	11,464,460	3,365,822	3,562,478	18,392,759
<i>Less:</i>				
Crew and Captain Shares	2,626,092	1,125,468	1,406,835	5,158,395
Fishery Contribution	8,838,368	2,240,354	2,155,643	13,234,364
Vessel Fixed Expenses				
Insurance	140,000	30,000	25,000	195,000
Repairs & Maintenance	700,000	150,000	125,000	975,000
Moorage	42,000	9,000	7,500	58,500
Miscellaneous	280,000	60,000	50,000	390,000
Total Vessel Expenses	1,162,000	249,000	207,500	1,618,500
Earnings (EBITDA)	\$7,676,368	\$1,991,354	\$1,948,143	\$11,615,864

Other Fishery Diversification

The following table provides a snapshot estimate of how the active geoduck fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

Primary activities are red sea urchins and sea cucumber. The table shows, for the active geoduck fleet, the approximate number of vessels engaged in the sea cucumber and red sea urchin fisheries, applying average per-vessel results for each of these fisheries.

Number of Vessels	39	4	4	
Geoduck Fleet Include Other Fisheries	Geoduck	Sea Cucumber	Red Sea Urchins	Total
Landings (lbs)	3,438,930	158,714	572,379	4,170,023
Vessel Price (per lb)	\$7.50	\$2.30	\$0.65	\$6.36
Gross Revenue (Gross Stock)	\$ 25,791,975	\$ 365,043	\$ 372,046	\$ 26,529,064
Less: Fishery Specific Expenses				
Fuel	412,500	14,000	43,641	470,141
At sea monitoring				
Offload Monitor	2,750,000	8,258	52,369	2,810,627
Licence / Co-management Fees				
Stacked licence/quota lease	4,126,716	118,452	7,092	4,252,260
Bait	-	-	-	-
Gear maintenance/replacement	110,000	5,484	17,456	132,940
Total Fishery Specific Expenses	7,399,216	146,194	120,559	7,665,969
Net Revenue (Net Stock)	18,392,759	218,849	251,487	18,863,095
Less:				
Crew and Captain Shares	5,158,395	91,261	167,421	5,417,077
Fishery Contribution	13,234,364	127,588	84,067	13,446,019
Vessel Fixed Expenses				
Insurance				195,000
Repairs & Maintenance		10,000	10,000	995,000
Moorage				58,500
Miscellaneous				390,000
Total Vessel Expenses				1,638,500
Earnings (EBITDA)				\$11,807,519

- The contribution from other fisheries is slight for the active geoduck fleet.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, and licences required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets in the geoduck fishery. The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.
- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Geoduck	
Replacement Cost of Assets	Geoduck Vessel & Licence
Licence Cost	2,500,000
Vessel Cost	200,000
Replacement cost	2,700,000
Amortization (annual) @ 5%	135,000
Loan Considerations if 50% borrowed:	
Loan amount	1,350,000
Interest (1st year)	108,000
Principal (1st year, 15 yr amort)	90,000
1st year pmt (principal + interest):	198,000

Observations on the above schedule:

- Financial schedules suggest that the purchase cost of a geoduck operation could be supported by earnings from the fishery.
- There is virtually no market for geoduck licences, however; no transactions have been reported for the last several years.

Keys/Challenges to Success

Financial Factors

- The financial strength of the fishery is driven by high product values and low harvesting costs. One of the major expenses incurred by harvesters is monitoring and research contribution to ensure the continued health of the resource and fishery.

Other Factors

- The growth of geoduck production from other jurisdictions is a concern the BC industry. Surging supply has resulted in softening prices for the BC geoduck sector.

Red Sea Urchin (ZC)

Fishery Overview

The BC red sea urchin fishery is a dive fishery managed under a quota and area management approach (2 areas, north and south coast). Licences are party based, with the holder selecting a vessel each season. Each licence receives an equal share of the TAC in the area chosen. Quotas are not divisible, but licence stacking is allowed, with a maximum of five licences per vessel.

Red urchins are harvested for their roe, with the roe extracted, salted, and exported to Japan. The fishery is considered well managed, with licence holders funding management activities and a monitoring program. Results in recent years have been very poor, as the Japanese market has been flooded with illegal, un-regulated, un-reported (IUU) product from Russia, meaning weak demand for BC product. Given non-viable economics, participation of BC ZC licence-holders has been sporadic. Less than half of the TAC has harvested in 2007, despite a healthy resource situation.

Asset values have plummeted in recent years along with profitability, and industry infrastructure (for example, processor participation) is eroding.

Licensing Profile

Red urchin vessels are typically involved with other dive fisheries, most notably sea cucumbers and green sea urchins; many hold a C licence as their vessel-based licence.

Other Fishery Licences	# Licences
ZC	85
Sea Cucumber	64
Green Sea Urchins	32
Schedule II (C)	31
Geoduck	9
Other	9
Non ZC licences	145

The licensing structure of the red sea urchin fleet is shown in the following table:

Licences/Vessel	# Vessels	# ZC Licences	# Other Licences
One ZC only	0	0	0
One ZC plus other lic's	15	15	46
Two ZC only	0	0	0
Two ZC plus other lic's	11	22	43
Three or more ZC only	0	0	0
Three or more ZC plus other lic's	13	48	56
Total ZC Vessels	39	85	145

Thirty-nine vessels participated in the 2007 fishery. These vessels were quite evenly split between one, two, and three (or more) ZC licences per vessel. The average red sea urchin vessel held: 2.2 ZC licences, 1.6 sea cucumber licences, and 0.8 green urchin licence.

Landings Profile

Because the DFO catch statistics database did not provide an accurate by-vessel catch breakdown, the landings profile is arrived at by multiplying the average landings per licence (about 65,000 lbs) by the number of licences per vessel. In the table below, the “three or more ZC licence” category averaged 3.7 licences per vessel.

Tier	# Vessels	#ZC Licences	% Vessels	Catch/ Vessel	Catch (lbs)	% Catch
One ZC lic	15	15	38%	65,655	984,832	18%
Two ZC lic	11	22	28%	131,311	1,444,420	26%
Three or more ZC lic	13	48	33%	242,420	3,151,461	56%
	39	85	100%	143,095	5,580,713	100%

The above table provides an approximation of the fleet landings profile for the financial schedules that follow.

Financial Profiles

Key Assumptions

- Landings per vessel are linked to the number of licenses fished, with an identical catch per licence (this is due to data limitations).
- Fish prices per research.
- No licence lease charge for the first licence, additional licence charged at \$1,500 each (lease rates have plummeted in this fishery).
- Crew shares at 45% of the gross stock; if fact, there are a wide variety of settlement arrangements used in this fishery.
- Vessel fixed expenses the same regardless of production level.

Individual Vessel Profiles

Red Sea Urchins Individual Vessels	One Licence	Two Licences	Three or More Licences (Avg 3.7)	Fleet Average
Landings (lbs)	65,655	131,310	242,420	143,095
Vessel Price (per lb)	\$0.65	\$0.65	\$0.65	\$0.65
Gross Revenue (Gross Stock)	\$ 42,676	\$ 85,352	\$ 157,573	\$ 93,012
Less: Fishery Specific Expenses				
Fuel	5,000	10,000	18,500	10,910
At sea monitoring	6,000	12,000	22,200	13,092
Offload Monitor				
Licence / Co-management Fees				
Stacked licence lease	-	1,500	4,050	1,773
Bait	-	-	-	-
Gear maintenance/replacement	2,000	4,000	7,400	4,364
Total Fishery Specific Expenses	13,000	27,500	52,150	30,140
Net Revenue (Net Stock)	29,676	57,852	105,423	62,872
<i>Less:</i>				
Crew and Captain Shares	19,204	38,408	70,908	41,855
Fishery Contribution	10,472	19,443	34,515	21,017
Vessel Fixed Expenses				
Insurance	5,000	5,000	5,000	5,000
Repairs & Maintenance	10,000	10,000	10,000	10,000
Moorage	1,500	1,500	1,500	1,500
Miscellaneous	1,500	1,500	1,500	1,500
Total Vessel Expenses	18,000	18,000	18,000	18,000
Earnings (EBITDA)	-\$7,528	\$1,443	\$16,515	\$3,017

- Results are poor for the active red sea urchin fleet. The fact that TACs are not fully harvested is the primary reason. Larger volumes of red sea urchin were simply un-marketable for the 2007 fishery.

Aggregate Vessel Profiles

Number of Vessels:	15	11	13	39
Red Sea Urchins Fleet Totals	One Licence	Two Licences	Three Licences	Total
Landings (lbs)	984,825	1,444,410	3,151,460	5,580,695
Vessel Price (per lb)	\$0.65	\$0.65	\$0.65	\$0.65
Gross Revenue (Gross Stock)	\$ 640,136	\$ 938,867	\$ 2,048,449	\$ 3,627,452
Less: Fishery Specific Expenses				
Fuel	75,000	110,000	240,500	425,500
At sea monitoring				
Offload Monitor	90,000	132,000	288,600	510,600
Licence / Co-management Fees				
Stacked licence lease	-	16,500	52,650	69,150
Bait	-	-	-	-
Gear maintenance/replacement	30,000	44,000	96,200	170,200
Total Fishery Specific Expenses	195,000	302,500	677,950	1,175,450
Net Revenue (Net Stock)	445,136	636,367	1,370,499	2,452,002
Less:				
Crew and Captain Shares	288,061	422,490	921,802	1,632,353
Fishery Contribution	157,075	213,877	448,697	819,648
Vessel Fixed Expenses				
Insurance	75,000	55,000	65,000	195,000
Repairs & Maintenance	150,000	110,000	130,000	390,000
Moorage	22,500	16,500	19,500	58,500
Miscellaneous	22,500	16,500	19,500	58,500
Total Vessel Expenses	270,000	198,000	234,000	702,000
Earnings (EBITDA)	-\$112,925	\$15,877	\$214,697	\$117,648

Other Fishery Diversification

The following table provides a snapshot estimate of how the active red sea urchin fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

Sea cucumber and geoduck are the primary diversification activities. The table shows, for the active red sea urchin fleet, the approximate number of vessels engaged in the sea cucumber and geoduck fisheries, applying average per-vessel results for each of these fisheries.

Number of Vessels	39	10	9	
Red Sea Urchin Fleet Include Other Fisheries	Red Sea Urchins	Sea Cucumber	Geoduck	Total
Landings (lbs)	5,580,695	396,785	793,599	6,771,080
Vessel Price (per lb)	\$0.65	\$2.30	\$7.50	\$1.55
Gross Revenue (Gross Stock)	\$ 3,627,452	\$ 912,607	\$ 5,951,994	\$ 10,492,053
Less: Fishery Specific Expenses				
Fuel	425,500	35,000	95,192	555,692
At sea monitoring	510,600	20,645	634,615	1,165,861
Offload Monitor				
Licence / Co-management Fees				
Stacked licence/quota lease	69,150	296,129	952,319	1,317,598
Bait	-	-	-	-
Gear maintenance/replacement	170,200	13,710	25,385	209,294
Total Fishery Specific Expenses	1,175,450	365,484	1,707,511	3,248,445
Net Revenue (Net Stock)	2,452,002	547,123	4,244,483	7,243,607
Less:				
Crew and Captain Shares	1,632,353	228,152	1,190,399	3,050,904
Fishery Contribution	819,648	318,971	3,054,084	4,192,704
Vessel Fixed Expenses				
Insurance				195,000
Repairs & Maintenance		25,000	22,500	437,500
Moorage				58,500
Miscellaneous				58,500
Total Vessel Expenses				749,500
Earnings (EBITDA)				\$3,443,204

- Participation by red sea urchin vessels in more-profitable fisheries allows profitable operations. There is a high degree of inter-relationships between red sea urchin vessels and the other dive fisheries.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, and licences required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets in the red sea urchin fleet. The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.

- Interest and principal payments for the first year, assuming 50% of the purchase price (replacement cost) is borrowed.

Red Sea Urchin Replacement Cost of Assets	Red Urchin Vessel & Licence
Licence Cost	50,000
Vessel Cost	200,000
Replacement cost	250,000
Amortization (annual) @ 5%	12,500
Loan Considerations if 50% borrowed:	
Loan amount	125,000
Interest (1st year)	10,000
Principal (1st year, 15 yr amort)	8,333
1st year pmt (principal + interest):	18,333

Observations on the above schedule:

- Red sea urchin licence values are extremely low. Although assets are highly affordable in an absolute sense, returns are still insufficient to service the entry cost.

Keys/Challenges to Success

Financial Factors

- The marketability of product is the key factor impairing profitability. This is driven by Russian IUU product swamping the Japanese market.

Other Factors

- Continued poor marketability of product is causing an exodus of processing capacity and infrastructure in the sector. This further hampers a recovery.

Sea Cucumber (ZD)

Fishery Overview

The BC sea cucumber fishery is a dive fishery operating under a quota/area licensing management framework (4 areas: north, central, WCVI, Strait of Georgia). ZD licences are party-based, with the holder choosing a vessel each season. Each licence receives an equal share of the TAC. Quotas are not divisible, but licence stacking is allowed, with a maximum of five licences per vessel.

Sea cucumbers are split and dried, with the meat exported to Asia for consumption. The fishery is closely held, with 85 licences issued annually. The resource is considered well managed, and the fishery is economically sound, with licence values having risen considerably in recent years.

Licensing Profile

Sea cucumber vessels are typically involved with other dive fisheries, most notably red and green sea urchins; many hold a C licence as their vessel-based licence.

Other Fishery Licences	# Licences
ZD	85
Red Sea Urchins	50
Green Sea Urchins	28
Schedule II (C)	21
Geoduck	8
Other	8
Non ZD licences	115

The licensing structure of the ZD fleet is shown below:

Licences/Vessel	# Vessels	# ZD Licences	# Other Licences	% of Vessels
One ZD only	0	0	0	0%
One ZD plus other lic's	5	5	12	16%
Two ZD only	0	0	0	0%
Two ZD plus other lic's	10	20	42	32%
Three or more ZD only	0	0	0	0%
Three or more ZD plus other lic's	16	60	61	52%
Total ZD Vessels	31	85	115	100%

Thirty-one vessels operated in 2007. Twenty-six vessels utilized two or more ZD licences. The average active sea cucumber vessel held: 2.75 cucumber licences, 1.6 red urchin licences, and 0.9 green urchin licences.

Landings Profile

Because the DFO catch statistics database did not provide an accurate by-vessel catch breakdown, the landings profile is arrived at by multiplying the average landings per licence (about 14,400 lbs) by the

number of licences per vessel. In the table below, the “three or more ZD licence” category averaged 3.75 licences per vessel.

Tier	# Vessels	#ZD Licences	% Vessels	Catch/ Vessel	Catch (lbs)	% Catch
One ZD lic	5	5	16%	14,471	72,353	6%
Two ZD lic	10	20	32%	28,941	289,412	24%
Three or more ZD lic	16	60	52%	54,265	868,235	71%
	31	85	100%	39,677	1,230,000	100%

The bulk of fishing activity was effected by 16 vessels fishing 60 licences – 71% of the total catch.

Financial Profiles

Key Assumptions

The information gathered for the sea cucumber fishery was only partial, so confidence in the assumptions used and the resulting financial profiles is low.

- Landings per vessel in split pounds are linked to the number of licenses fished, with an identical catch per licence (this is due to data limitations).
- Fish prices per research.
- No licence lease charge for the first licence, additional licence charged at \$17,000 each.
- Crew shares at 25% of the gross stock; if fact, there are a wide variety of settlement arrangements used in this fishery.
- Vessel fixed expenses the same regardless of production level.

Individual Vessel Profiles

Sea Cucumber Individual Vessels	One Licence	Two Licences	3.75 Licences	Fleet Average
Landings (lbs)	14,471	28,942	54,266	39,679
Vessel Price (per lb)	\$2.30	\$2.30	\$2.30	\$2.30
Gross Revenue (Gross Stock)	\$ 33,283	\$ 66,567	\$ 124,812	\$ 91,261
Less: Fishery Specific Expenses				
Fuel	1,750	2,625	4,594	3,500
At sea monitoring	800	1,500	2,813	2,065
Offload Monitor	-	-	-	-
Licence / Co-management Fees	-	-	-	-
Stacked licence lease	-	17,000	46,750	29,613
Bait	-	-	-	-
Gear maintenance/replacement	500	1,000	1,875	1,371
Total Fishery Specific Expenses	3,050	22,125	56,031	36,548
Net Revenue (Net Stock)	30,233	44,442	68,781	54,712
<i>Less:</i>				
Crew and Captain Shares	8,321	16,642	31,203	22,815
Fishery Contribution	21,912	27,800	37,578	31,897
Vessel Fixed Expenses				
Insurance	5,000	5,000	5,000	5,000
Repairs & Maintenance	10,000	10,000	10,000	10,000
Moorage	1,500	1,500	1,500	1,500
Miscellaneous	1,500	1,500	1,500	1,500
Total Vessel Expenses	18,000	18,000	18,000	18,000
Earnings (EBITDA)	\$3,912	\$9,800	\$19,578	\$13,897

- Because a single sea cucumber licence cannot support a vessel for the whole year, multi-licence operations predominate.

Aggregate Vessel Profiles

Number of Vessels:	5	10	16	31
Sea Cucumber Fleet Totals	One Licence	Two Licences	3.75 Licences	Total
Landings (lbs)	72,355	289,420	868,260	1,230,035
Vessel Price (per lb)	\$2.30	\$2.30	\$2.30	\$2.30
Gross Revenue (Gross Stock)	\$ 166,417	\$ 665,666	\$ 1,996,998	\$ 2,829,081
Less: Fishery Specific Expenses				
Fuel	8,750	26,250	73,500	108,500
At sea monitoring	4,000	15,000	45,000	64,000
Offload Monitor	-	-	-	-
Licence / Co-management Fees	-	-	-	-
Stacked licence lease	-	170,000	748,000	918,000
Bait	-	-	-	-
Gear maintenance/replacement	2,500	10,000	30,000	42,500
Total Fishery Specific Expenses	15,250	221,250	896,500	1,133,000
Net Revenue (Net Stock)	151,167	444,416	1,100,498	1,696,081
Less:				
Crew and Captain Shares	41,604	166,417	499,250	707,270
Fishery Contribution	109,562	278,000	601,249	988,810
Vessel Fixed Expenses				
Insurance	25,000	50,000	80,000	155,000
Repairs & Maintenance	50,000	100,000	160,000	310,000
Moorage	7,500	15,000	24,000	46,500
Miscellaneous	7,500	15,000	24,000	46,500
Total Vessel Expenses	90,000	180,000	288,000	558,000
Earnings (EBITDA)	\$19,562	\$98,000	\$313,249	\$430,810

Other Fishery Diversification

The following table provides a snapshot estimate of how the active sea cucumber fleet benefited from participation in other fisheries in 2007. The contribution from other fisheries, as well as an estimate of incremental repairs and maintenance related to enhanced operations, is calculated.

Red sea urchin and geoduck are the primary diversification activities. The table shows, for the active sea cucumber fleet, the approximate number of vessels engaged in the red sea urchin and geoduck fisheries, applying average per-vessel results for each of these fisheries.

Number of Vessels	31	20	8	
Sea Cucumber Fleet Include Other Fisheries	Sea Cucumber	Red Sea Urchins	Geoduck	Total
Landings (lbs)	1,230,035	2,861,895	705,422	4,797,351
Vessel Price (per lb)	\$2.30	\$0.65	\$7.50	\$2.08
Gross Revenue (Gross Stock)	\$ 2,829,081	\$ 1,860,232	\$ 5,290,662	\$ 9,979,974
Less: Fishery Specific Expenses				
Fuel	108,500	218,205	84,615	411,321
At sea monitoring				
Offload Monitor	64,000	261,846	564,103	889,949
Licence / Co-management Fees				
Stacked licence/quota lease	918,000	35,462	846,506	1,799,967
Bait	-	-	-	-
Gear maintenance/replacement	42,500	87,282	22,564	152,346
Total Fishery Specific Expenses	1,133,000	602,795	1,517,788	3,253,583
Net Revenue (Net Stock)	1,696,081	1,257,437	3,772,874	6,726,391
Less:				
Crew and Captain Shares	707,270	837,104	1,058,132	2,602,507
Fishery Contribution	988,810	420,333	2,714,741	4,123,884
Vessel Fixed Expenses				
Insurance				155,000
Repairs & Maintenance		-	-	310,000
Moorage				46,500
Miscellaneous				46,500
Total Vessel Expenses				558,000
Earnings (EBITDA)				\$3,565,884

- The sea cucumber fleet is closely inter-twined with the urchin and geoduck fisheries.

Capital Considerations

The cash flows shown in the preceding schedules ignore:

- The capital costs to acquire the vessel, gear, and licences required to mount the fishing operation.
- The costs of servicing any debt that may be incurred in assembling required capital assets.

Because every member of the fleet has a different capitalization arrangement (purchase cost, net book value, debt level, etc), the following schedule is offered to recognize:

- The replacement cost of assets in the sea cucumber fishery. The vessel cost includes fishing gear and assumes purchase of a reasonable quality used vessel.
- An amortization calculation based on newly purchased assets.
- Interest and principal payments for the first year, assuming 40% of the purchase price (replacement cost) is borrowed.

Sea Cucumber Replacement Cost of Assets	Sea Cucumber Vessel & Licence
Licence Cost (1 licence)	200,000
Vessel Cost	200,000
Replacement cost	400,000
Amortization (annual) @ 5%	20,000
Loan Considerations if 50% borrowed:	
Loan amount	200,000
Interest (1st year)	16,000
Principal (1st year, 15 yr amort)	13,333
1st year pmt (principal + interest):	29,333

Keys/Challenges to Success

- As most of the dive fisheries occur in the north and central coasts, it is most efficient to utilize multiple licences.
- Each cucumber licence makes a modest contribution to operations. When several opportunities are combined, vessels can make a reasonable return.
- Lease costs have risen dramatically in recent years, limiting returns per licence fished.
- The resource is considered healthy and well-managed.

Summary

Aggregating all fisheries analyzed in this study, and given the host of assumptions utilized, the following summary statistics are offered:

Fishery	# Active Vessels (exclude F)	Landings (lbs)	Landed Value	EBIDTA	EBITDA % Landed Value	Est # Crewmen ³	Avg # Persons/Vessel
Salmon Seine	123	27,610,731	\$8,596,889	-\$534,205	-6%	492	4.0
Salmon Gillnet	591	9,071,772	\$7,548,789	-\$575,771	-8%	591	1.0
Salmon Troll	277	3,852,937	\$10,340,421	\$1,954,760	19%	693	2.5
Roe Herring Seine ¹	75	9,396,900	\$4,346,066	\$1,110,836	26%	375	5.0
Halibut ²	181	11,550,044	\$49,336,035	\$17,971,646	36%	543	3.0
Sablefish ²	33	7,368,896	\$30,571,970	\$9,695,424	32%	149	4.5
Groundfish Trawl - Groundfish	48	73,876,928	\$35,460,925	\$5,276,282	15%	192	4.0
Groundfish Trawl - Hake	38	146,958,035	\$23,513,286	\$2,501,253	11%	152	4.0
Prawn	198	5,078,000	\$27,929,000	\$8,727,450	31%	594	3.0
Crab	207	13,671,000	\$33,489,750	\$8,160,461	24%	456	2.0
Shrimp	78	1,331,408	\$1,997,112	-\$152,599	-8%	156	2.0
Geoduck	39	25,791,975	\$25,791,975	\$11,615,864	45%	117	3.0
Red Sea Urchin	39	5,580,695	\$3,627,452	\$117,648	3%	117	3.0
Sea Cucumber	31	1,230,035	\$2,829,081	\$430,810	15%	93	3.0
Tuna	120	9,242,400	\$14,325,720	\$4,042,837	28%	360	3.0
	2,078	351,611,756	\$279,704,471	\$70,342,696	25%	5,079	

¹ the financial measure is Contribution Margin, not EBIDTA

² figures include other groundfish harvested with the primary species

³ the total number of crewmen is not additive, since many are involved with multiple fisheries

Use of EBIDTA as a measure of financial performance allows evaluation of the operating income earned from fishing, but not the “bottom line” for a vessel owner. As mentioned at the outset of this report, the financing arrangements and the purchase cost and book value of assets varies with each individual.

Some examples follow, showing how inclusion in the analysis of amortization expense, interest expense, and principal payments can influence the assessment of profitability. These examples, drawn from results already presented, assume that:

- Vessels, licences, and quotas (if applicable) are recently purchased at prevailing market values.
- Amortization of 5% per year is charged.
- 50% of the purchase price is financed through borrowing (8% interest rate, 15 year term), with the balance comprising contributed capital (equity).

Salmon Fisheries

Common configurations shown for individual vessels

	Salmon Seine (2 lic's)	Salmon Gillnet (1 lic)	Salmon Troll (1 lic)
Vessel Revenue	\$90,639	\$10,541	\$33,077
less: Operating Expenses	88,364	12,850	29,377
EBIDTA	2,276	- 2,309	3,700
less: Interest expense	37,200	7,600	10,000
less: Amortization	46,500	9,500	12,500
Pre-tax Earnings	- 81,424	- 19,409	- 18,800
Principal Payment	31,000	6,333	8,333
Pre-tax Cash Flow⁸	- 65,924	- 16,242	- 14,633

- Given slender (or slightly negative) EBEDTAs, it is not surprising that pre-tax earnings and cash flows are significantly negative.

Groundfish Fisheries

Sample configurations shown for individual vessels

	Halibut (mid tier, no leases)	Sablefish (top tier, no leases)	Trawl Groundfish (top tier, no leases)	Trawl Hake (top tier, no leases)
Vessel Revenue	\$264,820	\$2,140,177	\$1,325,772	\$1,226,929
less: Operating Expenses	140,947	1,258,990	1,031,685	912,318
EBIDTA	123,873	881,187	294,087	314,611
less: Interest expense	80,120	510,343	198,273	227,639
less: Amortization	100,150	637,929	247,842	284,549
Pre-tax Earnings	- 56,397	- 267,086	- 152,028	- 197,577
Principal Payment	66,767	425,286	165,228	189,699
Pre-tax Cash Flow	- 23,013	- 54,443	- 69,414	- 102,727

- Even in the major groundfish fisheries, where EBEDTAs are strongly positive, operating earnings are insufficient to support purchase and financing of 100% of assets.
- The high cost of halibut and sablefish quotas influence results in these fisheries, while the high operating costs inherent in trawling impact groundfish and hake outcomes.

⁸ Pre-tax cash flow = EBIDTA plus amortization (a non-cash expense) less principal payment (a non-income statement item).

Shellfish Fisheries

Sample configurations shown for individual vessels

	Prawn (300 traps, mid-tier)	Crab (Area B-J, top producer)	Shrimp (mid-tier)	Geoduck (one licence)
Vessel Revenue	\$126,500	\$176,000	\$19,731	\$468,945
less: Operating Expenses	86,775	88,790	26,973	194,789
EBIDTA	39,725	87,210	- 7,242	274,156
less: Interest expense	31,440	24,920	6,476	108,000
less: Amortization	39,300	31,150	8,095	135,000
Pre-tax Earnings	- 31,015	31,140	- 21,813	31,156
Principal Payment	26,200	20,767	5,397	90,000
Pre-tax Cash Flow	- 17,915	41,523	- 19,115	76,156

- Results depend on the scenario shown. In general, top producers in the shellfish fisheries may be able to sustain financing costs, but not middle (or lower) performers.
- In the geoduck fishery, all indicators are positive; however, note that in this fishery there have been few (if any) transactions in the last several years.

Implications

The preceding three tables are shown to illustrate the following points:

- EBIDTA should not be viewed as a bottom-line indicator of profitability.
- The bulk of fishermen in the fleet have been in business for many years, and possess assets that are to a large extent written-down. If this were not the case, the incidence of business failure would be much higher.
- Many fishermen combine asset ownership with leasing (of stacked licences, or additional quota) in order to make increasing production more affordable. More leased assets lowers entry cost, but raises operating expenses.
- New entrants to the fisheries face significant hurdles:
 - Assets are expensive, and returns do not necessarily justify valuations.
 - Access to capital (loans) is very restricted in the BC fishery, because licences and quotas are not considered suitable security by lenders, and because cash flows are highly variable.

Given the range of results shown for all fisheries in this study, the following summary comments are offered to re-cap the 2007 season for the Pacific commercial fleet:

- 2007 was a generally a challenging season, with earnings impacted negatively by a strong Canadian dollar and high fuel prices.

- While EBIDTA levels were positive for most fisheries, very few fisheries (or fleet segments) enjoyed EBIDTA's adequate to service significant amounts of debt (if indeed debt financing can be secured).
- A relatively small proportion of vessels in each fishery garner the bulk of production, and earn the best financial results, given:
 - A substantial ratio of inactive vessels in many of the fleets. Vessels are inactive either because of poor economics (eg salmon, shrimp), or because of licence/quota "stacking" (eg halibut, trawl, dive fisheries).
 - The top 1/3 of active vessels in each fishery tend to catch far more than their pro rata share, garnering 55-70% of landings. Factors influencing productivity include the amount of quota amassed on a licence, and the competitiveness of the operator (calibre of vessel and equipment, fishing sense, and "drive").
 - The bottom 1/3 of active vessels in each fishery may be part-time, leaving more fish for the full-time fishermen.
- BC's fisheries are highly dynamic, and financial results are sensitive to changes in prices (related to currency exchange rates and market conditions), operating costs, regulations, and resource availability.