

Fraser River Sockeye Management

Socio-Economic Implications

Prepared for:

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Preface

Canada Department of Fisheries & Oceans retained GSGislason & Associates Ltd. to develop socio-economic indicators for assessing different Fraser River sockeye management scenarios.

The consultants have benefited from discussions with industry, government, and others. Notwithstanding this assistance, GSGislason & Associates Ltd. has final responsibility for the analyses and conclusions of the study.

Summary

Background

- a need to assess the socio-economic implications of alternative Fraser River sockeye management regimes
- two study objectives for this pilot study:
 - to develop a set of socio-economic indicators for salmon fisheries management (based on an interview program and a literature review)
 - to apply the indicators to alternative management strategies for Fraser River sockeye (as modeled using the probabilistic Fraser River Sockeye Spawning Initiative or FFSSI model)

Socio-Economic Framework – Exhibit A

- a Multiple Account Evaluation (MAE) framework comprising five accounts: 1) Business, 2) First Nations, 3) Economy-Wide, 4) Net Benefits to Canada, 5) Social & Community

Application to Fraser Sockeye Management Scenarios

- median and mean catches under three 50 year harvest scenarios developed by DFO: 1) “Avoid Low Escapement”, 2) “Avoid Low Catch”, 3) “Recommended” (see Exhibit B)
- very little information available on importance of Fraser sockeye to social & community well-being so analysis focused on quantitative measures (see Exhibit C)
- gross value indicators
 - recreational: angler-expenditures
 - commercial: processed value
 - First Nation: landed value for FSC fish (a minimum valuation approach), processed value for Economic Opportunities fish
- wages, EBITDA, Gross Domestic Product, Labour Income, and Net Benefit estimates are illustrative (see Exhibit C)
- all indicators increase at higher catch levels
- Net Benefits for commercial sector are dragged down by non-viability of commercial salmon fleet under its current size, operating cost structure, and product prices
- But the analysis does not reflect some promising recent initiatives e.g., the agreement struck between the Commercial Salmon Advisory Board (CSAB) and four First Nations interests in the Lower Fraser

Conclusions

- the MAE approach allows consistent and fair treatment of the implications of alternative fisheries management plans on people, business, First Nations and governments – but the MAE approach is information-intensive
- this pilot study was constrained by severe data deficiencies which need to be addressed
- this pilot study can be used as a consultation piece to solicit feedback from users as to the utility of the approach and as to additional indicators of interest

Next Steps

- DFO will be conducting further analysis in 2006/07 in order to better determine the relationship between spawning stock size and productivity
- The new formulation of the model will then be utilized to explore additional harvest scenarios in order to determine those that will meet the goals of the Wild Salmon Policy and generate improved economic performance

Exhibit A: Socio-Economic Indicators for Fisheries Management

Socio-Economic Indicators

1. Business

- Commercial sector
 - harvest levels
 - participation
 - landed & processed values
 - net cash flow, net income
 - employment & wages
 - stability of access
 - gear/area breakouts
- Recreational sector
 - harvest levels
 - participation/angler-days
 - revenues/expenditures
 - employment & wages
 - lodge vs charter vs independent
 - stability of access
 - regional breakouts

2. First Nations

- Section 35 activities
 - harvest levels
 - community participation & distribution
 - use of traditional sites & technologies
 - season/duration of fishing
 - stability of access
 - ceremonial/First Salmon Festival
 - regional distribution
- Traditional commercial fishery
 - share of revenues, employment, wages
 - gear/area breakouts
- Quality of life

3. Economy-Wide

- GDP, wages, employment
- Direct plus multiplier effects
- Canadian vs regional impacts
- Gov't revenues/taxes & costs

4. Net Benefits to Canada

- Market & non-market benefits*
- Opportunity costs
- Total benefits net of opportunity costs
- Net Present Value

5. Social & Community

- Population characteristics e.g., age, education
- Community organizations & capacity e.g., SEP volunteers
- Community partnerships/stewardship e.g., co-management
- Quality of life e.g., health
- Social capital e.g., access to services

** includes existence values i.e., non-use values*

Exhibit B: Summary of Catch Scenarios

Pieces of Sockeye	Average per Year - Median Catch*			Average per Year - Mean Catch*		
	Avoid Low Escapement	Avoid Low Catch	Recommended	Avoid Low Escapement	Avoid Low Catch	Recommended
First Nations						
Marine FSC	238,200	250,000	243,200	247,700	250,000	248,300
Lower Fraser - FSC	138,600	112,500	120,500	121,800	112,500	116,200
- Ec Opp	328,000	407,800	365,900	382,800	435,700	401,400
Upper Fraser - FSC	<u>285,900</u>	<u>300,000</u>	<u>291,900</u>	<u>297,200</u>	<u>300,000</u>	<u>298,000</u>
Subtotal	990,700	1,070,300	1,021,500	1,049,500	1,098,200	1,063,900
Recreational						
Marine	2,300	4,200	2,900	3,500	5,400	4,200
Freshwater/ River	<u>43,000</u>	<u>80,000</u>	<u>55,300</u>	<u>66,700</u>	<u>102,400</u>	<u>79,400</u>
Subtotal	45,300	84,200	58,200	70,200	107,800	83,600
Commercial						
Seine - Area "B"	442,800	823,200	567,200	687,800	1,150,700	826,600
Gillnet - Area "D"	134,400	250,100	172,700	209,200	350,100	251,300
- Area "E"	246,800	459,600	317,700	384,500	643,700	461,900
Troll - Area "G"	10,500	23,000	20,400	21,800	38,400	25,200
- Area "H"	<u>101,700</u>	<u>189,100</u>	<u>130,400</u>	<u>158,000</u>	<u>264,400</u>	<u>189,900</u>
Subtotal	936,200	1,745,000	1,208,400	1,461,300	2,447,300	1,754,900
TOTAL CATCH	<u>1,972,200</u>	<u>2,899,500</u>	<u>2,288,100</u>	<u>2,581,000</u>	<u>3,653,300</u>	<u>2,902,400</u>

* Median is the mid point of the distribution – the point below which 50% of the distribution lies (the mean is the arithmetic average of the distribution)

Source: Averages over the 50 year projection period (see Appendices B through G)

Exhibit C: Summary of Quantitative Indicators – Illustrative Analysis

	NPV @ 6% DR \$ millions – Median Catch*			NPV @ 6% DR \$ millions – Mean Catch**		
	Avoid Low Escapement	Avoid Low Catch	Recommended	Avoid Low Escapement	Avoid Low Catch	Recommended
1. Business Sector						
Traditional Commercial Sector						
Processed Value	440	695	525	620	945	720
Wages	130	205	155	185	280	215
EBITDA	(5)	85	25	55	170	90
Recreational Sector						
Angler Expenditures	120	135	125	130	140	135
Wages	30	35	30	30	35	35
EBITDA	25	25	25	25	30	25
2. First Nations						
FSC Gross Value**	110	110	110	115	110	110
Economic Opportunities						
Processed Value	85	110	95	100	120	110
Wages	30	35	30	30	35	35
EBITDA	15	25	20	20	25	25
3. Economy-Wide						
Economic Impacts						
Gross Domestic Product	360	655	455	560	920	680
Labour Income	305	440	345	390	560	450
Government Taxes						
Personal Income Taxes	40	55	45	50	70	55
Commodity Taxes	40	55	45	50	70	55
4. Net Benefits to Canada						
First Nations - FSC**	110	110	110	115	110	110
- Ec Opp	10	15	10	10	15	15
Commercial Sector	(165)	(30)	(120)	(150)	100	(20)
Recreational Sector	<u>40</u>	<u>45</u>	<u>45</u>	<u>45</u>	<u>50</u>	<u>45</u>
Total	(5)	140	45	20	275	150

* EBITDA – Earnings Before Interest, Taxes, Depreciation & Amortization

NPV – Net Present Value over 50 years using 6% real discount rate

** Gross and net values of FSC fish assumed to be the same (landed value of equivalent fish caught in the commercial fishery)

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1.0 INTRODUCTION

- 1.1 Canada Department of Fisheries and Oceans (DFO) is assessing different management strategies for West Coast salmon fisheries. A key analytic tool for Fraser River sockeye fisheries is the Fraser River Sockeye Spawning Initiative (FRSSI) or FRSSI model that assesses biological parameters such as escapement and harvest for several stock groupings.
- 1.2 Individuals reflecting a broad range of values and interests met at five FRSSI workshops to shape the analytical approach and to develop candidate escapement strategies for the 2005 fishing season. At a sixth FRSSI workshop lessons learned during the 2005 Pilot Year were reviewed and work required to prepare for the 2006 fishing season was identified. At that workshop, a roadmap was also developed that linked the Spawning Initiative work to the Implementation Pilot under the *Wild Salmon Policy*.
- 1.3 The groundwork laid by the six workshops provided an essential foundation for piloting an approach to both long-term and immediate integrated strategic planning using Fraser River Sockeye as a focus. The scenarios evaluated in this report were developed through a series of three multi-sector meetings, and formed the basis for pre-season consultation for the 2006 fishing season.
- 1.4 In addition to assessing biological parameters, it is also important to assess the socio-economic implications of alternative management regimes on people, businesses, communities, governments and First Nations.
- 1.5 The intent of this pilot study is two-fold:
- to develop a set of socio-economic indicators for salmon resource management, and
 - to apply the set of indicators to alternative management strategies for Fraser River sockeye (as modelled using the FRSSI model).

This initial study can provide the underpinning for more refined analysis in the future.

- 1.6 The first phase of the study involved both primary (direct interview) and secondary (information review) research. In particular, participants from First Nations, commercial fishing and recreational fishing organizations were interviewed. We also reviewed socio-economic indicator work outside Canada and outside the fisheries field. In addition, the consultant attended and participated in two 2-day FRSSI workshops in January and February of this year.
- 1.7 This Phase I work resulted in a preliminary list of indicators based on the above research and is a “work in progress”. It is likely that the list of indicators will evolve over time as more direct experience is gained.

- I.8 The second study phase involved assessing the socio-economic implications of selected runs or scenarios from the FRSSI model. The analysis of socio-economic implications was to be based on existing information rather than new research/survey initiatives. The consultant made a presentation at the third 2-day FRSSI workshop in March to solicit feedback on the preliminary lists of indicators and economic parameters.
- I.9 DFO developed a harvest sharing rule to segment the available catch amongst First Nation, recreational and commercial harvest sectors. The resultant catch scenarios for each sector were used to analyze socio-economic impacts.

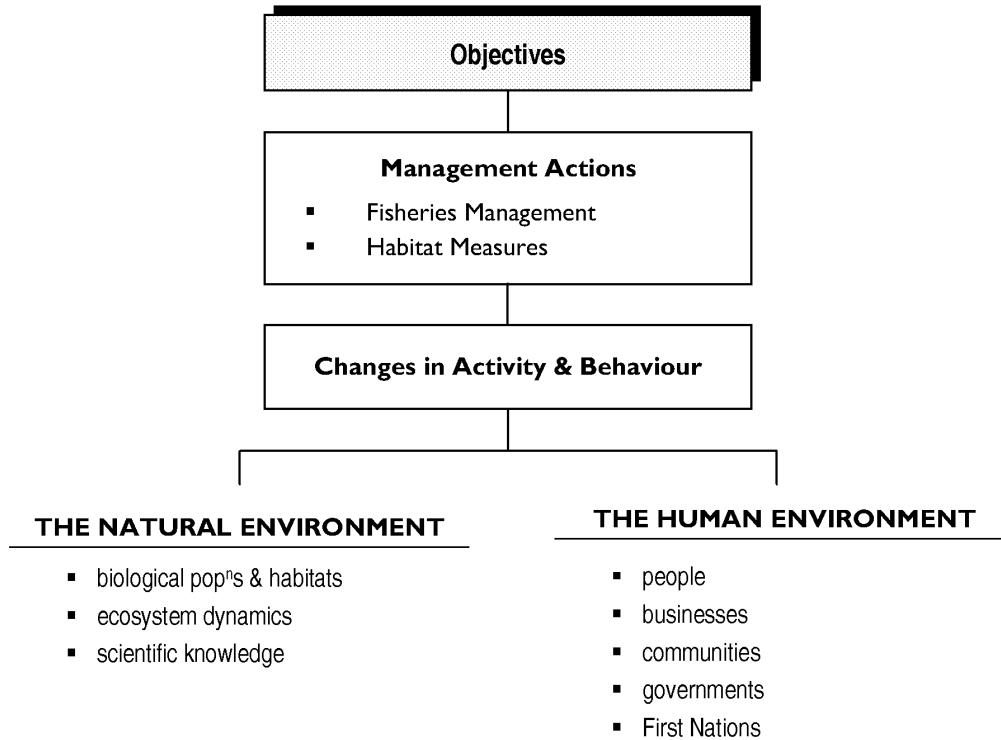
2.0 SOCIO-ECONOMIC ASSESSMENT FRAMEWORK

- 2.1 This section presents a Multiple Account Evaluation framework for assessing the socio-economic implications of Fraser River sockeye management. The framework reflects what we heard in our interview program and what we learned from the literature review. The framework is revised from that presented in the socio-economic assessment work on the Species at Risk Act for Fraser River salmon (Gislason 2005, GSGislason 2005).

2-1 Evaluation Framework

- 2.2 Multiple Account Evaluation (MAE) is a method for systematically displaying a broad spectrum of impacts associated with development projects or policy initiatives. An MAE framework organizes project information and anticipated implications or impacts under different objectives or "accounts".
- 2.3 MAE informs processes and decisions, and makes the trade-offs between accounts/objectives transparent. But, MAE says nothing about how to arrive at a decision. MAE does not offer a process to choose from competing proposals since MAE does not have any explicit weighting and rating scheme for the various accounts. This is both an advantage and disadvantage.
- 2.4 In impact assessment one develops a base case scenario or assessment of economic and social environmental activity/well-being in the absence of the environmental program, regulations or policy, in this case Fraser River sockeye management, and then develops the alternative scenario with the initiative. The impacts then are the differences between the "with" and "without" scenarios i.e., impact analysis focuses on incremental effects.
- 2.5 Typically a set of quantitative and qualitative impact indicators are identified for each account or category of impact. The indicators should focus on the key changes in activity and behaviour as a result of the regulatory action.
- 2.6 If one cannot designate in some detail the differences in activity and behaviour attributable to regulation, it is very difficult if not impossible to assess impacts of the regulations.
- 2.7 The impact framework can be used to assess the impacts of a single regulation. It can also be used to assess the impacts of a variety of potential regulations or measures. In the latter situation, it is unlikely that any one proposed measure will be uniformly superior to all interests for all indicators. However, the value of a formal impact framework is that it makes tradeoffs between interests or indicators transparent.
- 2.8 DFO launches management change to achieve certain objectives. Two broad types of DFO actions are possible – fisheries management changes and habitat initiatives (e.g., restoration, environmental controls, and enhancement).

Exhibit 1: Fraser Sockeye Management Framework



- 2.9 These DFO actions, as well as affecting the Natural Environment, can also affect people, business, communities, governments, and First Nations.
- 2.10 The Evaluation Framework is displayed in Exhibit I. DFO will be assessing the repercussions of the Fraser River sockeye management scenarios on a set of environmental indicators on a separate exercise. The next chapter of this study presents the proposed set of socio-economic/human environment indicators for Fraser River sockeye.

2-2 Some Observations

- 2.11 The same or similar set of indicators developed for this study can be used for other fisheries initiatives. These other initiatives include the Wild Salmon Policy (WSP), the Species at Risk Act (SARA), ongoing Fisheries Reform discussions involving fleet rationalization, the Salmonid Enhancement Program (SEP), and a myriad of other policy contexts.
- 2.12 Distribution issues are very important to socio-economic analysis of alternative management regimes. The “who gets what” issues relate to geographic region, harvest sector, income distribution (to people, business, government), short term vs long term etc.
- 2.13 It is important to assess both short term and long term implication of fisheries management actions. In many cases, such actions involve “short term pain for long term gain” i.e., the costs are front-loaded, the benefits are back-loaded.
- 2.14 The implications of fisheries management on affected business often is more amenable to numerical measurement than are the people, community and First Nations implications. One should strive to quantify as much as possible impacts and effects to all. However, if impacts cannot be quantified, this does not mean that such impacts necessarily are less significant or important than impacts that can be quantified.
- 2.15 Some First Nations participants are reluctant to identify First Nations indicators because they feel so doing may affect the Treaty process. Other First Nations feel that the whole Fraser River sockeye planning initiative is premature until longstanding grievances related to European settlement are resolved. Nevertheless, decisions on Fraser River sockeye management need to be made for the 2006 season and beyond.
- 2.16 The evaluation framework of Exhibit I embodies the “scientific method” as applied to fisheries management i.e., set clear objectives, launch management actions intended to meet the objectives, identify information items or indicators that tell whether objectives are being met, gather and analyze data/evidence on the indicators, and draw conclusions as to the meeting of objectives. The framework also can be used in an iterative manner e.g., if the performance is unsatisfactory, then identify an alternative management action and see what its implications are.

- 2.17 The implementation of socio-economic impact considerations in fisheries management planning is a relatively new venture for DFO. As one interviewee commented,

... DFO traditionally has a firewall between biological and socio-economic work, especially when it comes to decision-making.

- 2.18 The process as to how you get to a decision is important to the “buy-in” of the decision-making process (MMSD 2002, Hodge 2004). Engagement of affected communities of interest and a transparent, inclusive process is critical to sound and effective management of a public resource such as Fraser River sockeye.

3.0 A PRELIMINARY LIST OF INDICATORS

3.1 We propose to organize socio-economic indicators under five (5) accounts (see Exhibit 2):

1. Business
 - capital and labour benefits from commercial and recreational fishing activities on Fraser River sockeye
2. First Nations
 - First Nations use and benefits from Fraser River sockeye (including FSC plus other use)
3. Regional Development
 - impacts on Canadian and regional economies, including governments, from Fraser River sockeye
4. Net Benefits
 - Canadian social net benefits (gross benefits less costs) from Fraser River sockeye i.e., economic efficiency benefits
5. Social & Community
 - quality of life and community values derived from Fraser River sockeye

3.2 The order of the five does not indicate rank importance but rather the logic of information flow e.g., you need to estimate business revenue impacts before tackling economic impacts and efficiency benefits, you need to estimate commercial sector impacts before addressing First Nations impacts from changes in commercial sector activity.

Exhibit 2: Socio-Economic Indicators for Fisheries Management

Socio-Economic Indicators

1. Business

- Commercial sector
 - harvest levels
 - participation
 - landed & processed values
 - net cash flow, net income
 - employment & wages
 - stability of access
 - gear/area breakouts
- Recreational sector
 - harvest levels
 - participation/angler-days
 - revenues/expenditures
 - employment & wages
 - lodge vs charter vs independent
 - stability of access
 - regional breakouts

2. First Nations

- Section 35 activities
 - harvest levels
 - community participation & distribution
 - use of traditional sites & technologies
 - season/duration of fishing
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 - ceremonial/First Salmon Festival
 - regional distribution
- Traditional commercial fishery
 - share of revenues, employment, wages
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- Quality of life

3. Economy-Wide

- GDP, wages, employment
- Direct plus multiplier effects
- Canadian vs regional impacts
- Gov't revenues/taxes & costs

4. Net Benefits to Canada

- Market & non-market benefits*
- Opportunity costs
- Total benefits net of opportunity costs
- Net Present Value

5. Social & Community

- Population characteristics e.g., age, education
- Community organizations & capacity e.g., SEP volunteers
- Community partnerships/stewardship e.g., co-management
- Quality of life e.g., health
- Social capital e.g., access to services

** includes existence values i.e., non-use values*

4.0 SOCIO-ECONOMIC IMPLICATIONS OF SCENARIOS

4.1 This section outlines the socio-economic implications of three different scenarios for managing Fraser River sockeye:

- “avoid low escapement” – maximize catch from aggregate while maintaining a 90% probability that escapement for each stock achieves at least the low escapement benchmark every year
- “avoid low catch” – maximize catch from aggregate and maintain a 70% probability that aggregate catch achieves at least the low catch benchmark every year
- “recommended” (a compromise between the two) – maximize catch from aggregate and maintain a 70% probability that escapement for each stock achieves at least the low escapement benchmark every year, and maintains a 50% probability that aggregate catch achieves at least the low catch benchmark every year

DFO specified the definition of each of the above objectives or scenarios (the first year corresponds to the 2005 cycle line). DFO did not identify a “base case” scenario.

4.2 Each scenario involves projecting aggregate harvest, using the FRSSI model, over 50 years. The FRSSI model produces a probability distribution of harvests for each year. Median harvest, harvest revenue or value and gross revenue or value for each of the three scenarios are given in Appendix B, C, and D respectively. Mean harvest, harvest revenue or value and gross revenue or value for each of the three scenarios are given in Appendix E, F and G respectively. The mean figures are greater than the median i.e., the distributions are skewed.

4.3 For the recreational fishery, gross value represents angler expenditures (and harvest value is not relevant). For the commercial sector, gross value represents processed value – harvest value plus processing margin. For FSC fisheries, gross value and harvest value are the same proxy, the landed value if the fish had been caught in the commercial (net) fishery. This valuation approach for FSC fish does not include the important social cultural and ceremonial values and therefore represent a minimum approach – Section 4-3 to follow includes additional discussion on valuation of FSC fish.

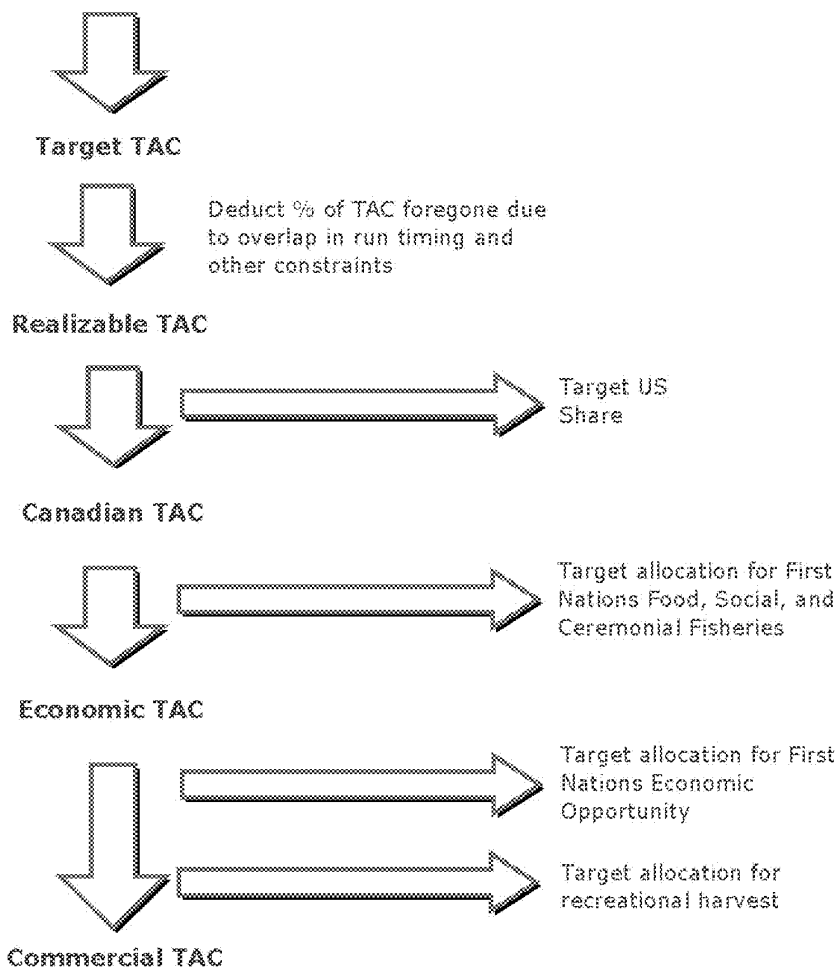
4-1 Harvest Sharing Rules

4.4 DFO developed an accounting algorithm to partition the aggregate harvest available to Canadian interests (see Exhibit 3). The key features are:

- applying an exploitation rate to the run size i.e., the Fraser River sockeye fishery is managed under an exploitation rate target and not an escapement target
- reducing the potential harvest available by an amount deemed inaccessible due to mixed stock/non-selective fishing concerns, lack of formal allocation etc.
- partitioning the resulting “Realizable TAC” amongst First Nations, recreational and commercial users

Exhibit 3: Harvest Sharing Schematic

FRSSI model simulates Fraser sockeye stocks 50 years into the future and determines optimal harvest rule based on specified management objectives. For each year of the simulation, the model produces a probability distribution of run sizes and total allowable catches (TAC).



Source: Simulated catches of Fraser sockeye are allocated among different types of harvest based on a simplified sharing rule. This sharing rule was developed by the FRSSI Working Group – it is intended to approximate current allocations (Illustration by Gottfried Pestal, SOLV Consulting Ltd.)

Exhibit 4: Fraser River Sockeye Harvest Scenarios – Median of Catch Distribution

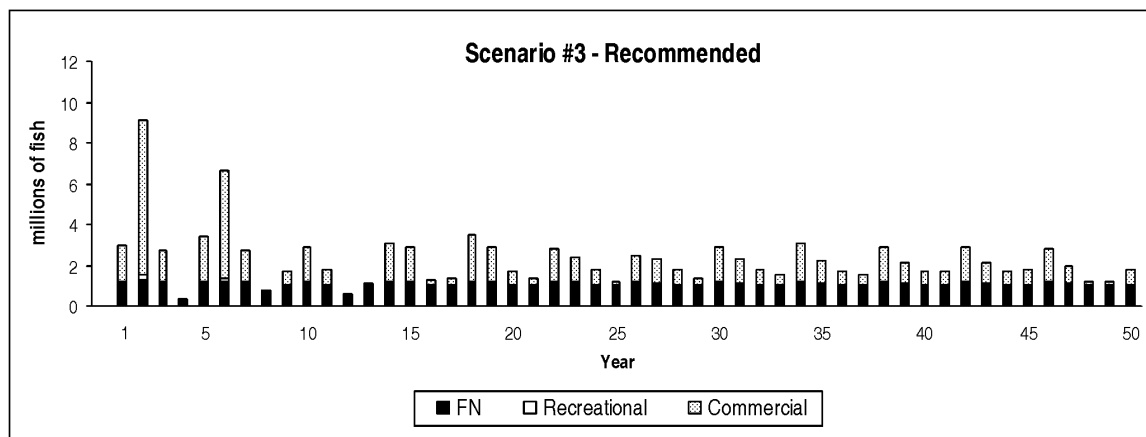
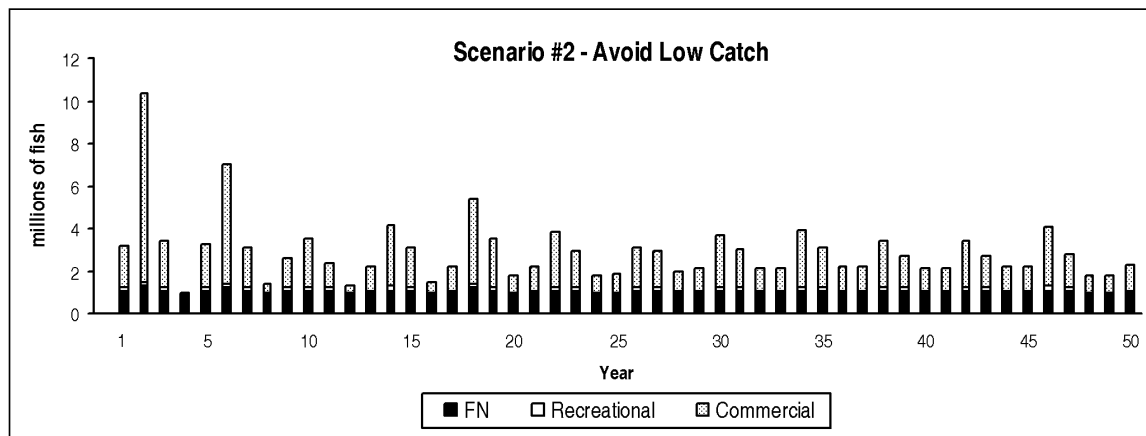
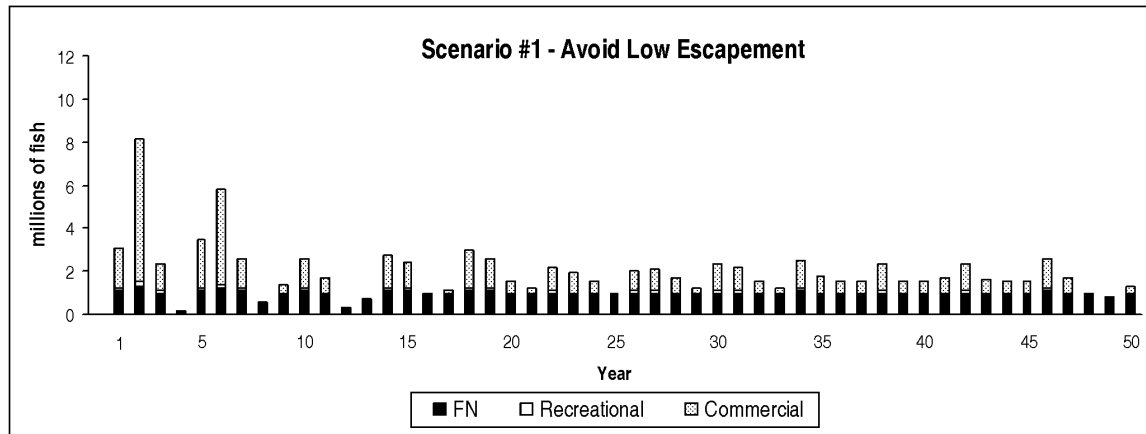


Exhibit 5: Fraser River Sockeye Harvest Scenarios – Mean of Catch Distribution

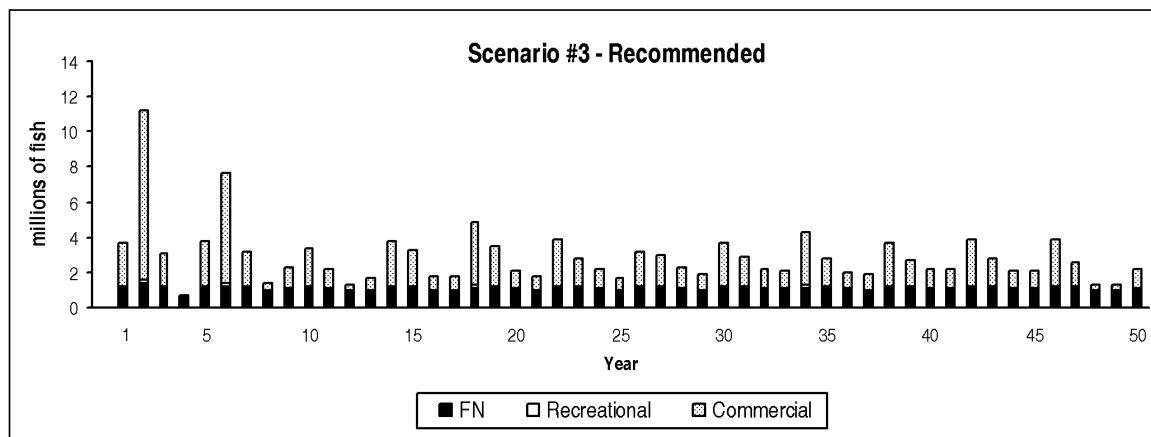
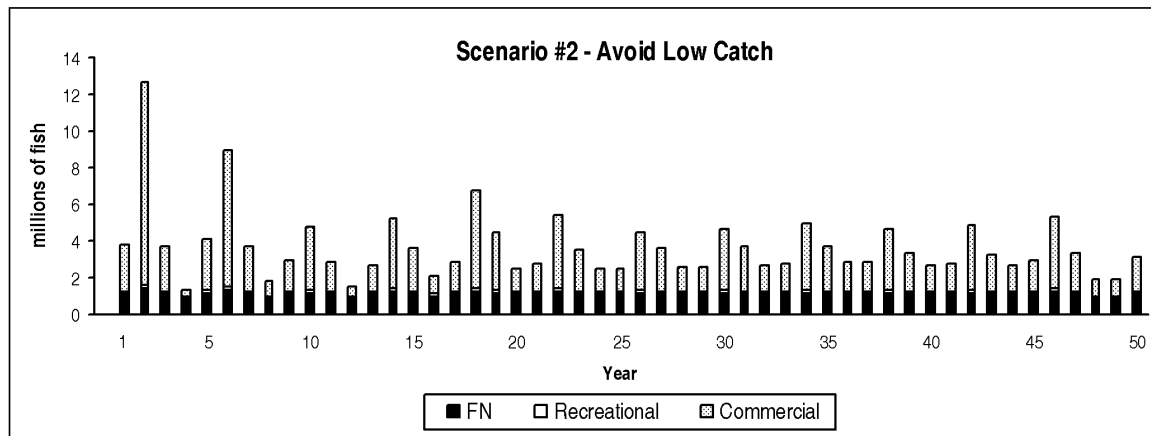
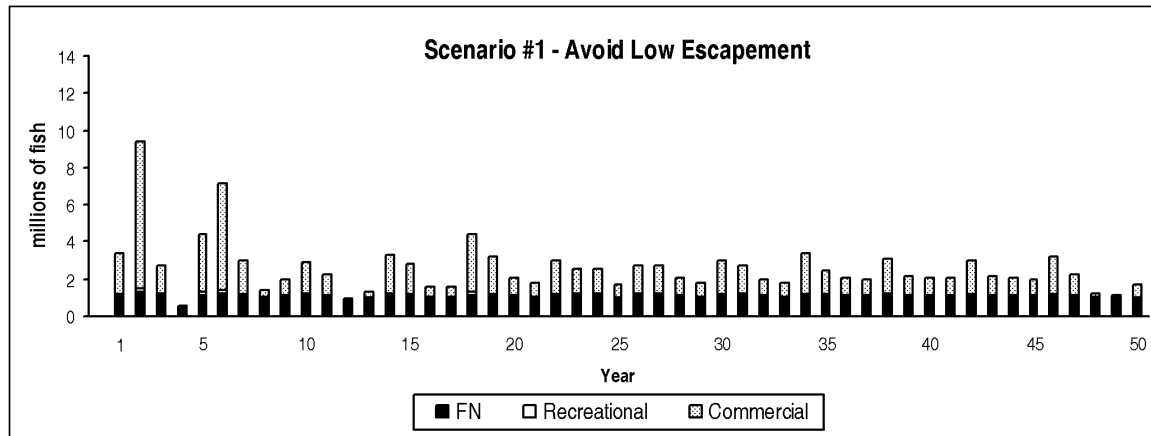


Exhibit 6: Summary of Catch Scenarios

Pieces of Sockeye	Average per Year - Median Catch*			Average per Year - Mean Catch*		
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* Median is the mid point of the distribution – the point below which 50% of the distribution lies (the mean is the arithmetic average of the distribution)

Source: Averages over the 50 year projection period (see Appendices B through G)

- 4.5 The actual harvest sharing rules are given in Exhibit A.I, Appendix A.
- 4.6 Exhibit 4 and 5 display the aggregate Canadian First Nations, recreational and commercial harvests under each of the three scenarios (the subcomponents within each sector are given in Appendices B through G). Exhibit 6 presents average catches over the 50 year projection period.
- 4.7 The catch scenarios results demonstrate that First Nations catches, both across scenarios and within scenarios, are the most stable. This stability reflects the allocative priority, second only to conservation, of First Nations Food Social & Ceremonial (FSC) use. Commercial catches show the most variability – the Appendices provide the Coefficient of Variation or CV, a measure of variability over the projection period, for each catch component.

4-2 Socio-Economic Implications - Business

- 4.8 The business sector comprises two distinct components:
- the commercial fishery (harvesting and processing), and
 - the recreational fishery

Commercial Sector

- 4.9 The traditional commercial harvesting sector in Southern BC that catches Fraser River sockeye consists of 1,159 salmon fishing licences (after the area reselection process of March 2006):

<u>Number of Licences</u>		
Seine	- Area "B"	164
Gillnet	- Area "D"	329
	- Area "E"	372
Troll	- Area "G"	171
	- Area "H"	<u>123</u>
		1,159

The Economic Opportunities component of First Nations (FN) catch is also sold commercially. The FN Economic Opportunities fishery is primarily a gillnet fishery.

- 4.10 Harvest (catch) revenues or landed values and processed revenues for both the traditional commercial fishery and the FN Economic Opportunities fishery are presented in the Appendices.
- 4.11 Commercial sector revenues are reduced by wages and other costs to arrive at estimates of net return to capital to cover interest, depreciation, and before tax profit (often called EBITDA or Earnings Before Interest, Taxes, Depreciation and Amortization). The estimates are based on the consultant's experience with the salmon fishery, fleet costs & earnings surveys, and processor financials over the past 25 years e.g., the SWOT study by GSGislason & Associates Ltd. 2004. The results should be considered illustrative as no recent data are available e.g., the last reported DFO Costs & Earnings survey refers to the 1994 fishing year. The financial results for FN Economic Opportunities harvests are also illustrative.

Exhibit 7: Business Sector Indicators Under Catch Scenarios – Commercial Sector

	NPV @ 6% DR \$ millions – Median Catch**			NPV @ 6% DR \$ millions – Mean Catch**		
	Avoid Low Escapement	Avoid Low Catch	Recommended	Avoid Low Escapement	Avoid Low Catch	Recommended
<u>FN Economic Opportunities</u>						
Harvesting Sector						
Landed Value	55	71	61	65	76	69
Crew Wages	20	25	20	20	25	25
EBITDA*	5	15	10	10	15	15
Processing Sector						
Processing Margin	56	40	34	36	43	38
Wages	10	10	10	10	10	10
EBITDA*	10	10	10	10	10	10
Total						
Processed Value	86	111	95	101	119	107
Wages	30	35	30	30	35	35
EBITDA*	15	25	20	20	25	25
<u>Traditional Commercial</u>						
Harvesting Sector						
Landed Value	258	410	311	365	556	424
Crew Wages	85	135	105	120	185	140
EBITDA*	(50)	15	(30)	(5)	75	20
Processing Sector						
Processing Margin	181	286	215	254	388	296
Wages	45	70	50	65	95	75
EBITDA*	45	70	55	60	95	70
Total						
Processed Value	439	696	526	619	944	720
Wages	130	205	155	185	280	215
EBITDA*	(5)	85	25	55	170	90

* Earnings Before Interest, Taxes, Depreciation & Amortization

** Net Present Value over 50 years using a 6% real discount rate

Source: Landed Values, Processing Margin, Processed Value – Appendices B through G
Wages, EBITDA – GSGislason & Associates Ltd. estimates

- 4.12 Exhibit 7 provides business sector indicators for harvesting and processing components under each scenario. Under all scenarios the health of the Southern-based salmon fleet is precarious i.e., has low or negative EBITDA.
- 4.13 The commercial salmon fleet with its present configuration needs an EBITDA in excess of 25% net book value or \$30 million to be viable. This corresponds to an annual commercial catch value of about \$120 million (GSGislason & Associates Ltd. 2004, Gislason 2006).
- 4.14 Since Fraser sockeye has contributed about half of total salmon fleet landed value in recent years, the annual EBITDA target for Fraser River sockeye alone is \$15 million annually or about \$235 million Net Present Value or NPV (using a 6% discount rate over the 50 year projection period). The fleet does not come close to achieving this target under the scenarios considered. Simply put, the salmon fleet, with its present configuration, cost structure and market prices, is not economically viable under any reasonable catch scenarios.
- But note that there are some promising initiatives that could not be reflected in the catch and value projections used in the study. For example, the Commercial Salmon Advisory Board (CSAB) recently struck an agreement with four First Nations organizations in the Lower Fraser that likely will increase fishing opportunities to both interests.
- Note also that EBITDA can be negative and fishermen owner-operators can continue to fish. For example, Employment Insurance (EI) benefits and skipper wages can overcome negative EBITDA for some time until the capital reinvestment decision looms. This appears to be the case for the BC salmon fleet as there is little turnover of licences each year, and as the average age of salmon skippers approaches 60 years.
- 4.15 For the Southern-based salmon fleet to earn an adequate return on investment, the fleet would require a landed value for Fraser sockeye of \$60 million annually i.e., half of \$120 million. Under the pricing assumptions used, i.e., approximately \$12 landed value per fish, this translates into a catch requirement of 5 million fish.
- 4.16 DFO could not identify how the salmon fleet actually would be managed under each of the scenarios i.e., openings and closings, weeks fished by year. As a result, we could not investigate the employment repercussions of the scenarios.
- 4.17 The reselection of fishing area by commercial salmon licence holders has just been completed. However, the distribution of the 1,159 southern-based Areas B, D, E, G & H licence holders by region of residence is not available (but the 2004 distribution of licence holders is available in GSGislason & Associates Ltd. 2005).

Recreational Sector

- 4.18 The recreational sector comprises both marine and freshwater/ river components – the freshwater fishery is assumed to take 95% of the total recreational catch of Fraser sockeye.
- 4.19 Average annual activity estimates for the recreational sector over the 50 year projection period are:

	Average per Year – Median Catch Scenario			Average per Year – Mean Catch Scenario		
	Avoid Low Escapement	Avoid Low Catch	Recommended	Avoid Low Escapement	Avoid Low Catch	Recommended
Catch pieces						
Marine	2,300	4,200	2,900	3,500	5,400	4,200
Freshwater/River	<u>43,000</u>	<u>80,000</u>	<u>55,300</u>	<u>66,700</u>	<u>102,400</u>	<u>79,400</u>
Total	45,300	84,200	58,200	70,200	107,800	83,600
Angler-days*						
Marine	13,400	14,000	13,600	13,800	14,400	14,000
Freshwater/river	<u>46,400</u>	<u>55,600</u>	<u>49,500</u>	<u>52,300</u>	<u>61,200</u>	<u>55,500</u>
Total	59,800	69,600	63,100	66,100	75,600	69,500
Angler Expenditures \$ millions*						
Marine	2.7	2.8	2.7	2.8	2.9	2.8
Freshwater/River	<u>4.6</u>	<u>5.6</u>	<u>4.9</u>	<u>5.2</u>	<u>6.1</u>	<u>5.5</u>
Total	7.3	8.4	7.7	8.0	9.0	8.3

* well under 5% of angler-days and expenditures result from lodge and charter (guided) angling activities

4.20 The numbers of angler-days and associated angler expenditures do not vary significantly among the three scenarios. This reflects the fact that anglers, when facing diminished access to sockeye, can redirect their activity to other species and/or other regions. In the calculations it is assumed that 85% of any change in marine angling effort represents redirected effort to/from other fisheries, and that 50% of any change in freshwater angling effort represents redirected effort to/from other fisheries i.e., effort elasticities of 0.15 and 0.50 respectively. The freshwater effort elasticity is higher because the sockeye fishery in August each year tends to draw river anglers who would not fish otherwise.

4.21 Discounted angler expenditures over the 50 year projected period under each scenario are (see Appendices B through G):

	NPV @ 6% DR \$ million – Median Scenario*			NPV @6% DR \$ millions – Mean Catch Scenario*		
	Avoid Low Escapement	Avoid Low Catch	Recommended	Avoid Low Escapement	Avoid Low Catch	Recommended
Angler Expenditures						
Marine	43	44	44	44	45	44
Freshwater/ River	<u>78</u>	<u>90</u>	<u>81</u>	<u>86</u>	<u>98</u>	<u>90</u>
Total	121	134	125	130	143	134

* Net Present Value over 50 years using 6% real discount rate

4.22 The EBIDTA figure for all scenarios is minimal because EBIDTA only refers to direct providers of angling activities, such as lodges and charters, and not to other service providers to anglers e.g., gear suppliers, fuel suppliers, restaurants and hotels etc. This approach provides consistent treatment with the commercial sector where, for example, gear suppliers are not considered part of direct harvesting and processing activities (Gislason et al 1996).

4-3 Socio-Economic Implications – First Nations

4.23 The First Nations interests in the Fraser River sockeye fishery comprise three distinct components:

- Food, Social & Ceremonial (FSC) use
- Economic Opportunities sales
- First Nations involvement in the traditional commercial fishery

The first two components comprise the First Nations fishery (see Exhibit 6).

FSC Use

4.24 Salmon is important to First Nations for food, social and ceremonial (FSC) use. First Nations have locally-adapted technologies for capture and processing of salmon and economic-trade relations.

“British Columbia’s First Nations have a special relationship with the wild Pacific salmon forged over nearly 10,000 years... cultures, languages and values are intimately linked to the continued existence of salmon and other marine resources” (Narcisse, 2003).

Salmon are a focal point of stories that are passed from one generation to the next and as such, comprise an important component of First Nations culture.

Salmon... formed an integral part of Indian cultural life... The first fish was treated as an honoured guest of the rank of a visiting Chief [First Salmon Ceremony]. They believed that salmon permitted itself to be harpooned or clubbed, or captured in certain definite ways consistent with the practice of the local tribe and family unit.

The fish fed these people of the coast. They fed their relatives who settled far inland along the banks of the Nass, the Skeena, the Fraser and their tributaries.

The fish determined where people lived... people lived close to the rivers because they were highways through the forests as well as conveyers upon which their protein arrived.

Hugh W. McKewill, “The Salmon People,” Gray’s Publishing, 1967.

4.25 About 90 First Nations along the Fraser River and its tributaries have harvested Fraser sockeye for FSC purposes for thousands of years. As well, many coastal First Nations bands on Vancouver Island and the mainland coast in Southern BC depend upon harvesting Fraser River sockeye in Johnstone Strait, the West Coast of Vancouver Island, Juan de Fuca Strait and Strait of Georgia in order to meet their FSC requirements. These harvests provide an important source of food to aboriginal people. Such harvest and cultural practices also provide very important social and cultural benefits to aboriginal people.

- Distribution – sharing of food among an extended family and the community
- Cultural expression and continuity – providing linkages to traditional lifestyles and ancestors
- Socialization – integrating young people into work roles and the community

- 4.26 Little recent work on the dimensions and importance of the FSC fishery on the Fraser River as a whole has been conducted. Some work has been conducted for a particular stretch or community e.g., the upper St'at'tmc or Lillooet area (de Shield 1995). Perhaps the most useful research on this important topic in the last 35 years is the 1973 study prepared for DFO and the Union of BC Indian Chiefs (Marilyn Bennett, "Indian Fishery and its Cultural Importance in the Fraser River System", April 1973).
- 4.27 The "value" of FSC harvests is estimated, at a minimum, based on the landed value of Area E gillnet fish in the commercial fishery i.e., the substitution or replacement cost. This valuation approach does not include the very important social and cultural benefits to aboriginal people from subsistence (FSC) harvests of Fraser sockeye. Nevertheless, it is better to estimate the replacement food costs of FSC harvests, and appreciate the limitation as a measure of value rather than to not value FSC harvests at all (Usher 1976). This use of landed price in the commercial fishery as a valuation approach is consistent with how DFO and others have valued FSC harvests under the Salmonid Enhancement Program (e.g., Pearse 1994).
- 4.28 The majority of FSC catch comes from marine areas or the Lower Fraser where there is access to fish caught by the commercial fleet. But valuing the "food" component of FSC catch at the landed price in the commercial fishery, in some cases, may understate the substitution cost e.g., in the Upper Fraser. But counterbalancing this is the omission of the costs of FSC harvesting activities which should be subtracted from gross values to come to a net value (e.g., Usher 1976).
- 4.29 In the analysis we treat the gross and net value of FSC fish as the same landed value of fish caught in the commercial fishery. The issue of valuation of FSC harvest deserves further attention by DFO in the future.

Economic Opportunities

- 4.30 Within the First Nations subsistence fishery is a Lower River component called "Economic Opportunity" (see harvest projections in the Appendices). Some First Nations in the Lower River, under agreement with DFO, are allowed to sell a portion of their harvest.

This economic component has a further processing margin applied to its landed value to come to a processed value (see Exhibit A.2, Appendix A). This processing margin is included in the gross value figures below.

First Nations Harvest	NPV @ 6% DR \$ million – Median Scenario*			NPV @6% DR \$ millions – Mean Catch Scenario*		
	Avoid Low Escapement	Avoid Low Catch	Recommended	Avoid Low Escapement	Avoid Low Catch	Recommended
Gross Value						
Marine FSC	39	42	40	41	42	41
Lower Fraser - FSC	23	19	21	22	19	21
- Ec Opp	86	111	94	101	119	107
Upper Fraser - FSC	<u>46</u>	<u>51</u>	<u>48</u>	<u>50</u>	<u>50</u>	<u>50</u>
Total	194	223	203	214	230	219

* Net Present Value over 50 years using 6% real discount rate

Commercial Fishery Involvement

- 4.31 A substantial 25% share of southern commercial salmon licences are operated by First Nations. And about 10% of processing plant employees in Southern BC are First Nations individuals.

	Seine Area B	Gillnet		Troll		Total
		Area D	Area E	Area G	Area H	
Native Participation						
% Native Owned	29%	38%	17%	13%	14%	22%
% Native Operated	46%	38%	17%	13%	15%	25%

Source: Michelle James "Native Participation in British Columbia Commercial Fisheries 2003".

As a result, changes in commercial catch result in changes in aboriginal revenue, wages, net returns, and employment. One can apply the above aboriginal shares to the projection of salmon fleet revenues by area in the Appendices to estimate aboriginal revenues over the projection period.

4-4 Socio-Economic Implications – Economy Wide

- 4.32 Economy-wide implications of Fraser River sockeye management include impacts on:
- the performance of the economy
 - taxes paid to government

The Economy

- 4.33 The cumulative repercussions of each scenario on Gross Domestic Product or GDP and Labour Income i.e., wages are:

Economic Impacts	NPV @ 6% DR \$ million – Median Scenario*			NPV @6% DR \$ millions – Mean Catch Scenario*		
	Avoid Low Escapement	Avoid Low Catch	Recommended	Avoid Low Escapement	Avoid Low Catch	Recommended
Direct Impacts						
GDP	225	410	285	350	575	425
Labour Income	190	275	215	245	350	280
Total Impacts						
GDP	360	655	455	560	920	680
Labour Income	305	440	345	390	560	450

* Net Present Value over 50 years using 6% real discount rate

- 4.34 The above impacts include both commercial and recreational sector impacts. The estimates are derived from the fisheries SWOT study (GSGislason & Associates Ltd. 2005), from estimates based on available financial data for the commercial sector, and from multiplier analysis. Total impacts include indirect supplier plus induced consumer responding impacts as well as direct impacts.

Exhibit 8: Net Benefits to Canada from Fraser Sockeye – Illustrative Analysis

	NPV @ 6% DR \$ million – Median Scenario*			NPV @ 6% DR \$ millions – Mean Catch Scenario*		
	Avoid Low Escapement	Avoid Low Catch	Recommended	Avoid Low Escapement	Avoid Low Catch	Recommended
Gross Value/Benefits						
First Nations - FSC	110	110	110	115	110	110
- Ec Opp	85	110	95	100	120	110
Recreational	120	135	125	130	140	135
Commercial	<u>440</u>	<u>695</u>	<u>525</u>	<u>620</u>	<u>945</u>	<u>720</u>
	755	1,050	855	965	1,315	1,075
Net Value/Benefits						
First Nations - FSC	110	110	110	115	110	110
- Ec Opp	10	15	10	10	15	15
Recreational	40	45	45	45	50	45
Commercial	<u>(165)</u>	<u>(30)</u>	<u>(120)</u>	<u>(150)</u>	<u>100</u>	<u>(20)</u>
	(5)	140	45	20	275	150

* consumer/angler surplus, worker surplus, capital surplus plus commodity tax adjustments

- Net Benefit Assumptions:
1. FSC
 - net equals gross benefit i.e., landed value
 2. Economic Opportunities
 - consumer surplus: 5% of sales
 - worker surplus: 25% of wages
 - capital surplus: zero
 - commodity tax adjustments: zero
 3. Recreational
 - consumer surplus: 20% of expenditures
 - worker surplus: zero
 - capital surplus: zero
 - commodity tax adjustments: 15% of expenditures
 4. Commercial
 - consumer surplus: 5% of sales
 - worker surplus: 25% of wages
 - capital surplus: fleet-actual EBITDA less target EBITDA of \$15 million/year
 - processors – zero
 - commodity tax adjustments: 5% of sales

Taxes Paid to Government

- 4.35 The cumulative personal and commodity taxes (including licence fees) associated with each scenario are estimated as:

Tax Revenues	NPV @ 6% DR \$ million – Median Scenario			NPV @ 6% DR \$ millions – Mean Catch Scenario		
	Avoid Low Escapement	Avoid Low Catch	Recommended	Avoid Low Escapement	Avoid Low Catch	Recommended
Personal Income Taxes*	40	55	45	50	70	55
Commodity Taxes**	40	55	45	50	70	55

* Assumed to be 20% of wages

** Estimated as 5% of commercial processed value plus 15% of angler expenditures

4-5 Socio-Economic Implications – Net Benefits to Canada

- 4.36 Net benefits to Canada measure the difference between the total benefits, market and non-market, and the costs to society from fishing activity directed to Fraser sockeye. Costs are the “opportunity costs” of production inputs, the value these inputs would earn in their next best alternative use e.g., a portion of workers would find jobs elsewhere, capital would earn a return in other investments (see Gislason et al 1996 for a discussion of economic benefits and cost concepts).
- 4.37 Net benefits from fishing have four main use value components i.e., existence values are not included in the quantitative analysis (Gislason et al 1996):
- consumer surplus – Canadian consumers of Fraser sockeye and Canadian anglers for Fraser sockeye earn a surplus or benefit over and above the costs of consumption/angling i.e., a non-market benefit
 - labour surplus – actual wages paid less the alternative (opportunity) job income
 - capital surplus – actual return to capital (EBITDA) less capital return in alternative investments
 - commodity tax adjustment – adjustment for commodity taxes and licence fees
- 4.38 Based on available information we have made approximations to the four surplus components for each of the First Nation, recreational and commercial fishery sectors (see Exhibit 8). The economic value approach is consistent with that used previously in British Columbia (Gislason et al 1996).
- 4.39 Note the following:
- First Nations (FN) FSC fishery – net benefits are high (assumed equal to landed value of FSC catch)
 - FN Economic Opportunities – net benefits are modest (from consumer surplus and worker surplus components)
 - recreational fishery – net benefits split approximately equally between angler surplus and commodity taxes (wage and capital surplus are zero)

- commercial fishery – net benefits are negative due to the extreme non-viability of the salmon fleet (positive consumer surplus, wage surplus and commodity tax components are overwhelmed by the large negative capital surplus component)

As noted earlier, the salmon fleet appears to need an average annual catch in excess of 5 million sockeye to earn a normal return on investment – none of the scenarios presented produce average catch levels of this magnitude

- 4.40 As indicated previously, a significant 25% share of the target TAC is not available for harvest due to overlap in run timing and other constraints e.g., lack of selective fishing, allocation issues (Exhibit 3, Exhibit A.I Appendix A). This foregone catch potentially could be accessed in the future with changes in management approach, the introduction of upriver commercial fisheries and other measures. This additional catch in turn would boost the Canadian net benefits from Canadian sockeye substantially.
- 4.41 The net benefit estimates above are illustrative – DFO has not conducted survey research into the economic dimensions of the First Nations, recreational and fishery components for over ten years e.g., DFO no longer does net benefit analysis of the Salmonid Enhancement Program. The net benefits of the salmon fishery under alternative catch scenarios is a research topic that requires attention.

4-6 Socio-Economic Implications – Social & Community

- 4.42 Salmon are special to the people of British Columbia. Beyond their economic importance, salmon are part of the intrinsic identity of the province, to both those who live here and those who visit from afar. The salmon and the people, businesses, and communities that depend on them are a rich part of our cultural heritage and psyche.
- 4.43 A wide variety of people value the continued existence of salmon regardless of whether or not they or their ancestors use the resource. For example, a household survey in the US Pacific Northwest estimated the existence value of doubling Columbia River salmon runs to be \$27 US per household and \$12 US per fish annually in 1990 (equivalent to about \$20 Canadian per fish today). While the US study addresses all species of salmon, and not one species or one subspecies such as Fraser River sockeye, it does illustrate the value that society at large places on healthy salmon populations (Olsen et al, "Existence and Sport Values for Doubling the Size of Columbia River Basin Salmon and Steelhead Runs", 1991).
- 4.44 There are several communities along coastal BC and the Fraser River that depend on Fraser sockeye and the economic benefits generated. Changes in salmon runs will have repercussions for a wide variety of people and communities in Southern BC.
- 4.45 In spite of the importance of Fraser sockeye, there is little targeted research on the importance of salmon to the social and community fabric of British Columbia. One useful report on this topic is the public opinion survey and focus groups conducted 10 years ago as part of a review of Fraser River fisheries management (Taylor and Duncan 1996). More direct research is required.

5.0 CONCLUSIONS

- 5.1 The Multiple Account Evaluation (MAE) approach allows the consistent and fair treatment of the impacts of alternative Fraser River fisheries management plans on people, businesses, communities, First Nations and governments. The MAE approach, however, is information-intensive.
- 5.2 This pilot study was constrained by severe data deficiencies for First Nations, recreational and commercial fisheries, specifically in describing their economic dimensions. Specific research needs to support future application of the socio-economic framework include:
- financial parameters related to commercial salmon harvesting and processing
 - the dimensions and importance of First Nations FSC activities e.g., gear utilized, preservation techniques, social & cultural components/importance (by region, community and/or First Nation)
 - a survey/profile of broad-based community interests and values related to Fraser salmon

Addressing these research needs, in our opinion, is critical to more refined socio-economic analysis of Fraser River fisheries management alternatives.

- 5.3 DFO will be conducting further analysis in 2006/07 in order to better determine the relationship between spawning stock size and productivity. The new formulation of the model will then be utilized to explore additional harvest scenarios in order to determine those that will meet the goals of the Wild Salmon Policy and generate improved economic performance.
- 5.4 DFO needs to integrate the FRSSI modelling results with the socio-economic results of this report. This will highlight the tradeoffs between classes of indicators and enhance decision-making e.g., higher catches and economic activity are associated with lower escapement levels.
- 5.5 Socio-economic indicators should be included in future assessments of Fraser River sockeye management scenarios. This pilot study can be used as a consultation piece to solicit feedback from users as to the utility of the approach and as to additional indicators of interest.

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Appendix A

Rules and Assumptions

Exhibit A.1: Harvest Sharing Rules

Harvest Component	Rule																					
Target TAC	Run size x target exploitation rate																					
Realizable TAC	75% of Target TAC (25% “lost” due to overlap in run timing & other constraints)																					
Canadian TAC	Realizable TAC less US share calculated as (Realizable TAC – 400,000 Aboriginal exemption) x .165																					
Economic TAC	Canadian TAC less First Nation harvests <ul style="list-style-type: none">• Marine – 250,000 (or 25% if Canadian TAC <1 million)• Upper River – 300,000 (or 30% if Canadian TAC <1 million)• Lower River – 450,000 (or 45% if Canadian TAC <1 million) with 75% of Lower River harvest for Economic Opportunity if Economic TAC >0 (otherwise all Lower River harvest is FSC)																					
Commercial TAC	Economic TAC less 3.7% Economic TAC for FN Economic Opportunity in Lower River and 5% of Economic TAC for Recreational (up to 150,000)with Commercial harvest split as: <table><tr><th colspan="3">Commercial TAC</th></tr><tr><th></th><th><5 million</th><th>>5 million</th></tr><tr><td>Area B</td><td>48.0%</td><td>43.0%</td></tr><tr><td>Area D</td><td>14.5%</td><td>13.5%</td></tr><tr><td>Area E</td><td>26.5%</td><td>25.5%</td></tr><tr><td>Area G</td><td>0</td><td>8.0%</td></tr><tr><td>Area H</td><td>11.0%</td><td>10.0%</td></tr></table>	Commercial TAC				<5 million	>5 million	Area B	48.0%	43.0%	Area D	14.5%	13.5%	Area E	26.5%	25.5%	Area G	0	8.0%	Area H	11.0%	10.0%
Commercial TAC																						
	<5 million	>5 million																				
Area B	48.0%	43.0%																				
Area D	14.5%	13.5%																				
Area E	26.5%	25.5%																				
Area G	0	8.0%																				
Area H	11.0%	10.0%																				

Source: DFO

Exhibit A.2: Economic Assumptions

	Round Weight per fish kg	\$ Value per kg		Recreational/Angler Parameters		
		Landed	Processed	Fish per Day	\$ per Day	Effort Elasticity
<u>First Nations</u>						
Marine FSC	2.7	3.96	NA	NA	NA	NA
Lower Fraser - FSC	2.7	3.96	NA	NA	NA	NA
- Ec Opp	2.7	3.96	6.16	NA	NA	NA
Upper Fraser - FSC	2.7	3.96	NA	NA	NA	NA
<u>Recreational</u>						
Marine	2.7	NA	NA	0.5	200	.15
Freshwater/ River	2.7	NA	NA	2.0	100	.50
<u>Commercial</u>						
Seine - Area "B"	2.7	4.40	7.70	NA	NA	NA
Gillnet - Area "D"	2.7	4.40	7.70	NA	NA	NA
- Area "E"	2.7	3.96	7.26	NA	NA	NA
Troll - Area "G"	2.7	6.16	8.36	NA	NA	NA
- Area "H"	2.7	6.16	8.36	NA	NA	NA

Appendix B

Scenario #1 - Avoid Low Escapement – Median of Distribution

Fraser River Sockeye Scenario #1 – Avoid Low Escapement (Median) Indicator: Sockeye Pieces

Year	First Nations					Recreational			Commercial					Grand Total
	Marine FSC	Lower Fraser FSC	Econ Opp	Upper Fraser FSC	Subtotal	Marine	River	Subtotal	Seine B	Gillnet D	E Gillnet	G Troll	H	Subtotal
1	250,000	112,500	413,273	300,000	1,075,773	5,120	97,277	102,396	897,484	271,115	495,486	0	205,673	1,869,759
2	250,000	112,500	595,275	300,000	1,257,775	7,500	142,500	150,000	2,820,418	885,480	1,672,573	524,729	655,911	6,559,111
3	250,000	112,500	386,644	300,000	1,049,144	3,321	63,080	66,411	582,078	175,836	321,366	0	133,393	1,212,663
4	32,674	94,814	0	63,209	210,697	0	0	0	0	0	0	0	0	210,697
5	250,000	112,500	429,820	300,000	1,092,320	6,238	118,519	124,757	1,093,473	330,320	603,688	0	250,588	2,278,089
6	250,000	112,500	513,450	300,000	1,375,950	7,500	142,500	150,000	2,126,144	642,241	1,173,809	0	487,241	4,429,466
7	250,000	112,500	392,541	300,000	1,055,041	3,719	70,661	74,380	651,929	196,937	359,919	0	149,400	2,487,608
8	159,701	287,461	0	191,641	638,803	0	0	0	0	0	0	0	0	638,803
9	250,000	112,500	355,095	300,000	1,017,595	1,189	22,589	23,778	208,406	62,956	115,058	0	47,760	434,180
10	250,000	112,500	394,279	300,000	1,056,779	3,636	72,882	76,518	672,512	203,155	371,283	0	154,117	1,401,067
11	250,000	112,500	366,575	300,000	1,029,075	1,965	37,326	39,291	344,374	104,030	190,123	0	78,919	717,447
12	81,326	146,387	0	97,591	325,305	0	0	0	0	0	0	0	0	325,305
13	182,715	328,887	0	219,258	730,860	0	0	0	0	0	0	0	0	730,860
14	250,000	112,500	396,428	300,000	1,058,928	3,982	75,651	79,633	697,966	210,844	385,336	0	159,951	1,454,096
15	250,000	112,500	388,066	300,000	1,050,566	3,417	64,915	68,332	598,916	180,923	330,652	0	137,252	1,247,742
16	239,190	430,541	0	287,028	956,758	0	0	0	0	0	0	0	0	956,758
17	250,000	112,500	342,779	300,000	1,005,279	357	6,777	7,133	62,521	18,867	34,517	0	14,328	130,253
18	250,000	112,500	412,162	300,000	1,074,662	5,045	95,850	100,895	884,324	267,140	486,221	0	202,658	1,842,342
19	250,000	112,500	393,618	300,000	1,056,118	3,792	72,043	75,835	664,679	200,788	366,958	0	152,322	1,384,747
20	250,000	112,500	359,023	300,000	1,021,523	1,454	27,631	29,085	254,923	77,008	140,739	0	58,420	531,089
21	250,000	112,500	344,629	300,000	1,007,129	482	9,152	9,634	84,442	25,508	46,619	0	19,351	175,921
22	250,000	112,500	381,620	300,000	1,044,120	2,981	56,640	59,621	522,567	157,859	288,501	0	119,755	1,088,681
23	250,000	112,500	374,197	300,000	1,036,697	2,480	47,111	49,591	434,655	131,302	239,966	0	99,609	905,532
24	250,000	112,500	357,862	300,000	1,020,362	1,376	26,140	27,516	241,174	72,855	133,148	0	55,268	502,447
25	250,000	112,500	336,789	300,000	1,001,289	87	1,654	1,742	15,264	4,611	8,427	0	3,498	31,801
26	250,000	112,500	375,057	300,000	1,037,557	2,538	48,215	50,753	444,841	134,379	245,589	0	101,943	926,752
27	250,000	112,500	378,414	300,000	1,040,914	2,764	52,525	55,289	484,597	146,389	267,538	0	111,053	1,009,576
28	250,000	112,500	365,493	300,000	1,027,993	1,891	35,937	37,828	331,554	100,157	183,046	0	75,981	690,738
29	250,000	112,500	346,521	300,000	1,009,021	610	11,581	12,911	106,847	32,277	58,989	0	24,486	222,599
30	250,000	112,500	385,650	300,000	1,048,150	3,253	61,815	65,068	570,309	172,281	314,858	0	130,696	1,188,143
31	250,000	112,500	382,715	300,000	1,045,215	3,055	58,047	61,102	535,547	161,790	295,686	0	122,729	1,115,722
32	250,000	112,500	359,432	300,000	1,021,932	1,482	28,156	29,638	259,770	78,472	143,415	0	59,531	541,188
33	250,000	112,500	347,177	300,000	1,009,677	654	12,423	13,077	114,618	34,624	63,278	0	26,267	238,787
34	250,000	112,500	391,277	300,000	1,053,777	3,634	69,038	72,672	636,951	192,412	351,620	0	145,968	1,326,982
35	250,000	112,500	370,828	300,000	1,033,328	2,252	42,785	45,037	394,742	119,245	217,931	0	90,462	822,380
36	250,000	112,500	358,391	300,000	1,020,891	1,412	26,819	28,231	247,438	74,747	136,606	0	56,705	515,496
37	250,000	112,500	356,350	300,000	1,018,850	1,274	24,199	25,472	223,261	67,443	123,259	0	51,164	465,128
38	250,000	112,500	387,346	300,000	1,049,846	3,568	63,992	67,360	590,393	178,348	325,946	0	135,298	1,229,986
39	250,000	112,500	359,209	300,000	1,021,709	1,467	27,870	29,337	257,130	77,675	141,957	0	58,926	535,688
40	250,000	112,500	359,042	300,000	1,021,542	1,456	27,655	29,110	232,145	77,075	140,862	0	58,471	531,553
41	250,000	112,500	365,599	300,000	1,028,099	1,899	36,073	37,971	332,810	100,536	183,739	0	76,269	693,355
42	250,000	112,500	385,666	300,000	1,048,166	3,254	61,835	65,089	570,496	172,337	314,961	0	130,739	1,188,533
43	250,000	112,500	362,251	300,000	1,024,751	1,672	31,775	33,447	293,158	88,558	161,848	0	67,182	610,746
44	250,000	112,500	357,227	300,000	1,019,727	1,333	25,326	26,659	233,657	70,584	128,998	0	53,546	486,786
45	250,000	112,500	357,770	300,000	1,020,270	1,370	26,022	27,392	240,084	72,525	132,546	0	55,019	500,174
46	250,000	112,500	394,303	300,000	1,056,803	3,838	72,923	76,761	672,795	203,240	371,439	0	154,182	1,401,657
47	250,000	112,500	366,254	300,000	1,028,754	1,943	36,914	38,857	340,571	102,881	186,024	0	78,048	709,523
48	242,475	436,456	0	290,970	969,901	0	0	0	0	0	0	0	0	969,901
49	204,520	368,136	0	245,424	818,080	0	0	0	0	0	0	0	0	818,080
50	250,000	112,500	349,833	300,000	1,012,333	833	15,833	16,666	146,073	44,126	80,645	0	33,475	304,319
Sum	11,912,601	6,930,182	16,397,931	14,295,122	49,535,837	113,088	2,148,677	2,261,765	22,141,041	6,721,918	12,339,167	524,729	5,083,554	98,608,011
Mean	238,252	138,604	327,959	285,002	990,717	2,262	42,974	45,235	442,821	134,438	246,783	10,495	101,671	996,208
Std Dev	38,836	79,533	138,501	46,603	171,988	1,851	35,176	37,027	496,782	153,312	285,592	73,462	114,766	1,102,575
NPV														
6%	3,604,807	2,146,932	5,189,729	4,325,768	15,267,236	45,378	862,179	907,557	9,866,643	3,010,344	5,549,975	467,007	2,269,619	21,163,588
														37,338,380

Fraser River Sockeye Scenario #1 – Avoid Low Escapement (Median)

Indicator: Harvest Revenue/Value \$

Year	First Nations					Recreational					Commercial					Grand Total
	Marine FSC	Lower Fraser Econ Opp	Upper Fraser FSC	Subtotal		Marine	River	Subtotal		Seine B	D	Gillnet E	G	Troll H	Subtotal	
1	2,673,000	1,202,850	4,418,719	3,207,600	0	11,502,169	NA	NA	NA	10,662,112	3,220,846	5,297,737	0	3,420,761	22,601,456	34,103,625
2	2,673,000	1,202,850	6,364,678	3,207,600	0	13,448,128	NA	NA	NA	33,506,560	10,519,502	17,883,153	8,727,290	10,903,113	81,545,618	94,993,745
3	2,673,000	1,202,850	4,133,998	3,207,600	0	11,217,448	NA	NA	NA	6,915,091	2,088,934	3,435,936	0	2,218,592	14,658,552	25,876,001
4	563,194	1,013,749	0	675,833	0	2,252,775	NA	NA	NA	12,950,458	3,924,201	6,454,634	0	0	27,537,065	39,216,155
5	2,673,000	1,202,850	4,595,640	3,207,600	0	11,675,080	NA	NA	NA	25,258,588	7,630,198	12,550,361	0	8,103,797	53,542,943	66,116,205
6	2,673,000	1,202,850	4,489,812	3,207,600	0	12,673,262	NA	NA	NA	7,744,919	2,339,611	3,848,257	0	2,484,828	16,417,615	27,688,119
7	2,673,000	1,202,850	4,197,054	3,207,600	0	11,280,504	NA	NA	NA	0	0	0	0	0	6,830,081	6,830,081
8	1,707,520	3,073,536	0	2,049,024	0	6,830,081	NA	NA	NA	2,475,865	747,918	1,230,196	0	0	5,248,319	16,128,450
9	2,673,000	1,202,850	3,796,681	3,207,600	0	10,880,131	NA	NA	NA	7,989,447	2,413,479	3,969,756	0	2,563,281	16,935,963	28,235,047
10	2,673,000	1,202,850	4,215,634	3,207,600	0	11,299,084	NA	NA	NA	4,091,169	1,235,874	2,032,800	0	1,312,583	8,672,426	19,675,296
11	2,673,000	1,202,850	3,919,421	3,207,600	0	11,002,871	NA	NA	NA	0	0	0	0	0	3,478,159	3,478,159
12	869,540	1,565,171	0	1,043,448	0	3,478,159	NA	NA	NA	8,291,840	2,504,827	4,120,008	0	2,860,299	17,576,972	28,899,034
13	1,953,590	3,516,462	0	2,344,308	0	7,814,360	NA	NA	NA	7,115,126	2,149,361	3,535,328	0	2,282,770	15,082,585	26,315,233
14	2,673,000	1,202,850	4,238,612	3,207,600	0	11,322,062	NA	NA	NA	0	0	0	0	0	10,229,661	10,229,661
15	2,673,000	1,202,850	4,149,198	3,207,600	0	11,232,661	NA	NA	NA	10,505,772	3,173,619	5,220,056	0	3,370,602	22,270,048	33,760,337
16	2,673,000	1,202,850	4,603,348	3,207,600	0	10,748,289	NA	NA	NA	7,896,382	2,385,365	3,923,515	0	2,533,423	16,738,685	28,030,698
17	2,673,000	1,202,850	3,664,989	3,207,600	0	10,748,439	NA	NA	NA	3,028,481	914,854	1,504,777	0	871,638	6,413,749	17,341,870
18	2,673,000	1,202,850	4,406,839	3,207,600	0	11,490,289	NA	NA	NA	1,003,170	303,041	496,450	0	321,850	2,126,511	12,894,737
19	2,673,000	1,202,850	4,208,563	3,207,600	0	11,292,013	NA	NA	NA	6,208,096	1,875,362	3,084,648	0	1,991,764	13,159,870	24,323,597
20	2,673,000	1,202,850	3,838,671	3,207,600	0	10,922,121	NA	NA	NA	2,865,152	865,515	1,423,622	0	919,236	6,073,525	16,983,236
21	2,673,000	1,202,850	3,684,777	3,207,600	0	10,769,227	NA	NA	NA	181,342	54,780	90,104	0	58,180	384,407	11,090,186
22	2,673,000	1,202,850	4,080,277	3,207,600	0	11,163,227	NA	NA	NA	5,284,713	1,566,424	2,625,842	0	1,695,512	11,202,490	22,296,053
23	2,673,000	1,202,850	4,000,918	3,207,600	0	10,984,368	NA	NA	NA	5,757,007	1,739,096	2,860,513	0	1,847,040	12,203,657	23,333,107
24	2,673,000	1,202,850	3,826,261	3,207,600	0	10,909,711	NA	NA	NA	3,938,865	1,189,865	1,957,124	0	1,263,719	8,349,573	19,340,871
25	2,673,000	1,202,850	3,622,329	3,207,600	0	10,705,779	NA	NA	NA	1,289,348	383,449	630,707	0	407,249	2,690,753	13,479,206
26	2,673,000	1,202,850	4,010,113	3,207,600	0	11,028,444	NA	NA	NA	6,775,266	2,046,695	3,366,460	0	2,173,731	14,362,151	25,568,975
27	2,673,000	1,202,850	4,046,001	3,207,600	0	11,129,451	NA	NA	NA	6,362,295	1,921,943	3,161,265	0	2,041,236	13,486,739	24,662,183
28	2,673,000	1,202,850	3,907,848	3,207,600	0	10,991,298	NA	NA	NA	3,086,072	932,251	1,533,392	0	990,115	6,541,831	17,468,328
29	2,673,000	1,202,850	3,705,002	3,207,600	0	10,768,452	NA	NA	NA	1,361,657	411,334	676,574	0	436,865	2,866,430	13,681,897
30	2,673,000	1,202,850	4,123,374	3,207,600	0	11,175,444	NA	NA	NA	7,566,962	2,285,859	3,759,844	0	2,427,740	16,040,425	27,307,408
31	2,673,000	1,202,850	4,091,994	3,207,600	0	11,175,444	NA	NA	NA	4,689,540	1,416,632	2,330,115	0	1,504,561	9,940,848	20,989,186
32	2,673,000	1,202,850	3,843,048	3,207,600	0	10,926,498	NA	NA	NA	2,939,563	887,993	1,460,596	0	943,110	6,231,262	17,146,627
33	2,673,000	1,202,850	3,712,017	3,207,600	0	10,795,467	NA	NA	NA	2,652,343	801,229	1,317,883	0	850,960	5,622,415	16,515,955
34	2,673,000	1,202,850	4,183,533	3,207,600	0	11,266,983	NA	NA	NA	7,013,873	2,118,774	3,485,018	0	2,250,284	14,867,951	26,092,905
35	2,673,000	1,202,850	3,964,888	3,207,600	0	11,048,338	NA	NA	NA	3,054,705	922,776	1,517,807	0	980,051	6,475,339	17,399,453
36	2,673,000	1,202,850	3,831,915	3,207,600	0	10,915,365	NA	NA	NA	3,031,127	915,653	1,506,091	0	972,487	6,425,359	17,347,681
37	2,673,000	1,202,850	3,810,090	3,207,600	0	10,893,565	NA	NA	NA	3,953,785	1,194,372	1,964,537	0	1,268,506	8,381,200	19,373,631
38	2,673,000	1,202,850	4,141,505	3,207,600	0	11,224,955	NA	NA	NA	6,777,490	2,047,367	3,967,565	0	2,174,445	14,366,867	25,573,859
39	2,673,000	1,202,850	3,840,664	3,207,600	0	10,924,114	NA	NA	NA	3,482,719	1,052,071	1,730,476	0	1,117,372	7,382,639	18,339,276
40	2,673,000	1,202,850	3,838,873	3,207,600	0	10,923,323	NA	NA	NA	2,775,850	838,538	1,379,251	0	890,585	5,884,224	16,787,149
41	2,673,000	1,202,850	3,906,981	3,207,600	0	10,992,431	NA	NA	NA	2,852,193	861,600	1,417,183	0	915,079	6,046,055	16,954,781
42	2,673,000	1,202,850	4,123,543	3,207,600	0	11,206,993	NA	NA	NA	7,982,806	2,414,494	3,971,426	0	2,564,359	16,943,084	28,242,423
43	2,673,000	1,202,850	3,873,187	3,207,600	0	10,956,637	NA	NA	NA	4,045,986	1,222,225	2,010,349	0	1,298,087	8,576,647	19,576,084
44	2,673,000	1,202,850	3,819,475	3,207,600	0	10,902,925	NA	NA	NA	0	0	0	0	0	0	10,370,185
45	2,673,000	1,202,850	3,825,276	3,207,600	0	10,908,726	NA	NA	NA	0	0	0	0	0	0	8,746,912
46	2,673,000	1,202,850	4,215,889	3,207,600	0	11,299,339	NA	NA	NA	1,735,350	524,220	862,252	0	556,758	3,678,580	14,502,442
47	2,673,000	1,202,850	3,819,475	3,207,600	0	10,902,925	NA	NA	NA	283,035,566	79,856,389	131,930,377	8,727,290	84,549,689	568,099,291	1,097,736,457
48	2,673,000	1,202,850	4,215,889	3,207,600	0	11,299,339	NA	NA	NA	2,852,193	861,600	1,417,183	0	915,079	6,046,055	16,954,781
49	2,673,000	1,202,850	3,915,987	3,207,600	0	10,969,437	NA	NA	NA	7,982,806	2,414,494	3,971,426	0	2,564,359	16,943,084	28,242,423
50	2,673,000	1,202,850	3,740,412	3,207,600	0	10,823,862	NA	NA	NA	4,045,986	1,222,225	2,010,349	0	1,298,087	8,576,647	19,576,084
Sum	127,369,533	74,097,510	175,326,683	152,843,440	0	529,637,166	NA	NA	NA	0	0	0	0	0	0	10,370,185
Mean	2,547,361	1,481,950	3,566,869	3,066,869	0	10,932,743	NA	NA	NA	0	0	0	0	0	0	8,746,912
Std Dev	415,232	850,365	1,480,848	498,278	0	1,838,901	NA	NA	NA	5,901,774	1,821,351	3,053,224	1,221,821	1,903,783	13,560,028	14,536,943
NPV	38,542,594	22,954,897	55,488,580	46,251,112	0	163,237,283	NA	NA	NA	117,215,718	35,762,891	59,340,332	7,767,257	37,748,300	257,834,499	421,071,762
6%																

Fraser River Sockeye Scenario #1 – Avoid Low Escapement (Median)

Indicator: Gross Revenue/Value \$

Year	First Nations				Commercial				Grand Total
	Marine FSC	Lower Fraser FSC	Upper Fraser FSC	Subtotal	Marine	River	Subtotal	Seine B	
1	2,673,000	1,202,850	6,873,562	13,957,012	2,857,189	5,994,415	8,851,604	18,658,696	5,636,481
2	2,673,000	1,202,850	9,900,610	16,984,060	3,000,000	7,125,000	10,125,000	58,636,481	18,409,128
3	2,673,000	1,202,850	6,430,664	13,514,114	2,749,233	5,139,759	7,888,992	12,101,409	3,655,634
4	2,673,000	1,202,850	0	2,252,775	2,500,000	3,562,500	6,112,500	22,733,302	6,867,352
5	2,673,000	1,202,850	7,148,773	14,323,223	2,924,272	6,525,486	9,449,758	44,202,528	13,352,847
6	2,673,000	1,202,850	8,539,707	15,623,157	3,000,000	7,125,000	10,125,000	44,202,528	13,352,847
7	2,673,000	1,202,850	6,528,750	13,612,200	2,773,141	5,329,034	8,102,175	13,553,609	4,094,319
8	1,707,520	3,073,536	0	6,830,081	2,500,000	3,562,500	6,112,500	0	0
9	2,673,000	1,202,850	5,905,947	12,989,397	2,621,333	4,127,219	6,748,552	4,332,765	1,308,856
10	2,673,000	1,202,850	6,557,653	13,841,103	2,780,186	5,384,808	8,164,995	13,981,532	4,223,588
11	2,673,000	1,202,850	6,096,876	13,180,326	2,667,872	4,465,652	7,133,524	7,159,545	2,162,779
12	889,540	1,585,171	0	3,478,159	2,500,000	3,562,500	6,112,500	0	0
13	1,953,590	3,516,462	0	7,814,360	2,500,000	3,562,500	6,112,500	0	0
14	2,673,000	1,202,850	6,593,396	13,676,846	2,788,899	5,453,781	8,242,680	14,510,719	4,383,446
15	2,673,000	1,202,850	6,454,308	13,537,758	2,754,996	5,185,385	7,940,381	12,451,470	3,761,382
16	2,557,415	4,603,348	0	10,229,661	2,500,000	3,562,500	6,112,500	0	0
17	2,673,000	1,202,850	5,701,094	12,784,544	2,571,400	3,731,914	6,303,314	1,289,819	392,654
18	2,673,000	1,202,850	6,655,083	13,938,533	2,852,685	5,968,756	8,821,441	18,385,101	5,553,833
19	2,673,000	1,202,850	6,546,653	13,630,103	2,777,505	5,363,581	8,141,086	13,818,669	4,174,390
20	2,673,000	1,202,850	5,971,267	13,054,717	2,637,254	4,253,265	6,890,519	5,299,842	1,600,984
21	2,673,000	1,202,850	5,731,875	12,815,325	2,578,903	3,971,312	6,549,215	1,755,547	530,321
22	2,673,000	1,202,850	6,347,097	13,430,547	2,728,863	4,978,501	7,707,364	10,864,168	3,281,884
23	2,673,000	1,202,850	6,224,650	13,307,100	2,688,773	4,740,287	7,429,060	9,036,485	2,729,771
24	2,673,000	1,202,850	5,951,961	13,035,411	2,632,549	4,216,011	6,848,560	5,014,016	1,514,651
25	2,673,000	1,202,850	5,634,735	12,718,185	2,555,225	3,603,862	6,159,087	317,348	95,866
26	2,673,000	1,202,850	6,231,953	13,321,403	2,702,259	4,767,867	7,470,147	9,248,246	2,793,741
27	2,673,000	1,202,850	6,293,779	13,377,229	2,715,867	4,875,613	7,591,479	10,074,763	3,043,418
28	2,673,000	1,202,850	6,078,874	13,162,324	2,663,484	4,680,913	7,344,397	6,893,014	2,082,265
29	2,673,000	1,202,850	5,763,337	12,846,787	2,585,572	3,852,025	6,438,596	2,221,359	671,036
30	2,673,000	1,202,850	6,414,137	13,497,587	2,746,504	5,107,866	7,853,071	11,856,716	3,581,716
31	2,673,000	1,202,850	6,365,324	13,448,774	2,733,306	5,013,672	7,746,978	11,134,016	3,363,401
32	2,673,000	1,202,850	5,978,074	13,061,524	2,638,914	4,266,401	6,905,314	5,400,627	1,631,439
33	2,673,000	1,202,850	5,774,246	12,857,696	2,589,231	3,873,080	6,462,311	2,362,900	719,635
34	2,673,000	1,202,850	6,507,718	13,591,168	2,768,015	5,288,449	8,056,463	13,242,218	4,000,253
35	2,673,000	1,202,850	6,167,604	13,251,054	2,685,112	4,632,134	7,317,246	8,206,695	2,479,106
36	2,673,000	1,202,850	5,960,757	13,044,207	2,634,693	4,232,983	6,867,676	5,144,236	1,553,988
37	2,673,000	1,202,850	5,928,807	13,010,257	2,626,417	4,167,471	6,793,889	4,641,600	1,402,150
38	2,673,000	1,202,850	6,442,340	13,525,790	2,752,079	5,162,290	7,914,369	12,274,279	3,707,855
39	2,673,000	1,202,850	5,974,368	13,057,816	2,638,010	4,259,246	6,897,256	5,345,734	1,614,857
40	2,673,000	1,202,850	5,971,579	13,055,029	2,637,331	4,253,868	6,891,199	5,304,473	1,602,393
41	2,673,000	1,202,850	6,080,638	13,164,088	2,663,914	4,464,317	7,128,230	6,919,123	2,090,152
42	2,673,000	1,202,850	6,414,400	13,497,850	2,745,268	4,586,374	7,853,642	11,860,602	3,582,892
43	2,673,000	1,202,850	6,024,958	13,108,408	2,650,342	4,356,871	7,007,213	6,094,759	1,841,125
44	2,673,000	1,202,850	5,941,406	13,024,856	2,629,976	4,195,642	6,825,618	4,857,638	1,467,442
45	2,673,000	1,202,850	5,950,429	13,033,879	2,632,175	4,213,055	6,845,230	4,991,337	1,507,800
46	2,673,000	1,202,850	6,558,050	13,841,500	2,780,263	5,385,575	8,166,858	13,987,411	4,225,364
47	2,673,000	1,202,850	6,091,536	13,174,986	2,666,570	4,465,347	7,151,917	7,080,475	2,138,693
48	2,592,546	4,666,583	0	10,311,056	2,550,000	3,562,500	6,112,500	0	0
49	2,186,728	3,936,111	0	8,746,942	2,550,000	3,562,500	6,112,500	0	0
50	2,673,000	1,202,850	5,818,418	12,901,868	2,598,998	3,958,315	6,558,313	3,036,862	917,385
Sum	127,369,533	74,097,510	272,730,395	134,285,296	231,841,924	366,127,549	460,312,241	139,748,980	241,872,358
Mean	2,547,391	1,481,950	5,454,608	12,540,818	2,665,706	4,636,831	7,322,514	9,206,245	7,794,974
Std Dev	415,232	850,365	2,303,541	498,278	111,081	879,391	980,472	10,328,104	3,187,365
NPV	38,542,594	22,954,997	86,315,569	46,251,112	42,915,416	77,706,108	120,621,523	205,127,507	62,585,060
6%									

Fraser River Sockeye Management – Socio-Economic Implications

GSGislason & Associates Ltd.

Appendix C

Scenario #2 - Avoid Low Catch – Median of Distribution

Fraser River Sockeye Scenario #2 – Avoid Low Catch (Median)

Indicator: Sockeye Pieces

Year	First Nations					Marine	Recreational		Commercial					Grand Total	
	Marine FSC	Lower Fraser FSC	Econ Opp	Upper Fraser FSC	Subtotal		Subtotal	River	Seine B	D	Gillnet	E	G		Troll
1	250,000	112,500	417,973	300,000	1,080,473	5,437	103,310	108,747	953,147	287,930	526,217	0	218,430	1,985,724	3,174,944
2	250,000	112,500	683,295	300,000	1,345,795	7,500	142,500	150,000	2,505,507	1,194,752	2,556,754	708,001	885,002	8,850,016	10,345,811
3	250,000	112,500	425,525	300,000	1,088,025	5,948	113,005	118,953	1,042,588	314,951	575,601	0	238,929	2,172,079	3,375,057
4	250,000	112,500	339,010	300,000	1,001,510	102	1,938	2,040	17,882	5,402	9,872	0	4,088	37,254	1,040,804
5	250,000	112,500	424,135	300,000	1,066,635	5,854	111,221	117,075	1,026,137	309,979	566,513	0	235,136	2,137,785	3,341,495
6	250,000	112,500	556,938	300,000	1,219,438	7,500	142,500	150,000	2,391,371	750,779	1,418,138	444,906	556,133	5,561,327	6,930,765
7	250,000	112,500	412,652	300,000	1,075,152	5,078	96,479	101,556	890,121	268,891	491,421	0	203,986	1,854,420	3,031,128
8	250,000	112,500	352,333	300,000	1,014,833	1,002	19,044	20,044	175,686	53,072	96,993	0	40,261	366,012	1,400,890
9	250,000	112,500	393,386	300,000	1,055,886	3,776	71,745	75,521	661,926	199,957	365,439	0	151,691	1,379,013	2,510,420
10	250,000	112,500	429,943	300,000	1,092,443	6,246	118,677	124,923	1,084,923	330,758	604,489	0	260,920	2,281,091	3,498,456
11	250,000	112,500	388,153	300,000	1,050,653	3,423	65,028	68,450	599,951	181,235	331,223	0	137,489	1,249,897	2,369,000
12	250,000	112,500	348,355	300,000	1,010,655	733	13,935	14,669	128,570	38,839	70,981	0	29,464	267,854	1,293,378
13	250,000	112,500	381,236	300,000	1,043,736	2,955	56,148	59,103	515,025	156,487	285,993	0	118,714	1,079,219	2,162,058
14	250,000	112,500	456,382	300,000	1,118,862	7,500	142,500	150,000	1,413,187	426,900	780,197	0	323,855	2,944,139	4,213,021
15	250,000	112,500	412,923	300,000	1,075,423	5,096	96,827	101,923	893,333	269,861	493,194	0	204,722	1,861,111	3,038,457
16	250,000	112,500	359,618	300,000	1,022,118	1,494	28,395	29,890	261,978	79,139	144,634	0	60,037	545,787	1,597,795
17	250,000	112,500	382,953	300,000	1,045,453	3,071	58,352	61,423	538,364	162,631	297,222	0	123,375	1,121,592	2,228,469
18	250,000	112,500	496,558	300,000	1,159,058	7,500	142,500	150,000	1,915,104	578,521	1,057,297	0	438,878	3,969,800	5,298,858
19	250,000	112,500	430,968	300,000	1,093,468	6,315	119,983	126,308	1,107,068	334,427	611,194	0	253,703	2,306,393	3,526,169
20	250,000	112,500	371,744	300,000	1,034,244	2,314	43,962	46,276	405,599	122,525	223,924	0	92,950	844,988	1,925,518
21	250,000	112,500	382,925	300,000	1,045,425	3,089	58,315	61,385	538,024	162,528	297,034	0	123,297	1,120,883	2,227,692
22	250,000	112,500	444,818	300,000	1,107,318	7,251	137,773	145,024	1,271,110	383,981	701,759	0	291,296	2,648,146	3,900,486
23	250,000	112,500	407,365	300,000	1,069,865	4,721	89,692	94,412	827,505	249,976	456,852	0	189,637	1,723,969	2,880,247
24	250,000	112,500	370,465	300,000	1,032,965	2,227	42,320	44,547	390,444	117,947	215,558	0	89,477	813,426	1,890,937
25	250,000	112,500	373,889	300,000	1,036,389	2,459	46,716	49,175	431,005	130,200	237,951	0	98,772	897,928	1,983,491
26	250,000	112,500	415,489	300,000	1,077,989	5,270	100,121	105,390	923,723	279,041	509,972	0	211,687	1,924,423	3,107,802
27	250,000	112,500	404,855	300,000	1,067,355	4,551	86,469	91,020	797,771	240,993	440,436	0	182,822	1,862,022	2,820,397
28	250,000	112,500	374,829	300,000	1,037,329	2,522	47,922	50,444	442,133	133,561	244,095	0	101,322	921,111	2,008,884
29	250,000	112,500	377,928	300,000	1,040,428	2,732	51,901	54,633	478,846	144,651	264,363	0	109,736	997,596	2,092,658
30	250,000	112,500	439,393	300,000	1,101,893	6,885	130,809	137,693	1,206,854	364,570	666,284	0	276,571	3,753,666	5,021,279
31	250,000	112,500	410,717	300,000	1,073,217	4,947	93,984	98,941	867,201	261,967	478,767	0	198,734	2,978,826	3,978,826
32	250,000	112,500	379,101	300,000	1,041,601	2,811	53,406	56,217	492,732	148,846	272,029	0	112,918	1,026,525	2,124,343
33	250,000	112,500	380,008	300,000	1,042,508	2,872	54,571	57,443	503,480	152,093	277,963	0	115,361	1,048,918	2,148,869
34	250,000	112,500	445,858	300,000	1,108,358	7,321	139,108	146,430	1,283,426	387,702	708,568	0	294,119	2,673,805	3,928,592
35	250,000	112,500	413,025	300,000	1,075,525	5,103	96,958	102,061	894,542	270,226	493,862	0	204,989	1,863,628	3,041,214
36	250,000	112,500	382,042	300,000	1,044,542	3,010	57,182	60,191	527,565	159,369	291,260	0	120,900	1,099,094	2,203,827
37	250,000	112,500	381,308	300,000	1,043,808	2,960	56,240	59,200	518,879	156,745	286,465	0	118,910	1,080,989	2,164,007
38	250,000	112,500	427,789	300,000	1,090,289	6,101	115,912	122,013	1,069,416	323,053	590,407	0	245,075	3,440,253	4,616,619
39	250,000	112,500	397,315	300,000	1,059,815	4,042	76,789	80,831	708,467	214,016	391,133	0	162,357	1,475,973	2,052,619
40	250,000	112,500	376,457	300,000	1,038,957	2,632	50,012	52,644	461,418	139,387	254,741	0	105,742	961,288	2,016,262
41	250,000	112,500	379,690	300,000	1,042,190	2,851	54,162	57,013	499,709	150,954	275,881	0	114,517	1,041,060	2,140,262
42	250,000	112,500	425,395	300,000	1,087,895	5,939	112,839	118,778	1,041,062	314,488	574,753	0	257,577	2,168,879	3,375,553
43	250,000	112,500	396,949	300,000	1,059,449	4,017	76,320	80,336	704,133	212,707	388,740	0	161,364	1,468,944	2,606,730
44	250,000	112,500	380,471	300,000	1,042,971	2,903	58,069	60,972	508,964	153,749	280,990	0	116,638	1,060,341	2,161,381
45	250,000	112,500	383,852	300,000	1,046,352	3,132	59,506	62,638	549,008	165,846	303,098	0	125,814	1,143,768	2,252,757
46	250,000	112,500	449,080	300,000	1,111,580	7,500	142,500	150,000	1,321,966	389,344	729,835	0	302,950	2,754,095	4,015,675
47	250,000	112,500	401,286	300,000	1,063,786	4,310	81,888	86,198	755,504	228,225	417,101	0	173,136	1,573,967	2,172,951
48	250,000	112,500	388,613	300,000	1,031,113	2,102	39,843	42,045	368,516	111,322	203,451	0	84,452	767,741	1,840,900
49	250,000	112,500	368,565	300,000	1,031,065	2,099	39,881	41,980	367,946	111,150	203,137	0	84,321	768,555	1,839,600
50	250,000	112,500	385,544	300,000	1,048,044	3,246	61,678	64,924	569,044	171,899	314,159	0	130,406	1,185,507	2,298,475
Sum	12,500,000	5,625,000	20,389,100	15,000,000	53,514,100	210,429	3,998,149	4,208,577	41,160,874	12,507,572	22,977,932	1,152,907	9,463,717	87,253,001	144,976,679
Mean	250,000	112,500	407,762	300,000	1,070,282	4,209	79,963	84,172	823,217	250,151	459,559	23,058	189,074	1,745,080	2,899,514
Std Dev	0	0	54,478	0	54,478	1,990	37,814	39,804	606,369	169,144	355,497	115,985	140,659	1,366,929	1,472,368
NPV	3,940,465	1,773,209	6,663,892	4,728,558	17,106,124	70,168	1,333,196	1,403,364	15,530,384	4,751,684	8,781,743	943,760	3,576,250	33,583,821	52,093,309
6%															

Fraser River Sockeye Management – Socio-Economic Implications

GSGislasen & Associates Ltd.

Fraser River Sockeye Scenario #2 – Avoid Low Catch (Median)

Indicator: Harvest Revenue/Value \$

Year	First Nations					Recreational		Commercial					Grand Total	
	Marine FSC	Lower Fraser FSC	Upper Fraser FSC	Subtotal		Marine	River	Subtotal	Seine	Gillnet	E	G		Troll
1	2,673,000	1,202,850	4,468,966	3,207,600	0	11,552,416	NA	NA	11,323,390	3,420,608	5,626,310	0	3,632,921	24,003,229
2	2,673,000	1,202,850	7,305,790	3,207,600	0	14,389,240	NA	NA	45,209,424	14,193,656	24,129,216	11,775,478	14,719,347	110,027,122
3	2,673,000	1,202,850	4,549,714	3,207,600	0	11,633,164	NA	NA	12,386,061	3,741,623	6,154,324	0	3,973,861	26,255,870
4	2,673,000	1,202,850	3,624,692	3,207,600	0	10,708,142	NA	NA	212,472	64,174	105,554	0	98,157	450,321
5	2,673,000	1,202,850	4,534,855	3,207,600	0	11,618,305	NA	NA	28,409,504	8,919,256	15,162,735	7,399,679	9,249,599	69,140,752
6	2,673,000	1,202,850	5,954,784	3,207,600	0	13,038,234	NA	NA	12,400,482	3,194,423	3,392,276	0	3,682,698	82,175,986
7	2,673,000	1,202,850	4,412,072	3,207,600	0	11,495,522	NA	NA	10,574,643	630,493	1,037,052	0	669,627	33,971,563
8	2,673,000	1,202,850	3,767,144	3,207,600	0	10,850,594	NA	NA	2,087,148	3,304,983	1,037,052	0	669,627	15,274,912
9	2,673,000	1,202,850	4,206,078	3,207,600	0	11,289,528	NA	NA	7,863,685	3,907,269	3,907,269	0	2,522,932	27,669,375
10	2,673,000	1,202,850	4,596,949	3,207,600	0	11,680,399	NA	NA	13,007,691	3,923,407	6,463,196	0	4,173,301	39,253,994
11	2,673,000	1,202,850	4,150,132	3,207,600	0	11,233,582	NA	NA	7,127,415	2,153,073	3,541,434	0	2,286,712	26,342,217
12	2,673,000	1,202,850	3,724,612	3,207,600	0	10,808,062	NA	NA	1,527,412	461,062	758,933	0	490,045	14,045,857
13	2,673,000	1,202,850	4,076,177	3,207,600	0	11,159,627	NA	NA	6,154,138	1,859,058	8,057,837	0	1,974,453	13,045,490
14	2,673,000	1,202,850	4,879,634	3,207,600	0	11,963,084	NA	NA	16,788,657	5,071,573	8,341,864	0	5,386,361	24,205,117
15	2,673,000	1,202,850	4,414,972	3,207,600	0	11,498,422	NA	NA	10,612,800	3,205,950	5,273,235	0	3,404,940	47,551,539
16	2,673,000	1,202,850	3,845,040	3,207,600	0	10,928,490	NA	NA	3,112,295	940,173	1,546,422	0	968,528	33,995,346
17	2,673,000	1,202,850	4,094,537	3,207,600	0	11,177,987	NA	NA	6,395,767	1,932,055	3,177,897	0	2,051,975	16,597,417
18	2,673,000	1,202,850	5,309,195	3,207,600	0	12,392,645	NA	NA	22,751,438	6,872,830	11,304,621	0	7,299,420	24,735,681
19	2,673,000	1,202,850	4,607,913	3,207,600	0	11,691,363	NA	NA	13,151,974	3,972,982	6,534,887	0	4,219,592	48,228,308
20	2,673,000	1,202,850	3,974,689	3,207,600	0	11,058,139	NA	NA	4,818,516	1,455,593	2,394,200	0	1,545,940	27,879,444
21	2,673,000	1,202,850	4,094,230	3,207,600	0	11,177,680	NA	NA	6,391,723	1,930,833	3,175,887	0	2,050,678	10,214,249
22	2,673,000	1,202,850	4,755,995	3,207,600	0	11,839,445	NA	NA	15,100,786	4,561,696	7,503,203	0	4,844,836	24,728,800
23	2,673,000	1,202,850	4,355,548	3,207,600	0	11,438,988	NA	NA	9,830,762	2,969,709	4,864,660	0	3,154,036	43,849,965
24	2,673,000	1,202,850	3,961,008	3,207,600	0	11,044,458	NA	NA	4,638,479	1,401,207	2,304,744	0	1,488,179	32,078,165
25	2,673,000	1,202,850	3,997,623	3,207,600	0	11,081,073	NA	NA	6,046,491	1,546,770	2,544,170	0	1,642,777	20,877,068
26	2,673,000	1,202,850	4,442,405	3,207,600	0	11,525,855	NA	NA	10,973,830	3,315,011	5,452,622	0	3,520,771	21,935,133
27	2,673,000	1,202,850	4,328,706	3,207,600	0	11,412,156	NA	NA	9,477,517	2,863,000	4,709,141	0	3,040,703	34,788,089
28	2,673,000	1,202,850	4,007,669	3,207,600	0	11,091,119	NA	NA	5,252,546	1,586,706	2,609,859	0	1,685,192	20,090,361
29	2,673,000	1,202,850	4,040,810	3,207,600	0	11,124,260	NA	NA	6,888,693	1,716,459	2,826,569	0	1,825,122	23,262,234
30	2,673,000	1,202,850	4,697,990	3,207,600	0	11,781,440	NA	NA	14,337,426	4,331,097	7,123,908	0	4,599,924	31,502,518
31	2,673,000	1,202,850	4,391,382	3,207,600	0	11,474,832	NA	NA	10,302,346	3,112,167	5,118,978	0	3,305,336	42,173,796
32	2,673,000	1,202,850	4,053,345	3,207,600	0	11,136,795	NA	NA	5,853,657	1,768,292	2,908,536	0	1,878,048	33,313,659
33	2,673,000	1,202,850	4,063,047	3,207,600	0	11,146,497	NA	NA	5,981,348	1,806,866	2,971,982	0	1,919,016	23,825,709
34	2,673,000	1,202,850	4,767,113	3,207,600	0	11,850,563	NA	NA	15,247,103	4,605,896	7,575,904	0	4,891,779	23,425,328
35	2,673,000	1,202,850	4,416,062	3,207,600	0	11,499,512	NA	NA	10,627,154	3,310,286	5,280,367	0	3,409,545	44,171,245
36	2,673,000	1,202,850	4,084,789	3,207,600	0	11,169,239	NA	NA	6,267,473	1,893,299	3,114,151	0	2,010,614	32,320,682
37	2,673,000	1,202,850	4,076,948	3,207,600	0	11,160,388	NA	NA	6,164,287	1,862,129	3,062,868	0	1,977,709	34,026,866
38	2,673,000	1,202,850	4,573,924	3,207,600	0	11,657,374	NA	NA	12,704,668	3,837,868	6,312,632	0	4,076,081	44,171,245
39	2,673,000	1,202,850	4,246,091	3,207,600	0	11,331,541	NA	NA	8,416,591	2,542,512	4,181,994	0	2,700,323	38,586,622
40	2,673,000	1,202,850	4,025,077	3,207,600	0	11,108,527	NA	NA	5,481,649	1,655,915	2,723,694	0	1,758,696	17,841,420
41	2,673,000	1,202,850	4,059,642	3,207,600	0	11,143,092	NA	NA	5,936,539	1,793,329	2,949,718	0	1,904,639	22,728,481
42	2,673,000	1,202,850	4,548,328	3,207,600	0	11,631,778	NA	NA	12,367,818	3,736,112	6,145,260	0	3,968,008	23,727,317
43	2,673,000	1,202,850	4,244,179	3,207,600	0	11,327,629	NA	NA	8,365,103	2,526,958	4,156,410	0	2,683,804	37,848,976
44	2,673,000	1,202,850	4,067,997	3,207,600	0	11,151,447	NA	NA	6,046,490	1,828,544	3,004,350	0	1,939,916	29,059,904
45	2,673,000	1,202,850	4,104,146	3,207,600	0	11,187,596	NA	NA	6,522,220	1,970,254	3,240,728	0	2,092,546	23,968,747
46	2,673,000	1,202,850	4,801,563	3,207,600	0	11,885,013	NA	NA	15,704,951	4,744,204	7,803,397	0	5,038,672	25,013,344
47	2,673,000	1,202,850	4,290,552	3,207,600	0	11,374,002	NA	NA	8,975,390	2,711,316	4,459,647	0	2,879,604	45,176,236
48	2,673,000	1,202,850	3,941,213	3,207,600	0	11,024,663	NA	NA	4,377,968	1,322,511	2,175,303	0	1,404,598	30,399,959
49	2,673,000	1,202,850	3,940,699	3,207,600	0	11,024,149	NA	NA	4,371,203	1,320,467	2,171,941	0	1,402,428	20,305,043
50	2,673,000	1,202,850	4,122,232	3,207,600	0	11,205,682	NA	NA	6,760,237	2,042,155	3,358,993	0	2,168,909	20,290,188
Sum	133,650,000	60,142,500	218,000,258	160,380,000	0	572,172,758	NA	NA	488,981,177	148,589,953	245,680,043	19,175,157	157,234,216	1,059,670,552
Mean	2,673,000	1,202,850	4,360,005	3,207,600	0	11,443,465	NA	NA	9,779,924	2,971,799	3,831,601	383,503	314,684	1,631,843,310
Std Dev	0	0	582,475	0	0	582,475	NA	NA	7,203,897	2,247,027	3,800,974	1,929,059	2,339,437	32,636,866
NPV	42,131,453	18,959,154	71,250,329	50,557,744	0	182,898,680	NA	NA	184,500,962	56,450,006	93,894,391	15,696,615	59,480,195	410,022,170
6%														592,920,850

Fraser River Sockeye Management – Socio-Economic Implications

GSGislason & Associates Ltd.
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Fraser River Sockeye Scenario #2 – Avoid Low Catch (Median)

Indicator: Gross Revenue/Value \$

Year	First Nations				Subtotal	Marine	Recreational		Subtotal	Seine	D	Gillnet	E	Commercial		Troll	H	Subtotal	Grand Total
	FSC	Lower Fraser	Econ Opp	Upper Fraser			River	G						FSC					
1	2,673,000	1,202,850	6,951,726	3,207,600	14,035,176	2,876,242	6,145,246	9,021,487	19,815,933	5,986,063	10,314,901	4,930,393	41,047,290	64,103,953					
2	2,673,000	1,202,850	11,364,563	3,207,600	18,448,013	3,000,000	7,125,000	10,125,000	79,116,492	24,838,899	44,236,896	19,976,257	184,149,550	212,722,563					
3	2,673,000	1,202,850	7,077,333	3,207,600	14,160,783	2,906,858	6,327,630	9,234,488	21,676,607	6,547,840	11,282,928	5,393,098	48,489,472	68,354,744					
4	2,673,000	1,202,850	6,638,410	3,207,600	12,721,860	2,561,124	3,610,955	6,167,075	19,334,382	11,230,341	193,516	92,498	770,083	19,669,018					
5	2,673,000	1,202,850	7,054,218	3,207,600	14,137,668	2,901,224	6,343,025	9,244,249	21,333,382	6,444,459	11,104,787	5,307,949	44,190,577	67,572,486					
6	2,673,000	1,202,850	9,262,998	3,207,600	16,346,448	3,000,000	7,125,000	10,125,000	49,716,594	15,608,698	27,798,348	12,553,027	115,719,089	142,190,537					
7	2,673,000	1,202,850	6,863,224	3,207,600	13,466,674	2,644,669	4,874,464	6,648,690	18,506,626	5,690,241	9,632,839	4,604,376	38,333,082	52,476,463					
8	2,673,000	1,202,850	5,860,001	3,207,600	12,943,451	2,610,133	4,038,556	6,648,690	18,506,626	5,690,241	9,632,839	4,604,376	38,333,082	52,476,463					
9	2,673,000	1,202,850	6,542,788	3,207,600	13,626,238	2,776,952	4,356,124	6,648,690	18,506,626	5,690,241	9,632,839	4,604,376	38,333,082	52,476,463					
10	2,673,000	1,202,850	7,150,610	3,207,600	14,234,260	2,924,768	6,529,417	9,544,185	22,763,459	6,876,462	11,849,193	5,663,765	47,152,879	70,841,324					
11	2,673,000	1,202,850	6,455,761	3,207,600	13,539,211	2,755,360	5,188,188	7,943,538	12,472,971	3,767,878	6,492,630	3,103,395	25,836,889	47,319,629					
12	2,673,000	1,202,850	5,793,840	3,207,600	12,877,290	2,594,007	3,910,887	6,504,893	10,769,741	3,253,359	5,604,035	2,679,614	22,308,750	24,919,052					
13	2,673,000	1,202,850	6,340,720	3,207,600	13,424,170	2,727,309	4,966,194	7,693,502	10,769,741	3,253,359	5,604,035	2,679,614	22,308,750	24,919,052					
14	2,673,000	1,202,850	7,690,541	3,207,600	14,673,991	3,000,000	7,125,000	10,125,000	29,380,150	8,675,424	15,293,417	7,310,061	60,858,882	85,657,873					
15	2,673,000	1,202,850	6,867,734	3,207,600	13,951,184	2,855,769	5,983,167	8,838,936	18,572,400	5,610,412	9,667,597	4,620,990	38,471,400	61,261,519					
16	2,673,000	1,202,850	5,981,174	3,207,600	13,064,624	2,639,669	4,272,382	6,912,051	14,446,517	5,446,517	10,042,422	3,135,145	23,128,070	31,258,745					
17	2,673,000	1,202,850	6,369,280	3,207,600	13,452,730	2,734,270	5,021,307	7,755,577	11,192,593	6,146,302	10,042,422	3,135,145	23,128,070	31,258,745					
18	2,673,000	1,202,850	8,258,749	3,207,600	15,342,199	3,000,000	7,125,000	10,125,000	39,815,016	8,432,402	15,293,417	7,310,061	60,858,882	85,657,873					
19	2,673,000	1,202,850	7,167,864	3,207,600	14,251,314	2,928,925	6,562,326	9,491,252	23,016,954	6,952,736	11,980,626	5,906,355	82,473,904	107,941,160					
20	2,673,000	1,202,850	6,182,849	3,207,600	13,266,299	2,688,828	4,861,552	7,350,380	18,572,400	5,610,412	9,667,597	4,620,990	38,471,400	61,261,519					
21	2,673,000	1,202,850	6,368,802	3,207,600	13,452,252	2,734,154	5,020,384	7,755,577	11,192,593	6,146,302	10,042,422	3,135,145	23,128,070	31,258,745					
22	2,673,000	1,202,850	7,398,214	3,207,600	14,481,664	2,985,073	7,006,830	9,991,903	26,428,376	7,982,968	13,755,872	6,575,134	54,740,350	79,213,917					
23	2,673,000	1,202,850	6,775,297	3,207,600	13,683,747	2,833,237	5,804,793	8,638,030	17,203,833	5,196,991	9,895,210	4,280,478	35,636,512	58,133,288					
24	2,673,000	1,202,850	6,161,569	3,207,600	13,245,019	2,683,641	4,620,488	7,301,129	18,572,400	5,610,412	9,667,597	4,620,990	38,471,400	61,261,519					
25	2,673,000	1,202,850	6,218,525	3,207,600	13,301,975	2,697,524	4,730,396	7,427,920	16,585,655	5,010,250	9,996,474	4,126,669	39,780,136	58,133,288					
26	2,673,000	1,202,850	6,910,408	3,207,600	13,983,858	2,866,170	6,065,515	8,931,685	19,204,203	5,801,270	9,996,474	4,126,669	39,780,136	58,133,288					
27	2,673,000	1,202,850	6,733,543	3,207,600	13,816,993	2,823,060	5,724,221	8,547,281	16,585,655	5,010,250	9,996,474	4,126,669	39,780,136	58,133,288					
28	2,673,000	1,202,850	6,234,151	3,207,600	13,317,601	2,701,333	4,860,031	7,461,883	16,585,655	5,010,250	9,996,474	4,126,669	39,780,136	58,133,288					
29	2,673,000	1,202,850	6,285,704	3,207,600	13,369,154	2,713,899	4,860,031	7,573,929	25,090,495	5,446,292	13,060,489	6,242,754	51,973,169	76,160,399					
30	2,673,000	1,202,850	7,307,985	3,207,600	14,391,435	2,963,080	6,832,715	9,795,795	25,090,495	5,446,292	9,384,793	4,485,813	37,346,004	60,019,672					
31	2,673,000	1,202,850	6,831,038	3,207,600	13,914,488	2,846,824	5,912,356	8,759,180	18,029,105	5,446,292	9,384,793	4,485,813	37,346,004	60,019,672					
32	2,673,000	1,202,850	6,305,203	3,207,600	13,388,653	2,718,651	4,897,657	7,616,309	10,243,900	3,094,511	5,332,316	2,548,780	21,219,507	42,735,245					
33	2,673,000	1,202,850	6,320,296	3,207,600	13,403,746	2,722,330	4,926,782	7,649,113	10,243,900	3,094,511	5,332,316	2,548,780	21,219,507	42,735,245					
34	2,673,000	1,202,850	7,415,009	3,207,600	14,498,959	2,989,289	7,040,203	10,029,492	26,682,430	8,660,318	13,889,168	6,638,843	55,270,749	79,799,199					
35	2,673,000	1,202,850	6,869,430	3,207,600	13,952,880	2,856,182	5,986,442	8,842,624	18,597,520	5,610,001	9,680,276	4,627,240	38,523,435	61,316,939					
36	2,673,000	1,202,850	6,354,116	3,207,600	13,437,566	2,730,574	4,892,044	7,626,618	10,968,078	3,313,274	5,709,274	2,728,962	22,719,590	43,879,774					
37	2,673,000	1,202,850	6,341,919	3,207,600	13,425,369	2,727,601	4,868,509	7,696,110	10,968,078	3,313,274	5,709,274	2,728,962	22,719,590	43,879,774					
38	2,673,000	1,202,850	7,114,993	3,207,600	14,198,443	2,916,038	6,460,300	9,376,338	22,233,168	6,716,270	11,573,158	5,531,824	46,054,420	69,629,201					
39	2,673,000	1,202,850	6,608,142	3,207,600	13,691,592	2,792,493	5,482,235	8,274,728	18,597,520	5,610,001	9,680,276	4,627,240	38,523,435	61,316,939					
40	2,673,000	1,202,850	6,261,231	3,207,600	13,344,681	2,721,039	4,816,562	7,637,601	10,968,078	3,313,274	5,709,274	2,728,962	22,719,590	43,879,774					
41	2,673,000	1,202,850	6,314,999	3,207,600	13,398,449	2,721,039	4,816,562	7,637,601	10,968,078	3,313,274	5,709,274	2,728,962	22,719,590	43,879,774					
42	2,673,000	1,202,850	7,075,177	3,207,600	14,158,627	2,906,332	6,383,469	9,289,802	21,643,930	6,638,196	11,266,309	5,385,154	44,833,341	68,281,770					
43	2,673,000	1,202,850	6,602,056	3,207,600	13,685,506	2,791,009	5,470,492	8,261,501	14,638,930	4,422,177	7,620,086	2,632,743	30,323,498	52,270,505					
44	2,673,000	1,202,850	6,327,996	3,207,600	13,411,446	2,724,207	4,950,149	7,665,848	10,581,358	3,196,452	5,507,975	2,839,883	23,643,048	44,896,788					
45	2,673,000	1,202,850	7,469,098	3,207,600	14,552,548	3,000,000	7,125,000	10,125,000	27,483,664	8,302,357	14,306,228	6,838,197	56,930,446	81,607,994					
46	2,673,000	1,202,850	6,674,192	3,207,600	13,757,642	2,808,593	5,609,692	8,418,284	15,708,933	4,744,803	9,176,019	3,908,034	32,535,789	54,711,715					
47	2,673,000	1,202,850	6,320,776	3,207,600	13,214,226	2,676,135	4,461,068	7,237,203	15,708,933	4,744,803	9,176,019	3,908,034	32,535,789	54,711,715					
48	2,673,																		

Appendix D

Scenario #3 – Recommended – Median of Distribution

Fraser River Sockeye Scenario #3 – Recommended (Median)

Indicator: Sockeye Pieces

Year	First Nations					Recreational					Commercial					Grand Total
	Marine FSC	Lower Fraser FSC	Econ Opp	Upper Fraser FSC	Subtotal	Marine	River	Subtotal	Seine B	D	Gillnet	E	G	Troll	H	Subtotal
1	250,000	112,500	410,616	300,000	1,073,116	4,940	93,865	98,805	866,004	261,605	478,107	478,107	0	0	196,459	1,804,176
2	250,000	112,500	634,442	300,000	1,296,942	7,500	142,500	150,000	3,268,765	1,023,101	1,932,523	1,932,523	606,282	0	757,852	9,025,465
3	250,000	112,500	400,157	300,000	1,062,657	4,234	80,438	84,672	742,129	224,185	409,717	409,717	0	0	170,071	2,893,431
4	66,406	119,530	0	79,687	265,623	5,919	0	0	0	0	0	0	0	0	0	265,623
5	250,000	112,500	425,098	300,000	1,087,598	5,919	112,457	118,376	1,037,538	313,423	572,807	572,807	0	0	237,769	2,161,537
6	250,000	112,500	543,326	300,000	1,205,826	7,500	142,500	150,000	2,239,032	702,952	1,327,798	1,327,798	416,564	0	520,705	6,562,878
7	250,000	112,500	398,236	300,000	1,060,736	4,104	77,972	82,076	719,382	217,313	397,159	397,159	0	0	164,858	2,641,525
8	199,460	359,027	0	239,351	797,838	0	0	0	0	0	0	0	0	0	0	797,838
9	250,000	112,500	367,180	300,000	1,029,680	2,005	38,102	40,108	351,535	106,193	194,077	194,077	0	0	80,560	1,802,152
10	250,000	112,500	405,297	300,000	1,067,797	4,581	87,037	91,618	803,011	242,576	443,329	443,329	0	0	184,023	2,832,353
11	250,000	112,500	371,703	300,000	1,034,203	2,311	43,909	46,220	405,110	122,377	223,654	223,654	0	0	92,836	1,524,402
12	144,850	280,731	0	173,820	579,401	0	0	0	0	0	0	0	0	0	0	579,401
13	250,000	112,500	341,868	300,000	1,004,368	295	5,608	5,903	51,742	15,630	28,566	28,566	0	0	11,857	1,118,067
14	250,000	112,500	412,605	300,000	1,075,105	5,075	96,418	101,493	889,563	268,722	491,113	491,113	0	0	203,858	1,853,257
15	250,000	112,500	406,844	300,000	1,069,344	4,685	89,022	93,708	821,329	248,110	453,442	453,442	0	0	186,221	1,711,102
16	250,000	112,500	351,126	300,000	1,013,626	921	17,492	18,413	161,386	48,752	89,099	89,099	0	0	36,984	1,368,260
17	250,000	112,500	351,791	300,000	1,014,291	966	18,347	19,312	189,269	51,133	93,451	93,451	0	0	38,791	1,368,247
18	250,000	112,500	431,553	300,000	1,084,033	6,354	120,718	127,072	1,113,757	336,447	614,887	614,887	0	0	255,236	2,320,327
19	250,000	112,500	405,735	300,000	1,068,235	4,610	87,599	92,209	808,197	244,143	446,192	446,192	0	0	185,212	1,883,445
20	250,000	112,500	363,896	300,000	1,026,396	1,784	33,887	35,670	312,641	94,444	172,604	172,604	0	0	71,647	1,551,335
21	250,000	112,500	352,902	300,000	1,015,402	1,041	19,773	20,814	182,431	55,109	100,717	100,717	0	0	41,807	1,416,282
22	250,000	112,500	402,481	300,000	1,064,981	4,391	83,421	87,812	769,650	232,499	424,911	424,911	0	0	176,378	1,603,438
23	250,000	112,500	387,696	300,000	1,050,196	3,392	64,441	67,832	594,535	179,599	328,233	328,233	0	0	136,248	1,238,615
24	250,000	112,500	370,095	300,000	1,032,595	2,202	41,844	44,047	386,081	116,200	213,138	213,138	0	0	88,472	804,294
25	250,000	112,500	347,311	300,000	1,009,811	663	12,585	13,258	116,200	35,102	64,152	64,152	0	0	26,629	1,265,155
26	250,000	112,500	391,601	300,000	1,054,101	3,655	69,545	73,109	640,786	193,571	353,768	353,768	0	0	146,847	1,334,972
27	250,000	112,500	386,499	300,000	1,049,999	3,311	62,904	66,215	580,363	175,318	320,409	320,409	0	0	123,000	1,209,089
28	250,000	112,500	370,944	300,000	1,033,444	2,260	42,934	45,194	396,116	119,669	218,689	218,689	0	0	90,777	1,003,879
29	250,000	112,500	352,336	300,000	1,014,836	1,002	19,046	20,049	175,722	53,083	97,013	97,013	0	0	40,270	968,087
30	250,000	112,500	407,435	300,000	1,069,935	4,725	89,781	94,506	828,327	250,224	457,306	457,306	0	0	189,825	1,400,971
31	250,000	112,500	386,997	300,000	1,049,497	3,344	63,544	66,888	596,262	177,100	323,666	323,666	0	0	134,352	1,221,380
32	250,000	112,500	368,595	300,000	1,031,095	2,101	39,920	42,021	388,303	111,258	203,334	203,334	0	0	84,403	767,297
33	250,000	112,500	358,326	300,000	1,020,826	1,407	26,736	28,143	246,671	74,515	136,183	136,183	0	0	56,529	1,162,867
34	250,000	112,500	413,720	300,000	1,076,220	5,150	97,849	102,999	902,769	272,711	498,404	498,404	0	0	206,885	1,880,768
35	250,000	112,500	382,804	300,000	1,045,304	3,061	58,161	61,222	536,596	162,097	296,245	296,245	0	0	122,970	1,117,907
36	250,000	112,500	364,112	300,000	1,026,612	1,798	34,164	35,963	315,205	95,218	174,019	174,019	0	0	72,234	656,677
37	250,000	112,500	357,725	300,000	1,020,225	1,367	25,964	27,331	239,547	72,363	132,250	132,250	0	0	54,896	499,056
38	250,000	112,500	406,107	300,000	1,068,607	4,636	88,077	92,712	812,604	245,474	448,625	448,625	0	0	186,222	1,546,611
39	250,000	112,500	376,076	300,000	1,038,576	2,807	49,524	52,130	456,910	138,025	252,252	252,252	0	0	104,708	2,854,245
40	250,000	112,500	365,332	300,000	1,027,832	1,881	35,731	37,611	329,654	99,583	161,997	161,997	0	0	75,546	1,752,223
41	250,000	112,500	387,885	300,000	1,030,385	2,053	39,007	41,060	359,886	108,716	198,687	198,687	0	0	82,474	686,780
42	250,000	112,500	404,968	300,000	1,067,468	4,559	86,615	91,173	799,117	241,400	441,179	441,179	0	0	183,131	1,864,828
43	250,000	112,500	379,617	300,000	1,042,117	2,846	54,069	56,914	498,843	150,692	275,403	275,403	0	0	114,318	1,039,256
44	250,000	112,500	363,847	300,000	1,026,347	1,780	33,824	35,604	312,065	94,270	172,286	172,286	0	0	71,515	650,135
45	250,000	112,500	368,334	300,000	1,030,834	2,083	39,584	41,667	365,207	110,323	201,624	201,624	0	0	83,693	760,847
46	250,000	112,500	400,452	300,000	1,063,952	4,254	80,817	85,071	745,629	225,242	411,650	411,650	0	0	170,873	1,553,395
47	250,000	112,500	374,703	300,000	1,037,203	2,514	47,761	50,275	440,649	133,113	243,275	243,275	0	0	100,962	916,019
48	250,000	112,500	347,006	300,000	1,009,506	642	12,203	12,845	112,586	34,010	62,157	62,157	0	0	25,801	234,555
49	250,000	112,500	346,623	300,000	1,009,123	616	11,712	12,328	108,054	32,641	59,655	59,655	0	0	24,762	225,113
50	250,000	112,500	371,757	300,000	1,034,257	2,315	43,979	46,294	405,756	122,572	224,011	224,011	0	0	92,986	845,325
Sum	12,160,716	6,026,788	18,295,737	14,592,859	51,076,100	145,437	2,763,304	2,908,742	28,362,895	8,633,218	15,883,761	1,022,846	1,022,846	6,518,476	60,421,196	114,408,037
Mean	243,214	120,536	365,915	291,857	1,021,522	2,909	55,266	58,175	567,258	172,664	317,675	20,457	20,457	1,208,424	1,208,424	2,288,121
Std Dev	30,005	39,892	103,896	36,006	139,419	1,897	36,036	37,933	540,612	168,841	317,644	101,998	101,998	125,464	1,240,469	1,353,603
NPV	3,711,075	2,007,118	5,689,422	4,453,291	15,860,907	52,991	1,006,831	1,059,822	11,670,921	3,578,754	6,626,679	833,250	833,250	2,689,776	25,399,380	42,320,108

Fraser River Sockeye Management – Socio-Economic Implications

GSGislason & Associates Ltd.
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Fraser River Sockeye Scenario #3 – Recommended (Median)

Indicator: Harvest Revenue/Value \$

Year	First Nations					Recreational			Commercial				Grand Total					
	Marine	FSC	Lower Fraser	Econ Opp	Upper Fraser	Subtotal	Marine	River	Subtotal	B	D	Gillnet	E	G	Troll	H	Subtotal	
1	2,673,000	1,202,850	4,390,301	3,207,600	3,207,600	0	11,473,751	NA	NA	10,288,131	3,107,873	5,111,915	5,111,915	0	3,300,775	0	21,808,693	33,282,445
2	2,673,000	1,202,850	6,783,456	3,207,600	3,207,600	0	13,866,906	NA	NA	38,714,128	12,154,436	12,154,436	12,154,436	10,083,680	12,604,600	0	94,219,383	108,086,290
3	2,673,000	1,202,850	4,278,478	3,207,600	3,207,600	0	11,361,928	NA	NA	8,816,494	2,663,316	4,380,695	4,380,695	0	2,828,625	0	18,689,130	30,051,058
4	710,010	1,202,850	0	852,012	0	0	2,840,041	NA	NA	0	0	0	0	0	0	0	2,840,041	2,840,041
5	2,673,000	1,202,850	4,545,147	3,207,600	3,207,600	0	11,628,597	NA	NA	12,325,948	3,723,464	6,124,456	6,124,456	6,928,294	3,954,575	0	26,128,442	37,757,039
6	2,673,000	1,202,850	5,809,247	3,207,600	3,207,600	0	12,892,687	NA	NA	26,598,702	8,351,069	14,196,816	14,196,816	0	8,660,368	0	64,736,251	77,628,948
7	2,673,000	1,202,850	4,257,944	3,207,600	3,207,600	0	11,341,394	NA	NA	8,546,255	2,581,661	4,246,421	4,246,421	0	2,741,924	0	18,116,281	29,457,675
8	2,132,622	1,202,850	0	2,559,146	0	0	8,530,487	NA	NA	0	0	0	0	0	0	0	8,530,487	8,530,487
9	2,673,000	1,202,850	3,925,885	3,207,600	3,207,600	0	11,009,335	NA	NA	4,176,239	1,281,572	2,075,089	2,075,089	0	1,339,877	0	8,852,756	19,862,090
10	2,673,000	1,202,850	4,333,436	3,207,600	3,207,600	0	11,416,886	NA	NA	9,539,766	2,881,804	4,740,071	4,740,071	0	3,060,675	0	20,222,316	31,639,202
11	2,673,000	1,202,850	3,974,247	3,207,600	3,207,600	0	11,057,697	NA	NA	4,812,704	1,453,838	2,391,312	2,391,312	0	1,544,076	0	10,201,930	21,259,627
12	1,548,739	1,202,850	0	1,858,487	0	0	6,194,957	NA	NA	0	0	0	0	0	0	0	6,194,957	6,194,957
13	2,673,000	1,202,850	3,655,258	3,207,600	3,207,600	0	10,738,708	NA	NA	614,691	185,688	305,425	305,425	0	197,213	0	1,303,017	12,041,724
14	2,673,000	1,202,850	4,411,568	3,207,600	3,207,600	0	11,495,018	NA	NA	10,568,011	3,192,420	5,250,960	5,250,960	0	3,390,570	0	22,401,961	33,896,999
15	2,673,000	1,202,850	4,349,973	3,207,600	3,207,600	0	11,433,423	NA	NA	9,757,388	2,947,544	4,848,202	4,848,202	0	3,130,495	0	20,683,629	32,117,052
16	2,673,000	1,202,850	3,754,235	3,207,600	3,207,600	0	10,837,685	NA	NA	9,917,270	579,175	952,643	952,643	0	615,124	0	4,064,213	14,901,898
17	2,673,000	1,202,850	3,761,351	3,207,600	3,207,600	0	10,844,801	NA	NA	12,010,916	607,464	999,174	999,174	0	645,169	0	4,262,724	15,107,525
18	2,673,000	1,202,850	4,613,950	3,207,600	3,207,600	0	11,697,400	NA	NA	13,231,431	3,996,995	6,574,367	6,574,367	0	4,245,084	0	28,047,876	39,745,277
19	2,673,000	1,202,850	4,338,119	3,207,600	3,207,600	0	11,421,569	NA	NA	9,601,386	2,900,419	4,770,688	4,770,688	0	3,080,445	0	20,352,937	31,774,506
20	2,673,000	1,202,850	3,890,774	3,207,600	3,207,600	0	10,974,224	NA	NA	3,714,171	1,121,989	1,845,479	1,845,479	0	1,191,630	0	7,873,289	18,847,493
21	2,673,000	1,202,850	3,773,233	3,207,600	3,207,600	0	10,866,663	NA	NA	2,167,284	654,700	1,076,869	1,076,869	0	695,337	0	4,594,191	15,450,873
22	2,673,000	1,202,850	4,303,322	3,207,600	3,207,600	0	11,386,772	NA	NA	9,143,446	2,762,083	4,543,150	4,543,150	0	2,933,522	0	19,382,201	30,768,972
23	2,673,000	1,202,850	4,145,244	3,207,600	3,207,600	0	11,228,694	NA	NA	7,063,081	2,133,639	3,509,468	3,509,468	0	2,266,072	0	14,972,260	26,200,953
24	2,673,000	1,202,850	3,957,051	3,207,600	3,207,600	0	11,040,501	NA	NA	4,586,404	1,385,476	2,278,870	2,278,870	0	1,471,471	0	9,722,221	13,762,723
25	2,673,000	1,202,850	3,713,445	3,207,600	3,207,600	0	10,796,895	NA	NA	1,380,462	417,014	685,917	685,917	0	442,898	0	2,926,291	13,723,187
26	2,673,000	1,202,850	4,186,995	3,207,600	3,207,600	0	11,270,445	NA	NA	7,612,543	2,299,622	3,782,482	3,782,482	0	2,442,357	0	16,137,005	27,407,450
27	2,673,000	1,202,850	4,132,450	3,207,600	3,207,600	0	11,215,900	NA	NA	6,884,710	2,082,777	3,425,809	3,425,809	0	2,212,063	0	14,615,360	25,831,250
28	2,673,000	1,202,850	3,966,128	3,207,600	3,207,600	0	11,049,578	NA	NA	4,705,659	1,421,562	2,336,224	2,336,224	0	1,508,796	0	9,975,440	21,025,019
29	2,673,000	1,202,850	3,767,176	3,207,600	3,207,600	0	10,890,626	NA	NA	2,087,573	630,621	1,037,263	1,037,263	0	669,763	0	4,425,219	15,275,845
30	2,673,000	1,202,850	4,356,290	3,207,600	3,207,600	0	11,439,740	NA	NA	9,840,525	2,972,659	4,889,511	4,889,511	0	3,157,168	0	20,859,862	32,299,602
31	2,673,000	1,202,850	4,137,775	3,207,600	3,207,600	0	11,221,225	NA	NA	6,964,796	2,103,949	3,460,633	3,460,633	0	2,234,539	0	14,763,917	25,985,142
32	2,673,000	1,202,850	3,941,021	3,207,600	3,207,600	0	11,024,471	NA	NA	4,375,437	1,321,747	2,174,045	2,174,045	0	1,403,786	0	9,275,015	20,299,486
33	2,673,000	1,202,850	3,831,222	3,207,600	3,207,600	0	10,914,672	NA	NA	2,930,448	885,240	1,456,066	1,456,066	0	940,185	0	6,211,939	17,126,612
34	2,673,000	1,202,850	4,423,489	3,207,600	3,207,600	0	11,506,939	NA	NA	10,724,894	3,239,812	5,328,932	5,328,932	0	3,400,904	0	22,734,541	34,241,480
35	2,673,000	1,202,850	4,082,941	3,207,600	3,207,600	0	11,176,391	NA	NA	6,574,755	1,925,707	3,167,456	3,167,456	0	2,045,234	0	13,513,153	24,689,543
36	2,673,000	1,202,850	3,893,089	3,207,600	3,207,600	0	10,976,539	NA	NA	3,744,635	1,131,192	1,860,616	1,860,616	0	1,201,404	0	7,937,847	18,914,366
37	2,673,000	1,202,850	3,824,791	3,207,600	3,207,600	0	10,908,241	NA	NA	2,845,815	859,673	1,414,014	1,414,014	0	913,032	0	6,032,535	16,940,777
38	2,673,000	1,202,850	4,342,097	3,207,600	3,207,600	0	11,425,547	NA	NA	9,653,739	2,916,234	4,796,702	4,796,702	0	3,097,241	0	20,463,916	31,889,462
39	2,673,000	1,202,850	4,021,007	3,207,600	3,207,600	0	11,104,457	NA	NA	5,428,087	1,639,735	2,697,081	2,697,081	0	1,741,511	0	11,506,414	22,610,871
40	2,673,000	1,202,850	3,906,132	3,207,600	3,207,600	0	10,989,582	NA	NA	3,916,293	1,183,047	1,945,098	1,945,098	0	1,256,477	0	8,301,725	19,291,307
41	2,673,000	1,202,850	3,933,423	3,207,600	3,207,600	0	11,016,873	NA	NA	4,275,446	1,291,541	2,124,362	2,124,362	0	1,371,706	0	9,063,055	20,079,928
42	2,673,000	1,202,850	4,329,922	3,207,600	3,207,600	0	11,413,372	NA	NA	9,493,516	2,887,833	4,717,091	4,717,091	0	3,045,836	0	20,124,276	31,537,648
43	2,673,000	1,202,850	4,056,861	3,207,600	3,207,600	0	11,142,311	NA	NA	5,926,255	1,790,223	2,944,608	2,944,608	0	1,901,340	0	12,362,425	23,704,736
44	2,673,000	1,202,850	3,890,254	3,207,600	3,207,600	0	10,973,704	NA	NA	3,707,330	1,119,923	1,842,080	1,842,080	0	1,189,435	0	7,858,768	18,832,472
45	2,673,000	1,202,850	3,938,226	3,207,600	3,207,600	0	11,021,676	NA	NA	4,338,654	1,310,635	2,155,769	2,155,769	0	1,391,985	0	9,197,042	20,218,718
46	2,673,000	1,202,850	4,281,638	3,207,600	3,207,600	0	11,365,588	NA	NA	8,858,078	2,675,878	4,401,357	4,401,357	0	2,841,967	0	18,777,280	30,142,368
47	2,673,000	1,202,850	4,006,329	3,207,600	3,207,600	0	11,089,779	NA	NA	5,234,913	1,581,360	2,601,097	2,601,097	0	1,679,534	0	11,086,924	22,186,703
48	2,673,000	1,202,850	3,710,183	3,207,600	3,207,600	0	10,793,633	NA	NA	1,337,525	404,044	664,583	664,583	0	425,123	0	2,835,275	13,628,908
49	2,673,000	1,202,850	3,706,092	3,207,600	3,207,600	0	10,789,542	NA	NA	1,283,686	387,780	637,831	637,831	0	411,849	0	2,721,147	13,510,668
50	2,673,000	1,202,850	3,974,830	3,207,600	3,207,600	0	11,058,280	NA	NA	4,620,380	1,456,156	2,395,126	2,395,126	0	1,546,539	0	10,218,201	21,276,461
Sum	130,022,371	64,438,418	195,618,025	156,026,846	156,026,846	0	546,105,660	NA	NA	336,951,196	102,582,626	169,829,174	17,011,974	17,011,974	108,415,290	0	734,770,280	1,280,875,920
Mean	2,600,447	1,288,768	3,912,361	3,120,537	3,120,537	0	10,922,113	NA	NA	6,739,024	2,051,252	3,396,583	3,396,583	0	2,169,306	0	14,695,405	25,617,518
Std Dev	320,815	426,526	1,110,430	384,978	384,978	0	1,490,665	NA	NA	6,422,475	2,005,836	3,396,253	3,396,253	0	2,086,724	0	15,379,959	16,228,648
NPV								NA	NA	138,650,543	42,515,596	70,852,456	13,858,613	44,736,347	310,613,555	0	480,198,368	
6%								NA	NA									

Fraser River Sockeye Scenario #3 – Recommended (Median)

Indicator: Gross Revenue/Value \$

Year	First Nations				Recreational			Commercial					Grand Total	
	Marine FSC	Upper Fraser FSC	Econ Opp	Subtotal	Marine	River	Subtotal	Seine B	D	Gillnet	E	G		Troll
1	2,673,000	3,207,600	6,829,358	13,912,808	2,846,414	5,909,114	8,756,528	18,004,228	5,438,777	9,371,844	0	4,479,623	0	37,294,473
2	2,673,000	3,207,600	17,635,493	3,000,000	3,000,000	7,125,000	10,125,000	67,749,724	21,270,262	37,881,275	13,684,994	17,106,243	0	157,682,547
3	2,673,000	3,207,600	6,655,410	2,804,015	2,804,015	5,573,449	8,377,464	15,428,884	4,680,803	8,031,324	0	3,838,848	0	31,959,789
4	2,673,000	3,207,600	0	2,840,041	2,550,000	3,562,500	6,112,500	0	0	0	0	0	0	0
5	2,673,000	3,207,600	7,070,228	14,153,678	2,905,127	6,373,919	9,279,045	21,570,409	6,516,061	11,228,168	0	5,366,923	0	44,661,562
6	2,673,000	3,207,600	9,036,606	10,200,056	7,125,000	10,125,000	46,548,478	14,614,371	26,027,469	9,402,885	9,402,885	11,731,182	0	108,347,390
7	2,673,000	3,207,600	6,623,468	13,706,918	2,006,228	5,511,811	8,308,039	14,955,947	4,517,942	7,785,105	0	3,721,182	0	30,980,176
8	2,673,000	3,207,600	0	2,559,146	2,550,000	3,562,500	6,112,500	0	0	0	0	0	0	0
9	2,673,000	3,207,600	6,106,932	13,190,382	2,670,323	4,515,056	7,185,379	7,308,417	2,207,751	3,804,292	0	1,818,404	0	15,138,965
10	2,673,000	3,207,600	6,740,901	13,824,351	2,824,853	5,738,420	8,563,273	16,894,590	5,043,157	8,690,130	0	4,153,773	0	34,591,851
11	2,673,000	3,207,600	6,265,812	13,265,812	2,688,680	4,680,227	7,348,887	8,422,282	2,544,216	4,384,073	0	2,095,532	0	17,446,052
12	1,548,739	2,767,731	0	6,194,957	2,550,000	3,562,500	6,112,500	0	0	0	0	0	0	12,307,457
13	2,673,000	3,207,600	5,885,957	12,769,407	2,367,710	3,702,704	6,270,415	1,075,709	324,954	559,945	0	287,647	0	21,268,076
14	2,673,000	3,207,600	6,862,440	13,945,890	2,854,478	5,702,952	8,827,430	18,494,019	5,566,735	9,626,797	0	4,601,488	0	38,309,039
15	2,673,000	3,207,600	6,766,624	13,281,123	2,695,057	8,619,160	17,075,422	1,013,522	5,158,202	8,868,370	0	4,248,529	0	57,839,785
16	2,673,000	3,207,600	6,839,921	12,923,371	2,805,299	3,999,809	6,605,048	3,355,229	1,013,557	1,748,513	0	8,940,103	0	67,478,523
17	2,673,000	3,207,600	7,100,990	12,934,440	2,607,937	4,021,169	6,628,106	3,159,104	1,063,063	1,831,018	0	8,755,587	0	72,863,118
18	2,673,000	3,207,600	7,177,256	14,200,706	2,931,215	6,590,449	9,511,664	23,155,003	6,994,741	12,053,009	0	5,761,185	0	71,736,306
19	2,673,000	3,207,600	6,748,184	13,831,634	2,826,628	8,579,103	16,802,425	5,752,475	9,697,732	8,746,285	0	4,180,603	0	57,215,760
20	2,673,000	3,207,600	6,052,315	13,153,765	2,657,010	4,409,663	7,066,673	1,963,481	1,983,481	3,363,378	0	1,617,212	0	33,463,871
21	2,673,000	3,207,600	8,869,473	12,952,923	2,912,442	4,056,835	6,689,277	3,762,747	1,145,726	1,974,260	0	9,81,209	0	78,564,404
22	2,673,000	3,207,600	6,694,056	13,771,506	2,813,435	5,648,023	8,461,458	16,001,001	4,833,645	8,329,108	0	3,981,209	0	55,383,965
23	2,673,000	3,207,600	6,448,157	13,531,807	2,753,497	5,173,514	7,927,011	12,360,391	3,733,868	6,434,025	0	3,075,383	0	47,162,238
24	2,673,000	3,207,600	6,155,413	13,238,863	2,682,140	4,608,610	7,290,751	8,026,207	2,424,583	4,177,927	0	1,966,987	0	37,055,329
25	2,673,000	3,207,600	5,776,471	12,859,921	2,589,773	3,767,369	6,467,142	2,415,908	729,775	1,257,514	0	601,076	0	24,331,236
26	2,673,000	3,207,600	6,513,103	13,566,553	2,789,327	5,268,841	8,068,168	13,321,950	4,024,339	6,934,551	0	3,314,628	0	49,260,168
27	2,673,000	3,207,600	6,428,525	13,511,705	2,748,646	5,135,111	7,883,756	12,065,743	3,644,880	6,280,650	0	3,002,072	0	24,963,325
28	2,673,000	3,207,600	6,169,533	13,252,983	2,685,582	4,635,857	7,321,439	8,235,293	2,487,733	4,266,743	0	2,049,009	0	46,368,787
29	2,673,000	3,207,600	5,860,051	12,943,501	2,610,146	4,038,653	6,648,799	3,653,262	1,103,587	1,901,648	0	908,984	0	37,633,160
30	2,673,000	3,207,600	6,776,451	13,868,801	2,833,518	5,807,020	8,640,538	17,220,918	5,202,152	8,694,103	0	4,284,728	0	27,159,751
31	2,673,000	3,207,600	6,436,539	13,519,989	2,750,665	5,151,096	7,901,761	12,168,393	3,661,910	6,344,494	0	3,032,568	0	46,669,136
32	2,673,000	3,207,600	6,130,477	13,213,927	2,676,062	4,560,491	7,236,553	7,957,015	2,313,057	3,965,750	0	1,905,138	0	36,331,439
33	2,673,000	3,207,600	9,969,679	13,043,129	2,634,430	4,230,904	8,665,334	5,128,284	1,549,169	2,969,455	0	1,275,968	0	30,531,337
34	2,673,000	3,207,600	6,860,983	13,460,433	2,868,998	6,008,735	8,867,733	18,768,595	5,669,671	9,769,708	0	4,699,798	0	61,709,906
35	2,673,000	3,207,600	6,966,787	13,954,243	2,723,665	5,016,514	7,750,179	11,555,821	3,969,988	5,807,003	0	2,775,675	0	47,308,913
36	2,673,000	3,207,600	6,055,916	13,139,366	2,657,888	4,416,612	7,074,500	6,553,112	1,979,586	3,411,129	0	1,979,586	0	33,768,169
37	2,673,000	3,207,600	6,949,676	13,033,126	2,631,992	4,211,601	6,843,592	4,980,177	1,504,428	2,592,380	0	1,239,111	0	30,192,787
38	2,673,000	3,207,600	6,754,373	13,837,823	2,828,137	5,764,416	8,592,553	16,894,043	5,103,409	8,793,953	0	4,203,389	0	57,425,179
39	2,673,000	3,207,600	6,254,900	13,338,530	2,706,390	4,800,589	7,506,960	9,498,152	2,869,536	4,944,648	0	2,963,480	0	34,964,804
40	2,673,000	3,207,600	6,076,068	13,159,656	2,662,833	4,455,765	7,118,598	8,653,513	2,200,332	3,567,468	0	1,705,219	0	14,196,562
41	2,673,000	3,207,600	6,186,658	13,202,108	2,673,181	4,537,684	7,212,865	7,482,030	2,280,197	3,864,664	0	1,861,600	0	35,911,465
42	2,673,000	3,207,600	6,735,434	13,838,884	2,823,520	5,727,871	8,551,391	16,613,653	5,138,708	8,647,999	0	4,133,635	0	56,784,270
43	2,673,000	3,207,600	6,331,784	13,367,234	2,720,743	4,914,216	7,634,959	10,370,945	3,132,890	5,398,448	0	2,590,390	0	31,462,671
44	2,673,000	3,207,600	6,051,507	13,134,957	2,666,813	4,408,103	7,064,916	6,487,828	1,955,865	3,357,146	0	1,819,233	0	33,638,944
45	2,673,000	3,207,600	6,126,129	13,209,579	2,675,002	4,552,101	7,227,103	7,592,864	2,263,611	3,922,242	0	1,694,122	0	15,727,620
46	2,673,000	3,207,600	6,860,325	13,743,715	2,895,213	5,582,934	8,388,147	15,501,636	4,682,786	8,069,155	0	3,866,955	0	32,110,533
47	2,673,000	3,207,600	6,232,067	13,315,517	2,700,825	4,756,528	7,457,353	9,161,097	2,987,415	4,768,678	0	2,279,388	0	18,978,558
48	2,673,000	3,207,600	5,771,986	12,854,646	2,588,536	3,867,575	6,456,111	2,340,668	707,077	1,218,402	0	582,381	0	24,159,468
49	2,673,000	3,207,600	5,765,032	12,846,462	2,586,965	3,855,295	6,442,280	2,426,450	678,615	1,169,588	0	598,936	0	33,961,125
50	2,673,000	3,207,600	6,163,069	13,266,519	2,668,861	4,661,978	7,350,869	4,632,665	2,456,274	4,391,065	0	2,068,674	0	27,473,877
Sum	130,022,371	84,438,418	304,294,706	654,762,341	136,226,225	247,207,612	383,433,837	569,864,593	179,484,595	311,353,466	23,087,679	147,195,036	0	2,288,941,566
Mean	2,600,447	1,268,768	6,085,894	13,095,647	2,727,336	4,944,152	7,064,777	11,793,292	3,589,692	6,222,070	461,754	2,942,701	0	45,776,831
Std Dev	320,815	1,727,336	384,978	2,071,976	113,798	900,902	1,168,600	1,128,332	3,510,213	6,226,464	2,302,268	2,931,983	0	25,794,320
NPV	39,676,819	21,460,109	84,626,473	203,379,962	43,372,209	81,322,362	124,684,601	242,639,450	74,402,292	129,866,170	18,808,118	60,713,613	0	854,533,227

Fraser River Sockeye Management – Socio-Economic Implications

GSGislason & Associates Ltd.
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Appendix E

Scenario #4 – Avoid Low Escapement – Mean of Distribution

Fraser River Sockeye Scenario #4 – Avoid Low Escapement (Mean)

Indicator: Sockeye Pieces

Year	First Nations					Marine		Recreational		Commercial					Grand Total		
	Lower Fraser	Upper Fraser	FSC	Econ Opp	Subtotal	FSC	Econ Opp	River	Subtotal	Seine	D	Gillnet	E	G		Troll	H
1	250,000	112,500	426,505	300,000	0	1,089,005	6,014	114,263	120,277	1,054,201	318,457	582,007	0	241,588	2,196,252	3,405,533	
2	250,000	112,500	646,881	300,000	0	1,309,381	7,500	142,500	150,000	3,397,978	1,066,807	2,015,080	632,182	790,227	2,902,275	9,361,656	
3	250,000	112,500	399,125	300,000	0	1,061,625	4,164	79,113	83,277	729,908	220,493	402,970	0	1,520,642	2,665,544		
4	250,000	112,500	281,530	300,000	0	825,623	0	0	0	0	0	0	0	0	0	825,623	
5	250,000	112,500	464,196	300,000	0	1,126,696	7,500	142,500	150,000	1,510,809	456,390	834,093	0	346,227	3,147,519	4,424,215	
6	250,000	112,500	563,045	300,000	0	1,225,545	7,500	142,500	150,000	2,459,718	772,237	1,458,670	457,622	5,720,273	7,095,619		
7	250,000	112,500	410,105	300,000	0	1,072,605	4,906	93,210	98,115	659,962	259,780	474,771	0	197,075	1,791,587	2,962,308	
8	250,000	112,500	352,206	300,000	0	1,014,706	894	18,879	19,873	174,182	52,618	96,163	0	39,917	362,880	1,397,458	
9	250,000	112,500	375,561	300,000	0	1,036,061	2,572	48,862	51,433	450,802	136,180	248,880	0	103,309	939,171	2,028,665	
10	250,000	112,500	408,139	300,000	0	1,070,639	4,773	90,885	95,458	836,667	252,743	461,910	0	191,736	1,743,057	2,909,154	
11	250,000	112,500	385,000	300,000	0	1,047,500	3,209	60,980	64,189	562,605	169,953	310,605	0	128,930	1,172,093	2,283,782	
12	227,005	408,610	0	272,406	0	908,022	0	0	0	0	0	0	0	0	0	908,022	
13	250,000	112,500	351,173	300,000	0	1,013,673	924	17,553	18,476	161,942	48,920	89,405	0	37,112	337,379	1,369,528	
14	250,000	112,500	424,607	300,000	0	1,087,107	5,886	111,827	117,712	1,031,724	311,666	569,597	0	236,437	2,149,424	3,354,243	
15	250,000	112,500	400,457	300,000	0	1,062,957	4,254	80,823	85,077	745,684	225,259	411,680	0	170,886	1,553,508	2,701,542	
16	250,000	112,500	383,575	300,000	0	1,026,075	1,762	33,474	35,236	308,636	83,284	170,503	0	70,775	643,409	1,704,719	
17	250,000	112,500	363,063	300,000	0	1,025,563	1,727	32,817	34,544	302,774	91,463	167,157	0	69,366	630,780	1,690,867	
18	250,000	112,500	463,828	300,000	0	1,126,328	7,500	142,500	150,000	1,506,213	455,002	831,555	0	345,174	3,137,943	4,414,271	
19	250,000	112,500	417,571	300,000	0	1,080,071	5,410	102,794	108,205	948,391	286,493	523,591	0	217,340	1,975,814	3,164,090	
20	250,000	112,500	377,231	300,000	0	1,039,731	2,685	51,007	53,691	470,592	142,158	259,806	0	107,844	980,400	2,073,823	
21	250,000	112,500	371,317	300,000	0	1,033,817	2,285	43,414	45,699	400,545	120,998	221,134	0	91,792	834,469	1,913,986	
22	250,000	112,500	411,731	300,000	0	1,074,231	5,016	95,296	100,312	879,215	265,596	485,400	0	201,487	1,831,697	3,006,240	
23	250,000	112,500	390,095	300,000	0	1,052,595	3,554	67,521	71,075	622,957	188,185	343,924	0	142,761	1,297,827	2,421,497	
24	250,000	112,500	389,915	300,000	0	1,052,415	3,542	67,269	70,831	620,818	187,539	342,743	0	142,271	1,293,371	2,416,617	
25	250,000	112,500	367,452	300,000	0	1,029,952	2,024	38,451	40,475	354,757	107,166	195,656	0	81,299	739,078	1,809,504	
26	250,000	112,500	399,868	300,000	0	1,062,368	4,214	80,068	84,280	738,702	223,149	407,625	0	169,286	1,538,682	2,685,610	
27	250,000	112,500	388,261	300,000	0	1,060,761	4,106	78,005	82,110	719,678	217,403	397,322	0	164,926	1,489,329	2,642,200	
28	250,000	112,500	379,974	300,000	0	1,042,474	2,870	54,527	57,397	503,072	151,970	277,738	0	115,287	1,048,068	2,147,938	
29	250,000	112,500	388,287	300,000	0	1,030,767	2,081	39,537	41,618	364,772	110,192	201,385	0	83,594	759,942	1,832,357	
30	250,000	112,500	410,267	300,000	0	1,072,767	4,917	93,417	98,334	861,877	260,359	475,828	0	197,513	1,795,577	2,966,678	
31	250,000	112,500	397,009	300,000	0	1,059,509	4,021	76,397	80,418	704,844	212,922	389,133	0	161,527	1,488,425	2,608,352	
32	250,000	112,500	375,785	300,000	0	1,038,285	2,587	49,150	51,736	453,459	136,962	250,347	0	103,918	944,706	2,034,727	
33	250,000	112,500	369,766	300,000	0	1,032,266	2,180	41,423	43,603	382,169	115,447	210,989	0	87,580	796,185	1,872,054	
34	250,000	112,500	427,516	300,000	0	1,090,016	6,082	115,562	121,644	1,066,184	322,076	588,622	0	244,334	2,221,216	3,432,877	
35	250,000	112,500	387,707	300,000	0	1,050,207	3,392	64,454	67,847	594,663	179,638	328,303	0	136,277	1,238,881	2,356,934	
36	250,000	112,500	378,212	300,000	0	1,040,712	2,751	52,266	55,017	482,211	145,668	266,221	0	110,507	1,004,607	2,100,336	
37	250,000	112,500	375,685	300,000	0	1,036,185	2,580	49,021	51,601	452,271	136,623	249,691	0	103,645	942,231	2,032,016	
38	250,000	112,500	413,093	300,000	0	1,075,593	5,108	97,044	102,152	895,342	270,468	494,303	0	205,183	1,865,296	3,043,041	
39	250,000	112,500	380,447	300,000	0	1,042,947	2,902	55,135	58,036	508,677	153,663	280,832	0	116,572	1,059,743	2,160,727	
40	250,000	112,500	378,565	300,000	0	1,041,065	2,775	52,718	55,493	486,383	146,928	268,524	0	111,463	1,013,297	2,109,854	
41	250,000	112,500	376,561	300,000	0	1,039,061	2,639	50,145	52,785	462,647	139,758	255,420	0	106,023	963,849	2,055,694	
42	250,000	112,500	411,923	300,000	0	1,074,423	5,029	95,544	100,572	881,494	266,285	486,658	0	202,009	1,836,447	3,011,442	
43	250,000	112,500	390,724	300,000	0	1,043,224	2,921	54,676	58,411	511,963	154,655	282,646	0	117,325	1,066,589	2,168,225	
44	250,000	112,500	377,960	300,000	0	1,040,460	2,734	51,942	54,676	479,225	144,766	264,572	0	109,822	988,366	2,093,522	
45	250,000	112,500	375,835	300,000	0	1,038,335	2,590	49,214	51,804	454,049	137,161	250,673	0	104,053	945,935	2,036,074	
46	250,000	112,500	419,288	300,000	0	1,081,768	5,525	104,972	110,497	968,484	292,563	534,884	0	221,944	2,017,674	3,209,939	
47	250,000	112,500	385,886	300,000	0	1,046,386	3,270	62,130	65,400	573,216	173,159	316,463	0	131,362	1,194,200	2,307,966	
48	250,000	112,500	345,683	300,000	0	1,008,183	553	10,506	11,059	96,926	29,280	53,511	0	22,212	201,929	1,221,170	
49	250,000	112,500	340,416	300,000	0	1,002,916	197	3,744	3,941	34,543	10,435	19,070	0	7,916	71,964	1,078,821	
50	250,000	112,500	364,675	300,000	0	1,027,175	1,836	34,886	36,722	321,864	97,230	177,696	0	73,761	670,550	1,734,447	
Sum	12,383,411	6,060,140	19,142,170	14,860,093	0	52,475,815	175,555	3,335,552	3,511,108	34,389,693	10,458,176	19,225,956	1,089,804	7,900,906	73,064,835	129,051,757	
Mean	247,668	121,803	392,843	297,202	0	1,049,516	3,511	66,711	70,222	687,800	209,164	21,786	384,519	21,786	158,018	1,461,297	2,581,035
Std Dev	13,429	47,313	92,756	16,115	0	81,387	1,931	36,680	38,621	570,099	177,912	334,508	108,196	132,267	1,305,522	1,400,564	
NPV	3,854,902	2,054,255	6,080,889	4,625,883	0	16,615,928	62,291	1,183,536	1,245,827	13,794,317	4,223,514	7,810,412	885,245	3,177,335	29,890,822	47,752,578	
6%																	

Fraser River Sockeye Management – Socio-Economic Implications

GSGislason & Associates Ltd.

Fraser River Sockeye Scenario #4 – Avoid Low Escapement (Mean)

Indicator: Harvest Revenue/Value \$

Year	First Nations					Recreational			Commercial					Grand Total			
	Marine FSC	Lower Fraser FSC	Econ Opp	Upper Fraser FSC	Subtotal	Marine	River	Subtotal	Seine B	D	Gillnet	E	G		H	Troll	Subtotal
1	2,673,000	1,202,850	4,560,189	3,207,600	0	11,643,639	NA	NA	NA	12,523,907	3,783,263	6,222,816	2,545,235	10,514,450	0	4,018,087	26,548,073
2	2,673,000	1,202,850	6,916,454	3,207,600	0	13,999,904	NA	NA	NA	40,367,979	12,673,668	21,545,235	13,143,063	98,244,396	0	13,143,063	98,244,396
3	2,673,000	1,202,850	4,267,446	3,207,600	0	11,350,896	NA	NA	NA	8,671,307	2,619,457	4,308,556	0	2,782,044	0	2,782,044	18,381,364
4	1,672,280	3,010,123	0	2,006,748	0	6,689,161	NA	NA	NA	NA	0	0	0	0	0	0	0
5	2,673,000	1,202,850	4,963,183	3,207,600	0	12,046,633	NA	NA	NA	17,948,412	5,421,916	8,918,117	0	5,758,449	0	5,758,449	38,046,895
6	2,673,000	1,202,850	6,020,080	3,207,600	0	13,103,530	NA	NA	NA	29,221,444	9,174,174	15,596,096	7,611,167	9,513,959	71,116,841	9,513,959	71,116,841
7	2,673,000	1,202,850	4,384,847	3,207,600	0	11,468,297	NA	NA	NA	10,216,345	3,086,188	5,076,247	0	3,277,744	0	3,277,744	21,656,524
8	2,673,000	1,202,850	3,765,786	3,207,600	0	10,849,236	NA	NA	NA	2,089,284	625,096	1,028,176	0	683,895	0	683,895	4,386,451
9	2,673,000	1,202,850	4,015,494	3,207,600	0	11,098,944	NA	NA	NA	5,355,531	1,617,817	2,661,029	0	1,718,233	11,352,610	1,718,233	11,352,610
10	2,673,000	1,202,850	4,363,819	3,207,600	0	11,447,269	NA	NA	NA	9,939,610	3,002,590	4,938,744	0	3,188,958	21,069,902	3,188,958	21,069,902
11	2,673,000	1,202,850	4,116,419	3,207,600	0	11,199,869	NA	NA	NA	6,683,744	2,019,048	3,320,985	0	2,144,368	14,188,144	2,144,368	14,188,144
12	2,427,142	4,368,855	0	2,912,570	0	9,708,567	NA	NA	NA	0	0	0	0	0	0	0	0
13	2,673,000	1,202,850	3,754,737	3,207,600	0	10,838,167	NA	NA	NA	1,923,869	581,189	955,922	0	617,241	4,078,201	617,241	4,078,201
14	2,673,000	1,202,850	4,539,898	3,207,600	0	11,623,348	NA	NA	NA	12,256,876	3,702,598	6,090,135	0	3,932,414	25,982,024	3,932,414	25,982,024
15	2,673,000	1,202,850	4,281,687	3,207,600	0	11,365,137	NA	NA	NA	8,858,725	2,676,073	4,401,679	0	2,842,174	18,778,650	2,842,174	18,778,650
16	2,673,000	1,202,850	3,887,340	3,207,600	0	10,970,790	NA	NA	NA	3,668,974	1,108,336	1,823,021	0	1,177,460	7,777,460	1,177,460	7,777,460
17	2,673,000	1,202,850	3,881,868	3,207,600	0	10,965,318	NA	NA	NA	3,566,959	1,086,581	1,787,239	0	1,154,024	7,624,804	1,154,024	7,624,804
18	2,673,000	1,202,850	4,959,249	3,207,600	0	12,042,869	NA	NA	NA	17,893,808	5,405,421	8,890,986	0	5,740,930	37,931,145	5,740,930	37,931,145
19	2,673,000	1,202,850	4,464,673	3,207,600	0	11,548,123	NA	NA	NA	11,266,884	3,403,538	5,598,233	0	3,614,792	23,863,448	3,614,792	23,863,448
20	2,673,000	1,202,850	4,033,359	3,207,600	0	11,116,909	NA	NA	NA	5,590,633	1,688,837	2,777,846	0	1,793,661	11,850,977	1,793,661	11,850,977
21	2,673,000	1,202,850	3,970,127	3,207,600	0	11,053,577	NA	NA	NA	4,758,477	1,437,457	2,364,369	0	1,526,678	10,086,981	1,526,678	10,086,981
22	2,673,000	1,202,850	4,402,227	3,207,600	0	11,485,677	NA	NA	NA	10,445,070	3,155,282	5,189,894	0	3,351,127	22,141,372	3,351,127	22,141,372
23	2,673,000	1,202,850	4,170,900	3,207,600	0	11,254,350	NA	NA	NA	7,400,727	2,235,636	3,677,236	0	2,374,400	15,688,000	2,374,400	15,688,000
24	2,673,000	1,202,850	4,168,969	3,207,600	0	11,252,419	NA	NA	NA	7,375,321	2,227,961	3,664,612	0	2,366,249	15,634,143	2,366,249	15,634,143
25	2,673,000	1,202,850	3,928,793	3,207,600	0	11,012,243	NA	NA	NA	4,214,516	1,273,135	2,094,087	0	1,352,157	8,933,895	1,352,157	8,933,895
26	2,673,000	1,202,850	4,275,384	3,207,600	0	11,358,634	NA	NA	NA	8,775,774	2,651,015	4,360,463	0	2,815,561	18,602,813	2,815,561	18,602,813
27	2,673,000	1,202,850	4,258,211	3,207,600	0	11,341,661	NA	NA	NA	8,549,772	2,582,744	4,248,168	0	2,743,052	18,123,735	2,743,052	18,123,735
28	2,673,000	1,202,850	4,062,679	3,207,600	0	11,146,129	NA	NA	NA	5,976,501	1,805,401	2,969,574	0	1,917,461	12,688,937	1,917,461	12,688,937
29	2,673,000	1,202,850	3,937,834	3,207,600	0	11,021,284	NA	NA	NA	4,333,493	1,309,076	2,153,205	0	1,390,329	9,186,103	1,390,329	9,186,103
30	2,673,000	1,202,850	4,386,576	3,207,600	0	11,470,026	NA	NA	NA	10,239,097	3,093,060	5,087,551	0	3,285,044	21,704,752	3,285,044	21,704,752
31	2,673,000	1,202,850	4,244,820	3,207,600	0	11,328,270	NA	NA	NA	8,373,547	2,529,509	4,160,606	0	2,686,513	17,750,175	2,686,513	17,750,175
32	2,673,000	1,202,850	4,017,892	3,207,600	0	11,101,342	NA	NA	NA	5,387,092	1,627,351	2,676,711	0	1,728,359	11,419,512	1,728,359	11,419,512
33	2,673,000	1,202,850	3,953,538	3,207,600	0	11,036,988	NA	NA	NA	4,540,166	1,371,508	2,255,895	0	1,456,637	9,624,205	1,456,637	9,624,205
34	2,673,000	1,202,850	4,571,006	3,207,600	0	11,654,456	NA	NA	NA	12,666,264	3,826,267	6,293,550	0	4,063,760	26,849,841	4,063,760	26,849,841
35	2,673,000	1,202,850	4,145,358	3,207,600	0	11,228,908	NA	NA	NA	7,064,593	2,134,096	3,510,219	0	2,266,557	14,975,465	2,266,557	14,975,465
36	2,673,000	1,202,850	4,043,848	3,207,600	0	11,127,298	NA	NA	NA	5,728,672	1,730,536	2,846,434	0	1,837,949	12,143,591	1,837,949	12,143,591
37	2,673,000	1,202,850	4,016,820	3,207,600	0	11,100,270	NA	NA	NA	5,372,975	1,623,086	2,669,697	0	1,723,830	11,389,588	1,723,830	11,389,588
38	2,673,000	1,202,850	4,416,785	3,207,600	0	11,500,235	NA	NA	NA	10,636,665	3,213,159	5,285,093	0	3,412,597	22,547,513	3,412,597	22,547,513
39	2,673,000	1,202,850	4,067,738	3,207,600	0	11,151,188	NA	NA	NA	6,043,081	1,825,514	3,002,656	0	1,938,822	12,810,073	1,938,822	12,810,073
40	2,673,000	1,202,850	4,047,613	3,207,600	0	11,131,063	NA	NA	NA	5,778,225	1,745,506	2,871,056	0	1,863,847	12,248,634	1,863,847	12,248,634
41	2,673,000	1,202,850	4,026,187	3,207,600	0	11,109,637	NA	NA	NA	5,486,250	1,680,326	2,730,949	0	3,359,816	22,198,785	3,359,816	22,198,785
42	2,673,000	1,202,850	4,074,285	3,207,600	0	11,148,735	NA	NA	NA	10,472,154	3,163,463	5,203,352	0	3,359,816	22,198,785	3,359,816	22,198,785
43	2,673,000	1,202,850	4,070,704	3,207,600	0	11,154,154	NA	NA	NA	6,082,118	1,837,306	3,022,052	0	1,951,346	12,892,822	1,951,346	12,892,822
44	2,673,000	1,202,850	4,041,152	3,207,600	0	11,124,602	NA	NA	NA	5,693,196	1,719,820	2,828,807	0	1,826,567	12,088,389	1,826,567	12,088,389
45	2,673,000	1,202,850	4,018,425	3,207,600	0	11,101,875	NA	NA	NA	5,394,102	1,629,468	2,680,194	0	1,730,608	11,434,372	1,730,608	11,434,372
46	2,673,000	1,202,850	4,482,811	3,207,600	0	11,566,261	NA	NA	NA	11,505,566	3,475,646	5,716,838	0	3,691,375	24,389,444	3,691,375	24,389,444
47	2,673,000	1,202,850	4,125,998	3,207,600	0	11,209,448	NA	NA	NA	6,809,807	2,057,129	3,383,623	0	2,184,813	14,435,871	2,184,813	14,435,871
48	2,673,000	1,202,850	3,696,046	3,207,600	0	10,779,496	NA	NA	NA	1,151,478	347,842	572,140	0	389,432	2,440,893	389,432	2,440,893
49	2,673,000	1,202,850	3,639,732	3,207,600	0	10,723,182	NA	NA	NA	4,10,367	123,965	203,901	0	131,659	869,892	131,659	869,892
50	2,673,000	1,202,850	3,899,100	3,207,600	0	10,982,950	NA	NA	NA	3,823,744	1,155,089	1,899,923	0	1,226,785	8,105,542	1,226,785	8,105,542
Sum	132,403,432	65,115,778	204,668,083	158,884,118	0	561,071,411	NA	NA	NA	408,553,119	124,243,125	205,563,918	18,125,617	131,407,874	887,893,654	1,448,965,066	28,979,301
Mean	2,648,069	1,302,316	4,093,362	3,177,862	0	11,221,428	NA	NA	NA	8,171,062	2,484,863	4,111,278	382,512	2,628,157	17,757,873	26,878,501	16,848,308
Std Dev	143,582	505,869	991,743	172,298	0	870,192	NA	NA	NA	6,772,760	2,113,590	3,576,564	1,799,515	2,199,863	16,180,072	16,848,308	16,848,308
NPV	41,216,614	21,964,091	65,016,866	49,459,936	0	177,657,507	NA	NA	NA	163,876,480	50,175,342	83,508,928	14,723,396	52,845,433	365,129,579	542,787,085	542,787,085

Fraser River Sockeye Management – Socio-Economic Implications

GSGislason & Associates Ltd.
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Fraser River Sockeye Scenario #4 – Avoid Low Escapement (Mean)

Year	First Nations					Recreational			Commercial					Grand Total		
	Marine FSC	Lower Fraser Econ Opp	Upper Fraser FSC	Econ Opp	Subtotal	Marine	River	Subtotal	Seine B	D	Glinnet	E	G		Troll	H
1	2,673,000	1,202,850	7,093,627	3,207,600	0	14,177,077	2,910,830	6,419,071	9,329,901	21,916,836	6,620,711	11,408,496	0	5,453,118	0	45,399,161
2	2,673,000	1,202,850	10,758,929	3,207,600	0	17,842,379	3,000,000	7,125,000	10,125,000	70,643,963	22,178,919	39,499,598	14,269,611	17,837,012	0	164,429,106
3	2,673,000	1,202,850	6,638,249	3,207,600	0	13,721,689	2,979,832	5,540,333	8,340,165	5,174,787	4,584,050	7,869,019	0	3,775,634	0	31,433,468
4	1,672,290	3,010,123	0	2,006,748	0	6,689,161	2,550,000	3,982,500	6,112,500	0	0	0	0	0	0	12,801,681
5	2,673,000	1,202,850	7,720,507	3,207,600	0	14,803,957	3,000,000	7,125,000	10,125,000	31,409,721	9,468,353	16,349,882	0	7,815,038	0	65,082,994
6	2,673,000	1,202,850	9,364,569	3,207,600	0	16,448,019	3,000,000	7,125,000	10,125,000	51,137,528	16,054,805	28,582,844	10,329,441	12,911,801	0	119,026,418
7	2,673,000	1,202,850	6,820,873	3,207,600	0	13,904,323	2,846,346	5,892,740	6,737,087	17,678,604	5,906,828	9,306,452	0	4,448,367	0	59,675,661
8	2,673,000	1,202,850	8,587,890	3,207,600	0	12,941,340	2,609,619	4,034,482	6,844,101	3,621,247	1,093,918	1,884,988	0	9,001,001	0	7,501,155
9	2,673,000	1,202,850	6,246,324	3,207,600	0	13,329,774	2,704,300	4,784,040	7,488,340	9,372,179	2,831,179	4,878,554	0	2,331,887	0	40,231,913
10	2,673,000	1,202,850	6,798,163	3,207,600	0	13,871,613	2,636,373	5,829,620	8,665,983	17,394,317	2,534,533	9,054,363	0	4,327,872	0	58,568,691
11	2,673,000	1,202,850	6,403,319	3,207,600	0	13,486,769	2,742,567	5,066,981	7,829,559	11,696,551	3,533,333	6,088,473	0	2,910,213	0	24,228,571
12	2,427,142	4,368,855	0	2,912,570	0	9,708,567	2,550,000	3,582,500	6,112,500	0	0	0	0	0	0	45,544,888
13	2,673,000	1,202,850	5,840,701	3,207,600	0	12,924,151	2,605,429	4,001,314	6,606,743	3,366,771	1,017,045	1,752,524	0	837,685	0	15,821,067
14	2,673,000	1,202,850	7,062,064	3,207,600	0	14,145,514	3,002,136	6,356,184	9,261,300	21,449,533	6,278,547	11,165,248	0	5,336,848	0	28,504,920
15	2,673,000	1,202,850	6,660,402	3,207,600	0	13,743,852	2,805,231	5,983,081	8,388,313	15,502,768	4,863,128	8,069,744	0	3,857,236	0	67,837,990
16	2,673,000	1,202,850	6,046,973	3,207,600	0	13,130,423	2,655,708	4,399,354	7,055,062	6,420,704	1,939,588	3,242,206	0	1,597,532	0	33,465,515
17	2,673,000	1,202,850	6,038,461	3,207,600	0	13,121,911	2,653,633	4,382,938	7,036,561	8,294,679	1,901,518	3,276,605	0	1,566,176	0	33,197,450
18	2,673,000	1,202,850	7,714,368	3,207,600	0	14,787,838	3,000,000	7,125,000	10,125,000	31,341,164	9,598,162	16,300,141	0	7,791,262	0	68,865,054
19	2,673,000	1,202,850	6,945,407	3,207,600	0	14,028,497	2,874,614	6,132,357	9,006,971	19,171,048	4,956,192	10,263,428	0	4,905,789	0	80,842,456
20	2,673,000	1,202,850	6,274,113	3,207,600	0	13,587,963	2,711,073	4,837,684	7,334,798	9,763,608	2,955,465	5,092,771	0	2,434,255	0	11,172,348
21	2,673,000	1,202,850	6,175,752	3,207,600	0	13,259,202	2,687,098	4,647,858	7,324,956	8,327,336	2,515,549	4,394,676	0	2,071,920	0	37,843,640
22	2,673,000	1,202,850	6,847,908	3,207,600	0	13,931,358	2,850,938	5,944,910	8,795,846	18,278,873	5,521,743	9,514,806	0	4,547,958	0	67,863,379
23	2,673,000	1,202,850	6,486,967	3,207,600	0	13,571,517	2,765,225	5,250,528	8,013,752	12,951,273	3,921,364	6,741,800	0	3,222,400	0	28,827,935
24	2,673,000	1,202,850	6,485,063	3,207,600	0	13,568,513	2,762,493	5,244,733	8,007,225	12,908,811	3,988,932	6,718,456	0	3,211,337	0	48,142,905
25	2,673,000	1,202,850	6,111,456	3,207,600	0	13,194,906	2,672,841	4,523,786	7,195,212	13,375,402	2,227,986	3,839,160	0	1,835,070	0	35,667,737
26	2,673,000	1,202,850	6,650,597	3,207,600	0	13,734,047	2,802,841	5,564,161	8,307,043	15,357,605	4,539,277	7,984,182	0	3,821,118	0	53,913,232
27	2,673,000	1,202,850	6,623,884	3,207,600	0	13,707,334	2,798,330	5,512,613	8,308,934	14,962,101	4,519,801	7,788,308	0	3,722,713	0	30,982,923
28	2,673,000	1,202,850	6,319,723	3,207,600	0	13,403,173	2,722,191	4,925,677	7,647,867	10,458,878	3,159,452	5,444,219	0	2,602,268	0	21,684,816
29	2,673,000	1,202,850	6,125,519	3,207,600	0	13,308,969	2,647,854	4,725,778	7,255,971	7,563,619	2,380,863	3,947,542	0	1,886,675	0	13,708,913
30	2,673,000	1,202,850	6,823,962	3,207,600	0	13,907,012	2,845,002	5,897,930	8,692,930	17,918,419	5,412,856	9,327,177	0	4,488,273	0	37,116,726
31	2,673,000	1,202,850	6,603,054	3,207,600	0	13,686,504	2,761,253	5,472,418	8,263,670	14,653,707	4,265,641	7,627,778	0	3,645,982	0	30,354,108
32	2,673,000	1,202,850	6,250,055	3,207,600	0	13,333,505	2,705,209	4,791,239	7,496,448	9,427,410	2,847,863	4,907,304	0	2,345,629	0	40,358,159
33	2,673,000	1,202,850	6,149,848	3,207,600	0	13,233,398	2,680,080	4,598,084	7,278,872	7,945,290	2,400,140	4,135,807	0	1,976,864	0	38,970,371
34	2,673,000	1,202,850	7,110,453	3,207,600	0	14,193,903	2,914,931	6,451,041	9,366,472	12,165,962	6,965,968	11,538,175	0	5,515,102	0	69,475,582
35	2,673,000	1,202,850	6,448,335	3,207,600	0	13,331,785	2,753,550	4,859,150	7,584,200	10,025,176	3,028,439	5,218,462	0	2,464,359	0	25,609,148
36	2,673,000	1,202,850	6,290,429	3,207,600	0	13,373,879	2,715,050	4,869,150	7,527,200	12,363,037	5,173,687	6,435,402	0	3,076,041	0	47,068,333
37	2,673,000	1,202,850	6,248,356	3,207,600	0	13,331,836	2,704,802	4,768,019	7,492,801	9,402,707	2,940,401	4,894,445	0	2,339,483	0	30,971,035
38	2,673,000	1,202,850	6,870,550	3,207,600	0	13,954,005	2,858,456	5,988,611	8,845,067	18,614,163	5,623,028	6,689,337	0	4,631,381	0	38,557,991
39	2,673,000	1,202,850	6,327,593	3,207,600	0	13,411,043	2,724,109	4,800,863	7,684,972	10,573,392	3,194,650	5,504,869	0	2,631,258	0	21,906,170
40	2,673,000	1,202,850	6,286,287	3,207,600	0	13,379,737	2,716,478	4,860,452	7,596,890	10,111,694	3,054,635	5,263,602	0	2,515,958	0	20,846,067
41	2,673,000	1,202,850	6,262,967	3,207,600	0	13,346,407	2,706,354	4,816,137	7,524,491	9,618,437	2,965,570	5,006,740	0	2,383,159	0	19,923,906
42	2,673,000	1,202,850	6,851,109	3,207,600	0	13,934,559	2,851,716	5,951,088	8,802,804	18,326,270	5,536,061	9,539,478	0	4,569,750	0	37,961,559
43	2,673,000	1,202,850	6,332,207	3,207,600	0	13,415,657	2,725,234	4,949,787	7,675,000	10,643,706	3,215,286	5,540,429	0	2,648,255	0	43,138,334
44	2,673,000	1,202,850	6,286,236	3,207,600	0	13,369,886	2,714,028	4,861,058	7,575,086	9,963,093	3,009,684	5,166,146	0	2,478,912	0	20,637,635
45	2,673,000	1,202,850	6,250,883	3,207,600	0	13,334,333	2,705,411	4,792,838	7,498,249	9,439,678	2,792,384	4,913,690	0	2,348,682	0	19,553,619
46	2,673,000	1,202,850	6,973,261	3,207,600	0	14,056,711	2,861,491	6,186,021	8,988,293	20,134,775	6,082,380	10,080,889	0	5,009,724	0	41,707,748
47	2,673,000	1,202,850	6,418,220	3,207,600	0	13,501,670	2,746,199	5,115,745	7,668,944	11,917,162	3,569,976	6,203,308	0	2,965,103	0	24,685,549
48	2,673,000	1,202,850	5,749,405	3,207,600	0	12,832,855	2,563,176	4,325,140	6,408,315	2,015,086	6,028,924	1,048,924	0	501,373	0	46,048,163
49	2,673,000	1,202,850	5,661,805	3,207,600	0	12,745,255	2,561,823	4,356,610	6,207,924	718,142	2,169,939	3,873,919	0	1,78,681	0	23,415,277
50	2,673,000	1,202,850	6,065,267	3,207,600	0	13,148,717	2,860,167	4,434,656	7,084,823	6,891,553	2,021,407	3,483,192	0	1,664,922	0	34,104,613
Sum	132,403,432	65,115,778	318,372,574	158,884,118	0	674,775,902	138,033,323	261,513,805	399,547,128	714,967,959	217,425,468	376,887,183	24,569,052	178,339,258	0	2,586,521,952
Mean	2,646,069	1,302,316	6,367,451	3,177,682	0	13,485,518	2,750,276	7,960,943	7,957,344	14,289,358	4,366,762	7,537,344	461,961	3,566,785	0	51,730,438
Std Dev	143,582	505,989	1,542,712	1,172,296	0	1,366,680	116,866	520,217	1,033,121	11,852,366	3,686,782	6,557,034	2,442,199	2,965,528	0	29,074,620
NPV	41,216,614	21,964,091	101,137,347	49,459,936	0	213,777,988	43,930,227	85,740,031	129,670,258	286,783,841	87,806,848	153,099,701	19,981,751	71,718,802	0	618,390,943
6%																962,839,189

Fraser River Sockeye Management – Socio-Economic Implications

GSGilson & Associates Ltd.
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Appendix F

Scenario #5 – Avoid Low Catch – Mean of Distribution

Fraser River Sockeye Scenario #5 – Avoid Low Catch (Mean)

Indicator: Sockeye Pieces

Year	First Nations					Recreational					Commercial					Grand Total
	Marine FSC	Lower Fraser FSC	Upper Fraser FSC	Econ Opp	Subtotal	Marine	River	Subtotal	Seine B	D Gillnet	E	G	H	Subtotal		
1	250,000	112,500	442,448	300,000	0	1,104,948	7,081	134,730	1,243,038	375,501	686,260	0	284,863	2,589,662	3,836,431	
2	250,000	112,500	769,404	300,000	0	1,431,904	7,500	142,500	4,769,203	1,497,308	2,828,248	887,294	1,109,117	11,091,169	12,673,072	
3	250,000	112,500	437,680	300,000	0	1,100,180	6,769	128,609	1,186,564	358,441	655,082	0	271,921	2,472,009	3,707,567	
4	250,000	112,500	347,913	300,000	0	1,010,413	704	13,368	1,010,413	37,256	68,089	0	28,263	256,940	1,261,424	
5	250,000	112,500	462,536	300,000	0	1,115,036	7,500	142,500	1,365,147	412,388	753,675	0	312,846	2,844,056	4,109,092	
6	250,000	112,500	631,682	300,000	0	1,294,182	7,500	142,500	3,227,980	1,914,267	800,554	0	750,893	7,506,931	8,951,123	
7	250,000	112,500	438,829	300,000	0	1,102,329	6,914	131,369	1,212,020	368,131	689,136	0	277,755	2,525,042	3,765,654	
8	250,000	112,500	370,483	300,000	0	1,032,963	2,229	44,585	390,778	118,048	215,742	0	89,553	814,121	1,891,669	
9	250,000	112,500	408,709	300,000	0	1,072,209	4,879	92,701	855,270	258,363	472,180	0	195,999	1,781,812	2,951,601	
10	250,000	112,500	476,536	300,000	0	1,139,036	7,500	142,500	1,664,976	502,961	919,205	0	381,557	3,468,699	4,757,736	
11	250,000	112,500	407,575	300,000	0	1,070,075	4,735	89,961	829,989	250,726	458,223	0	190,206	1,728,143	2,893,914	
12	250,000	112,500	359,385	300,000	0	1,021,885	1,479	28,096	259,217	78,305	143,109	0	59,404	540,035	1,591,494	
13	250,000	112,500	368,992	300,000	0	1,061,492	4,155	78,942	83,097	728,328	402,098	0	166,909	1,517,351	2,661,939	
14	250,000	112,500	488,256	300,000	0	1,150,756	7,500	142,500	1,811,392	547,191	1,000,039	0	415,111	3,773,733	5,074,489	
15	250,000	112,500	436,266	300,000	0	1,098,768	6,673	126,795	1,169,820	353,383	645,838	0	268,084	2,437,125	3,669,359	
16	250,000	112,500	377,568	300,000	0	1,040,068	2,707	51,439	474,578	143,362	262,007	0	108,757	988,704	2,082,918	
17	250,000	112,500	404,377	300,000	0	1,066,877	4,519	85,855	792,108	239,263	437,310	0	161,525	1,650,225	2,807,475	
18	250,000	112,500	549,688	300,000	0	1,212,168	7,500	142,500	2,309,999	725,232	1,389,883	429,767	537,209	5,372,092	6,734,259	
19	250,000	112,500	464,463	300,000	0	1,126,963	7,500	142,500	1,514,389	457,475	836,074	0	347,050	3,154,987	4,431,961	
20	250,000	112,500	390,509	300,000	0	1,053,009	3,562	68,052	763,945	189,664	346,628	0	143,883	1,308,031	2,432,673	
21	250,000	112,500	401,999	300,000	0	1,064,499	4,358	82,803	87,161	230,775	421,761	0	175,071	1,591,553	2,743,212	
22	250,000	112,500	466,695	300,000	0	1,159,195	7,500	142,500	1,916,819	579,039	1,058,244	0	439,271	3,983,372	5,302,567	
23	250,000	112,500	429,249	300,000	0	1,091,749	6,199	117,786	1,086,702	328,275	599,950	0	249,036	2,263,963	3,479,696	
24	250,000	112,500	399,718	300,000	0	1,052,218	3,528	67,037	70,565	618,491	186,836	0	141,737	1,288,522	2,411,306	
25	250,000	112,500	391,574	300,000	0	1,054,074	3,654	69,419	640,471	193,476	353,593	0	146,775	1,334,315	2,461,462	
26	250,000	112,500	466,237	300,000	0	1,128,737	7,500	142,500	1,536,306	464,092	848,169	0	352,070	3,200,637	4,479,374	
27	250,000	112,500	433,378	300,000	0	1,095,678	6,478	123,066	1,135,608	343,048	626,950	0	260,243	2,365,850	3,591,292	
28	250,000	112,500	392,688	300,000	0	1,058,168	3,729	70,849	653,662	197,460	360,876	0	146,798	1,361,796	2,491,561	
29	250,000	112,500	395,957	300,000	0	1,058,457	3,950	75,046	862,381	209,157	382,252	0	158,671	1,442,460	2,579,913	
30	250,000	112,500	472,142	300,000	0	1,134,642	7,500	142,500	1,610,084	486,379	888,900	0	368,977	3,354,341	4,638,963	
31	250,000	112,500	439,995	300,000	0	1,102,495	6,925	131,582	1,213,989	366,726	670,223	0	278,206	2,529,143	3,770,146	
32	250,000	112,500	398,485	300,000	0	1,061,965	4,188	79,575	734,170	221,760	405,323	0	168,247	1,529,521	2,675,269	
33	250,000	112,500	402,106	300,000	0	1,064,606	4,365	82,940	765,218	231,159	472,464	0	175,362	1,594,203	2,746,115	
34	250,000	112,500	484,526	300,000	0	1,147,026	7,500	142,500	1,764,795	533,115	974,314	0	404,432	3,676,656	4,973,682	
35	250,000	112,500	439,983	300,000	0	1,102,483	6,925	131,586	1,213,840	366,681	670,141	0	278,172	2,528,834	3,769,807	
36	250,000	112,500	405,666	300,000	0	1,068,166	4,606	87,510	92,116	807,375	243,885	0	185,023	1,682,031	2,842,312	
37	250,000	112,500	405,479	300,000	0	1,067,979	4,593	87,271	805,169	243,228	444,520	0	184,518	1,677,435	2,837,278	
38	250,000	112,500	472,635	300,000	0	1,135,135	7,500	142,500	1,616,238	488,238	892,298	0	370,388	3,367,162	4,652,297	
39	250,000	112,500	422,123	300,000	0	1,084,623	5,718	108,638	1,002,306	302,780	553,357	0	229,695	2,088,138	3,287,117	
40	250,000	112,500	397,427	300,000	0	1,059,927	4,049	76,933	709,791	214,416	391,864	0	162,660	1,478,730	2,619,639	
41	250,000	112,500	401,475	300,000	0	1,063,975	4,323	82,129	757,735	228,899	418,333	0	173,648	1,578,614	2,729,041	
42	250,000	112,500	481,758	300,000	0	1,144,258	7,500	142,500	1,730,208	522,667	955,219	0	396,506	3,604,600	4,898,858	
43	250,000	112,500	418,831	300,000	0	1,061,331	5,495	104,411	735,269	290,999	531,825	0	220,758	2,006,888	3,198,125	
44	250,000	112,500	399,580	300,000	0	1,062,080	4,195	79,698	963,306	222,122	405,946	0	168,506	1,531,874	2,677,846	
45	250,000	112,500	408,836	300,000	0	1,071,336	4,820	91,579	844,921	255,237	466,467	0	193,628	1,780,253	2,927,988	
46	250,000	112,500	493,375	300,000	0	1,155,875	7,500	142,500	1,875,339	566,509	1,035,343	0	429,765	3,906,955	5,212,630	
47	250,000	112,500	424,146	300,000	0	1,066,646	5,854	111,235	1,026,262	310,017	566,562	0	235,165	2,138,045	3,341,780	
48	250,000	112,500	374,184	300,000	0	1,036,684	2,479	49,573	434,495	131,254	239,878	0	99,572	905,198	1,991,455	
49	250,000	112,500	373,547	300,000	0	1,036,047	2,436	46,277	426,953	128,975	235,714	0	97,843	889,465	1,974,244	
50	250,000	112,500	413,436	300,000	0	1,075,936	5,131	97,466	899,413	271,688	486,551	0	206,116	1,873,778	3,052,331	
Sum	12,500,000	5,625,000	21,783,547	15,000,000	0	54,908,547	269,433	5,119,222	57,537,280	17,503,401	32,187,348	1,917,615	13,220,583	122,366,227	182,663,429	
Mean	250,000	112,500	435,671	300,000	0	1,098,171	5,389	107,773	1,150,746	350,068	643,747	38,352	264,412	2,447,325	3,653,269	
Std Dev	0	0	68,836	0	0	68,836	1,880	35,724	764,355	239,244	450,675	158,689	177,537	1,765,290	1,860,425	
NPV	3,940,465	1,773,209	7,136,414	4,728,558	0	17,578,647	87,170	1,656,224	21,007,971	6,433,160	11,898,218	1,363,622	4,839,184	45,542,155	64,864,195	
6%																

Fraser River Sockeye Management – Socio-Economic Implications

Fraser River Sockeye Scenario #5 – Avoid Low Catch (Mean)

Indicator: Harvest Revenue/Value \$

Year	First Nations							Recreational			Commercial					Grand Total					
	Marine	FSC	Lower Fraser	Econ Opp	Upper Fraser	FSC	Subtotal	Marine	River	Subtotal	Seine	B	D	Gillnet	E		G	H	Troll	Subtotal	
1	2,673,000	1,202,850	4,730,654	3,207,600	3,207,600	0	11,814,104	NA	NA	NA	14,767,287	4,460,951	7,337,496	30,239,628	14,757,466	0	4,737,838	0	4,737,838	31,303,572	43,117,676
2	2,673,000	1,202,850	8,226,464	3,207,600	3,207,600	0	15,309,914	NA	NA	NA	56,658,127	17,788,016	7,004,140	30,239,628	14,757,466	0	4,737,838	0	4,737,838	137,890,068	153,199,983
3	2,673,000	1,202,850	4,679,674	3,207,600	3,207,600	0	11,763,124	NA	NA	NA	14,086,383	4,258,282	7,280,010	0	4,522,589	0	4,522,589	0	4,522,589	29,881,395	41,644,519
4	2,673,000	1,202,850	3,719,883	3,207,600	3,207,600	0	10,803,333	NA	NA	NA	14,086,383	4,258,282	7,280,010	0	4,522,589	0	4,522,589	0	4,522,589	29,881,395	41,644,519
5	2,673,000	1,202,850	4,838,519	3,207,600	3,207,600	0	11,921,969	NA	NA	NA	14,086,383	4,258,282	7,280,010	0	4,522,589	0	4,522,589	0	4,522,589	29,881,395	41,644,519
6	2,673,000	1,202,850	6,754,046	3,207,600	3,207,600	0	13,837,496	NA	NA	NA	38,348,407	12,039,616	20,467,347	9,988,422	12,485,528	0	4,619,616	0	4,619,616	93,329,320	107,166,816
7	2,673,000	1,202,850	4,702,854	3,207,600	3,207,600	0	11,786,104	NA	NA	NA	14,398,802	4,349,638	7,154,405	0	4,619,616	0	4,619,616	0	4,619,616	30,522,461	42,308,565
8	2,673,000	1,202,850	3,961,310	3,207,600	3,207,600	0	11,044,760	NA	NA	NA	14,402,445	4,402,405	2,306,715	0	4,489,451	0	4,489,451	0	4,489,451	20,885,777	27,399,224
9	2,673,000	1,202,850	4,380,611	3,207,600	3,207,600	0	11,464,061	NA	NA	NA	10,160,604	3,069,349	5,048,550	0	3,259,861	0	3,259,861	0	3,259,861	21,538,364	33,002,426
10	2,673,000	1,202,850	5,095,125	3,207,600	3,207,600	0	12,178,575	NA	NA	NA	19,779,911	5,975,182	9,628,143	0	6,346,055	0	6,346,055	0	6,346,055	41,929,291	54,107,866
11	2,673,000	1,202,850	4,357,790	3,207,600	3,207,600	0	11,441,240	NA	NA	NA	9,860,266	2,978,622	4,898,320	0	3,163,502	0	3,163,502	0	3,163,502	20,901,709	32,342,949
12	2,673,000	1,202,850	3,842,548	3,207,600	3,207,600	0	10,925,998	NA	NA	NA	8,079,494	930,284	1,530,123	0	988,004	0	988,004	0	988,004	6,527,885	17,453,882
13	2,673,000	1,202,850	4,266,020	3,207,600	3,207,600	0	11,349,470	NA	NA	NA	8,652,540	2,613,788	4,299,231	0	2,776,023	0	2,776,023	0	2,776,023	18,341,882	29,691,052
14	2,673,000	1,202,850	5,220,434	3,207,600	3,207,600	0	12,303,884	NA	NA	NA	21,519,336	6,500,633	10,692,420	0	6,904,120	0	6,904,120	0	6,904,120	45,616,510	57,920,394
15	2,673,000	1,202,850	4,664,559	3,207,600	3,207,600	0	11,748,009	NA	NA	NA	13,897,460	4,198,191	6,905,300	0	4,458,768	0	4,458,768	0	4,458,768	29,459,720	41,207,729
16	2,673,000	1,202,850	4,036,957	3,207,600	3,207,600	0	11,120,407	NA	NA	NA	5,637,987	1,703,142	2,801,375	0	1,808,854	0	1,808,854	0	1,808,854	11,951,358	23,071,765
17	2,673,000	1,202,850	4,323,594	3,207,600	3,207,600	0	11,407,044	NA	NA	NA	9,410,241	2,842,677	4,675,714	0	3,019,119	0	3,019,119	0	3,019,119	19,947,751	27,399,224
18	2,673,000	1,202,850	5,877,046	3,207,600	3,207,600	0	12,960,496	NA	NA	NA	27,442,792	8,615,760	14,646,793	7,147,890	8,934,863	0	5,772,131	0	5,772,131	38,137,293	50,186,998
19	2,673,000	1,202,850	4,966,255	3,207,600	3,207,600	0	12,049,705	NA	NA	NA	17,991,057	5,434,799	8,939,307	0	2,393,069	0	2,393,069	0	2,393,069	15,811,346	27,070,117
20	2,673,000	1,202,850	4,175,321	3,207,600	3,207,600	0	11,256,771	NA	NA	NA	7,458,915	2,253,214	3,706,148	0	2,993,069	0	2,993,069	0	2,993,069	19,238,531	30,620,153
21	2,673,000	1,202,850	4,298,172	3,207,600	3,207,600	0	11,381,622	NA	NA	NA	9,075,671	2,741,609	4,509,474	0	2,911,778	0	2,911,778	0	2,911,778	15,811,346	27,070,117
22	2,673,000	1,202,850	5,310,663	3,207,600	3,207,600	0	12,394,113	NA	NA	NA	22,771,804	6,878,983	11,314,740	0	7,305,954	0	7,305,954	0	7,305,954	48,271,481	60,665,594
23	2,673,000	1,202,850	4,589,528	3,207,600	3,207,600	0	11,672,978	NA	NA	NA	12,910,020	3,899,902	6,414,666	0	4,141,965	0	4,141,965	0	4,141,965	27,366,554	39,039,532
24	2,673,000	1,202,850	4,166,868	3,207,600	3,207,600	0	11,250,318	NA	NA	NA	7,347,670	2,219,609	3,650,874	0	2,357,378	0	2,357,378	0	2,357,378	15,575,531	26,825,849
25	2,673,000	1,202,850	4,186,710	3,207,600	3,207,600	0	11,270,160	NA	NA	NA	7,608,797	2,298,491	3,780,621	0	2,441,156	0	2,441,156	0	2,441,156	16,129,064	27,399,224
26	2,673,000	1,202,850	4,985,004	3,207,600	3,207,600	0	12,068,454	NA	NA	NA	18,251,311	5,513,417	9,068,620	0	5,855,629	0	5,855,629	0	5,855,629	36,688,978	50,757,432
27	2,673,000	1,202,850	4,633,676	3,207,600	3,207,600	0	11,711,126	NA	NA	NA	13,491,022	4,075,413	6,703,351	0	4,328,369	0	4,328,369	0	4,328,369	28,598,155	40,315,281
28	2,673,000	1,202,850	4,198,618	3,207,600	3,207,600	0	11,282,068	NA	NA	NA	7,765,503	2,345,829	3,658,484	0	2,491,432	0	2,491,432	0	2,491,432	16,461,248	27,743,315
29	2,673,000	1,202,850	4,233,570	3,207,600	3,207,600	0	11,317,020	NA	NA	NA	8,225,486	2,484,782	4,087,038	0	2,639,010	0	2,639,010	0	2,639,010	17,436,317	28,753,337
30	2,673,000	1,202,850	5,048,146	3,207,600	3,207,600	0	12,131,596	NA	NA	NA	19,127,793	5,776,188	9,504,122	0	6,136,834	0	6,136,834	0	6,136,834	40,546,937	52,678,533
31	2,673,000	1,202,850	4,704,431	3,207,600	3,207,600	0	11,787,881	NA	NA	NA	14,422,185	4,356,702	7,166,023	0	4,627,118	0	4,627,118	0	4,627,118	30,572,028	42,359,909
32	2,673,000	1,202,850	4,271,293	3,207,600	3,207,600	0	11,354,743	NA	NA	NA	8,721,939	2,634,752	4,333,713	0	2,798,289	0	2,798,289	0	2,798,289	18,488,693	29,843,436
33	2,673,000	1,202,850	4,299,320	3,207,600	3,207,600	0	11,382,770	NA	NA	NA	9,090,784	2,746,174	4,516,983	0	2,916,627	0	2,916,627	0	2,916,627	19,270,569	30,653,339
34	2,673,000	1,202,850	5,180,555	3,207,600	3,207,600	0	12,264,005	NA	NA	NA	20,965,763	6,333,408	10,417,363	0	6,726,516	0	6,726,516	0	6,726,516	44,443,050	56,707,054
35	2,673,000	1,202,850	4,704,297	3,207,600	3,207,600	0	11,787,747	NA	NA	NA	14,420,422	4,356,169	7,165,147	0	4,626,552	0	4,626,552	0	4,626,552	30,568,291	42,356,038
36	2,673,000	1,202,850	4,337,376	3,207,600	3,207,600	0	11,420,826	NA	NA	NA	9,591,614	2,897,467	4,765,633	0	3,077,309	0	3,077,309	0	3,077,309	20,332,223	31,753,049
37	2,673,000	1,202,850	4,335,385	3,207,600	3,207,600	0	11,418,835	NA	NA	NA	9,565,405	2,899,550	4,752,811	0	3,068,901	0	3,068,901	0	3,068,901	20,276,667	31,695,501
38	2,673,000	1,202,850	5,053,413	3,207,600	3,207,600	0	12,136,863	NA	NA	NA	19,200,904	5,800,273	9,540,449	0	6,160,290	0	6,160,290	0	6,160,290	40,701,916	52,838,780
39	2,673,000	1,202,850	4,513,343	3,207,600	3,207,600	0	11,596,793	NA	NA	NA	11,907,397	3,597,026	5,916,486	0	3,820,290	0	3,820,290	0	3,820,290	25,241,200	36,637,993
40	2,673,000	1,202,850	4,249,286	3,207,600	3,207,600	0	11,332,736	NA	NA	NA	8,432,312	2,547,261	4,189,805	0	2,705,367	0	2,705,367	0	2,705,367	17,874,746	29,207,481
41	2,673,000	1,202,850	4,292,565	3,207,600	3,207,600	0	11,376,015	NA	NA	NA	9,001,889	2,719,321	4,472,814	0	2,888,106	0	2,888,106	0	2,888,106	19,082,130	30,458,145
42	2,673,000	1,202,850	5,150,954	3,207,60																	

Fraser River Sockeye Scenario #5 – Avoid Low Catch (Mean) Indicator: Gross Revenue/Value \$

Year	First Nations					Recreational					Commercial					Grand Total				
	Marine	FSC	Lower Fraser	Econ Opp	Upper Fraser	FSC	Econ Opp	Subtotal	Marine	River	Subtotal	Seine	D	Gillnet	E		G	Troll	H	Subtotal
1	2,673,000	1,202,850	7,358,794	3,207,600	0	14,442,244	2,975,465	6,930,762	9,906,227	25,842,753	7,806,665	13,452,076	0	6,429,923	0	6,429,923	0	6,429,923	53,531,416	77,879,887
2	2,673,000	1,202,850	12,796,722	3,207,600	0	19,880,172	3,000,000	7,125,000	10,125,000	99,151,721	31,129,029	55,439,318	20,027,989	25,034,986	0	25,034,986	0	25,034,986	230,783,043	260,788,215
3	2,673,000	1,202,850	7,279,493	3,207,600	0	14,362,943	2,966,135	6,777,736	9,733,871	24,668,670	7,451,994	12,480,924	0	6,137,800	0	6,137,800	0	6,137,800	51,089,387	75,196,202
4	2,673,000	1,202,850	5,786,484	3,207,600	0	12,869,934	2,592,214	3,896,991	6,488,905	2,564,059	7,774,559	1,334,684	0	637,962	0	637,962	0	637,962	5,311,265	24,670,103
5	2,673,000	1,202,850	7,526,586	3,207,600	0	14,610,036	3,000,000	7,125,000	10,125,000	28,381,401	8,573,548	14,773,533	0	7,081,563	0	7,081,563	0	7,081,563	58,790,045	83,525,081
6	2,673,000	1,202,850	10,506,294	3,207,600	0	17,569,744	3,000,000	7,125,000	10,125,000	67,109,712	21,069,328	37,523,470	13,555,716	16,944,645	0	16,944,645	0	16,944,645	166,202,871	183,917,614
7	2,673,000	1,202,850	7,315,239	3,207,600	0	14,369,689	2,964,848	6,846,715	9,811,563	25,197,904	7,811,867	13,116,409	0	6,269,479	0	6,269,479	0	6,269,479	52,195,658	76,405,911
8	2,673,000	1,202,850	6,162,037	3,207,600	0	13,267,734	2,683,755	4,621,393	7,305,148	8,124,280	2,454,209	9,255,678	0	2,021,398	0	2,021,398	0	2,021,398	16,828,865	37,379,500
9	2,673,000	1,202,850	6,814,284	3,207,600	0	13,987,734	2,842,740	5,880,026	8,727,767	17,781,058	5,371,381	9,265,678	0	4,424,096	0	4,424,096	0	4,424,096	56,452,191	98,636,379
10	2,673,000	1,202,850	7,925,750	3,207,600	0	15,009,200	3,000,000	7,125,000	10,125,000	34,614,845	10,458,588	18,018,263	0	8,612,503	0	8,612,503	0	8,612,503	71,702,178	98,936,379
11	2,673,000	1,202,850	6,775,764	3,207,600	0	13,662,234	2,834,067	4,264,900	6,903,624	5,389,114	1,627,961	2,805,226	0	1,340,863	0	1,340,863	0	1,340,863	35,743,464	58,251,307
12	2,673,000	1,202,850	5,977,296	3,207,600	0	13,060,746	2,698,724	4,284,900	6,903,624	5,389,114	1,627,961	2,805,226	0	1,340,863	0	1,340,863	0	1,340,863	31,217,535	53,420,281
13	2,673,000	1,202,850	6,636,031	3,207,600	0	13,719,481	2,799,291	5,536,053	8,335,344	15,141,945	4,574,129	7,881,921	0	3,767,460	0	3,767,460	0	3,767,460	53,365,457	83,420,281
14	2,673,000	1,202,850	8,120,676	3,207,600	0	15,204,126	3,000,000	7,125,000	10,125,000	37,658,839	11,376,108	19,602,771	0	9,369,878	0	9,369,878	0	9,369,878	103,336,720	130,376,639
15	2,673,000	1,202,850	7,255,981	3,207,600	0	14,339,431	2,950,404	6,732,364	9,662,768	24,320,555	7,346,534	12,659,718	0	6,051,166	0	6,051,166	0	6,051,166	74,400,491	74,400,491
16	2,673,000	1,202,850	6,278,710	3,207,600	0	13,363,160	2,712,438	4,848,465	7,560,903	9,866,477	2,980,468	5,135,854	0	2,454,874	0	2,454,874	0	2,454,874	20,437,703	41,361,767
17	2,673,000	1,202,850	6,725,591	3,207,600	0	13,808,041	2,821,121	5,708,877	8,529,988	16,467,922	4,974,685	8,572,142	0	4,097,376	0	4,097,376	0	4,097,376	34,112,124	56,451,163
18	2,673,000	1,202,850	9,142,071	3,207,600	0	16,225,521	3,000,000	7,125,000	10,125,000	48,024,887	15,077,581	26,852,453	9,700,708	12,125,885	0	12,125,885	0	12,125,885	111,761,514	136,132,035
19	2,673,000	1,202,850	7,725,286	3,207,600	0	14,908,736	3,000,000	7,125,000	10,125,000	31,454,350	9,510,897	16,388,729	0	7,833,606	0	7,833,606	0	7,833,606	65,217,582	90,151,318
20	2,673,000	1,202,850	6,494,944	3,207,600	0	13,578,394	2,784,901	5,263,800	8,028,701	13,053,101	3,943,124	6,794,605	0	3,247,736	0	3,247,736	0	3,247,736	27,038,567	48,645,662
21	2,673,000	1,202,850	6,686,045	3,207,600	0	13,769,485	2,811,482	5,632,565	8,444,046	15,882,424	4,797,616	8,287,369	0	3,951,698	0	3,951,698	0	3,951,698	32,889,306	55,112,848
22	2,673,000	1,202,850	8,261,031	3,207,600	0	15,344,461	3,000,000	7,125,000	10,125,000	39,850,657	12,036,219	20,743,680	0	9,915,223	0	9,915,223	0	9,915,223	82,547,790	108,017,271
23	2,673,000	1,202,850	7,139,265	3,207,600	0	14,222,715	2,921,954	6,507,139	9,429,094	22,852,536	6,824,829	11,760,222	0	5,621,238	0	5,621,238	0	5,621,238	46,798,824	70,450,631
24	2,673,000	1,202,850	6,481,795	3,207,600	0	13,565,245	2,761,696	5,238,426	8,000,122	12,858,423	3,884,315	6,693,289	0	3,199,288	0	3,199,288	0	3,199,288	26,635,305	48,240,672
25	2,673,000	1,202,850	6,512,660	3,207,600	0	13,598,110	2,769,219	5,297,986	8,067,205	13,315,394	4,022,359	6,931,138	0	3,312,997	0	3,312,997	0	3,312,997	49,245,204	49,245,204
26	2,673,000	1,202,850	7,754,451	3,207,600	0	14,837,901	3,000,000	7,125,000	10,125,000	31,939,795	9,648,480	16,625,804	0	7,946,925	0	7,946,925	0	7,946,925	66,161,004	91,123,905
27	2,673,000	1,202,850	7,207,940	3,207,600	0	14,291,390	2,938,684	6,639,659	9,578,353	23,609,288	7,131,972	12,988,478	0	5,874,216	0	5,874,216	0	5,874,216	48,904,954	72,774,697
28	2,673,000	1,202,850	6,531,183	3,207,600	0	13,614,633	2,773,384	5,333,729	8,107,463	13,589,630	4,105,201	7,073,888	0	3,381,229	0	3,381,229	0	3,381,229	28,149,947	49,872,043
29	2,673,000	1,202,850	6,565,553	3,207,600	0	13,668,003	2,776,967	5,438,646	8,226,633	14,394,601	4,348,369	7,492,904	0	3,581,514	0	3,581,514	0	3,581,514	29,817,368	51,712,024
30	2,673,000	1,202,850	7,852,672	3,207,600	0	14,938,122	3,000,000	7,125,000	10,125,000	33,473,638	10,111,828	17,424,224	0	8,328,560	0	8,328,560	0	8,328,560	69,338,250	94,399,372
31	2,673,000	1,202,850	7,318,003	3,207,600	0	14,401,453	2,965,522	6,852,048	9,817,570	25,238,924	7,624,228	13,137,709	0	6,279,680	0	6,279,680	0	6,279,680	52,280,421	76,490,445
32	2,673,000	1,202,850	6,644,234	3,207,600	0	13,727,684	2,801,290	5,551,882	8,353,172	15,263,393	4,610,817	7,945,141	0	3,767,677	0	3,767,677	0	3,767,677	31,617,028	53,697,884
33	2,673,000	1,202,850	6,687,831	3,207,600	0	13,771,281	2,811,917	5,636,012	8,447,929	15,906,872	4,605,605	8,281,136	0	3,956,279	0	3,956,279	0	3,956,279	32,954,093	55,173,303
34	2,673,000	1,202,850	8,056,640	3,207,600	0	15,142,090	3,000,000	7,125,000	10,125,000	36,690,085	11,083,463	19,098,500	0	9,128,843	0	9,128,843	0	9,128,843	76,000,891	101,267,981
35	2,673,000	1,202,850	7,317,795	3,207,600	0	14,401,245	2,965,471	6,851,646	9,817,117	25,235,739	7,623,296	13,136,103	0	6,278,892	0	6,278,892	0	6,278,892	52,274,031	76,492,393
36	2,673,000	1,202,850	6,747,029	3,207,600	0	13,830,479	2,826,347	5,750,246	8,578,583	16,785,324	5,070,567	8,373,361	0	4,176,349	0	4,176,349	0	4,176,349	34,789,601	57,176,673
37	2,673,000	1,202,850	6,743,932	3,207,600	0	13,827,362	2,825,592	5,744,268	8,568,860	16,739,459	5,056,712	8,713,486	0	4,184,937	0	4,184,937	0	4,184,937	57,071,836	57,071,836
38	2,673,000	1,202,850	7,860,885	3,207,600	0	14,944,315	3,000,000	7,125,000	10,125,000	33,601,582	10,150,478	17,480,824	0	8,360,394	0	8,360,394	0	8,360,394	69,603,277	94,672,592
39	2,673,000	1,202,850	7,020,755	3,207,600	0	14,104,205	2,893,068	6,278,451	9,171,519	20,837,944	6,294,796	10,486,894	0	5,184,679	0	5,184,679	0	5,184,679	43,164,313	66,440,037
40	2,673,000	1,202,850	6,610,000	3,207,600	0	13,693,450	2,792,946	5,485,821	8,278,767	14,756,547	4,457,707	7,681,310	0	3,671,569	0	3,671,569	0	3,671,569	52,539,350	52,539,350
41	2,673,000	1,202,850	6,677,324	3,207,600																

Appendix G

Scenario #6 – Recommended – Mean of Distribution

Fraser River Sockeye Scenario #6 – Recommended (Mean)

Indicator: Sockeye Pieces

Year	First Nations					Recreational			Commercial					Grand Total					
	Marine FSC	Lower Fraser FSC	Econ Opp	FSC	Upper Fraser FSC	Econ Opp	Subtotal	Marine	River	Subtotal	Seine B	D	Gillnet	E	G	Troll	Subtotal		
1	250,000	112,500	437,079	300,000	0	0	1,099,579	6,728	127,838	134,566	1,179,443	356,290	651,151	270,289	0	0	270,289	2,457,173	3,691,317
2	250,000	112,500	710,754	300,000	0	0	1,373,254	7,500	142,500	150,000	4,112,622	1,291,235	2,438,999	956,470	765,176	0	956,470	9,564,701	11,087,956
3	250,000	112,500	412,967	300,000	0	0	1,075,467	5,089	96,864	101,963	893,862	270,021	493,486	204,843	0	0	204,843	1,862,212	3,039,862
4	186,184	289,131	0	199,421	0	0	864,736	0	0	0	0	0	0	0	0	0	0	864,736	0
5	250,000	112,500	444,073	300,000	0	0	1,065,573	7,201	136,817	144,018	1,262,286	381,316	696,887	289,274	493,571	0	289,274	2,629,763	3,880,354
6	250,000	112,500	580,311	300,000	0	0	1,242,811	7,500	142,500	150,000	2,852,944	832,901	1,573,257	616,964	1,573,257	0	616,964	6,169,637	7,562,448
7	250,000	112,500	419,171	300,000	0	0	1,081,671	5,518	104,848	110,366	967,339	292,217	534,051	221,882	2,015,289	0	221,882	2,015,289	3,207,326
8	250,000	112,500	354,589	300,000	0	0	1,017,089	1,155	21,939	23,093	202,407	111,146	111,746	46,385	421,681	0	46,385	421,681	1,461,864
9	250,000	112,500	384,673	300,000	0	0	1,047,173	3,187	60,560	63,748	558,734	168,784	308,468	128,043	1,164,030	0	128,043	1,164,030	2,274,950
10	250,000	112,500	426,349	300,000	0	0	1,088,849	6,003	114,063	120,066	1,052,355	317,899	580,988	241,165	2,192,406	0	241,165	2,192,406	3,401,321
11	250,000	112,500	383,019	300,000	0	0	1,045,519	3,076	58,436	61,512	599,140	162,885	287,850	123,553	1,123,208	0	123,553	1,123,208	2,230,238
12	250,000	112,500	351,249	300,000	0	0	1,013,749	929	17,051	18,580	162,849	49,194	89,906	37,320	339,269	0	37,320	339,269	1,371,598
13	250,000	112,500	384,077	300,000	0	0	1,026,577	1,798	34,119	35,915	314,785	95,091	173,788	72,138	655,803	0	72,138	655,803	1,718,295
14	250,000	112,500	442,933	300,000	0	0	1,105,433	7,124	135,353	142,477	1,248,779	377,235	689,430	286,178	2,601,622	0	286,178	2,601,622	3,849,532
15	250,000	112,500	424,054	300,000	0	0	1,086,554	5,848	111,117	116,965	1,025,173	309,688	565,981	234,935	2,135,776	0	234,935	2,135,776	3,339,295
16	250,000	112,500	371,797	300,000	0	0	1,034,297	2,317	44,030	46,347	406,221	122,713	224,268	93,092	846,295	0	93,092	846,295	1,926,938
17	250,000	112,500	370,333	300,000	0	0	1,032,833	2,218	142,500	150,000	1,143,286	338,885	117,476	89,119	810,177	0	89,119	810,177	1,887,379
18	250,000	112,500	480,786	300,000	0	0	1,143,286	7,500	118,766	125,017	1,095,750	331,008	604,945	251,109	2,282,812	0	251,109	2,282,812	3,500,342
19	250,000	112,500	430,013	300,000	0	0	1,092,513	6,251	53,012	55,802	489,097	147,748	270,022	112,085	1,018,952	0	112,085	1,018,952	2,116,048
20	250,000	112,500	378,794	300,000	0	0	1,041,294	2,790	53,012	55,802	382,229	115,465	211,022	87,594	796,309	0	87,594	796,309	1,872,190
21	250,000	112,500	368,771	300,000	0	0	1,032,271	2,180	41,429	43,609	329,739	711,770	0	295,452	2,665,925	0	295,452	2,665,925	3,941,867
22	250,000	112,500	446,349	300,000	0	0	1,108,649	7,355	139,739	147,093	1,269,244	389,459	711,770	171,904	1,562,767	0	171,904	1,562,767	3,941,867
23	250,000	112,500	400,852	300,000	0	0	1,063,332	4,279	81,305	85,584	750,128	226,601	414,133	123,522	1,122,924	0	123,522	1,122,924	2,229,928
24	250,000	112,500	383,007	300,000	0	0	1,045,507	3,075	58,436	61,496	539,004	162,824	297,575	80,227	1,729,341	0	80,227	1,729,341	1,998,940
25	250,000	112,500	367,057	300,000	0	0	1,029,557	1,987	37,945	39,942	350,083	105,754	193,275	221,315	2,011,957	0	221,315	2,011,957	3,203,677
26	250,000	112,500	419,036	300,000	0	0	1,081,536	5,509	104,675	110,184	965,740	291,734	533,169	128,562	1,576,291	0	128,562	1,576,291	2,726,817
27	250,000	112,500	411,604	300,000	0	0	1,074,104	5,007	95,134	100,141	877,712	265,142	484,570	201,142	1,828,568	0	201,142	1,828,568	3,002,812
28	250,000	112,500	384,916	300,000	0	0	1,047,416	3,204	60,772	64,075	561,607	169,652	310,054	128,702	1,170,015	0	128,702	1,170,015	2,281,507
29	250,000	112,500	374,260	300,000	0	0	1,036,760	2,484	47,192	49,676	435,401	131,527	240,378	98,779	907,085	0	98,779	907,085	1,953,522
30	250,000	112,500	437,521	300,000	0	0	1,100,021	6,758	128,405	135,163	1,184,678	357,872	654,041	271,489	2,468,080	0	271,489	2,468,080	3,703,264
31	250,000	112,500	408,234	300,000	0	0	1,070,734	4,779	90,807	95,586	837,795	253,084	462,533	191,895	1,745,407	0	191,895	1,745,407	2,911,727
32	250,000	112,500	382,475	300,000	0	0	1,044,975	3,039	57,738	60,777	532,696	160,919	294,094	122,077	1,109,787	0	122,077	1,109,787	2,215,539
33	250,000	112,500	376,979	300,000	0	0	1,039,479	2,688	50,683	53,350	467,606	141,256	258,158	107,160	974,180	0	107,160	974,180	2,067,010
34	250,000	112,500	460,254	300,000	0	0	1,122,754	7,500	142,500	150,000	1,461,564	441,514	806,905	334,842	3,044,925	0	334,842	3,044,925	4,317,679
35	250,000	112,500	401,380	300,000	0	0	1,063,880	4,316	82,009	86,325	756,620	228,562	417,717	173,392	1,576,291	0	173,392	1,576,291	2,726,817
36	250,000	112,500	375,226	300,000	0	0	1,037,726	2,549	48,432	50,981	446,837	134,962	246,891	102,400	930,911	0	102,400	930,911	2,019,617
37	250,000	112,500	373,520	300,000	0	0	1,036,020	2,434	46,242	48,676	426,632	128,678	235,536	97,770	888,816	0	97,770	888,816	1,973,511
38	250,000	112,500	440,509	300,000	0	0	1,103,009	6,960	132,242	139,202	1,220,076	368,565	673,584	279,801	2,541,825	0	279,801	2,541,825	3,784,036
39	250,000	112,500	400,126	300,000	0	0	1,062,626	4,231	80,398	84,629	741,760	224,073	409,513	169,987	1,545,334	0	169,987	1,545,334	2,682,589
40	250,000	112,500	381,786	300,000	0	0	1,044,286	2,992	56,854	59,846	524,537	158,454	289,588	120,206	1,092,786	0	120,206	1,092,786	2,196,918
41	250,000	112,500	381,915	300,000	0	0	1,044,415	3,001	57,020	60,021	526,071	158,917	290,435	120,558	1,095,981	0	120,558	1,095,981	2,200,417
42	250,000	112,500	445,135	300,000	0	0	1,107,635	7,273	136,160	145,453	1,274,686	385,116	703,632	282,157	2,655,971	0	282,157	2,655,971	3,909,060
43	250,000	112,500	400,994	300,000	0	0	1,063,494	4,280	81,513	85,803	752,044	227,180	415,191	172,343	1,566,759	0	172,343	1,566,759	2,716,056
44	250,000	112,500	379,222	300,000	0	0	1,041,722	2,819	53,562	56,381	484,170	149,280	272,823	113,247	1,029,520	0	113,247	1,029,520	2,127,623
45	250,000	112,500	378,450	300,000	0	0	1,040,950	2,767	52,571	55,338	485,025	146,518	267,724	111,152	1,010,469	0	111,152	1,010,469	2,106,757
46	250,000	112,500	445,937	300,000	0	0	1,108,437	7,327	146,537	153,070	1,284,364	387,965	709,076	294,333	2,675,758	0	294,333	2,675,758	3,930,731
47	250,000	112,500	394,821	300,000	0	0	1,057,321	3,873	73,587	77,460	678,926	205,092	374,824	155,587	1,414,429	0	155,587	1,414,429	2,549,210
48	250,000	112,500	351,413	300,000	0	0	1,013,913	940	17,861	18,801	164,787	49,780	90,576	37,764	343,307	0	37,764	343,307	1,376,021
49	250,000	112,500	348,904	300,000	0	0	1,011,404	771	14,641	15,411	135,078	40,805	74,575	30,955	281,413	0	30,955	281,413	1,308,229
50	250,000	112,500	380,720	300,000	0	0	1,043,220	2,920	55,485	58,406	511,915	154,641	282,619	117,314	1,066,489	0	117,314	1,066,489	2,168,115
Sum	12,416,164	5,811,631	20,089,375	14,899,421	0	0	53,196,611	209,039	3,971,732	4,180,771	41,330,131	12,595,454	23,084,866	1,258,747	9,484,434	0	9,484,434	87,743,432	145,120,813
Mean	248,324	116,233	401,387	297,988	0	0	1,063,932	4,181	79,435	83,615	826,003	251,309	461,993	189,889	1,754,869	0	189,889	1,754,869	2,902,416
Std Dev	11,734	26,128	82,165	14,081	0	0	81,947	2,173	41,286	43,459	664,429	207,326	389,781	126,287	1,521,112	0	126,287	1,521,112	2,622,301
NPV	3,874,075	1,921,039	6,441,875	4,648,890	0	0	16,885,679	70,968	1,348,384	1,419,351	16								

Fraser River Sockeye Scenario #6 – Recommended (Mean)

Indicator: Harvest Revenue/Value \$

Year	First Nations					Recreational		Commercial					Subtotal				
	Marine FSC	Lower Fraser FSC	Econ Opp	Upper Fraser FSC	Econ Opp	Subtotal	Marine	River	Subtotal	Seine B	D	Gillnet		E	G	Troll	H
1	2,673,000	1,202,850	4,673,246	3,207,600	0	11,756,696	NA	NA	NA	14,011,782	4,232,726	6,962,104	6,962,104	0	4,495,447	29,702,059	41,458,755
2	2,673,000	1,202,850	7,599,366	3,207,600	0	14,682,636	NA	NA	NA	48,860,321	15,339,868	26,077,776	12,726,409	15,908,011	5,906,953	118,912,386	133,596,222
3	2,673,000	1,202,850	4,415,449	3,207,600	0	11,498,898	NA	NA	NA	10,619,075	3,207,846	5,276,353	5,276,353	0	3,406,953	22,510,227	34,008,125
4	1,776,839	3,198,310	0	2,132,207	0	7,107,356	NA	NA	NA	0	0	0	0	0	0	0	7,107,356
5	2,673,000	1,202,850	4,748,029	3,207,600	0	11,831,479	NA	NA	NA	14,985,959	4,530,029	7,451,117	7,451,117	0	4,811,204	31,788,310	43,619,789
6	2,673,000	1,202,850	6,204,681	3,207,600	0	13,288,131	NA	NA	NA	31,516,975	9,894,864	16,821,269	8,209,073	10,281,341	7,670,521	89,991,652	89,991,652
7	2,673,000	1,202,850	4,481,777	3,207,600	0	11,565,227	NA	NA	NA	11,491,982	3,471,536	5,170,078	5,170,078	0	3,687,011	24,360,807	35,925,834
8	2,673,000	1,202,850	3,791,265	3,207,600	0	10,874,715	NA	NA	NA	2,404,596	726,388	1,194,784	1,194,784	0	771,475	5,097,242	15,971,958
9	2,673,000	1,202,850	4,112,926	3,207,600	0	11,196,376	NA	NA	NA	6,637,764	2,005,158	3,298,139	3,298,139	0	2,129,616	14,070,676	25,267,051
10	2,673,000	1,202,850	4,558,522	3,207,600	0	11,641,972	NA	NA	NA	12,501,974	3,776,638	6,211,919	6,211,919	0	4,011,050	26,501,581	38,143,553
11	2,673,000	1,202,850	4,095,237	3,207,600	0	11,178,687	NA	NA	NA	6,404,979	1,934,837	3,182,474	3,182,474	0	2,054,931	13,577,221	24,755,909
12	2,673,000	1,202,850	3,755,556	3,207,600	0	10,839,006	NA	NA	NA	1,934,645	584,424	961,277	961,277	0	620,689	4,101,045	14,940,051
13	2,673,000	1,202,850	3,892,710	3,207,600	0	10,976,160	NA	NA	NA	3,739,650	1,129,686	1,858,139	1,858,139	0	1,199,805	7,927,280	18,903,440
14	2,673,000	1,202,850	4,735,836	3,207,600	0	11,819,286	NA	NA	NA	14,835,492	4,481,555	7,371,385	7,371,385	0	4,759,720	31,448,151	43,267,431
15	2,673,000	1,202,850	4,533,984	3,207,600	0	11,617,434	NA	NA	NA	12,179,051	3,679,088	6,051,466	6,051,466	0	3,907,446	25,817,051	37,434,486
16	2,673,000	1,202,850	3,975,251	3,207,600	0	11,058,701	NA	NA	NA	4,825,911	1,457,827	2,397,875	2,397,875	0	1,548,313	10,229,926	21,288,626
17	2,673,000	1,202,850	3,959,601	3,207,600	0	11,043,051	NA	NA	NA	4,619,955	1,395,611	2,295,540	2,295,540	0	1,482,235	9,793,342	20,836,392
18	2,673,000	1,202,850	5,140,560	3,207,600	0	12,224,010	NA	NA	NA	20,410,590	6,165,699	10,141,512	10,141,512	0	6,548,398	43,266,198	55,490,208
19	2,673,000	1,202,850	4,597,895	3,207,600	0	11,681,145	NA	NA	NA	13,017,509	3,932,373	6,468,075	6,468,075	0	4,176,451	27,594,408	39,275,553
20	2,673,000	1,202,850	4,050,063	3,207,600	0	11,133,515	NA	NA	NA	5,810,473	1,755,247	2,887,079	2,887,079	0	1,864,194	12,316,593	23,450,506
21	2,673,000	1,202,850	3,953,992	3,207,600	0	11,037,042	NA	NA	NA	4,540,875	1,371,723	2,256,247	2,256,247	0	1,456,864	9,625,708	20,662,750
22	2,673,000	1,202,850	4,772,364	3,207,600	0	11,855,814	NA	NA	NA	15,316,218	4,626,774	7,610,246	7,610,246	0	4,913,953	32,467,192	44,323,006
23	2,673,000	1,202,850	4,285,699	3,207,600	0	11,369,149	NA	NA	NA	8,911,525	2,892,023	4,427,914	4,427,914	0	2,859,114	18,890,577	30,259,726
24	2,673,000	1,202,850	4,095,115	3,207,600	0	11,178,565	NA	NA	NA	6,403,364	1,934,350	3,181,672	3,181,672	0	2,054,413	13,573,798	24,572,363
25	2,673,000	1,202,850	3,924,574	3,207,600	0	11,008,024	NA	NA	NA	4,158,992	1,256,362	2,066,499	2,066,499	0	1,334,343	8,816,196	19,824,220
26	2,673,000	1,202,850	4,480,334	3,207,600	0	11,563,784	NA	NA	NA	11,472,986	3,465,798	5,700,640	5,700,640	0	3,680,916	24,320,339	35,884,123
27	2,673,000	1,202,850	4,400,871	3,207,600	0	11,484,321	NA	NA	NA	10,427,224	3,149,891	5,181,027	5,181,027	0	3,345,401	22,103,543	33,587,864
28	2,673,000	1,202,850	4,115,519	3,207,600	0	11,198,969	NA	NA	NA	6,671,896	2,015,469	3,315,098	3,315,098	0	2,140,567	14,143,030	25,341,989
29	2,673,000	1,202,850	4,001,591	3,207,600	0	11,085,041	NA	NA	NA	5,172,562	1,562,545	2,570,117	2,570,117	0	1,659,530	10,964,755	22,049,796
30	2,673,000	1,202,850	4,677,972	3,207,600	0	11,761,422	NA	NA	NA	14,073,979	4,251,514	6,993,008	6,993,008	0	4,515,402	29,833,903	41,595,325
31	2,673,000	1,202,850	4,364,837	3,207,600	0	11,448,287	NA	NA	NA	9,953,008	3,006,638	4,945,401	4,945,401	0	3,193,257	21,098,303	32,546,589
32	2,673,000	1,202,850	4,089,422	3,207,600	0	11,172,672	NA	NA	NA	6,328,449	1,911,719	3,144,448	3,144,448	0	2,030,377	13,414,993	24,587,865
33	2,673,000	1,202,850	4,030,663	3,207,600	0	11,114,113	NA	NA	NA	5,555,163	1,678,122	2,760,221	2,760,221	0	1,782,281	11,775,787	22,889,901
34	2,673,000	1,202,850	4,921,037	3,207,600	0	12,004,487	NA	NA	NA	17,363,380	5,245,188	8,627,430	8,627,430	0	5,570,751	36,806,749	48,811,236
35	2,673,000	1,202,850	4,291,559	3,207,600	0	11,375,009	NA	NA	NA	8,988,644	2,715,319	4,466,232	4,466,232	0	2,883,857	19,054,052	30,429,061
36	2,673,000	1,202,850	4,011,915	3,207,600	0	11,095,365	NA	NA	NA	5,308,425	1,603,587	2,637,624	2,637,624	0	1,703,120	11,252,755	22,346,119
37	2,673,000	1,202,850	4,709,926	3,207,600	0	11,077,725	NA	NA	NA	5,068,384	1,531,074	2,516,353	2,516,353	0	1,626,106	10,743,917	21,821,041
38	2,673,000	1,202,850	4,287,428	3,207,600	0	11,129,635	NA	NA	NA	14,494,501	4,378,547	7,201,955	7,201,955	0	4,650,319	30,725,322	42,518,698
39	2,673,000	1,202,850	4,278,145	3,207,600	0	11,361,595	NA	NA	NA	8,812,112	2,661,992	4,378,518	4,378,518	0	2,827,219	18,679,841	30,041,436
40	2,673,000	1,202,850	4,082,056	3,207,600	0	11,165,506	NA	NA	NA	6,231,503	1,882,433	3,096,278	3,096,278	0	1,999,274	13,209,488	24,374,994
41	2,673,000	1,202,850	4,083,440	3,207,600	0	11,166,890	NA	NA	NA	6,249,721	1,887,936	3,105,330	3,105,330	0	2,005,119	13,248,106	24,414,995
42	2,673,000	1,202,850	4,759,386	3,207,600	0	11,842,636	NA	NA	NA	15,145,411	4,575,176	7,525,376	7,525,376	0	4,859,153	32,105,116	43,947,951
43	2,673,000	1,202,850	4,287,428	3,207,600	0	11,370,878	NA	NA	NA	8,934,285	2,698,989	4,439,223	4,439,223	0	2,866,417	18,938,824	30,309,702
44	2,673,000	1,202,850	4,064,642	3,207,600	0	11,138,092	NA	NA	NA	5,870,734	1,773,451	2,972,021	2,972,021	0	1,863,527	12,444,732	23,582,825
45	2,673,000	1,202,850	4,046,388	3,207,600	0	11,129,635	NA	NA	NA	5,762,101	1,740,635	2,863,044	2,863,044	0	1,848,674	12,214,453	23,344,291
46	2,673,000	1,202,850	4,767,959	3,207,600	0	11,851,409	NA	NA	NA	15,258,240	4,609,260	7,581,438	7,581,438	0	4,895,352	32,344,289	44,195,698
47	2,673,000	1,202,850	4,221,424	3,207,600	0	11,304,874	NA	NA	NA	8,065,637	2,436,495	4,007,614	4,007,614	0	2,587,725	17,097,471	28,402,344
48	2,673,000	1,202,850	3,757,305	3,207,600	0	10,840,755	NA	NA	NA	1,957,674	591,381	972,719	972,719	0	628,087	4,149,860	14,990,615
49	2,673,000	1,202,850	3,730,487	3,207,600	0	10,813,937	NA	NA	NA	1,604,732	484,763	797,351	797,351	0	514,852	3,401,698	14,215,635
50	2,673,000	1,202,850	4,070,661	3,207,600	0	11,154,111	NA	NA	NA	6,081,545	1,837,133	3,021,767	3,021,767	0	1,951,162	12,891,608	24,045,718
Sum	132,753,839	62,137,960	214,581,756	159,304,607	0	568,778,162	NA	NA	NA	491,001,950	149,277,597	246,928,170	20,935,482	157,911,429	1,066,054,628	1,634,832,790	1,634,832,790
Mean	2,655,077	1,242,759															

Fraser River Sockeye Management – Socio-Economic Implications

Fraser River Sockeye Scenario #6 – Recommended (Mean) Indicator: Gross Revenue/Value \$

Year	First Nations					Recreational				Commercial					Grand Total	
	Marine FSC	Lower Fraser FSC	Upper Fraser FSC	Econ Opp	Subtotal	Marine	River	Subtotal	Seine B	Gillnet	E	G	Troll	H	Subtotal	
1	2,673,000	1,202,850	7,289,484	3,207,600	0	2,953,698	6,758,439	9,712,137	24,520,619	7,407,270	12,763,858	17,271,555	0	6,100,963	50,792,710	74,857,790
2	2,673,000	1,202,850	11,821,267	3,207,600	0	3,000,000	7,125,000	10,125,000	85,505,562	26,844,769	48,505,562	17,271,555	21,589,444	21,589,444	199,020,587	228,050,303
3	2,673,000	1,202,850	6,868,475	3,207,600	0	2,855,949	5,964,599	8,840,548	8,840,548	5,613,730	9,673,314	0	4,623,722	38,494,147	61,286,621	61,286,621
4	1,776,839	3,198,310	0	2,132,207	0	2,550,000	3,562,500	6,112,500	0	0	0	0	0	0	0	13,219,856
5	2,673,000	1,202,850	7,385,823	3,207,600	0	2,982,053	6,982,920	9,964,973	28,242,929	7,927,551	13,660,382	11,140,884	0	6,529,491	54,360,352	78,794,569
6	2,673,000	1,202,850	9,651,725	3,207,600	0	3,000,000	7,125,000	10,125,000	55,154,706	17,316,012	30,838,993	11,140,884	13,926,105	0	128,376,701	155,236,876
7	2,673,000	1,202,850	6,971,653	3,207,600	0	2,881,089	6,163,700	9,044,789	20,110,968	6,075,188	10,688,477	0	5,003,800	41,658,433	64,778,335	64,778,335
8	2,673,000	1,202,850	5,897,523	3,207,600	0	2,619,280	4,110,963	6,730,242	4,208,043	1,271,180	2,190,437	0	1,047,001	8,716,680	28,427,935	28,427,935
9	2,673,000	1,202,850	6,397,884	3,207,600	0	2,741,243	5,076,504	7,817,746	11,616,066	3,509,026	6,046,568	0	2,890,193	24,061,883	45,360,973	45,360,973
10	2,673,000	1,202,850	7,091,034	3,207,600	0	2,910,198	6,414,068	9,324,266	21,878,455	6,608,117	11,368,517	0	5,443,568	45,319,657	68,818,408	68,818,408
11	2,673,000	1,202,850	6,370,369	3,207,600	0	2,734,536	5,023,408	7,757,944	11,208,713	3,385,966	5,834,536	0	2,788,835	23,218,049	44,429,812	44,429,812
12	2,673,000	1,202,850	5,841,975	3,207,600	0	2,605,740	4,003,772	6,609,512	3,385,630	1,022,742	1,762,341	0	842,377	7,013,090	26,548,027	26,548,027
13	2,673,000	1,202,850	6,055,327	3,207,600	0	2,657,744	4,415,475	7,073,219	6,544,388	1,976,951	3,406,568	0	1,628,306	13,558,233	33,768,229	33,768,229
14	2,673,000	1,202,850	7,366,856	3,207,600	0	2,977,430	6,946,319	9,923,749	25,962,110	7,842,721	13,514,206	0	6,459,620	53,778,657	78,152,712	78,152,712
15	2,673,000	1,202,850	7,052,885	3,207,600	0	2,900,894	6,340,413	9,241,307	21,313,339	6,438,405	11,094,354	0	5,302,962	44,149,080	67,526,862	67,526,862
16	2,673,000	1,202,850	6,183,723	3,207,600	0	2,669,041	4,663,239	7,352,280	8,445,344	2,551,198	4,386,103	0	2,011,282	17,493,927	36,113,380	36,113,380
17	2,673,000	1,202,850	6,159,379	3,207,600	0	2,683,107	4,616,263	7,299,370	8,064,921	2,442,320	4,208,490	0	1,747,336	16,747,336	37,289,535	37,289,535
18	2,673,000	1,202,850	7,996,426	3,207,600	0	3,000,000	7,125,000	10,125,000	35,718,532	10,789,973	18,592,772	0	8,887,111	73,988,388	99,193,264	99,193,264
19	2,673,000	1,202,850	7,151,971	3,207,600	0	2,925,051	6,531,656	9,456,708	22,780,641	6,881,652	11,858,137	0	5,668,041	47,188,471	70,880,001	70,880,001
20	2,673,000	1,202,850	6,300,098	3,207,600	0	2,717,407	4,887,808	7,605,215	10,188,328	3,071,682	5,292,978	0	2,529,877	21,062,966	42,051,729	42,051,729
21	2,673,000	1,202,850	6,150,032	3,207,600	0	2,680,828	4,598,226	7,279,054	7,946,531	2,400,514	4,136,453	0	1,977,173	16,460,671	36,973,206	36,973,206
22	2,673,000	1,202,850	7,423,678	3,207,600	0	2,991,280	6,053,967	9,045,247	28,803,382	8,096,855	13,952,117	0	6,668,937	55,521,291	80,075,666	80,075,666
23	2,673,000	1,202,850	6,666,643	3,207,600	0	2,806,753	5,595,125	8,401,877	15,595,169	4,711,041	8,117,842	0	3,880,227	32,304,278	54,456,249	54,456,249
24	2,673,000	1,202,850	6,370,178	3,207,600	0	2,734,489	5,023,040	7,757,529	11,205,888	3,385,112	5,833,085	0	2,788,132	23,212,196	44,423,353	44,423,353
25	2,673,000	1,202,850	6,104,893	3,207,600	0	2,689,826	4,511,122	7,190,948	7,278,235	2,188,634	3,788,581	0	1,810,884	15,075,345	35,445,638	35,445,638
26	2,673,000	1,202,850	6,969,408	3,207,600	0	2,800,552	6,179,367	9,059,916	20,077,725	6,065,146	10,451,173	0	4,985,529	41,588,573	64,702,349	64,702,349
27	2,673,000	1,202,850	6,845,799	3,207,600	0	2,850,420	5,940,849	8,791,261	18,247,642	5,512,309	9,697,550	0	4,540,187	37,796,668	60,519,198	60,519,198
28	2,673,000	1,202,850	6,401,919	3,207,600	0	2,742,226	5,084,289	7,826,515	11,675,818	3,527,070	6,077,680	0	2,905,055	24,185,623	45,487,507	45,487,507
29	2,673,000	1,202,850	6,224,697	3,207,600	0	2,699,028	4,742,307	7,441,335	9,051,984	2,734,454	4,711,881	0	2,252,220	18,750,539	39,500,021	39,500,021
30	2,673,000	1,202,850	7,276,845	3,207,600	0	2,955,490	6,772,626	9,728,115	24,629,463	7,440,150	12,820,515	0	6,128,045	51,016,173	75,106,584	75,106,584
31	2,673,000	1,202,850	6,789,746	3,207,600	0	2,836,759	5,832,676	8,669,435	17,417,763	5,281,616	9,066,568	0	4,333,705	36,079,652	58,622,284	58,622,284
32	2,673,000	1,202,850	6,361,323	3,207,600	0	2,732,331	5,005,952	7,738,283	11,074,786	3,345,508	5,764,821	0	2,755,512	22,940,627	44,123,864	44,123,864
33	2,673,000	1,202,850	6,269,921	3,207,600	0	2,710,051	4,829,574	7,539,625	9,721,535	2,936,714	5,060,406	0	2,418,810	20,137,465	41,030,460	41,030,460
34	2,673,000	1,202,850	7,654,947	3,207,600	0	3,000,000	7,125,000	10,125,000	30,385,915	9,179,079	15,816,954	0	7,560,305	62,942,253	87,805,650	87,805,650
35	2,673,000	1,202,850	6,675,758	3,207,600	0	2,808,974	5,612,715	8,421,689	15,730,127	4,751,809	8,188,093	0	3,913,805	32,583,834	54,764,731	54,764,731
36	2,673,000	1,202,850	6,240,756	3,207,600	0	2,702,843	4,773,296	7,476,138	9,288,743	2,806,277	4,835,643	0	2,311,377	19,245,040	40,043,484	40,043,484
37	2,673,000	1,202,850	6,212,363	3,207,600	0	2,696,027	4,718,545	7,414,571	8,869,671	2,679,360	4,616,961	0	2,206,859	16,372,890	39,063,295	39,063,295
38	2,673,000	1,202,850	7,326,551	3,207,600	0	2,967,605	6,868,542	9,836,148	25,385,376	7,662,457	13,203,584	0	6,311,147	52,542,585	76,788,714	76,788,714
39	2,673,000	1,202,850	6,654,892	3,207,600	0	2,803,888	5,572,450	8,376,338	15,421,195	4,658,486	8,027,283	0	3,836,940	31,943,904	54,058,584	54,058,584
40	2,673,000	1,202,850	6,349,864	3,207,600	0	2,729,538	4,983,840	7,713,378	10,905,130	3,284,258	5,676,510	0	2,713,300	22,589,199	43,735,591	43,735,591
41	2,673,000	1,202,850	6,352,017	3,207,600	0	2,730,063	4,987,995	7,718,058	10,937,011	3,303,889	5,693,105	0	2,721,233	22,855,237	43,808,762	43,808,762
42	2,673,000	1,202,850	7,403,489	3,207,600	0	2,986,359	7,017,008	10,003,367	28,504,469	8,006,558	13,796,523	0	6,594,564	54,902,114	79,392,420	79,392,420
43	2,673,000	1,202,850	6,689,333	3,207,600	0	2,807,408	5,600,316	8,407,724	15,635,000	4,723,073	8,138,576	0	3,890,137	32,386,785	54,547,292	54,547,292
44	2,673,000	1,202,850	6,307,221	3,207,600	0	2,719,143	4,901,552	7,620,695	10,273,784	3,103,539	5,347,871	0	2,556,215	21,281,410	42,292,777	42,292,777
45	2,673,000	1,202,850	6,204,381	3,207,600	0	2,716,014	4,876,774	7,592,788	10,083,676	3,046,111	5,248,914	0	2,508,915	20,887,615	41,858,234	41,858,234
46	2,673,000	1,202,850	7,416,825	3,207,600	0	2,989,610	7,042,743	10,032,353	28,701,919	8,066,205	13,869,303	0	6,643,692	55,311,119	79,643,747	79,643,747
47	2,673,000	1,202,850	6,566,659	3,207,600	0	2,782,361	5,402,187	8,184,546	14,114,865	4,853,866	7,747,291	0	3,511,913	29,237,935	51,072,612	51,072,612
48	2,673,000	1,202,850	5,844,697	3,207,600	0	2,606,403	4,029,025	6,635,428	3,425,929	1,034,916	1,783,318	0	852,404	7,096,587	20,620,142	20,620,142
49	2,673,000	1,202,850	5,802,979	3,207,600	0	2,596,234	3,928,522	6,524,757	2,808,281	846,335	1,461,811	0	688,727	5,817,154	25,228,341	25,228,341
50	2,673,000	1,202,850	6,332,139	3,207,600	0	2,725,217	4,949,636	7,674,853	10,642,703	3,214,983	5,539,907	0	2,648,006	22,045,599	43,136,042	43,136,042
Sum	132,753,839	62,137,960	333,793,843	159,304,607	0	140,042,312	277,418,301	417,460,612	850,253,413	261,235,794	452,701,646	28,412,439	214,308,368	1,815,911,681	2,921,362,522	2,921,362,522
Mean	2,655,077	1,242,759	6,675,877	3,186,092	0	2,800,846	5,548,366	8,349,212	17,185,068	5,224,716	9,224,716	568,249	4,286,167	36,313,233	58,427,250	58,427,250
Std Dev	125,463	279,364	1,366,572	150,555	0	1,364,238	1,032,140	1,162,515	13,813,483	4,310,311	7,640,487	2,850,546	3,479,366	31,628,519	33,640,189	33,640,189
NPV					0	218,808,556	89,861,226	134,312,025	333,379,867	102,073,350	177,974,472</					