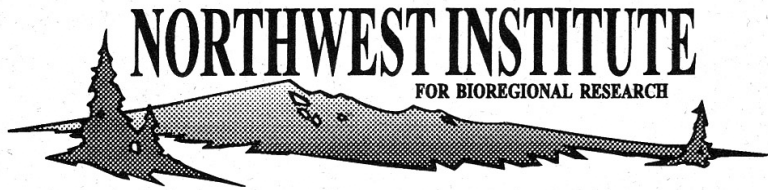


Business Consulting Services



## Valuation of the Wild Salmon Economy of the Skeena River Watershed

March 13<sup>th</sup>, 2006



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## Executive Summary

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- In November 2005, IBM Business Consulting was commissioned by the Northwest Institute to conduct a valuation of the wild Salmon economy of the Skeena River Watershed.
- All study numbers are non-multiplicative and represent only direct revenues to the regions. Multipliers and other indirect spin-off values have not been calculated.
- Based on a comprehensive review of existing data, 22 interviews with subject-matter experts, and a series of assumptions, IBM estimates that the wild Salmon economy of the Skeena River can be valued at approximately \$109,987,000<sup>1</sup> based on a 2004 base year and 4-year average revenue or revenue-equivalents.
- This sum consolidates revenue from multiple streams including: recreational tourism, sport-fishing, commercial harvesting, wholesale values, added-value processing, retailing, value to the First-Nations and Alaskan values.
- Alaskan values only include commercial landed value, wholesale value and added-value processing. Alaskan recreational angling, tourism and First Nations values have not been included.
- This sum does not include other sources of value arising from wild salmonids of the Skeena including in-migration or retention of residents, feed for wild-life, ecosystem-services and 'existence value'.

<sup>1</sup>This figure is also a mid estimate with high and low sensitivity ranging from +/-21%.

## Glossary of Terms

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**Value Driver-** Category of value used to aggregate study revenues and revenue equivalents

**CPI-** Consumer Price Index- a price index which tracks the prices of a specified set of consumer goods and services, providing a measure of inflation. The CPI is a fixed quantity price index and a sort of cost-of-living index

**Salmonid-** Any of the following salmon species: Coho, Chinook, Chum, Pink and Sockeye. For recreational angling, Steelhead trout is also included.

**Recreational Angling-** Includes freshwater and saltwater sport fishing.

**Revenue Equivalent-** Revenues that have been calculated based on Sockeye Equivalent values multiplied by total pieces or fish.

**Proxy-** Allocation % previously used in a related area of study.

**Added Value Processing-** The additional value added to wholesale values resulting from activities taken place further along the value chain (e.g. the preparing of fresh fish at a restaurant).

**GDP-** Gross Domestic Product- GDP is defined as the total value of goods and services produced within a territory during a specified period, regardless of ownership. GDP measures only final goods and services, that is those goods and services that are consumed by their final user, and not used as an input into other goods. Measuring intermediate goods and services would lead to double counting of economic activity within a country. This distinction also removes transfers between individuals and companies from GDP

**Revenue-** Amount of money received for activities, mostly from sales of products and/or services, to customers. Reported in dollars Canadian.

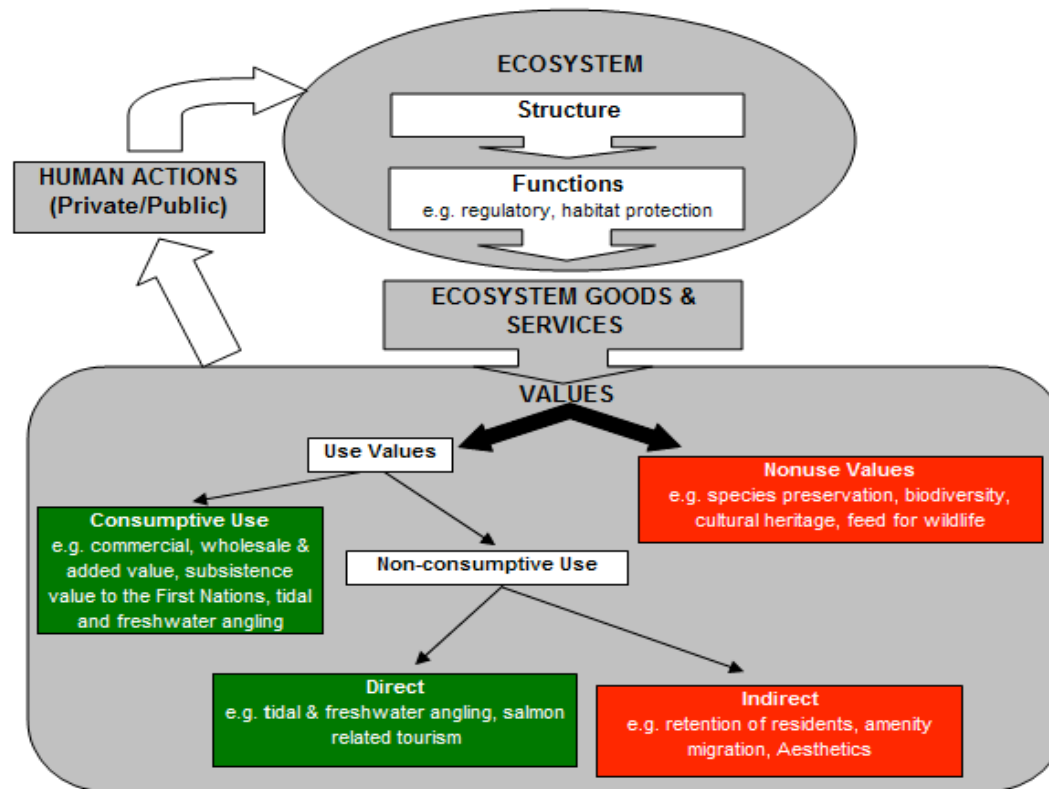
**Landed Value-** Value paid to fisherman for the raw material harvest.

**Wholesale Value-** Value of the preliminary and final processing activities. Dollar impact of the added value steps / processes consumed in converting the raw material fish into the following states: Frozen, Fresh, Canned, Roe and Other.

**Double Counting-** The capture or counting of figures more than once, within a study. Typically occurs across separate value areas within a study (e.g. counting the landed value under commercial fishing and wholesale processing).

## Scope of Study

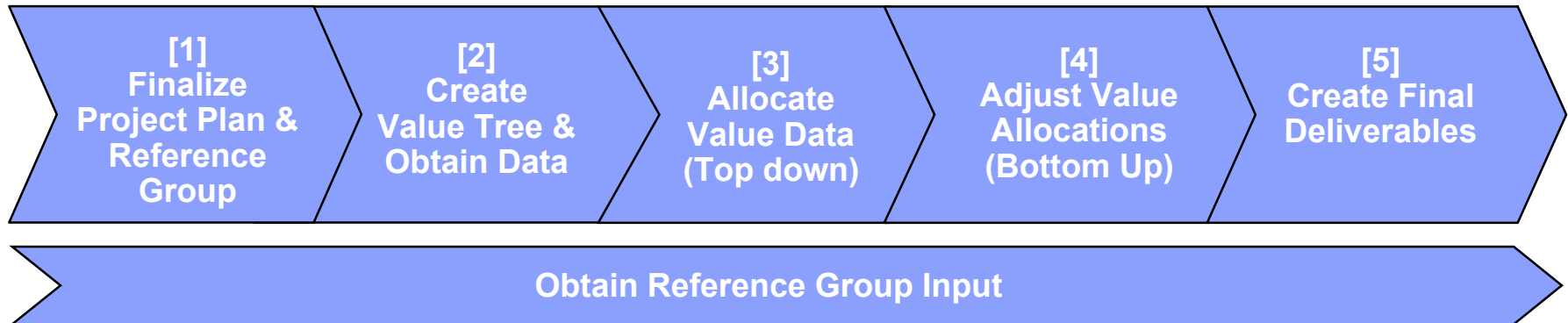
- Our study focused on the sources of revenue that were directly quantifiable based on existing sources of data
- Indirect and Non-consumptive Use Indirect values were not quantified.
- In order to quantify these additional areas, "Willingness to Pay" and other primary quantification techniques would be required. These methods fell outside the scope of the study.



**LEGEND:**  
 Out of Scope (Non-Quantified)  
 In Scope (Quantified)

Adapted from: Value Ecosystems  
 Services Toward Better  
 Environmental Decision Making: 2002

## Project Approach

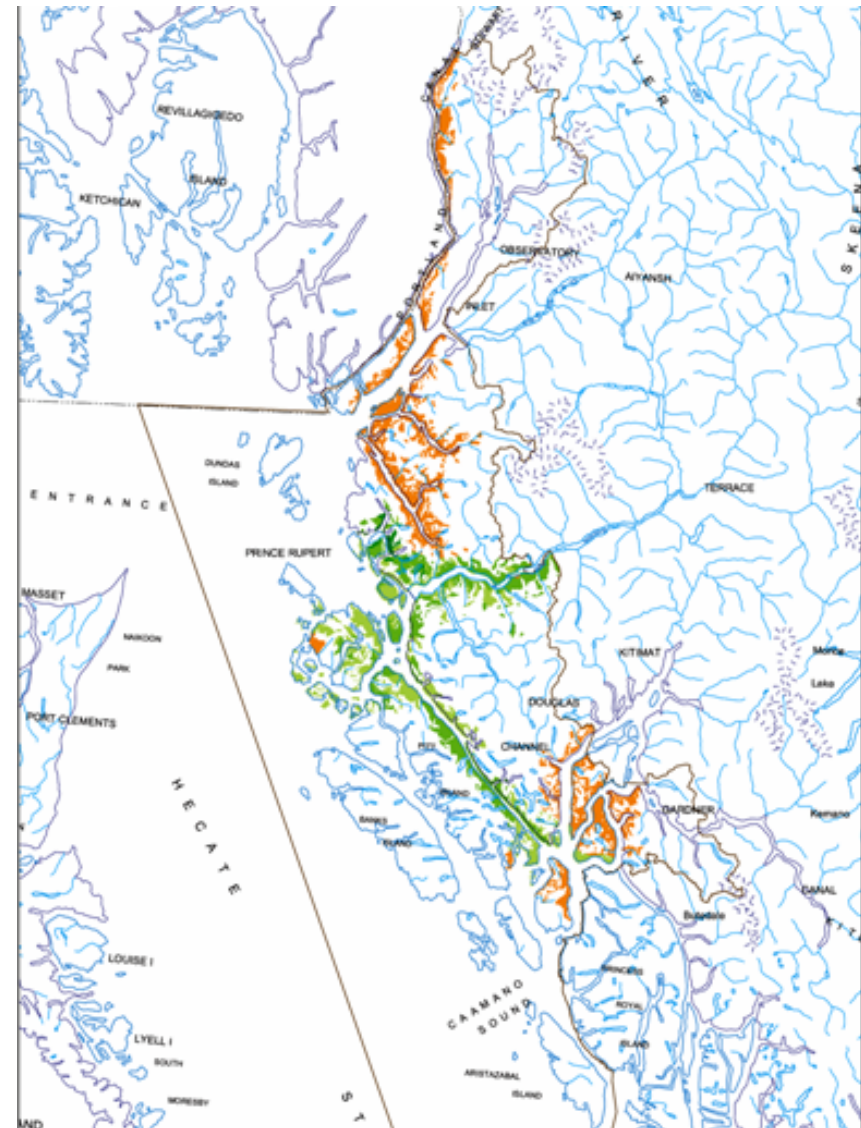


### Activities

<ul style="list-style-type: none"> <li>Created detailed projected plan</li> <li>Selected 'Reference Group' of 8 members</li> <li>Launched project</li> </ul>	<ul style="list-style-type: none"> <li>Created 'Value-Tree' of revenue-streams for quantification</li> <li>Conducted detailed review of 18 existing reports and 18 other secondary sources.</li> <li>Populated 'Value Tree'</li> </ul>	<ul style="list-style-type: none"> <li>Allocated % of B.C. revenue attributable to salmonids</li> <li>Allocated % of B.C. revenue attributable to Skeena</li> <li>Allocated % of revenue attributable to Alaska</li> </ul>	<ul style="list-style-type: none"> <li>Interviewed 22 Subject Matter Experts (SMEs)</li> <li>Adjusted % allocations based on latest data and SME recommendations</li> <li>Created updated Value Tree</li> </ul>	<ul style="list-style-type: none"> <li>Synthesized findings</li> <li>Created Power Point Summary</li> <li>Created detailed Excel workbook including assumptions and sources</li> </ul>
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## Region of Study

- The region of study included the Skeena Watershed and all Skeena salmonid migration areas along the B.C. and Alaskan coastlines.



Source: LRMP, 2000



## Detailed Findings





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## Overall assumptions supporting findings

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-  Overall approach relied on secondary source data at the provincial level and used allocations to apportion value to:
  - (a) Salmonid species,
  - (b) Skeena watershed,
  - (c) Skeena migration path
  
-  Salmonid species included Sockeye, Pink, Chum, Coho, and Chinook. Steelhead trout were included under the recreational fishing category.
  
-  Revenue figures have been provided for a base year of 2004. Where data was not available for the base year, assumptions based on known trends (e.g. Consumer Price Index) and multi-year averages were used to estimate the base year.
  
-  Allocations from Provincial figures to Skeena salmonids were based on input from numerous sources:
  - (a) Subject Matter Experts (SMEs)
  - (b) Regional catch statistics
  - (c) Stock assessment estimates
  - (d) Secondary source surveys
  - (e) Tonnes landed statistics, and
  - (f) Proxies (Allocations used in other areas of the study, and applied to current value areas where relevant. i.e. Using 'commercial landed value' % of 26.6% to allocate wholesale values to the Skeena region).

# Revenue Allocation Approach & Detailed Assumptions...

Value Driver - L1	Value Driver Category - L2	Discrete Revenue Component - L3	% of \$ or (\$/item) column	\$ or (\$/item)	Description	Statistical Year	A B		% Salmonoid	% Salmonoid Description
							Trend (U,D)			
Fish Processing	Wholesale Value	Canned	31.2%	\$167,000,000	% of Canned - Added Value Processing	2003	102%		38%	In 2004 a full 62% of all BC canned salmon was derived from imported salmon. Source: The 2004 BC Seafood Industry Year in Review.
Fish Processing	Wholesale Value	Roe	9.0%	\$167,000,000	% of Roe - Added Value Processing	2003	102%		70%	Assumption: Allocation % takes removes impact of any "imported" salmon used.
Fish Processing	Wholesale Value	Fresh Whole	14.6%	\$167,000,000	% of Fresh - Added Value Processing	2003	102%		70%	Assumption: Allocation % takes removes impact of any "imports" used.
Fish Processing	Wholesale Value	Frozen Whole	27.1%	\$167,000,000	% of Frozen - Added Value Processing	2003	102%		70%	Assumption: Allocation % takes removes impact of any "imports" used.
Fish Processing	Wholesale Value	Other (Fillets, Portions, Smoked, Cooked, Peeled Meat, Fishmeal etc.)	18.1%	\$167,000,000	% of Other - Added Value Processing	2003	102%		70%	Assumption: Allocation % takes removes impact of any "imports" used.

**Value Areas**

Value areas are classifications of value based on the unique attributes of various study components (appendix 6)

The "Trend" column is used to trend non-current data to 2004 levels using Consumer Price Index (CPI) and other economic indicies.

The "% Domestic Salmon" column is used to remove the impacts of (1) Other fish species and (2) Salmonoids originating outside B.C.

# Revenue Allocation Approach & Detailed Assumptions

F	C	D=AxBxC	E=DxF			
% Skeena	% Skeena Description	Provincial Revenue	Provincial Salmonoid Revenue	Skeena Salmonoid Revenue	Report & Page #	Notes
14.6%	Used Commercial Landed Value % as a Proxy.	\$52,030,151	\$20,164,909	\$2,944,077	Seafood Industry Year in Review, pg 2	Used 2002 Wholesale Salmon by Added Value Product %'s (GSGislason's SWOT report (pg 142) to determine % allocation. Used 2004 Total wholesale value of \$167M (\$218.9M - \$51.9M) from the Seafood Industry YIR study.
14.6%	Used Commercial Landed Value % as a Proxy.	\$15,105,528	\$10,784,289	\$1,574,506	Seafood Industry Year in Review, pg 2	Used 2002 Wholesale Salmon by Added Value Product %'s (GSGislason's SWOT report (pg 142) to determine % allocation. Used 2004 Total wholesale value of \$167M (\$218.9M - \$51.9M) from the Seafood Industry YIR study.
14.6%	Used Commercial Landed Value % as a Proxy.	\$24,336,683	\$17,374,688	\$2,536,705	Seafood Industry Year in Review, pg 2	Used 2002 Wholesale Salmon by Added Value Product %'s (GSGislason's SWOT report (pg 142) to determine % allocation. Used 2004 Total wholesale value of \$167M (\$218.9M - \$51.9M) from the Seafood Industry YIR study.
14.6%	Used Commercial Landed Value % as a Proxy.	\$45,316,583	\$32,352,868	\$4,723,519	Seafood Industry Year in Review, pg 2	Used 2002 Wholesale Salmon by Added Value Product %'s (GSGislason's SWOT report (pg 142) to determine % allocation. Used 2004 Total wholesale value of \$167M (\$218.9M - \$51.9M) from the Seafood Industry YIR study.
14.6%	Used Commercial Landed Value % as a Proxy.	\$30,211,055	\$21,568,579	\$3,149,012	Seafood Industry Year in Review, pg 2	Used 2002 Wholesale Salmon by Added Value Product %'s (GSGislason's SWOT report (pg 142) to determine % allocation. Used 2004 Total wholesale value of \$167M (\$218.9M - \$51.9M) from the Seafood Industry YIR study.

The "% Skeena" column is used to isolate revenue impacts from the Skeena salmon (i.e. Salmonoids originating from the Skeena region).

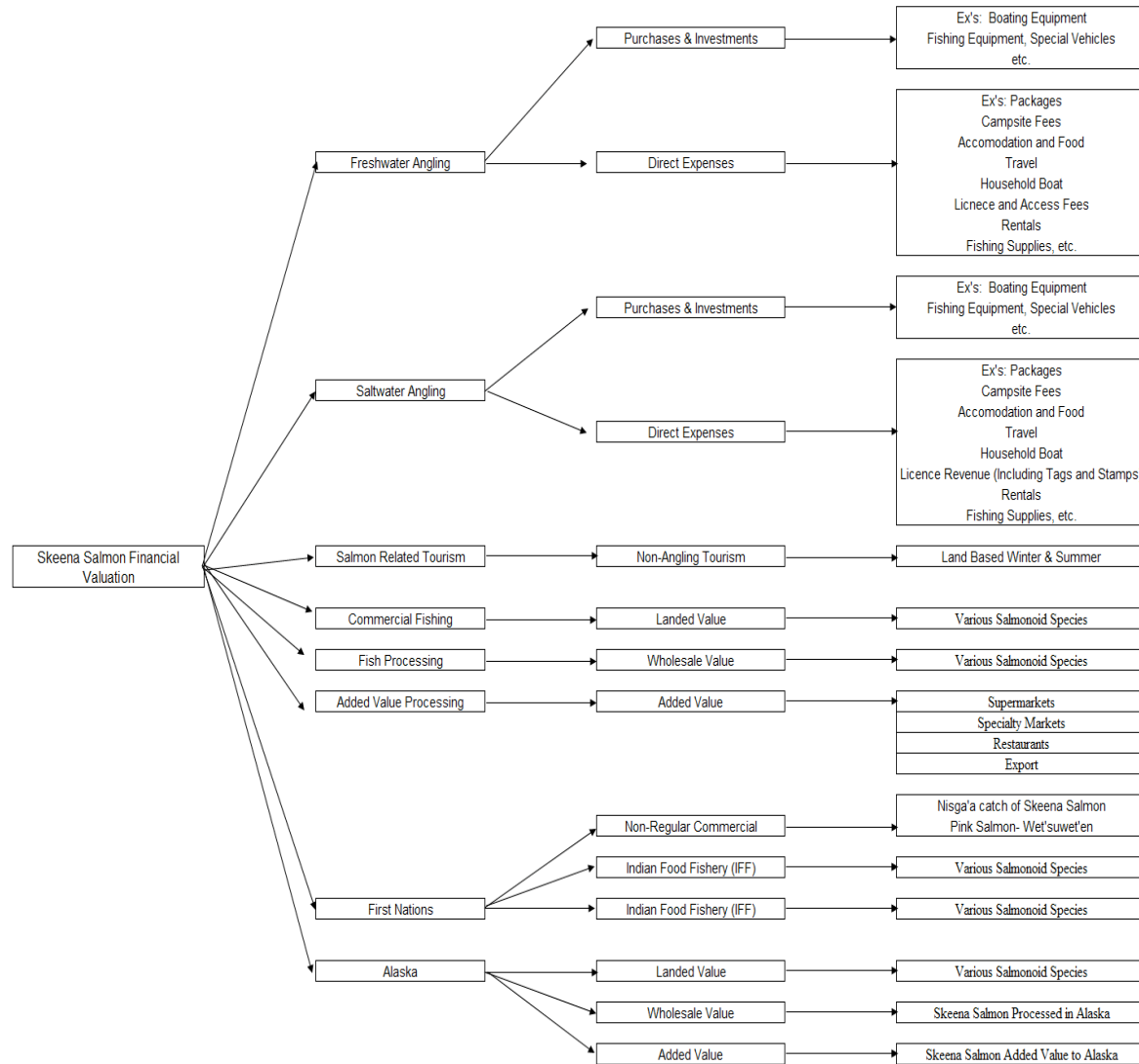
The "Provincial Revenue" column contains the high-level revenue figures for all fish species across the entire province. \*Note, in some cases the secondary source data is already factored for Salmon and for Skeena salmon at this stage.

The "Provincial Salmon Revenue" column is the Provincial Revenue figure net of (1) Non-salmonoids and (2) Salmonoids originating outside of B.C.

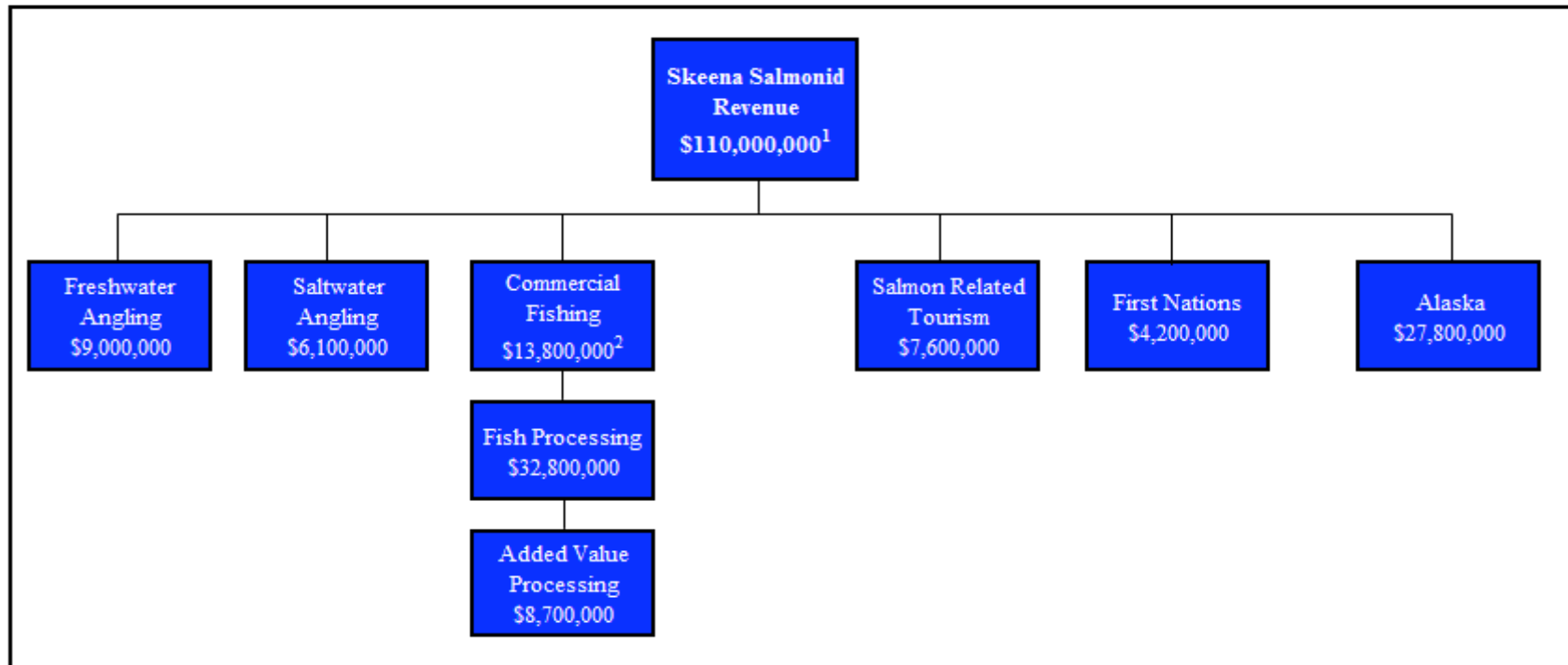
The "Skeena Salmon Revenue" column contains the revenue impact of the Skeena fish (salmon) and is derived by removing all non-Skeena salmonoids from the Provincial Salmon Revenue column. \*Note, this is the final step in the model.

The "Report and Page #" column along with the "Notes" column, provide the secondary source references and line by line modeler methodology for arriving at the final Skeena Salmon figure.

# Unpopulated Value-Tree



## Level 1 (L1) Value Tree



<sup>1</sup>Medium estimate only. High and low estimates (not provided) range from +10% to +50% and -10% to -50%, by discrete revenue component. On an aggregate study basis, level one value driver sensitivity ranges from -21% to +21% yielding a high study value of 133,000,000 and a low study value of 87,000,000.

<sup>2</sup>Total costs to fisherman for Commercial and First Nations Commercial Licences are estimated at \$322,000 per annum.

## Level 1 (L1) Value Table

Value Driver	Provincial Revenue <sup>1</sup>	Provincial 'Salmonid' Revenue <sup>2</sup>	2004 'Skeena Salmonid' Revenue	2001-2004 Average Skeena Salmonid Revenue <sup>3</sup>	2001-2004 Average Skeena Salmonid GDP <sup>3</sup>
Freshwater Angling	\$ 429,457,662		\$ 8,940,552	\$ 7,700,000	\$ 2,800,000
Saltwater Angling	\$ 493,703,426		\$ 6,139,596	\$ 5,800,000	\$ 2,200,000
Salmon Related Tourism	\$ 483,600,000	\$ 170,120,808	\$ 7,655,436		
Commercial Fishing <sup>4</sup>		\$ 51,900,000	\$ 13,818,273	\$ 12,900,000	\$ 5,000,000
Fish Processing		\$ 128,992,814	\$ 32,782,990	\$ 38,100,000	\$ 8,400,000
Added Value Processing			\$ 8,654,709		
First Nations			\$ 4,188,078		
Alaska			\$ 27,808,228		
<b>Grand Total<sup>5</sup></b>			<b>\$ 109,987,862</b>		

### Notes:

<sup>1</sup>Level 1 value driver figures for Commercial Fishing, Fish Processing, Added Value Processing, and First Nations, to Government have intentionally been left blank as secondary data was available at the Provincial 'Salmonid' Level.

<sup>2</sup>The Added Value Processing figure is intentionally blank as the value was extrapolated from the Skeena Salmonid Fish Processing figure at the Skeena Salmonid level.

<sup>3</sup>GDP and 4-year average figures shown are based on extrapolations (see appendix 4)

<sup>4</sup>Total estimated costs to fisherman for Commercial and First Nations Commercial Licences is \$322,000 per annum.

<sup>5</sup>Grand totals only shown for complete value driver areas.

## Level 2 (L2) Value Tree

Value Driver - L1	Value Driver Category - L2	Provincial Revenue	Provincial Salmonid Revenue	Skeena Salmonid Revenue
Freshwater Angling	Direct Expenses	\$ 240,355,267	\$ 25,754,261	\$ 5,154,526
	Purchases and Investments	\$ 189,102,395	\$ 20,085,019	\$ 3,786,026
<b>Freshwater Angling Total</b>		<b>\$ 429,457,662</b>	<b>\$ 45,839,281</b>	<b>\$ 8,940,552</b>
Saltwater Angling	Direct Expenses	\$ 265,786,836	\$ 132,591,828	\$ 3,302,929
	Purchases and Investments	\$ 227,916,590	\$ 113,874,376	\$ 2,836,667
<b>Saltwater Angling Total</b>		<b>\$ 493,703,426</b>	<b>\$ 246,466,204</b>	<b>\$ 6,139,596</b>
Salmon Related Tourism	Land Based Winter and Summer	\$ 483,600,000	\$ 170,120,808	\$ 7,655,436
<b>Salmon Related Tourism Total</b>		<b>\$ 483,600,000</b>	<b>\$ 170,120,808</b>	<b>\$ 7,655,436</b>
Commercial Fishing	Landed Value		\$ 51,900,000	\$ 13,818,273
<b>Commercial Fishing Total</b>			<b>\$ 51,900,000</b>	<b>\$ 13,818,273</b>
Fish Processing	Wholesale Value		\$ 123,244,322	\$ 32,782,990
<b>Fish Processing Total</b>			<b>\$ 123,244,322</b>	<b>\$ 32,782,990</b>
Added Value Processing	Added Value			\$ 8,654,709
<b>Added Value Processing Total</b>				<b>\$ 8,654,709</b>
First Nations	Non-Regular Commercial	\$ -	\$ -	\$ 10,280
	Section 35 FSC Catch	\$ -	\$ -	\$ 2,317,798
	Babine Terminal Harvest	\$ -	\$ -	\$ 1,860,000
<b>First Nations Total</b>		<b>\$ -</b>	<b>\$ -</b>	<b>\$ 4,188,078</b>
Alaska	Landed Value	\$ -	\$ -	\$ 5,231,839
	Wholesale Value	\$ -	\$ -	\$ 17,861,067
	Added Value	\$ -	\$ -	\$ 4,715,322
<b>First Nations Total</b>		<b>\$ -</b>	<b>\$ -</b>	<b>\$ 27,808,228</b>
<b>Grand Total</b>				<b>\$ 109,987,862</b>

Certain Provincial and Provincial Salmonid Revenue fields have intentionally been left blank as secondary source data was only available at the Skeena Salmonid level.

## Discrete Revenue Components (1 of 2)

Value Driver - L1	Value Driver Category - L2	Discrete Revenue Component - L3	Skeena Salmonid Revenue	Skeena Salmonid Revenue High	Skeena Salmonid Revenue Low
Commercial Fishing	Landed Value	Chinook	\$476,420	\$524,062	\$428,778
Commercial Fishing	Landed Value	Chum	\$12,529	\$13,782	\$11,276
Commercial Fishing	Landed Value	Coho	\$50,344	\$55,378	\$45,309
Commercial Fishing	Landed Value	Pink	\$866,580	\$953,238	\$779,922
Commercial Fishing	Landed Value	Sockeye	\$12,412,400	\$13,653,640	\$11,171,160
<b>Total Commercial Landed Value</b>			<b>\$13,818,273</b>	<b>\$15,200,100</b>	<b>\$12,436,446</b>
Fish Processing	Wholesale Value	Canned	\$5,259,208	\$6,311,049	\$4,207,366
Fish Processing	Wholesale Value	Roe	\$5,826,202	\$6,991,442	\$4,660,962
Fish Processing	Wholesale Value	Fresh Whole	\$10,848,790	\$13,018,548	\$8,679,032
Fish Processing	Wholesale Value	Frozen Whole	\$7,232,527	\$8,679,032	\$5,786,021
Fish Processing	Wholesale Value	Other (Fillets, Portions, Smoked, Cooked, Peeled Meat, Fishmeal etc.)	\$3,616,263	\$4,339,516	\$2,893,011
<b>Total Wholesale Value</b>			<b>\$32,782,990</b>	<b>\$39,339,587</b>	<b>\$26,226,392</b>
Added Value Processing	Added Value	Supermarkets	\$2,950,469	\$4,425,704	\$1,475,235
Added Value Processing	Added Value	Specialty Markets	\$983,490	\$1,475,235	\$491,745
Added Value Processing	Added Value	Restaurants	\$3,278,299	\$4,917,448	\$1,639,149
Added Value Processing	Added Value	Export	\$1,442,452	\$1,875,187	\$1,009,716
<b>Total Added Value</b>			<b>\$8,654,709</b>	<b>\$12,693,574</b>	<b>\$4,615,845</b>
Freshwater Angling	Direct Expenses	Fishing Supplies	\$301,960	\$377,450	\$226,470
Freshwater Angling	Direct Expenses	Packages	\$1,258,468	\$1,573,085	\$943,851
Freshwater Angling	Direct Expenses	Travel	\$1,330,379	\$1,662,974	\$997,784
Freshwater Angling	Direct Expenses	Campsite Fees	\$150,494	\$188,117	\$112,870
Freshwater Angling	Direct Expenses	Household Boat	\$290,558	\$363,197	\$217,918
Freshwater Angling	Direct Expenses	Rentals	\$71,465	\$89,331	\$53,598
Freshwater Angling	Direct Expenses	Guides	\$138,420	\$173,025	\$103,815
Freshwater Angling	Direct Expenses	Licence Fees	\$347,551	\$382,307	\$312,796
Freshwater Angling	Direct Expenses	Access Fees	\$21,946	\$24,141	\$19,752
Freshwater Angling	Direct Expenses	Other Expenditures	\$11,248	\$14,059	\$8,436
Freshwater Angling	Direct Expenses	Accommodation and Food	\$1,232,038	\$1,540,047	\$924,028
Freshwater Angling	Purchases and Investments	Boating Equipment	\$799,747	\$1,039,671	\$559,823
Freshwater Angling	Purchases and Investments	Fishing Equipment	\$351,107	\$456,439	\$245,775
Freshwater Angling	Purchases and Investments	Camping Equipment	\$658,759	\$856,386	\$461,131
Freshwater Angling	Purchases and Investments	Special Vehicles	\$1,208,889	\$1,571,556	\$846,222
Freshwater Angling	Purchases and Investments	Land-Buildings	\$622,835	\$809,685	\$435,984
Freshwater Angling	Purchases and Investments	Other Purchases and Investments	\$144,690	\$188,097	\$101,283
<b>Total Freshwater Angling</b>			<b>\$8,940,552</b>	<b>\$11,309,566</b>	<b>\$6,571,537</b>



## Discrete Revenue Components (2 of 2)

Value Driver - L1	Value Driver Category - L2	Discrete Revenue Component - L3	Skeena Salmonid Revenue	Skeena Salmonid Revenue High	Skeena Salmonid Revenue Low
Saltwater Angling	Direct Expenses	Fishing Supplies	\$135,727	\$176,445	\$95,009
Saltwater Angling	Direct Expenses	Other	\$3,306	\$4,297	\$2,314
Saltwater Angling	Direct Expenses	Packages	\$976,982	\$1,270,076	\$683,887
Saltwater Angling	Direct Expenses	Travel	\$1,160,411	\$1,508,534	\$812,288
Saltwater Angling	Direct Expenses	Licence Revenue (Including Tags and Stamps)	\$81,001	\$101,251	\$60,751
Saltwater Angling	Direct Expenses	Fishing Services	\$191,866	\$249,426	\$134,306
Saltwater Angling	Direct Expenses	Accommodation and Food	\$753,636	\$979,727	\$527,545
Saltwater Angling	Purchases and Investments	Boating Equipment	\$1,269,484	\$1,650,329	\$888,639
Saltwater Angling	Purchases and Investments	Fishing Equipment	\$223,812	\$290,955	\$156,668
Saltwater Angling	Purchases and Investments	Camping Equipment	\$158,520	\$206,076	\$110,964
Saltwater Angling	Purchases and Investments	Special Vehicles	\$440,397	\$572,517	\$308,278
Saltwater Angling	Purchases and Investments	Land-Buildings	\$684,997	\$890,497	\$479,498
Saltwater Angling	Purchases and Investments	Other Purchases and Investments	\$59,457	\$77,294	\$41,620
<b>Total Saltwater Angling</b>			<b>\$6,139,596</b>	<b>\$7,977,425</b>	<b>\$4,301,767</b>
Salmon Related Tourism	Land Based Winter and Summ	Land Based Winter and	\$7,655,436	\$10,717,611	\$4,593,262
<b>Total Salmon Related Tourism</b>			<b>\$7,655,436</b>	<b>\$10,717,611</b>	<b>\$4,593,262</b>
First Nations	Non-Regular Commercial	Nisga'a catch of Skeena Salmon	\$2,480	\$2,976	\$1,984
First Nations	Non-Regular Commercial	Pink Salmon-Wet'suwet'en	\$7,800	\$9,360	\$6,240
First Nations	Section 35 FSC Catch	Sockeye	\$1,860,000	\$2,232,000	\$1,488,000
First Nations	Section 35 FSC Catch	Chinook	\$408,360	\$490,032	\$326,688
First Nations	Section 35 FSC Catch	Chum	\$788	\$946	\$630
First Nations	Section 35 FSC Catch	Coho	\$44,750	\$53,700	\$35,800
First Nations	Section 35 FSC Catch	Pink	\$3,900	\$4,680	\$3,120
First Nations	Babine Terminal Harvest	Terminal Harvest	\$1,860,000	\$2,232,000	\$1,488,000
<b>Total to First Nations</b>			<b>\$4,188,078</b>	<b>\$5,025,694</b>	<b>\$3,350,462</b>
Alaska	Landed Value	Chinook	\$510,450	\$561,495	\$459,405
Alaska	Landed Value	Chum	\$41,764	\$45,940	\$37,588
Alaska	Landed Value	Coho	\$335,625	\$369,188	\$302,063
Alaska	Landed Value	Pink	\$624,000	\$686,400	\$561,600
Alaska	Landed Value	Sockeye	\$3,720,000	\$4,092,000	\$3,348,000
Alaska	Wholesale Value	Skeena Salmon Processed in Alaska	\$17,861,067	\$19,647,174	\$16,074,960
Alaska	Added Value	Skeena Salmon Added Value to Alaska	\$4,715,322	\$5,186,854	\$4,243,790
<b>Total to Alaska</b>			<b>\$27,808,228</b>	<b>\$30,589,050</b>	<b>\$25,027,405</b>
<b>GRAND TOTAL</b>			<b>\$109,987,862</b>	<b>\$132,852,607</b>	<b>\$87,123,116</b>



# Appendices

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## Appendix 1: Reference Group Members

<b>Name</b>	<b>Title</b>	<b>Organization</b>
Pat Moss	Executive Director	Northwest Institute
Hon. John A. Fraser	Chair	Pacific Salmon Forum
Fred Oliemans	Section Head	Government of B.C.- Integrated Land Management Bureau
Richard Overstall	Legal Counsel	Babine River Foundation
David Lane	Executive Director	TBuck Suzuki Environmental Foundation
Stephen Hidber	President	Oscar's Source for Sports
Ivan Thompson	Director	Northwest Institute and Tides
Des Nobles	Staff Member	TBuck Suzuki Environmental Foundation

## Appendix 2: Subject Matter Experts

#	Name	Referred By	Organization	Title	Area of Expertise
1	Joy Thorkleson	Pat Moss	UF&AWU	TBD	General Industry Knowledge
2	Steven Cox Rogers	Joy Thorkleson	DFO	Stock Assessment	Commercial / Wholesale value
3	Steven Groves	Joy Thorkleson	DFO	Acting Chief Resource Management	Commercial / Wholesale value
4	Brian Gunn	Jay Ritchlin	Wilderness Tourism Association	TBD	Tourism
5	Grant Snell	Dave Lane	BC Salmon Marketing Council	TBD	Value Added Processing and Retail Sales
6	Dave Peacock	Pat Moss	DFO- Prince Rupert	Head of Stock Assessment	Commercial Fishing, Wholesale and Allocations
7	Allen Gottesfeld	Pat Moss	Skeena Fisheries Commission	TBD	First Nations- Skeena
8	Cory Paterson	Pat Moss	DFO-Economist (consultant)	TBD	Commercial Fishing and Economics
9	Brad Mirow	Joy Thorkleson	Aero Packing	TBD	Added Value Processing
10	Brent McCallum	Steve Hidber	Redl Sports Distributors	TBD	Wholesale Distribution
11	Gordon Gislason	N/A	GSGislason & Assoc Ltd.	President	Recreational Fisheries
12	Mr. Mark Beere	Fred Oliemans	Skeena Ministry of Environment	TBD	Migration Patterns
13	Mr. Dana Atagi	Fred Oliemans	Skeena Ministry of Environment	TBD	Commercial Fisheries
14	John Brockley	Steve Hidber	Sport Fish Advisory Board	Ex-Chief of Recreational Fisheries	Recreational Fisheries
15	David Einarson	Dana Atagi	DFO	Chief of Fisheries Mgmt	Commercial Fishing
16	Mary Hobbs	Dave Peacock	DFO	TBD	Statistics
17	Laurie Biagini	Cory Paterson	DFO	TBD	Statistics
18	Sue Rocque	N/A	DFO- Ottawa	Chief of Recreational Fisheries	Recreational Fisheries
19	Divona Adams	Sue Rocque	DFO	TBD	Recreational Fisheries
20	Jim Steward	Allen Gottesfeld	TBD	Resource Manager	First Nations- Skeena
21	Richard Alexander	Jim Steward	DFO	TBD	First Nations- Skeena
22	Maria Poon	Jim Steward	DFO	TBD	Catch Statistics

## Appendix 3: Secondary sources of data (1 of 3)

#	Source Documentation	Report Title	Source Authors / Department	Link	Date	Contact Name	Contact #
1	BC Sport Fishing Industry Profile	BC Sport Fishing Industry Profile	Fisheries and Oceans Canada & the Province of BC (BC Ministry of Agriculture, Food and Fisheries)	<a href="http://wlapwww.gov.bc.ca/fw/fish/pdf/sport-fishing-profile.pdf">http://wlapwww.gov.bc.ca/fw/fish/pdf/sport-fishing-profile.pdf</a>	1-Apr-00	Karen Culham	250-387-9560
2	BC 's Freshwater Recreational Fishery- Setting Direction for the Future	Setting Direction for the Future	Joint Government- Sector Steering Committee	<a href="http://wlapwww.gov.bc.ca/fw/fish/pdf/consultation_final.pdf">http://wlapwww.gov.bc.ca/fw/fish/pdf/consultation_final.pdf</a>	May-02	Joyce Murray	
3	Fisheries and Aquaculture - BC Ministry of Agriculture and Lands	Fisheries and Aquaculture	Fisheries and Aquaculture	<a href="http://www.agf.gov.bc.ca/fisheries/index.htm">http://www.agf.gov.bc.ca/fisheries/index.htm</a> , <a href="mailto:fishstats@gov.bc.ca">fishstats@gov.bc.ca</a>	17-Aug-05		BC STATS toll-free at 1-888-447-4427 ext 3
4	Industry Canada	Stat-USA Market Research Reports	Stats USA	<a href="http://strategis.ic.gc.ca/epic/internet/inimrri.nsf/en/gr117145e.html">http://strategis.ic.gc.ca/epic/internet/inimrri.nsf/en/gr117145e.html</a> , <a href="http://strategis.ic.gc.ca/engdoc/main.html">http://strategis.ic.gc.ca/engdoc/main.html</a>	4-Nov-05		
5	Information on BC: Tourism in BC and Gofishbc.com	N/A	N/A	<a href="http://www.gofishbc.com">www.gofishbc.com</a>	2003		
6	The Vancouver Sun	BC Coastal Towns Losing Access to Fishing: Sutdy	BC Ministry of Agriculture, Food and Fisheries, Canadian Sablefish Assoc, PwC and Others	<a href="#">See Vancouver Sun</a>	15-Nov-04	Joel Baglloe	
7	Canadian Sablefish Assoc	Fact Sheet	BC Ministry of Agriculture, Food and Fisheries, Canadian Sablefish Assoc, PwC and Others	<a href="http://www.canadiansablefish.com/">http://www.canadiansablefish.com/</a>	9-Sep-04	Eric Wickham	Phone: (604) 915-9117
8	Bank of Canada	Monetary Policy	Government of Canada	<a href="http://www.bankofcanada.ca/en/cpi.html">http://www.bankofcanada.ca/en/cpi.html</a>	1995 - Present		1-800-303-1282 (toll-free, North America)
9	Annual Summary of BC Commercial Catch Statistics	Historic Commercial Catch Stats	Fisheries & Oceans Canada	<a href="ftp://ftp.pac.dfo-mpo.gc.ca/pub/BiaginiL/HistoricCommercialCatchStatistics/">ftp://ftp.pac.dfo-mpo.gc.ca/pub/BiaginiL/HistoricCommercialCatchStatistics/</a>	1995		
10	Salmon Landings by District, Area and Species (Value)		Fisheries & Oceans Canada	<a href="http://www-sci.pac.dfo-mpo.gc.ca/sa/Commercial/AnnSumm_e.htm">http://www-sci.pac.dfo-mpo.gc.ca/sa/Commercial/AnnSumm_e.htm</a>	2005		

## Appendix 3: Secondary sources of data (2 of 3)

#	Source Documentation	Report Title	Source Authors / Department	Link	Date	Contact Name	Contact #
11	Salmon - Pacific Region- Licensing	Licensing	Fisheries & Oceans Canada	<a href="http://www.pac.dfo-mpo.gc.ca/ops/fm/salmon/licensing_e.htm">http://www.pac.dfo-mpo.gc.ca/ops/fm/salmon/licensing_e.htm</a>			
12	BC Fisheries and Aquaculture Sector- BC Stats	Statistics	BC Fisheries, Fisheries and Oceans Canada, BC Stats and Stats Can	<a href="http://www.agf.gov.bc.ca/fish_stats/pdf/BC_Fisheries_&amp;_Aquaculture_Sector_2002.pdf">http://www.agf.gov.bc.ca/fish_stats/pdf/BC Fisheries &amp; Aquaculture Sector 2002.pdf</a>	1984-2001	Lillian Holleen / Sarah Adams	<a href="http://www.bcstats.gov.bc.ca/phomes.asp">http://www.bcstats.gov.bc.ca/phomes.asp</a> / <a href="mailto:bernadette.alain@statscan.ca">bernadette.alain@statscan.ca</a>
13	BC Fisheries and Aquaculture Sector- BC Stats	Statistics	BC Fisheries, Fisheries and Oceans Canada, BC Stats and Stats Can	<a href="http://www.agf.gov.bc.ca/fish_stats/pdf/BC_Fish_Product_&amp;_Seafood_Industry_in_the_1990s.pdf">http://www.agf.gov.bc.ca/fish_stats/pdf/BC Fish Product &amp; Seafood Industry in the 1990s.pdf</a>	(1990-1999)		
14	Fisheries Statistics	Statistics	Ministry of Agriculture and Lands	<a href="http://www.agf.gov.bc.ca/fish_stats/statistics.htm">http://www.agf.gov.bc.ca/fish_stats/statistics.htm</a>			
15	BC Stats	Main Subject Index	N/A	<a href="http://www.bcstats.gov.bc.ca/data/dd/details.asp#AZ">http://www.bcstats.gov.bc.ca/data/dd/details.asp#AZ</a>			
16	BC Gov	Listing of all reports	Oceans and Marine Fisheries Division (OMFD)	<a href="http://www.env.gov.bc.ca/omfd/reports.html">http://www.env.gov.bc.ca/omfd/reports.html</a>	1990's - 2005		
17	Michelle James- Teakerne Resource Consultants	Native Participation in BC Commercial Fisheries - 2003	Teakerne Resource Consultants	<a href="http://www.agf.gov.bc.ca/fisheries/reports/NativeParticipationBCFishing03.pdf">http://www.agf.gov.bc.ca/fisheries/reports/NativeParticipationBCFishing03.pdf</a>	2003		
18	BC Gov	The 2004 BC Seafood Industry Year in Review	Ministry of Agriculture and Lands	<a href="http://www.agf.gov.bc.ca/fish_stats/pdf/Seafood_Industry_YIR_2004.pdf">http://www.agf.gov.bc.ca/fish_stats/pdf/Seafood Industry YIR 2004.pdf</a>	2004		
19	GS Gislason and Assoc Ltd	BC Seafood Sector and Tidal Water Recreational Fishing: A SWOT Assessment	GS Gislason and Assoc Ltd.	<a href="http://www.agf.gov.bc.ca/fisheries/reports/SWOT/FULL_Report.pdf">http://www.agf.gov.bc.ca/fisheries/reports/SWOT/FULL_Report.pdf</a>	Feb-04	Gordon Gislason	

## Appendix 3: Secondary sources of data (3 of 3)

#	Source Documentation	Report Title	Source Authors / Department	Link	Date	Contact Name	Contact #
20	Fisheries and Oceans Canada	Licensing - Commercial Licensing Prices	N/A	<a href="http://www.pac.dfo-mpo.gc.ca/ops/fm/salmon/licensing_e.htm">http://www.pac.dfo-mpo.gc.ca/ops/fm/salmon/licensing_e.htm</a>	2005 / 1998		
21	Ministry of Environment	Sport Fishing Stats	N/A	<a href="http://www.env.gov.bc.ca/fw/fish/stats/statistics-rec_sportfish.html">http://www.env.gov.bc.ca/fw/fish/stats/statistics-rec_sportfish.html</a>	2001		
22	Freshwater Angling in BC - An Economic Profile	Freshwater Angling in BC - An Economic Profile	GS Gislason and Asoc Ltd.	<a href="..\Research and Supporting Documents\BB-FreshwaterAngling.pdf">..\Research and Supporting Documents\BB-FreshwaterAngling.pdf</a>	Apr-03		
23	Saltwater Fishing Charters in BC - An Economic Profile	Saltwater Fishing Charters in BC - An Economic Profile	GS Gislason and Asoc Ltd., support of Skeena Region (MSRM)	<a href="http://srmwww.gov.bc.ca/rmd/srdb/docs/huntingfishing/BB-SaltwaterFishingCharters.pdf">http://srmwww.gov.bc.ca/rmd/srdb/docs/huntingfishing/BB-SaltwaterFishingCharters.pdf</a>	Oct-03		
24	Saltwater Angling in BC - An Economic Profile	Saltwater Angling in BC - An Economic Profile	GS Gislason and Asoc Ltd., support of Skeena Region (MSRM)	<a href="http://srmwww.gov.bc.ca/rmd/srdb/docs/huntingfishing/BB-SaltwaterAngling.pdf">http://srmwww.gov.bc.ca/rmd/srdb/docs/huntingfishing/BB-SaltwaterAngling.pdf</a>	Oct-03		
25	Tourism			<a href="http://www.bcstats.gov.bc.ca/pubs/pr_tour.asp">http://www.bcstats.gov.bc.ca/pubs/pr_tour.asp</a>	2004		
26	Tourism			<a href="http://www.bcstats.gov.bc.ca/data/bus_stat/busind/tourism/timcurr.pdf">http://www.bcstats.gov.bc.ca/data/bus_stat/busind/tourism/timcurr.pdf</a>			
27	Tourism			<a href="http://www.bcstats.gov.bc.ca/pubs/tour/tsm0401.pdf">http://www.bcstats.gov.bc.ca/pubs/tour/tsm0401.pdf</a>			
28	Nature Based Tourism in BC	Characteristics of the Commercial Nature-Based Industry in BC	Tourism BC Canada Research Services	<a href="http://www.tourism.bc.ca/PDF/Characteristics%20of%20Commercial%20Nature-Based%20Tourism.pdf">http://www.tourism.bc.ca/PDF/Characteristics%20of%20Commercial%20Nature-Based%20Tourism.pdf</a>	Jan-05		research@tourismbc.com
29	Stats Canada	Consumer price index, historical summary, by province or territory	CPI	<a href="http://www40.statcan.ca/101/cst01/econ150b.htm">http://www40.statcan.ca/101/cst01/econ150b.htm</a>	2004		
30	2000 Survey of Sport Fishing in British Columbia	2000 Survey of Sport Fishing in British Columbia	J. Levey and Robert Williams	Print-out	Mar-03		
31	2000 Survey of Recreational Fishing in Canada	2000 Survey of Recreational Fishing in Canada		<a href="http://www.dfo-mpo.gc.ca/communic/statistics/recreational/canada/2000/index_e.htm">http://www.dfo-mpo.gc.ca/communic/statistics/recreational/canada/2000/index_e.htm</a>	2000		

## Appendix 4: Extrapolated GDP and 4-Year Averages

**Extrapolated GDP and Revenues**  
**Value Tree Level 1- GDP and Revenue 4 Year Average**  
*(all figures reported in millions of Cdn \$s)*

	2001	2002	2003	2004	4-Year Average	4-Year Average Salmonids Only	4-Year Average Skeena Fish
<b><u>GDP</u></b>							
Commercial							
Landed Vaue <sup>1</sup>	\$ 14.5	\$ 22.3	\$ 18.8	\$ 20.2	\$ 19.0	\$ 19.0	\$ 5.0
Fish Processing							
Wholesale Value <sup>2</sup>	\$ 27.5	\$ 31.1	\$ 30.8	\$ 36.7	\$ 31.5	\$ 31.5	\$ 8.4
Sport Fishing							
Saltwater <sup>3</sup>	\$ 187.4	\$ 191.8	\$ 195.9	\$ 199.8	\$ 193.7	\$ 89.3	\$ 2.2
Freshwater <sup>4</sup>	\$ 148.8	\$ 152.3	\$ 155.5	\$ 158.6	\$ 153.8	\$ 15.1	\$ 2.8
<b>GDP Totals</b>	<b>\$ 378.2</b>	<b>\$ 397.5</b>	<b>\$ 401.0</b>	<b>\$ 415.4</b>	<b>\$ 398.0</b>	<b>\$ 154.9</b>	<b>\$ 18.5</b>
<b><u>Revenue</u></b>							
Commercial							
Landed Vaue <sup>5</sup>	\$ 37.1	\$ 57.3	\$ 48.2	\$ 51.9	\$ 48.6	\$ 48.6	\$ 12.9
Fish Processing							
Wholesale Value <sup>6</sup>	\$ 124.8	\$ 141.3	\$ 140.2	\$ 167.0	\$ 143.3	\$ 143.3	\$ 38.1
Sport Fishing							
Saltwater <sup>7</sup>	\$ 486.8	\$ 498.2	\$ 508.7	\$ 518.9	\$ 503.1	\$ 231.9	\$ 5.8
Freshwater <sup>8</sup>	\$ 402.2	\$ 411.6	\$ 420.4	\$ 428.7	\$ 415.7	\$ 40.7	\$ 7.7
<b>Revenue Totals</b>	<b>\$ 1,050.9</b>	<b>\$ 1,108.4</b>	<b>\$ 1,117.5</b>	<b>\$ 1,166.5</b>	<b>\$ 1,110.8</b>	<b>\$ 464.6</b>	<b>\$ 64.6</b>



## Appendix 4: Extrapolated GDP and 4-Year Averages

### **Extrapolated GDP and Revenues**

#### **Value Tree Level 1- GDP and Revenue 4 Year Average**

*(all figures reported in millions of Cdn \$s)*

#### **Notes:**

<sup>1</sup> GDP contribution from landed values were extrapolated from the commercial landed value (Revenue section) using the 1998-2001 four year average percentage of GDP:landed value of 39%, derived from the BC Fisheries and Aquaculture Sector Report September 2002 Tables 2 & 5.

<sup>2</sup> GDP contribution from wholesale values were extrapolated from the wholesale value (Revenue section) using the 1998-2001 four year average percentage of GDP:wholesale value of 22%, derived from the BC Fisheries and Aquaculture Sector Report September 2002 Tables 2 & 5.

<sup>3</sup> GDP contribution from saltwater angling was extrapolated from the saltwater angling revenue, using the 1998-2001 four year average percentage of GDP:saltwater angling revenue of 38.5%, derived from the "BC Fisheries and Aquaculture Sector" September 2002 Tables 2 & 5.

<sup>4</sup> GDP contribution from freshwater angling was extrapolated from the freshwater angling revenue, using the 1998-2001 four year average percentage of GDP:freshwater angling revenue of 37%, derived from the "BC Fisheries and Aquaculture Sector" September 2002 Tables 2 & 5.

<sup>5</sup> Landed Values were referenced from the report: "The 2004 British Columbia Seafood Industry Year in Review", page 2

<sup>6</sup> Wholesale Values were referenced from the report: "The 2004 British Columbia Seafood Industry Year in Review", page 2. Commercial Landed Values have been backed out of the stated figure to avoid double counting.

<sup>7</sup> Saltwater sport fishing revenues for 2001 are referenced from Sport Fishing Statistics- BC Sport Fishing Quick Facts estimated 2001 revenues. Data for 2002 - 2004 was extrapolated using CPI for British Columbia.

<sup>8</sup> Freshwater sport fishing revenues for 2001 are referenced from Sport Fishing Statistics- BC Sport Fishing Quick Facts estimated 2001 revenues. Data for 2002 - 2004 was extrapolated using CPI for British Columbia.

## Appendix 5: Study Limitations & Mitigation Approach

Limitation	Mitigation Approach
Access to Skeena salmonid specific data.	Use of bottom-up, regional subject matter experts to validate provincial allocations to Skeena salmonids.
Availability of current secondary data sources (i.e. 2004).	Where 2004 figures were not available through secondary source research, modifying assumptions (e.g. Consumer Price Index- CPI, economic trend information etc.) were used to estimate the 2004 base year activity.
Availability of Gross Domestic Product figures for the Salmon industry in 2004.	An extrapolation approach was used based on the 4 year average ratio (1998-2001) of Revenue to GDP for Landed Value, Wholesale Value, and Sport Fishing. Estimates were obtained from the BC Fisheries and Aquaculture Sector report of 2002.
Accuracy of allocations from Provincial level data to the salmon species and on to Skeena salmonids.	Approximations based on data such as “the # of Fish Caught” were used to isolate Skeena salmon. Allocations to be verified by various SME’s. High and low ranges were provided to strengthen estimates.

## Appendix 5: Study Limitations & Mitigation Approach

Limitation	Mitigation Approach
Potential exists for “double-counting” figures across multiple value areas.	Where instances of potential double counting occurred (e.g. Landed value to wholesale to retail value) only added value incremental revenues were included. In addition, secondary source authors were contacted to clarify line item descriptions and ensure no instances of double-counting. Industry, government and other SME’s were also contacted to verify the independent reporting of figures used in the study.
Allocation data and percentages exist for certain discrete revenue components but does not exist for others.	Depending on the nature of the discrete revenue component, methodological allocation estimates used in similar study areas, were used as proxies. Results were vetted with applicable SMEs and High and Low estimates, including IBM’s degree of confidence, were provided.
No secondary data exists in some value areas	In areas where no secondary data could be located, logical assumptions were used and vetted with SME’s.

## Appendix 6: Explanation of Value Drivers

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### **Level 1 Value Drivers:**

Level 1 value drivers are the most aggregated or macro grouping of revenue and revenue equivalents within the study. Level 1 value drivers break-down into Level 2 and Level 3 categories, with each level adding more detail to the aggregated Level 1 figure.

Level 1 groupings include the following 9 categories:

- ⊙ Freshwater Angling
- ⊙ Saltwater Angling (Tidal)
- ⊙ Commercial Fishing
- ⊙ Fish Processing
- ⊙ Added Value Processing
- ⊙ Salmon Related Tourism
- ⊙ First Nations
- ⊙ Alaska
- ⊙ Government Licence Revenue

## Appendix 6: Explanation of Value Drivers

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### **Level 2 Value Drivers:**

Level 2 value drivers are the second most aggregated grouping of revenue and revenue equivalents. Level 2 value drivers roll-up into Level 1 categories and can be further disaggregated into Level 3 discrete revenue components.

Level 1 groupings with their Level 2 detail are shown below:

- ⊙ Freshwater Angling:
  - Level 2 Value Drivers
  - Direct Expenses
  - Purchases & Investments
- ⊙ Saltwater Angling:
  - Level 2 Value Drivers
  - Direct Expenses
  - Purchases & Investments
- ⊙ Commercial Fishing
  - Level 2 Value Drivers
  - Landed Value
- ⊙ Fish Processing
  - Level 2 Value Drivers
  - Wholesale Value
- ⊙ Added Value Processing
  - Level 2 Value Drivers
  - Added Value
- ⊙ Salmon Related Tourism
  - Level 2 Value Drivers
  - Land Based Winter and Summer
- ⊙ First Nations
  - Level 2 Value Drivers
  - Non-Regular Commercial
  - Section 35 FSC Catch
- ⊙ Alaska
  - Level 2 Value Drivers
  - TBD
- ⊙ Government Licence Revenue
  - Level 2 Value Drivers
  - Commercial Licences
  - First Nations Licences
  - Saltwater Angling Licences
  - Freshwater Angling Licences

## Appendix 6: Explanation of Value Drivers

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### **Level 3 Value Drivers or Discrete Revenue Components:**

Level 3 value drivers or discrete revenue components are the third and most disaggregated level of revenue and revenue equivalents. Level 3 value drivers roll-up into Level 2 categories and cannot be further disaggregated. All revenue and revenue equivalent figures within the study originate at the Discrete Revenue Component/Level 3 value driver.

Level 1-3 Value Drivers for the Saltwater Angling area have been itemized below. Note, complete Level 3 value driver information can be found within the study.

### **Level 1 Value Driver**

Saltwater Angling:

#### **Level 2 Value Drivers**

Direct Expenses

#### **Level 3 Value Drivers**

Packages  
Accommodation and Food  
Travel  
Fishing Services  
Fishing Supplies  
Other

Purchases & Investments

#### **Level 3 Value Drivers**

Fishing Equipment  
Boating Equipment  
Camping Equipment  
Special Vehicles  
Land-Buildings  
Other Purchases and Investments