

**British Columbia (Canada) Commercial Salmon Fisheries
Managed by the Department of Fisheries and Oceans
An Independent Assessment**

Contract Number:

Version: SCS_Draft Report to Client and Stakeholders

Date: 27 August 2007

Client: British Columbia Salmon Marketing Council

MSC reference standards:

MSC Accreditation Manual Issue 4,

MSC Fisheries Certification Methodology (FCM) Version 5,

MSC TAB Directives (All)

MSC Chain of Custody Certification Methodology (CoC CM) Version 6.

Accredited Certification Body:

Scientific Certification Systems, Inc.

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Amd. No	Date	Description Of Amendment
1	27 August 2007	Draft Report to Client and Stakeholders for Review Prior to Peer Review
3		Draft Report for Peer Review
4		Draft Report for Public Comment
5		Final Report after Public Comment Period

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Preamble

This report is the sole responsibility of SCS. All advice and comments from Assessment team members have been reviewed by SCS and incorporated into the report by SCS at SCS's sole discretion.

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1 Introduction

The Marine Stewardship Council (MSC) is a non-profit organization dedicated to the long-term protection or “sustainability” of marine fisheries and related habitats. First started as a joint initiative between Unilever and the World Wildlife Fund (WWF), the MSC is now a fully independent organization that is governed by an independent Board of Directors advised by a panel of scientific, economic, and fishery experts.

The MSC’s original mission statement promoted responsible, environmentally appropriate, socially beneficial, and economically viable fisheries practices, as well as the maintenance of biodiversity, productivity and ecological processes of the marine environment. The current MSC mission statement (redrafted in 2001) provides a slightly more focused mission and reads,

“To safeguard the world’s seafood supply by promoting the best environmental choice”.

Dedicated to promoting “well-managed” or “sustainable” fisheries, the MSC initiative intends to identify such fisheries through means of independent third-party assessments and certification. Once certified, fisheries will be awarded the opportunity to utilize an MSC promoted eco-label to gain economic advantages in the marketplace. Through certification and eco-labelling, the MSC intends to promote and encourage better management of world fisheries, many of which have been suggested to suffer from poor management.

The Marine Stewardship Council developed standards for sustainable fisheries management in a three-step process (May, Leadbitter, Sutton, and Weber, 2003): 1) Assemble a group of experts in Bagshot (UK) to draft an initial set of Principles and Criteria; 2) Conduct an 18-month process to review the standard in 8 major international venues; and 3) Convene a second set of experts in Warrenton, Virginia (Airlie Conference Center, USA) to revise and finalize the MSC Principles and Criteria.

The final MSC Fisheries Certification standard was issued in 1998, and has since been used as the basis by which fisheries are evaluated under the MSC program. In contrast, the MSC Certification Methodology has evolved over the past six years as has the MSC Standard and Certification Methodology for Chain of Custody. The latest documents concerning these requirements, processes, and procedures were used in this assessment.

This assessment is the one of the largest projects undertaken under the MSC program examining numerous stocks of salmon spread over the coast of British Columbia. This project is as robust as any assessment on salmon to date, and as a result has required more time than first anticipated to gather, examine, and review all the information pertinent to the management of the salmon fisheries in British Columbia proving compliance with MSC standards.

2 The British Columbia (BC) Salmon Fisheries

2.1 Target Species

Originally the scope of this project included the examination of all 5 salmon species along the coast of BC; however, it soon became apparent that tackling all 5 species, all gear types, and all British Columbia Salmon Fisheries

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locations would be too large a scope for the first assessment project in Canada. The BC Salmon Marketing Council (BCSMC) on behalf of the commercial salmon industry decided that a more tractable project, and one that could be used as a format for other salmon assessments, was to confine the project to looking only at sockeye fisheries in BC.

The target species assessed for this project is Sockeye salmon (*Oncorhynchus nerka*).

2.2 Life Histories

The life history of sockeye salmon has been studied and written about extensively. The general description provided below is taken from 2 sources: Canada's Department of Oceans and Fisheries web site (http://www.pac.dfo-mpo.gc.ca/species/salmon/salmon_facts/sockeye_e.htm) and the Alaska Department of Fish and Game's Notebook series (<http://www.adfg.state.ak.us/pubs/notebook/fish/sockeye.php>).

Sockeye salmon (*Oncorhynchus nerka*)

The main spawning area of sockeye salmon extends from the Fraser River to Alaska's Bristol Bay. Most sockeye in BC and the Yukon spawn in late summer or fall in lake-fed systems; at lake outlets, in lakes, or in streams flowing into lakes. Major spawning runs are found in the Fraser, Skeena, Nass, Stikine, Taku and Alsek watersheds as well as those of the Smith and Rivers inlets.

Young sockeye may remain in their freshwater nursery lakes for a year or more, with some waiting until the second or third year to make their seaward journey. Once in salt water, BC sockeye move north and north-westward along the coast. Their maturing years find them in a huge area of the Pacific Ocean extending west to approximately the International Date Line (2600 miles from the coast of Vancouver Island), north to the northern Gulf of Alaska and south to the Oregon-California border.

The female selects the spawning site, digs a nest (redd) with her tail, and deposits eggs in the downstream portion of the redd as one or more males swim beside her and fertilize the eggs as they are extruded. After each spawning act, the female covers the eggs by dislodging gravel at the upstream end of the redd with her tail. A female usually deposits about five batches of eggs in a redd. Depending upon her size, a female produces from 2,000 to 4,500 eggs.

Eggs hatch during the winter, and the young sac-fry, or alevins, remain in the gravel, living off the material stored in their yolk sacs, until early spring. At this time they emerge from the gravel as fry and move into rearing areas. In systems with lakes, juveniles usually spend one to three years in fresh water before migrating to the ocean in the spring as smolts. However, in systems without lakes, many juveniles migrate to the ocean soon after emerging from the gravel.

Sockeye salmon return to their natal stream to spawn after spending one to four years in the ocean. Mature sockeye salmon that have spent only one year in the ocean are called jacks and are, almost without exception, males. Once in the ocean, sockeye salmon grow quickly. While returning adults usually weigh between 4 and 8 pounds, weights in excess of 15 pounds have been reported.

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In some areas, populations of sockeye salmon remain in fresh water all their lives. This landlocked form of sockeye salmon, called "kokanee," reaches a much smaller maximum size than the anadromous form and rarely grows to be over 14 inches long."

2.3 Overview of Fisheries Under Assessment

2.3.1 Units of Certification

The units of certification for this project are the four sockeye fisheries targeting stocks returning to the Fraser, Skeena and Nass watersheds and Barlkey Sound. These fisheries represent the majority of the BC commercial fisheries that harvested sockeye salmon in recent years. Specific sockeye fisheries that are not included in this evaluation are those targeting central coasts stocks (primarily Rivers and Smith Inlet stocks) and the transboundary stocks (Taku and Stikine). Commercial fisheries targeting central coast sockeye stocks have not been conducted since 1995. Most of the harvesting associated with transboundary fisheries occur in Alaskan waters so these fisheries are covered under the MSC evaluations for Alaskan salmon fisheries (The Commercial Alaska Salmon Fisheries Managed by the Alaska Department of Fish and Game; A 5-Year Re-Assessment Based on the Marine Stewardship Council Program (Chaffee, et al., 2007).

SCS derived the Units of Certification through consultation with the Client (salmon fishers and processors in BC), specific staff within DFO, and members of the assessment team. Although not required by the MSC certification methodology, the proposed Units of Certification were also posted for public comment 26 September 2002 to allow stakeholder concerns to be voiced about the proposed units.. The only comments received after public posting were received (23 December 2002) from the client (BCSMC) on behalf of the salmon fishing and processing industry. The final units of certification were posted on the MSC web site 3 June 2003 (see Table 1).

Table 1. List of BC commercial salmon fisheries proposed as units of certification						
Fisheries	Target Species					Target Stocks
	Sockeye	Pink	Chum	Chinook	Coho	
Marine Fisheries						
Seine & Gillnet Fisheries						
North Coast						
Nass	X	X	X			Nass
Skeena	X	X	X			Skeena
Central Coast		X	X			Many
South Coast						
Fraser	X	X	X			Fraser
Somass	X					Somass
West Coast Van. Is.			X			Nitnat+Nooka
Inside Fisheries		X	X			Many
Troll Fisheries						

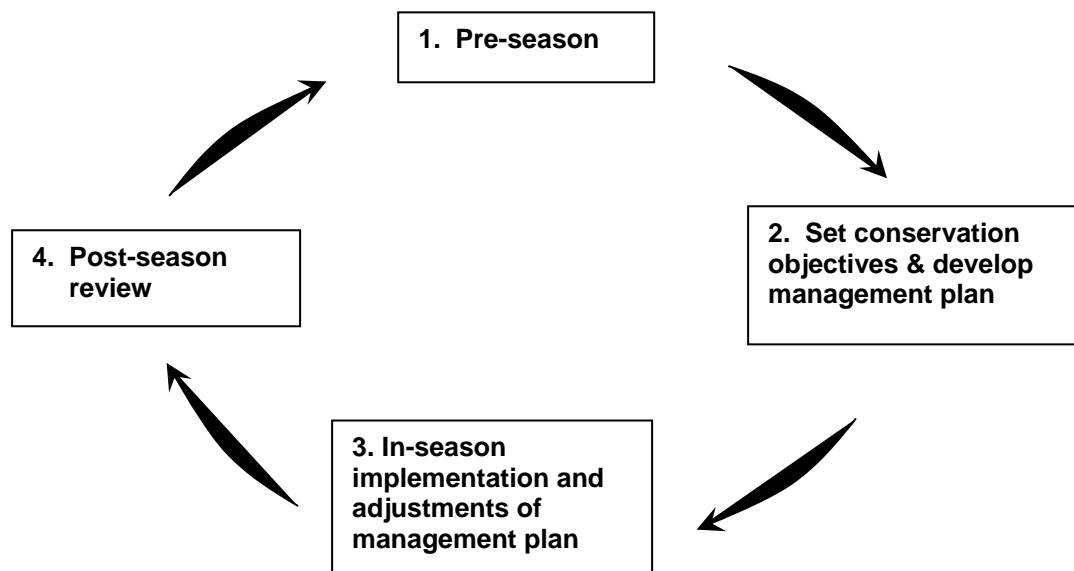
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North Coast		X		X		Many
West Coast Van. Is.	X	X	X	X		Many
Inside Fisheries	X	X	X			Many
Freshwater Fisheries						
Taku	X			X	X	Taku
Stikine	X					Stikine
Nass	X	X	X	X	X	Nass
Skeena	X	X				Skeena
Fraser	X		X			Fraser
Somass	X			X	X	Somass
Number of Fisheries	12	10	10	5	3	

3 Fisheries Management System

“Fisheries and Oceans Canada has a responsibility to manage Canada’s salmon resources to rigorous conservation standards. Because of the variable and sometimes unpredictable nature of salmon and the environment, management decisions give priority to the conservation and protection of all fish stocks and their habitat.

Salmon management is an extremely complex process that includes three harvesting sectors - Aboriginal, commercial and recreational - and integrated management plans that are guided by law, regulation, court decisions, treaties, and a number of policies. Salmon management follows an annual cycle as with four key planning phases:



1. The pre-season outlook provides managers with a tool to aid in the planning process for the coming fisheries. DFO’s Science Branch collects and analyzes a range of data to develop a forecast for the coming season – a hypothesis of likely returns of salmon to specific fishing areas.

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- Pre-season planning is a collaborative effort between the Integrated Harvest Planning Committee, sector advisory committees and DFO branches of Fisheries and Aquaculture Management, Conservation and Protection, and Science.
- The PSARC (Pacific Scientific Advice Review Committee) advises the Resource Management Executive Committee (RMEC) of Fisheries and Oceans Canada and other bodies on stock and habitat status, and the potential biological consequences of fisheries management actions and natural events.
- With this information DFO develops a pre-season outlook – an estimate of the likely number of salmon that will return to their spawning grounds in a given year. This is done for most species and river systems.

2. The development of Integrated Fisheries Management Plans (IFMPs) ensures that conservation concerns are balanced with the harvesting interests of recreational, commercial and First Nations fishers. As part of the fishing plan development, obligations under the Pacific Salmon Treaty are considered and incorporated into the final plan.

- IFMPs are developed based on information provided by DFO research scientists, resource managers, Conservation and Protection staff, and Salmon Enhancement Project managers. The plans are then brought to First Nations and stakeholders, including recreational and commercial fishers and environmental organizations for extensive consultations, both separately as individual groups, and collectively through the Integrated Harvest Planning Committee.
- Fishing plans for Fraser River sockeye take into account the potential number of migrating sockeye salmon that may die in the river due to environmental conditions or migration timing factors. These plans are designed to be adjusted during the fishing season to accommodate for fluctuations in temperatures and water flow levels. The plans outline conservation objectives and set the criteria or ‘decision rules’ that determine how the plan will be adjusted to reflect changing conditions (e.g. abundance, timing, environmental conditions).
- After conservation needs and First Nations’ food, social and ceremonial requirements are met, DFO consults with other fishing groups and a share is estimated for each fishery. These consultations are guided by past practice and departmental policy. Harvesting this share is contingent on actual returns of salmon to the Fraser River, which is assessed in-season, and takes place under strict regulations with a series of fishery openings.

3. In-season management

In the case of Fraser River sockeye and pink salmon, the fishery is managed collaboratively by the Fraser River Panel (FRP) (a group comprised of government, First Nations and recreational and commercial interests from both the U.S. and Canada). The Pacific Salmon Commission (PSC), a body independent of government, provides advice to the Fraser River Panel and to DFO regarding run size, stock identification, timing of returns and migration conditions.

At the peak of the fishing season, DFO, the PSC and the FRP meet twice a week to analyze data from test fisheries and assess environmental conditions to determine when and where fishery openings may take place. All three of these groups are involved in the analysis and decision-

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making process. As in-river environmental conditions fluctuate, actual return numbers come in, and allocations are fished, this group continually analyzes data and adjusts fishing plans to maximize fishing opportunities while ensuring sufficient numbers of salmon reach their respective spawning grounds.

4. Post-season review

At the end of each fishing season, DFO estimates the number of salmon that have migrated up the Fraser River to their spawning grounds. These numbers are collected and analyzed and the information is then compiled into a report called a post-season review. This information is used for a range of purposes including identification of any catch imbalance between Canada and the US to be addressed in future years, determining the impact of water temperatures and levels on salmon survival, and whether escapement (the number of fish reaching the spawning grounds) goals were met. “¹

4 Processing, Transshipment

For the BC salmon fisheries, all landings are recorded and reported to the government. Processing occurs predominately at shore-side plants where landings are monitored by fishery enforcement officers and recorded by each licensed processing facility. Landings at remote locations or at tenders are transported to processing facilities. Each processor controls the transport of its product from landing locations to processing facilities. Transshipments at sea are the exception, not the rule.

This report acknowledges that sufficient monitoring takes place to identify the fishery of origin for all landed salmon. This is sufficient to allow a Chain of Custody to be established from the point of landing forward for all products derived from the fishery. MSC chain of custody certifications were not undertaken in this project, and therefore, are to be undertaken on a separate and individual basis for those entities that may wish to identify and/or label products derived from the MSC certified fishery.

5 Other Fisheries in the area

There are numerous fisheries that operate wholly or partially within the provincial and federal waters off of British Columbia, Canada.. For the purposes of this report, the number and types of fisheries are too numerous to list. In general there are fisheries on a number of finfish and invertebrate species. A full list of fisheries in BC waters can be found at the web sites for both the provincial and federal governments:

¹ This description of DFO management of salmon was quoted from the DFO web site at http://www-comm.pac.dfo-mpo.gc.ca/pages/release/bckgrnd/2006/bg012_e.htm.

(http://www.pac.dfo-mpo.gc.ca/ops/fm/Commercial/index_e.htm;
http://www.agf.gov.bc.ca/fisheries/commercial/commercial_main.htm).

6 Summary of Previous Certification Evaluations

No previous assessments under the MSC program have been conducted on BC salmon fisheries. In addition, no other fisheries in the vicinity of, or in the waters off, BC have been assessed under the MSC program. Currently, an assessment is taking place on BC halibut, and other sectors of the BC Seafood Industry are considering MSC assessments.

7 The Assessment Process

Pre-assessment

Scientific Certification Systems, Inc. conducted a pre-assessment of the BC salmon fisheries, as required by the MSC program, prior to the initiation of certification in 2001. After review of the pre-assessment, the applicant (BCSMC) for certification authorized the formal, full assessment of the salmon fisheries in BC. The project initially was constructed to examine all 5 species of salmon, but was then revised to focus solely on sockeye fisheries in 4 locations.

Fisheries Assessment

All aspects of the assessment process for this project have been carried out under the auspices of Scientific Certification Systems, Inc., an accredited MSC certification body, and in direct accordance with MSC requirements (MSC Fisheries Certification Methodology Version 5), except where the MSC approved a variance in its methodological requirements.

At the initiation of this project, SCS was contacted by representatives in the conservation sector in BC interested in discussing the MSC assessment process for salmon. The conservation sector representatives informed SCS that a number of conservation groups were interested in participating in the process, and that these groups as a collective had discussed their interests and the processes they believed would be necessary to make the MSC assessment of salmon in BC a success in the opinion of the conservation sector.

In general, conservation stakeholders explained to SCS that the project would only be successful and supported by the conservation sector if the processes followed were completely open and transparent, allowing stakeholders to both question and comment on each step of the process – even where such consultation was not specifically required under the MSC program. In specific, the conservation groups wanted to be able to receive any information used in the assessment, and to have access to the information in a timely manner so they could have sufficient time to comment. Receiving information in a timely manner was defined in this context as stakeholders receiving information at the same time as other participants in the process. Thus, when the industry and government submitted information to SCS, or when SCS conveyed information to the client or the government, the stakeholders requested that they receive the very same information at the very same time. The concerns were simple – stakeholders wanted to ensure

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that the assessment was based on validated information and that the assessment team was not biased by information that could not be reviewed and comment upon by all participants.

Although the MSC certification methodology does not require stakeholder involvement at every step of the assessment process, the client agreed to meet the requests of the conservation community to ensure a fully open, transparent, and successful process.

To finalize the agreed consultative processes, SCS exchanged letters with the Sierra Club as a representative from the conservation community (see Appendix 1). From this exchange, a final set of protocols were agreed. Although following the agreed consultative process significantly increased the time required to complete certain steps in the certification methodology, it also provided SCS with important and significant insights into issues associated with both the MSC process and with salmon management in British Columbia.

As a result of the agreed protocols, SCS made an effort to include all stakeholders at all the critical junctures of the process.

Team Selection

SCS contacted the client and stakeholders in the environmental community to solicit input on assessment team members. Comments were received from all parties and SCS retained the services of three assessment team members based on negotiations with both industry and conservation groups.

Setting Performance Indicators and Scoring Guideposts

All stakeholders in the BC salmon assessment process expressed concerns that the Performance Indicators and Scoring Guideposts that had been developed and used to assess the salmon fisheries in Alaska in 2000, were deficient. In general, most participants in the process in BC felt the set of Performance Indicators and Scoring Guideposts used in Alaska were far too general, and required greater specificity to ensure acceptable performance against the MSC standard. To achieve that objective, the SCS assessment team drafted a new set of performance indicators and scoring guideposts with greater specificity about the performance objectives being required to meet the MSC standard. In addition, SCS worked with stakeholders (industry and conservation groups) to identify two peer reviewers (Brian Riddell and Randall Peterman) that independently commented on the acceptability of the indicators and guideposts drafted for use in the BC salmon assessment (Appendix 2). The SCS assessment team reviewed the comments received and revised the draft accordingly.

SCS posted the peer reviewed Draft Performance Indicators and Scoring Guideposts (31 March 2003) as required by the MSC, but for a period longer than the required 30 days to allow enough time for all interested parties to comment. SCS received a few comments (Appendix 3). The final Performance Indicators and Scoring Guideposts for use in the assessment were posted on 3 June 2003.

Obtaining and Reviewing Data on Fishery Performance

During a full assessment of a fishery, it is the responsibility of the applicant or client to provide the assessment team with the required information to prove that the fishery or fisheries being assessed meet the MSC standard. Upon request, and with some consultation from the SCS assessment team, the client working in conjunction with the Department of Fisheries and Oceans provided the following written documents as proof that the sockeye fisheries in BC comply with the MSC standards:

- Response to Marine Stewardship Council Indicators for Principle 1 – Stock Assessment and Stock Status, Pacific Wild Salmon Fishery, Skeena River Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004
- Response to Marine Stewardship Council Indicators for Principle 2 – Ecosystem Impacts Pacific Wild Salmon Fishery, Skeena Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004
- Response to Marine Stewardship Council Indicators for Principle 3– Fishery Management System, Pacific Wild Salmon Fishery, Fraser River Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004
- Response to Marine Stewardship Council Indicators for Principle 3– Fishery Management System, Pacific Wild Salmon Fishery, Skeena River Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004 Fisheries and Oceans Canada Pacific Region, May 2004
- Response to Marine Stewardship Council Indicators for Principle 1 – Stock Assessment and Stock Status, Pacific Wild Salmon Fishery, Fraser River Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004
- Response to Marine Stewardship Council Indicators for Principle 2 – Ecosystem Impacts, Pacific Wild Salmon Fishery, Fraser River Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004
- Response to Marine Stewardship Council Indicators for Principle 1 – Stock Assessment and Stock Status, Pacific Wild Salmon Fishery, Nass River Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004
- Response to Marine Stewardship Council Indicators for Principle 2 – Ecosystem Impacts, Pacific Wild Salmon Fishery, Nass Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004
- Response to Marine Stewardship Council Indicators for Principle 3– Fishery Management System, Pacific Wild Salmon Fishery, Nass Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004
- Response to Marine Stewardship Council Indicators for Principle 1 – Stock Assessment and Stock Status, Pacific Wild Salmon Fishery, Barkley Sound Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004
- Response to Marine Stewardship Council Indicators for Principle 2 – Ecosystem Impacts, Pacific Wild Salmon Fishery, Barkley Sound Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004

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- Response to Marine Stewardship Council Indicators for Principle 3– Fishery Management System, Pacific Wild Salmon Fishery, Barkley Sound Sockeye, Fisheries and Oceans Canada Pacific Region, May 2004.

These documents were also released simultaneously to all interested stakeholders either by direct email or by posting to the MSC web site.

Upon release of the client/DFO documents, SCS also posted a notice to all stakeholders that the assessment team would take input from any interested parties on the sustainability of the sockeye salmon fisheries. The Marine Conservation Caucus, the body organized to represent the conservation groups in BC, pulled together their own review of the fisheries under examination, as well as comments on the documents submitted by the client to SCS. The documents submitted to the SCS assessment, and released publicly are:

- Review of MSC Certification Evaluation of Skeena Sockeye Stocks, Prepared by: Robert Bocking, LGL Limited, environmental research associates, Prepared for: Sierra Club of Canada, BC Chapter, Date: April 21, 2005.
- Independent Review of Nass River Sockeye Fishery Performance Measures, Prepared for Sierra Club of Canada, BC Chapter, Victoria, BC, Prepared by David Levy, Ph.D., Levy Research Services Ltd., North Vancouver, BC, April 2005
- Marine Stewardship Council Evaluation of the Barkley Sound sockeye fishery., Assessment of the Department of Fisheries and Ocean's response to the Marine Stewardship Council's principles of sustainable fishing., Prepared by R. John Nelson for the Sierra Club of British Columbia, April 30, 2005
- Independent Assessment of British Columbia Salmon Fisheries for Fraser Sockeye, Barkley Sound Sockeye and Skeena River Sockeye., Prepared by: Ken Wilson, Prepared For: The Sierra Club of Canada, BC Chapter,

In addition to the documents submitted by the conservation groups, SCS also received email correspondence from Fred Hawkshaw (see Appendix 3). Mr. Hawkshaw provided some specific comments about individual indicators of performance, as well as some general comments about fisheries management in BC and the MSC process.

Meetings with industry, managers, and stakeholders

SCS planned for and conducted meetings with fishery managers, and fishery scientists on several occasions during the review and evaluation process. The most intensive series of meetings between the SCS assessment team, industry, and DFO occurred in May 2005. There was a specific request from the Marine Conservation Caucus (MCC) to attend these meetings; however, it was agreed in the end that these meetings would be disrupted considerably if we had all parties in the room at one time trying to debate the issues. To their credit, MCC representatives agreed to be briefed directly after the meeting by the SCS

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assessment team, at which time the stakeholders were given the opportunity to provide direct comment to the assessment team as well. This ensured a free and thorough exchange of information and documents, but limited public debates that could have reduced the efficiency of the meetings. . In June 2005, representatives from the BC Aboriginal Fisheries Commission (BCAFC), Cowichan Tribes and Secwepemc Fisheries Commission requested an opportunity to meet with members of the SCS evaluation team. In the interest of efficiency one member of the evaluation team (Karl English) met with each of these groups on the following dates: June 9, 2005 for the BCAFC, June 30, 2005 for Cowichan Tribes, and July 29, 2005 for the Secwepemc Fisheries Commission. Subsequent to these meeting the Secwepemc Fisheries Commission submitted a letter, dated August 3, 2005, to SCS describing their concerns related to MSC Certification of BC Salmon Fisheries.

Scoring fishery

The assessment team scored the fishery using the required MSC methodology and without input from the client group or stakeholders. All team members participated in and agreed upon the outcome of the review.

Drafting report

The assessment team in collaboration with the SCS lead assessor, Chet Chaffee, drafted the report in accordance with MSC required process. As agreed with all participants and stakeholders, the draft report will be provided to the client and all other stakeholders prior to peer review. This is a variation from the MSC required methodology, which only requires the Certification Body (CB) to releae the report to the client for comment before peer review.

Selection of peer reviewers

SCS, as required, will release an announcement of potential peer reviewers soliciting input from stakeholders on the merits of selected reviewers.

Peer Review and Public Comment on Draft Reports

As required, SCS will have this report peer reviewed and posted for public comment for the appropriate amount of time.

7.1 Evaluation Team

Project Manager: Dr. Chet Chaffee, SCS (USA)

Team Members:

MSC Principle 1: Mr. Karl English (LGL, Sidney, BC, Canada))

MSC Principle 2: Dr. Dana Schmidt (Golder & Associates, Canada))

MSC Principle 3: Dr. Jim Joseph (independent, San Diego, California)

7.2 The MSC Standard and Certification Methodology

The Marine Stewardship Council standards for sustainable fisheries management were developed through an 18-month process (May, Leadbitter, Sutton, and Weber, 2003). An original draft was developed by an expert working group, which met in Bagshot, UK in 1996. The draft standard was then presented through a series of 8 workshops that lasted 3 days each. Comments from each of the workshops, and from written submissions to the MSC were compiled and made available to a second expert working group at Airlie House in Virginia, USA.

The final MSC standard (see below) was issued in 1998, and has since been used as the basis by which fisheries are evaluated under the MSC program.

The scope of the MSC Principles and Criteria relates to marine fisheries activities up to but not beyond the point at which the fish are landed. The MSC Principles and Criteria apply at this stage only to marine fishes, fresh water fishes, and invertebrates (including, but not limited to shellfish, crustaceans and cephalopods). Aquaculture and the harvest of other species are not currently included. Issues involving allocation of quotas and access to marine resources are considered to be beyond the scope of these Principles and Criteria.

Sustainable fishing Principles and Criteria have been identified by the MSC to recognize the diversity of fisheries across the world. The MSC derived an evaluation methodology to maintain the intent and rigor of its Principles and Criteria but allow enough flexibility in the application of the standard to permit scientists to make sound judgments about the sustainability of any given fishery regardless of differences in species composition, geographic location, oceanographic conditions, or fishing methods. This method uses a set of performance measures that can be prioritized to reflect regional, biological, or ecological characteristics in the fishery.

Section 7.4 contains the proposed set of sub-criteria, indicators, and scoring guideposts for use in evaluating the BC sockeye fisheries. .

Under the MSC assessment protocols, all criteria, sub-criteria, and indicators are weighted using Analytical Hierarchy Process (AHP), and a method known as pairwise comparison. The weights assigned indicate the relative importance of each performance indicator, sub criteria, and criteria in achieving the overall scores for the fishery.

The scoring of the fishery occurs once the assessment team has completed its review of all the information collected on the fishery. Each performance indicator is assigned a score between 0 and 100 through a consensus process where the entire assessment team agrees to the assigned score.

Scoring guideposts provide an indication of what level of performance is required to achieve specific scores. Benchmarks or guideposts are provided for achieving scores of 60, 80, or 100 to help guide the assessment team scoring discussions. Scoring guideposts labeled as '100' indicate the best performance achievable for an indicator. This is the highest mark any fishery could be expected to receive. The '80' scoring guidepost references the level of acceptable performance for an indicator; whereas, the '60' scoring guidepost indicates the minimal threshold allowable in an MSC evaluation. Therefore, performance indicator scores between 80 and 100 indicate performance in line with the anticipated performance under the MSC standard. A score between 60 and 80 for an indicator, points out that the evaluating scientists identified a minor deficiency that needs corrective action. An indicator score below 60 indicates a major deficiency

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in the fishery that needs corrective action. The scoring guideposts used to rate an indicator are considered hierarchical in that to achieve a particular score, the scoring guideposts of all lower scores must first be met.

An overall score is calculated for each MSC Principle by combining the individual scores and weights of the performance indicators, sub-criteria, and criteria under the Principle. A fishery fails the assessment process if either the weighted average score for any of the three MSC Principles falls below 80 (<80), or if any individual performance indicator is assigned a score of less than 60 (<60). In either case, before certification can be awarded the applicant must show that the factors causing the problems have been corrected.

A fishery is considered to have passed the MSC evaluation process and is recommended for certification when it achieves a weighted average score of 80 or above (≥ 80) on each of the three MSC Principles individually, and the applicant agrees by contract to improve the score for the fishery on any individual performance indicator that scores between 60 and 79 ($\geq 60 - <80$). Improvement is defined as improving the score to the level of 80 for each individual performance indicator where a score between 60 -79 originally occurred. Improvements must be completed to the satisfaction of the certifying body within a specified time period of no more than 5 years, which is the period of certification. Specific actions and timeframes for making improvements must be spelled out by the client in an Action Plan submitted to and approved by the certifying body.

7.3 MSC Principles and Criteria

7.3.1 MSC Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Intent:

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favor of short term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

MSC Criteria

1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary

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approach and the ability of the populations to produce long-term potential yields within a specified time frame.

3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

7.3.2 MSC Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

Intent:

The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

MSC Criteria:

The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.

The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimizes mortality of, or injuries to endangered, threatened or protected species.

Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

7.3.3 MSC Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

MSC Criteria:

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A. Management System:

1. The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.

The management system shall:

2. demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishing-dependent communities shall be addressed as part of this process;
3. be appropriate to the cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedures for implementation and a process for monitoring and evaluating performance and acting on findings;
4. observe the legal and customary rights and long term interests of people dependent on fishing for food and livelihood, in a manner consistent with ecological sustainability;
5. incorporates an appropriate mechanism for the resolution of disputes arising within the system;
6. provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing;
7. act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty;
8. incorporate a research plan – appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interested parties in a timely fashion;
9. require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted;
10. specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:
 - a. setting catch levels that will maintain the target population and ecological community's high productivity relative to its potential productivity, and account for the non-target species (or size, age, sex) captured and landed in association with, or as a consequence of, fishing for target species;
 - b. identifying appropriate fishing methods that minimize adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
 - c. providing for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames;
 - d. mechanisms in place to limit or close fisheries when designated catch limits are reached;
 - e. establishing no-take zones where appropriate;
11. contains appropriate procedures for effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

B. MSC Operational Criteria:

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Fishing operations shall:

12. make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimize mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive;
13. implement appropriate fishing methods designed to minimize adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
14. not use destructive fishing practices such as fishing with poisons or explosives;
15. minimize operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.;
16. be conducted in compliance with the fishery management system and all legal and administrative requirements; and
17. assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

7.4 Performance Indicators and Scoring Guideposts

This section contains the proposed set of sub-criteria, performance indicators, and scoring guideposts for use in evaluating BC sockeye fisheries.

To facilitate the correct interpretation of the evaluation components drafted, we have also provided definitions (see Definitions section below) for most of the important terms commonly associated with the management of salmon fisheries. These terms are used to define the fisheries being evaluated, the evaluation sub-criteria and indicators, and the scoring guideposts. These definitions are again the same as those used in the evaluation of California and Alaska salmon fisheries.

The key to understanding the criteria is to understand the differences between the MSC Principles. Principle 1 focuses on the target population, defined as target species or target stocks. Under this principle the fundamental building blocks for sound fisheries management are considered:

1. The definition of the target stocks;
2. The quality of monitoring and stock assessment programs;
3. The specific management goals for target stocks;
4. The procedures to facilitate the recovery of target stocks that are depleted; and
5. The fisheries are conducted in a manner that will not compromise the age, size and genetic structure of the target stocks.

Principle 2 focuses on the impact of the fishery on the ecosystem and non-target populations. Here we are assessing how the fishery management operations deal with:

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1. The importance of maintaining a productive, functional and diverse ecosystem;
2. Provisions to minimize the fishery impacts on endangered, threatened, protected or icon species; and
3. Procedures for the recovery of depleted non-target stocks.

Principle 3 focuses on the management and operational framework that has been put in place to achieve the management goals. Some indicators under Principle 3 appear to overlap with indicators under Principles 1 and 2, however, the Principles 1 and 2 are concerned with the outcomes of a management system respecting the fact that the resources are maintained at the desired levels of abundance, while Principle 3 is concerned with evaluating whether all of the processes for reaching management objectives are in place. Components unique to Principle 3 include:

1. The evaluation of the consultation process;
2. The procedures used to control fisheries;
3. The extent of internal and external review of the management system;
4. The compliance with legal and administrative requirements; and
5. The implementation of responsible fishing practices.

The management of salmon fisheries has often been divided into five major components:

1. Resource inventory;
2. Pre-season planning;
3. In-season management (i.e. conducting the fisheries);
4. Post-season evaluations; and
5. Research and stock assessment.

Each of these components is covered by the proposed evaluation criteria. Criteria under Principles 1 and 2 address most of the issues associated with resource inventory and pre-season planning while Principle 3 criteria address in-season management and post-season evaluations. Issues associated with research and stock assessment are included under each of the three MSC Principles as they apply to target stocks, non-target stocks and the management of fisheries.

Definitions

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Managers and biologist use a wide variety of terms to describe the groups of fish they manage for specific fisheries. For the purpose of this evaluation we will use the following terms and definitions:

Bycatch – the harvest of non-target species or non-target stocks.

Enhanced stocks - stocks of salmon that have been directly augmented using artificial propagation techniques (e.g. hatcheries, in-stream incubators, spawning channels, hatchery out-planting)

Escapement – those mature salmon that are not harvested and thus may contribute to the spawning component of the stock.

Fisheries scientists outside the management system – this includes fisheries scientists that are not full-time employees of Alaska Department of Fish and Game but have demonstrated expertise related to the fisheries management or stock assessment issues in question. These could include professional scientists employed in the private sector, universities or other non-governmental organizations.

Harvest – those fish or other species that are caught and killed during a fishery or die as a direct result of fishing activity.

Indicator stock – a salmon stock for which detailed information is collected and used to manage a larger group of salmon stocks or stock management unit.

Limit Reference Point (LRP) - indicates the state of a fishery and/or a resource, which is not considered desirable. Fishery harvests should be stopped before reaching it. If a LRP is inadvertently reached, management action should severely curtail or stop fishery development, as appropriate, and corrective action should be taken. Stock rehabilitation programs should consider an LRP as a very minimum rebuilding target to be reached before the rebuilding measures are relaxed or the fishery is re-opened.

Majority – this could be a simple majority (e.g. >50% of the stocks in a stock management unit) or a numerical majority (e.g. >50% of the fish in a stock management unit or scientists in a region), where the management system has provided acceptable rationale for the definition used in their submission for each indicator.

Natural salmon stock – a naturally-spawning stock that includes spawners produced by hatcheries. This terminology is used to distinguish it from a “wild” or native stock that has not been influenced by artificial propagation.

Non-target species – species that are not the focus of the fishery but are caught in a fishery that is attempting to harvest other species.

Non-target stock – a stock of salmon that is not the focus of the fishery but is caught in a fishery that is attempting to harvest other salmon stocks.

Precautionary approach - A set of measures and actions, including future courses of action, which ensures prudent foresight, reduces or avoids risk to the resources, the environment, and the people, to the extent possible, taking explicitly into account existing uncertainties and the potential consequences of being wrong.

Productivity, related to ecological community or the ecosystem – the rate of biomass production per unit area per unit time.

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Productivity, related to salmon – the number of salmon per spawner per unit of time (usually per year). A common measure of productivity for salmon is the number of recruits per spawner, where a fish is classified as a recruit if it survives to be harvested or escapes to a spawning area.

Reference points - A (management) reference point is an estimated value derived from an agreed scientific procedure and an agreed model to which corresponds a state of the resource and of the fishery and which can be used as a guide for fisheries management.

Risk - the possibility of suffering harm or loss; danger; a factor, thing, element, or course involving uncertain danger, a hazard. In decision theory “the degree of probability of loss. A statistical measure representing an average amount of opportunity loss.” This terminology is used “when large amounts of information are available on which to base estimates of likelihood, so that accurate statistical probabilities can be formulated”

Risk analysis - Any analysis of unknown chance events for purposes of effecting or evaluating decisions in terms of possible penalties and benefits attending these events. A method for generating different probability distributions with accompanying cost and benefits that may attend different courses of action.

Stock – meaning a group of salmon defined by its species, spawning location or spawning region, and in some cases run timing.

Stock management unit – meaning the stock or group of salmon stocks that are treated as a single unit when setting management goals or making fisheries management decisions.

Target Reference Point (TRP) - corresponds to the state of a fishery and/or a resource, which is considered desirable. Management action, whether during a fishery development or stock rebuilding process, should aim at maintaining the fishery system at its level.

Target species – the species of salmon that a specific fishery is attempting to harvest.

Target stocks – specific salmon stock or stock management unit that a specific fishery is attempting to harvest.

Uncertainty - The condition of being uncertain. Doubt. Something uncertain. In statistics, the estimated amount or percentage by which an observed or calculated value may differ from the true value. The incompleteness of knowledge about the states or processes in nature.

Wild stocks – stocks of salmon that have not been augmented through artificial propagation techniques (e.g. hatcheries, in-stream incubators, spawning channels, hatchery out-planting).

(Adapted from FAO, 1995 The Precautionary Approach To Fisheries and its Implications for Fishery Research, Technology and Management: an updated review by S.M. Garcia, Fishery Resources Division, FAO Fisheries Department.)

Summary of Performance Indicators

Tables 2A, 2B, and 2C provide a summary of the performance indicators derived for this assessment. This set of performance indicators has subsequently been used in the assessment of both California and Alaska salmon fisheries, with some modifications for British Columbia Salmon Fisheries
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including more specificity about the management performance of enhanced salmon stocks.

Table 2A. MSC Principle 1 - Summary of proposed evaluation criteria for BC commercial salmon fisheries	
MSC PRINCIPLE 1 - Fishery Management for Target Populations	
Criterion 1.1 - Maintain high productivity of target population & associated ecological community	
Subcriterion 1.1.1 - Stock units	
Indicator 1.1.1.1	Stock units defined
Indicator 1.1.1.2	Scientific agreement on units
Indicator 1.1.1.3	Geographic distribution known
Indicator 1.1.1.4	Indicator Stocks
Indicator 1.1.1.5	Enhanced Stocks
Subcriterion 1.1.2 - Monitoring and assessment	
Indicator 1.1.2.1	Reliable estimates of removals
Indicator 1.1.2.2	Reliable estimates of escapement
Indicator 1.1.2.3	Information on fish age and size
Indicator 1.1.2.4	Productivity estimates
Subcriterion 1.1.3 - Management goals	
Indicator 1.1.3.1	Limit reference points
Indicator 1.1.3.2	Target reference points
Criterion 1.2 - Fishery allows for the recovery of depleted stocks (Target Stocks)	
Indicator 1.2.1	Well-defined and effective strategy
Indicator 1.2.2	Stocks are not depleted and harvest rates are sustainable
Criterion 1.3 - Fishing does not impair reproductive capacity	
Indicator 1.3.1	Age, sex and genetic structure are monitored

Table 2B. MSC Principle 2 - Summary of proposed evaluation criteria for BC commercial salmon fisheries.	
MSC PRINCIPLE 2 - Ecosystem and Non-Target Populations	
Criterion 2.1 - Maintain natural functional relationships among species	
Indicator 2.1.1	Impacts on non-target species can be identified
Indicator 2.1.2	Provisions to reduce ecosystem impacts
Indicator 2.1.3	Sufficient research to manage ecosystem impacts
Indicator 2.1.4	Monitoring and research related to escapement goals
Criterion 2.2 - Fishery minimizes impacts on endangered, threatened or protected species	
Indicator 2.2.1	Information on biological diversity acquired and used by managers

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Criterion 2.3 - Fishery allows for the recovery of depleted stocks (Non-target Stocks)

Indicator 2.3.1 Provide for recovery of non-target stocks

Table 2C. MSC Principle 3 - Summary of proposed evaluation criteria for BC commercial salmon fisheries.

MSC PRINCIPLE 3 - Management and Operational Framework

Management Framework

Criterion 3.1 - Management system consistent with MSC principles and criteria

Indicator 3.1.1 Clear and defensible set of objectives

Indicator 3.1.2 Periodic assessment of biological status of target species

Indicator 3.1.3 Identify the impact of fishing on the ecosystem

Indicator 3.1.4 Uses best scientific information and precautionary approach

Indicator 3.1.5 Responses to new information are timely and adaptive

Indicator 3.1.6 Responsive to social and economic impact of fishery

Indicator 3.1.7 Useful and relevant information provided to decision makers

Indicator 3.1.8 Socioeconomic incentives for sustainable fishing

Criterion 3.2 - Framework for research pertinent to management

Indicator 3.2.1 Research plan for target and non-target species, ecosystem and socioeconomic factors

Indicator 3.2.2 Research is timely, available and periodic review of research plan

Criterion 3.3 - Transparency in operations and consultation process

Indicator 3.3.1 Open consultations process

Criterion 3.4 - Measure to control levels of harvest

Subcriterion 3.4.1 - Catch and exploitation levels

Indicator 3.4.1.1 Fishery control systems

Indicator 3.4.1.2 Measures to restore depleted fish populations

Subcriterion 3.4.2 - Ensure that conservation objectives are met.

Indicator 3.4.2.1 Compliance provisions (effective enforcement)

Indicator 3.4.2.2 Monitoring provisions

Criterion 3.5 - Regular and timely review of management system

Indicator 3.5.1 Internal review

Indicator 3.5.2 External review

Indicator 3.5.3 Recommendations from reviews incorporated

Indicator 3.5.4 Mechanism for resolving disputes

Criterion 3.6 - Compliance with legal and administrative requirements

Indicator 3.6.1 Compliance with international agreements

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Indicator 3.6.2	Compliance with domestic laws and regulations
Indicator 3.6.3	Observes legal and customary (First Nation) rights

Fisheries Operational Framework

Criterion 3.7 - Ecosystem sensitive gear and fishing practices

Indicator 3.7.1	Avoid catch and minimize mortality of non-target species
Indicator 3.7.2	No destructive fishing practices
Indicator 3.7.3	Minimize operational waste
Indicator 3.7.4	Cooperation of fishers
Indicator 3.7.5	Fishing methods minimize impacts on habitat

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Final Sub-criteria, Performance Indicators, and scoring guideposts for use in evaluating BC sockeye fisheries

MSC Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Intent:

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favor of short-term interests. Thus, exploited stocks would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

MSC Criterion 1.1

The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.

Our interpretation of MSC Criterion 1: The performance indicators listed under Criteria 1 focused on the adequacy of the information used to manage the fisheries and stocks. For our assessment, we have organized the performance indicators into the three sub-criteria: 1) the definition of the stock units for each fishery; 2) the information available on the harvests, escapement, biological characteristic, and productivity; and 3) the management goals for each stock unit. As in the evaluations of other fisheries, the effect of the fishery on the associated ecological community will be primarily dealt with under Principle 2. However, the 100% level for indicators related to management goals under Principle 1 cannot be achieved unless information is collected on the associated ecological community and used in setting management goals.

Subcriterion 1.1.1 Scientifically defensible stock units have been defined and the geographic distribution of these stocks are known.

The intention of this sub-criterion is to evaluate whether the definition of the stock units are clear and appropriate for each species harvested in the fishery.

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Indicator 1.1.1.1: The stock units are well defined for the purposes of conservation, fisheries management and stock assessment.

100 Scoring Guidepost

- There is an unambiguous description of each stock unit, including: its geographic location, run timing, details on all the component stocks, and rationale for its definition.
- The rationale for each stock unit is clear with regard to conservation, fisheries management and stock assessment requirements.

80 Scoring Guidepost

- The stock units are well defined and include details on the major component stocks.
- The rationale for each stock unit for the target species is clear with regard to conservation, fisheries management and stock assessment requirements.

60 Scoring Guidepost

- The majority of stock units are defined.
- The rationale for the majority of stock units for the target species is clear with regard to conservation, fisheries management and stock assessment requirements.

Indicator 1.1.1.2: There is general scientific agreement that the stock units are appropriate.

100 Scoring Guidepost

- The stock units for target species have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientists outside the management agency that the stock units are appropriate.
- There is general scientific agreement regarding the stock units for non-target species

80 Scoring Guidepost

- There is general agreement among regional fisheries scientists within the management agency that the stock units are appropriate for target species.
- There is no significant scientific disagreement regarding the stock units used by the management agency to formulate management decisions for the fishery.

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60 Scoring Guidepost

- There is general agreement among regional fisheries scientist within the management agency that the majority of stock units are appropriate for target species.

Indicator 1.1.1.3: The geographic range for harvest of each stock unit in the fishery is known.

100 Scoring Guidepost

- The geographic range for harvests of each stock unit in the fishery is estimated and documented each year.
- The information on the geographic range of harvests is monitored during the fishing season and used when making in-season management decisions.

80 Scoring Guidepost

- The geographic range for harvests of target stocks is defined.
- The information on the geographic range of the harvests of target stocks is monitored during the fishing season and is sufficient to prevent the over harvesting of these stocks.
- The information available on the geographic range for harvest of non-target stocks is sufficient to prevent the over harvesting of these stocks.

60 Scoring Guidepost

- The information available on the geographic range for harvests of target or non-target stocks is sufficient to prevent the over harvesting for the majority of the stocks within each stock unit.

Indicator 1.1.1.4: Where indicator stocks are used as the primary source of information for making management decisions on a larger group of stocks in a region, the status of the indicator stocks reflects the status of other stocks within the management unit.

100 Scoring Guidepost

- The status of the indicator stocks is well correlated with the stocks that are most at risk from a conservation point of view, not just correlated with the most productive stocks in the region.

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- The indicator stocks used have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientists outside the management agency that the indicator stocks are appropriate.
- The relationships between indicator stocks and stocks of interest are assessed every three to five years.

80 Scoring Guidepost

- There is general agreement among regional fisheries scientists within the management agency that the status of indicator stocks reflects the status of other stocks within the management unit.
- There is no significant scientific disagreement regarding the indicator stocks used by the management agency to formulate management decisions for the fishery.

60 Scoring Guidepost

- There is no significant scientific disagreement regarding the indicator stocks used by the management agency to formulate management decisions for the fishery.
- There is a scientific basis for the indicator stocks used in the management of the fishery.

Indicator 1.1.1.5: Where stock units are composed of significant numbers of fish from enhancement activities, the management system provides for identification of the enhanced fish and their harvest without adversely impacting the diversity, ecological function or viability of unenhanced stocks.

100 Scoring Guidepost

- Fisheries targeting enhanced stocks are geographically removed from unenhanced stocks and separate terminal harvest areas are established for these fisheries.
- Times and areas have been identified where the majority of enhanced fish migrate through the general fishery.
- There is real time mark recovery program during the prosecution of the fishery that allows determination of harvest rates of the enhanced component of the run and this data is used in regulation of the fishery.

80 Scoring Guidepost

- In fisheries where both enhanced and un-enhanced stocks are harvested at the same time, the harvest guidelines are based on the goals and objectives established for the un-enhanced stocks.

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- There are adequate data and analyses to determine that the presence of enhanced fish in the management units do not adversely impact the unenhanced fish stocks.

60 Scoring Guidepost

- There is general scientific agreement within the management agency regarding the impacts of enhanced fish on the resultant harvest rates or escapements of un-enhanced fish stocks.
- Managers have some scientific basis for assuring that harvest rates for enhanced stocks are not adversely affecting the majority of un-enhanced stocks within each stock unit.

Subcriterion 1.1.2 The monitoring and assessment of fisheries and stocks is adequate for fisheries managers to maintain the high productivity of the target stocks and associated ecological community relative to its potential productivity.

The foundation for the management of most salmon fisheries is information on fishery harvest and escapements. Long-term (>10 yrs) monitoring of specific stocks is generally required to compute estimates of productivity. For some target species, additional information on fish size and age is required. The relative importance of each type of information will vary across fisheries and the species harvested.

Indicator 1.1.2.1: Estimates exist of the removals for each stock unit.

100 Scoring Guidepost

- Catch estimates are available for all fisheries in Canadian waters that harvest the target and non-target stocks harvested in the fishery being evaluated.
- Mortality rates are available for the fish released or discarded during the fishery.
- Catch estimates are available for fisheries outside Canadian waters that harvest the stocks that are the target of the fishery being evaluated.

80 Scoring Guidepost

- Catch estimates are available for all target stocks harvested in the fishery.
- Catch estimates are available for non-target stocks where the catch of the non-target stock may represent a significant component of the harvest of that stock.
- Mechanisms exist to ensure accurate catch reporting and these mechanisms are evaluated at least once every 5 years.

60 Scoring Guidepost

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- Catch estimates for the majority of target stocks are available.
- Catch estimates are available for non-target stocks where the catch of the non-target stocks may represent a significant component of that stock.
- Mechanisms exist to ensure accurate catch reporting and these mechanisms are evaluated at least once every 10 years.

Indicator 1.1.2.2: Estimates exist of the spawning escapement for each stock unit.

100 Scoring Guidepost

- Estimates are available for the annual escapement for each stock unit harvested in the fishery.
- In-season escapement data are collected for all stock units and used to regulate the fishery.

80 Scoring Guidepost

- Estimates are available for the annual escapement of each target stock harvested in the fishery.
- Fishery independent indicators of abundance are available for the non-target species harvested in the fishery.
- In-season escapement data are collected for the target stocks and used to regulate the fishery.

60 Scoring Guidepost

- Escapement estimates for target stocks are available, where escapement estimates are necessary to protect the target stock from overexploitation.
- Fishery independent indicators of abundance are available for non-target stocks where the fishery harvests may represent a significant component of the harvest of that stock.

Indicator 1.1.2.3: The age and size of catch and escapement have been considered, especially for the target stocks.

100 Scoring Guidepost

- Annual monitoring programs collect data on the age and size of the catch and escapement for target and non-target stocks where there is a clear scientific basis for collecting these data.

80 Scoring Guidepost

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- Periodic monitoring programs collect data on the age and size of the catch and escapement for target stocks, and for non-target stocks where the fishery harvests may represent a significant component of the harvest of those non-target stocks.
- There is a scientific basis for the frequency of the sampling program to collect age and size data where there is a clear scientific basis for collecting these data.

60 Scoring Guidepost

- The information on age and size of catch and escapement is adequate, where there is general scientific agreement that these data are important to assess the status of the stocks or adjust fisheries management decisions. For example: information on the age distribution of pink salmon harvests would not be considered important for stock assessment or fisheries management decisions where age information would be important for the assessment and management related to most chinook and sockeye fisheries. Monitoring programs should be in place to detect changes in the size of the fish harvested for each salmon species.

Indicator 1.1.2.4: The information collected from catch monitoring and stock assessment programs is used to compute productivity estimates for the target stocks and management guidelines for both target and non-target stocks.

100 Scoring Guidepost

- Scientifically defensible productivity estimates (e.g. stock/recruitment relationships) have been derived for all target stocks and the relative productivity of non-target stocks is known.
- Risk assessment has been conducted to determine the impact of alternative harvest strategies on non-target stocks. The risk assessment should include an assessment of the uncertainties with estimates of stock productivity for both the target and non-target stocks.

80 Scoring Guidepost

- There is adequate information to identify the harvest limitations and production strategies required to maintain the high productivity of the target stocks.
- There is adequate information to estimate the relative productivity of the non-target stocks where the fishery harvests may represent a significant component of those non-target stocks.
- The harvest limitations for target stocks take into consideration the impacts on non-target stocks and the uncertainty of the productivity for these stocks.

60 Scoring Guidepost

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- The available information and analyses are adequate to identify the harvest limitations and production strategies required to maintain the productivity of the majority of target stocks.
- The relative productivity of the non-target stocks is considered in the management strategy, where the fishery harvests may represent a significant component of those non-target stocks.

Subcriterion 1.1.3 Management goals have been set and are appropriate to protect the stocks from decline to their Limit Reference Point or operationally equivalent undesirable low level of abundance.

Indicator 1.1.3.1: Limit Reference Points or operational equivalents have been set and are appropriate to protect the stocks harvested in the fishery.

The Limit Reference Point (LRP) or operational equivalent set by the management agency has been defined above as “the state of a fishery and/or a resource, which is not considered desirable. Fishery harvests should be stopped before reaching it. If a LRP is inadvertently reached, management action should severely curtail or stop fishery development, as appropriate, and corrective action should be taken. Stock rehabilitation programs should consider an LRP as a very minimum rebuilding target to be reached before the rebuilding measures are relaxed or the fishery is re-opened.”

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- The Limit Reference Point for target species have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientist outside the management agency that the LRP's are appropriate.
- There is general scientific agreement regarding the LRP's for non-target species.

80 Scoring Guidepost

- There is some scientific basis for the LRP's for target stocks and these LRP's are defined to protect the stocks harvested by the fisheries.
- There is no significant scientific disagreement regarding the LRP's used by the management agency to formulate management decision for the fishery.

60 Scoring Guidepost

- There is general agreement among regional fisheries scientist within the management agency that the LRP's or equivalent are appropriate to achieve the management goals for target stocks.

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Indicator 1.1.3.2: Target Reference Points or operational equivalent have been set.

The Target Reference Point (TRP) or operational equivalent set by the management agency has been defined above as “the state of a fishery and/or a resource, which is considered desirable. Management action, whether during a fishery development or stock rebuilding process, should aim at maintaining the fishery system at its level.”

100 Scoring Guidepost

- The Target Reference Point (TRP) for target species have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientist outside the management agency that the TRP's are appropriate.
- The TRP's for the target stocks take into account variability in the productivity of each component of the target stock and productivity of non-target stocks.

80 Scoring Guidepost

- There is no significant scientific disagreement regarding the TRP's used by the management agency to formulate management decision for the fishery.
- The TRP's for the target stocks take into account variability in the productivity of each component of the target stock and the productivity of non-target stocks.

60 Scoring Guidepost

- There is general agreement among fisheries scientist within the management agency that the TRP's are appropriate for the target stocks.
- Target reference points have been defined for the majority of target stocks harvested in the fishery and these target reference points are not scientifically disputed.
- The management agency has taken into account the relative productivity of non-target stocks when setting the TRP's for the majority of target stocks.

MSC Criterion 1.2

Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.

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Our interpretation of MSC Criterion 1.2: This criterion refers to “populations” where our indicators and evaluation criteria refer to stocks or stock units. The evaluation under this criterion will assess the degree to which the management strategy is designed to keep targeted stocks from becoming depleted, and to promote recovery if they become depleted. Note that this has already been partially assessed under Subcriterion 1.1.3.

Indicator 1.2.1: There is a well-defined and effective strategy, and a specific recovery plan in place, to promote recovery of the target stock within reasonable time frames.

100 Scoring Guidepost

- There are comprehensive and pre-agreed responses to low stock size that utilize a range of management measures to ensure rapid recovery.
- Stocks are allowed to recover to the TRP before commercial fisheries are permitted that target these stocks.
- The management agency does not use artificial propagation as a substitute for maintaining or recovering wild stocks.

80 Scoring Guidepost

- In the event of severe depletion, recovery plans are developed and implemented to facilitate the recovery of the depleted stocks with 3 reproductive cycles.
- Stocks are allowed to recover to more than 150% of the LRP for abundance before any fisheries are permitted that target these stocks.

60 Scoring Guidepost

- In the event of severe depletion, recovery plans are developed and implemented to facilitate the recovery of the depleted stocks within 5 reproductive cycles
- Stocks are allowed to recover to more than 125% of the LRP for abundance before any fisheries are permitted that target these stocks.

Indicator 1.2.2: Target stocks are not depleted and recent stock sizes are assessed to be above appropriate limit reference points for the target stocks.

In contrast to Indicator 1.2.1, which evaluates the strategy for stock recovery, this indicator evaluates the current status of the target species or stocks, and the basis for being reasonably certain about their status. The Scoring Guideposts are arranged hierarchically, so that evaluation

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of the current status depends on the assessment, which in turn depends on data and knowledge about the stocks and the fishery

100 Scoring Guidepost

- There is general agreement among regional fisheries scientist outside the management agency that the methods of estimating escapements and exploitation rates for the target stocks are scientifically defensible.
- Management actions have reduced fishing as the target stocks approach the LRP and fisheries have only resulted in escapements that approach or are below the LRP escapement goal in one year in a period of the most recent 10 consecutive years, for any of the target stocks.

80 Scoring Guidepost

- There is general agreement among regional fisheries scientist inside the management agency that the methods of estimating escapements and exploitation rates for the target stocks are scientifically defensible.
- Management actions have reduced fishing as the target stocks approach the LRP and fisheries have only resulted in escapements that approach or are below the LRP escapement goal in one year in a period of the most recent 5 consecutive years, for any of the target stocks.

60 Scoring Guidepost

- There is general agreement among regional fisheries scientist inside the management agency that the methods of estimating escapements and exploitation rates for the majority of target stocks are scientifically defensible.
- Management actions have reduced fishing as the target stocks approach the LRP and fisheries have only resulted in escapements that approach or are below the LRP escapement goal in no more than two years in a period of the most recent 5 consecutive years, for the majority of the target stocks.

MSC Criterion 1.3

Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

Our interpretation of MSC Criterion 1.3: The effects of fishing on the “reproductive capacity” of the target stocks have already been partially assessed under criterion 1.1 and 1.2. Criterion 1.3 considers specific concerns about impacts of fishing on age, size, sex and genetic structure of British Columbia Salmon Fisheries

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stocks. Because genetic structure is very difficult to determine in most exploited fish stocks, impacts on component stocks (i.e. the stocks that comprise a stock unit) are used as a proxy at the 80 scoring level. Also included in this indicator is an assessment of the management agency's ability to identify and manage the potential impact of enhanced stocks on un-enhanced stocks.

Indicator 1.3.1: Information on biological characteristics such as the age, size, sex and genetic structure of the target stocks is considered prior to making management decisions and management actions are consistent with maintaining healthy age, size, sex and genetic structure of the target stocks.

100 Scoring Guidepost

- There is comprehensive knowledge of the effect of fishing on biological characteristics such as the age, size, sex and genetic structure of the target stocks and the impact of changes in these factors on the reproductive capacity of the target stocks.
- Management actions are consistent with maintaining healthy target stocks relative to biological characteristics such as age, size, sex and genetic structure of all target stocks.
- Enhanced fish are identified and managed as separate target stocks.

80 Scoring Guidepost

- The knowledge of the effect of fishing on biological characteristics such as the age, size, sex and component stocks is adequate to detect threats to the reproductive capacity of the target stocks.
- Management actions are consistent with maintaining healthy target stocks relative to biological characteristics such as age, size, sex and genetic structure of all target stocks.
- The management system includes provisions to minimize any adverse impacts to the genetic structure of un-enhanced stocks that may be due to the enhancement of other stocks.

60 Scoring Guidepost

- The knowledge of the effect of fishing on the biological characteristics such as age, size, sex and component stocks is adequate to detect threats to the reproductive capacity of the majority of target stocks.
- Management actions are consistent with maintaining healthy target stocks relative to biological characteristics such as age, size, sex or genetic structure for the majority of target stocks.
- The management system includes provisions to minimize the major adverse impacts for the majority of un-enhanced stocks that may be due to the enhancement of other stocks.

MSC PRINCIPLE 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

Intent: The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem. The criteria and indicators developed are limited to the impacts of fishing operations and the response and effectiveness of the regulatory system to impacts external to the commercial fishing operations, such as other harvests, climate change, and habitat degradation. We acknowledge that forces other than commercial fishing may result in a fishery being unsustainable, and that these may be anthropogenic or natural forces. This certification process addresses the impact of commercial fishing on the harvested stocks and the ecosystem, and the response of fishers and managers to changes in external environmental factors.

MSC Criterion 2.1

The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.

Intent

In the certification of the Alaska salmon fishery, the performance indicators listed under Criteria 1 focused on the adequacy of the information used to assess non-target discards and the effects of harvests on associated ecosystems. For our assessment, we have reorganized the Alaskan performance indicators into two indicators that reflect impacts on marine systems (bycatch and biomass removal) and on freshwater systems (adequacy of escapements in maintaining the ecosystem and integrity of watersheds). These indicators are: 1) the adequacy of management plans, data collection and monitoring of directed marine fisheries on by-catch; 2) the adequacy of escapement objectives to address the freshwater ecosystem concerns. The degree to which the information is collected in the management of the fisheries under Principle 1 will apply for determining if this criterion is adequately addressed and will influence the evaluation scores.

Indicator 2.1.1: The management plan for the prosecution of the marine fisheries provides a high confidence that direct impacts on non-target species are identified.

The intent of this measure is to ensure that the management plans for the fisheries require collection of adequate data to address direct impacts of fishing on non-target species.

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- A monitoring program exists that provides estimates of bycatch that meet statistical criteria acceptable to external reviewers.
- All historic monitoring data is readily available to stakeholder groups and external reviewers.
- Quantities of gear lost are recorded, and the impacts of lost gear on target and non-target species have been researched and accurate projections of impacts have been completed.

80 Scoring Guidepost

- A monitoring program exists that provides estimates of bycatch.
- In known problem areas of high bycatch, there is an ongoing monitoring program.

60 Scoring Guidepost

- Data on bycatch in the majority of the fisheries are available to determine impacts on non-target species.

Indicator 2.1.2 The management system includes measures to reduce marine ecosystem impacts.

For salmon fisheries, the primary concerns related to marine ecosystem impacts are related to the bycatch of non-salmon species and the removal of large numbers of the target salmon species.

100 Scoring Guidepost

- A risk assessment of bycatch concerns has been conducted as part of developing the management plan.
- The effect of the fishery on the marine ecosystem has been explicitly addressed in the management plan.
- Research has been conducted on marine piscivores that utilize the target species to ensure that commercial harvests do not present significant risks to the populations of these piscivores.
- Where conflicts exist between the harvest of fish and ecosystem concerns based on their removal, the balance achieved has been the subject of an open review by stakeholders.
- This information is presented in documents that are made available to stakeholders.

80 Scoring Guidepost

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- The effect of the fishery on the marine ecosystem has been addressed by the management system.
- Where problems are identified, fisheries managers make adjustments to reduce impacts on non-target species.
- Where conflicts exist between the harvest of fish and ecosystem concerns based on their removal, the balance achieved has been made known to stakeholders through publicly available information sources.

60 Scoring Guidepost

- The management system does include measures to reduce marine ecosystem impacts to achieve management objectives.
- The management system has a history of responding to bycatch mortality problems and has procedures that are followed to limit bycatch.

Indicator 2.1.3 Research efforts are ongoing to identify new problems and define the magnitude of existing problems, and fisheries managers have a process to incorporate this understanding into their management decisions.

The intent of this measure is to ensure that a research program has been established to evaluate historic and new data to identify future problems. It is also necessary to have an established management process that will ensure research conclusions can quickly be transparently incorporated into future management activities associated with prosecuting the fishery.

100 Scoring Guidepost

- There is detailed knowledge of the relationship between the fishery and the marine ecosystem impacts or ongoing research is attempting to identify if such problems exist.
- The management agency has a proven history of incorporating new research findings into management plans.
- The management agency has a proven history of closing fisheries when bycatch mortality problems arise.
- The management agency has supported the development of more selective fishing practices.

80 Scoring Guidepost

- There is ongoing research of previously identified problems areas to determine if bycatch reduction measures are effective.
- When new problems are identified, the management plans require a new monitoring program be instituted to determine the effectiveness of bycatch reduction measures.

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- The management plan allows for between season assessment and institution of new controls on the fishery or stakeholder consultation following the identification of bycatch problems or ecosystem related impacts.
- The management agency has a proven history of successfully arbitrating stakeholder concerns when balance between fish harvests and ecosystem concerns have arisen.

60 Scoring Guidepost

- The management agency collects or plans to collect data on bycatch problems or ecosystem concerns.
- There are procedures established to incorporate any knowledge obtained about bycatch problems into management actions.
- The management agency responds to data provided on bycatch problems by entities outside of their agency.

Indicator 2.1.4 The management system supports research efforts to understand the adequacy of existing escapement goals for meeting freshwater ecosystem needs.

The intent of this is to encourage the collection of information and data that can be used to address freshwater ecosystem concerns. It is our intent that future reviews of Pacific Salmon certification demonstrate that the information developed from these research programs on ecosystem requirements, such as aquatic system nutrient requirements and piscivore food requirements are incorporated into the management system.

100 Scoring Guidepost

- There is research to determine tradeoffs of fish harvests with ecosystem concerns such as providing for sustainable populations of dependent components of the aquatic ecosystem.
- Results and conclusions from research are made available to stakeholders.

80 Scoring Guidepost

- Ongoing research is supported to determine the impacts of carcass on freshwater ecosystem processes and identify any tradeoffs between harvests and freshwater ecosystem concerns.
- The management system provides for the communication of research results to managers so that the results can be used in the development of escapement goals for meeting freshwater ecosystem needs.

60 Scoring Guidepost

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- The management system supports research efforts to understand the adequacy of existing escapement goals for meeting freshwater ecosystem needs.

MSC Criterion 2.2

The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimizes mortality of, or injuries to endangered, threatened or protected species.

Intent

This criteria focuses on direct mortality of the prosecuted fisheries on non-target species and the adequacy of the management units of the target species to ensure significant sub-components of the target species are adequately protected to provide for a reasonable expectation of sustainability of these components and their contribution to the genetic diversity of the target population. The impacted species of concern are expanded beyond that of the Alaska Criteria to ensure icon species, such as marine mammals, bears, coastal wolves, and eagles, are adequately protected from direct or indirect impacts of the fisheries (we define icon species as any species of particular public interest that does not qualify under the terms ‘endangered, threatened, or protected’). These impacts may be identified at the population and community level. We also address the issue of harvests of fish stocks that have been created or enhanced through fisheries enhancement activities, such as fish hatcheries and spawning channels. Our concern is that the production or harvest of enhanced stocks does not affect the sustainability of natural spawning stocks by adversely impacting the genetic structure of the wild fish. The enhanced component of fish stocks are assumed to be addressed as separate stocks using the indicators and guidelines listed.

Indicator 2.2.1 The management of the fishery includes provisions for integrating and synthesizing new scientific information on biological diversity at the genetic, species or population level of all species harvested in the fishery and impacts on endangered, threatened, protected or icon species.

The intent of this measure is to ensure that the management system incorporates available knowledge and considers the impacts of the fishery on biodiversity issues. This indicator includes the impacts of enhanced fishery harvests on these issues.

100 Scoring Guidepost

- A risk assessment has been conducted, based on current knowledge of direct and incidental mortalities from the fishery, to ensure the fishery does not pose a significant threat to the biodiversity of the target or non-target species.

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- Stock composition including enhanced component, is known within Fishery Management Units with the likelihood of harvest of endangered, threatened, protected, or icon species has been estimated.
- Time and area of migrations of weak year classes, sub-stock or population components are known.
- The management system contains provisions to reduce harvests based on biodiversity concerns of affected endangered, threatened, protected or icon species, or weak year classes, of stocks, including the enhanced components, of the targeted species.

80 Scoring Guidepost

- The fishery has been monitored and the stock composition is assessed with a special effort to determine presence of rare, endangered, protected, or icon species.
- The management agency has a history of incorporating new research into management as new research data on impacts of fisheries on biodiversity become available.
- The fisheries management system includes provisions for harvest reduction when biodiversity concerns are identified for target or non-target species.

60 Scoring Guidepost

- Efforts are being made to assess the impacts of the fishery on the biodiversity of the endangered, threatened, and protected or icon species.
- The impact of the fishery on endangered, threatened, and protected or icon species is identified and is considered in the management of fisheries.
- There are provisions in the management system to reduce the impacts of the fishery on the biodiversity of the endangered, threatened, and protected or icon species.

MSC Criterion 2.3

Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

Intent

Are reductions in fish abundance caused by human activity, unrelated to the directed harvest, considered in the management plan and in the establishment of escapement goals? If so, is the management system sufficiently robust to accommodate the long term recovery of depleted populations and ensure that directed or by-catch harvests, including harvests on enhanced fisheries, do not present significant risks to the long term sustainability of these populations.

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Indicator 2.3.1 Management strategies include provision for restrictions to the fishery to enable recovery of non-target stocks to levels above established LRPs (Limit Reference Points)

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- The management plans and escapement goals have been shown to have a high (>80%) probability of achieving a long-term recovery of depleted non-target stocks using risk analysis.
- Historic data have been thoroughly examined to ensure fisheries restoration objectives are based on the likely habitat capacity, rather than on trends that cover only the most recent decades, thus avoiding the “moving baseline” syndrome.
- Monitoring and assessment programs are established to determine with a high degree of confidence and in a timely manner that recovery is occurring.
- Proposed management strategies have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- The management system supports the collection of data on non-fishing related human activity in the development of recovery plans for non-target stocks.

80 Scoring Guidepost

- The management system includes assessment of plans for the recovery of non-target stocks to levels above established LRPs.
- Objectives for recovery have at least some consideration of historic documents on stock abundance.
- The management system has a reasonable (>60%) probability of achieving long-term recovery of depleted non-target stocks.
- Monitoring and assessment programs are established to determine with a high degree of confidence and in a timely manner that recovery is occurring.
- Escapement goals will be revised periodically to accommodate new data indicating success or failure of existing recovery plans.
- The management system considers the impact of non-fishing related human activity in the development of recovery plans for non-target stocks

60 Scoring Guidepost

- The management system attempts to prevent extirpation of non-target stocks and does have rebuilding strategies for the majority of the stocks.
- The management system has at least a 50% probability of achieving long-term recovery of depleted non-target stocks.

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- The management system has a strategy for periodic revisiting escapement goals to respond to new data on recovery success or failure for the majority of the stocks.

MSC PRINCIPLE 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

MSC Intent: The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

For the purposes of this section, the management system is defined to mean all public sector entities with responsibility for managing salmon in British Columbia, including Fisheries and Oceans Canada (FOC), the Pacific Salmon Treaty (PST), and Pacific Salmon Commission (PSC), in addition to scientific assessment groups such as Pacific Scientific Advice Review Committee (PSARC) and other governmental entities that provide advice to managers.

Some indicators under Principle 3 appear to overlap with indicators under Principles 1 and 2, however, Principles 1 and 2 are concerned with the outcomes of a management system respecting the fact that the resources are maintained at the desired levels of abundance, while Principle 3 is concerned with evaluating whether all of the processes for reaching management objectives are in place.

Management System Criteria

MSC Criterion 3.1

The management system has a strategy for management that clearly defines long-term objectives for managing the impact of fishing on target species, non-target species and the ecosystem; the objectives are consistent with a well- managed fishery and MSC principles and criteria; and the management strategy includes provision for the effective implementation of measures to attain these objectives.

Intent:

The objective regarding this criterion dealing with Management Systems is to compare the Fisheries and Oceans Canada management system for British Columbia salmon, as detailed in the Integrated Fisheries Management Plan for British Columbia Salmon, and elsewhere, with the standards for a well-managed fishery as defined in the MSC Principles and Criteria for Sustainable Fishing. Particularly important is whether the management system has clearly defined objectives and goals that incorporate currently evolving standards for responsible fisheries management with respect to conservation of the species, regard for the ecosystem to

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which they belong, transparency of the management process and recognition of the impact of the fishery on social, cultural and economic issues.

Throughout this section the term “impact on the ecosystem” is taken to mean the degree to which fishing alters the ecosystem relative to its non-fished state.

Indicator 3.1.1: The management system has a clear and defensible set of objectives for the harvest and escapement for target species and accounts for the non-target species captured in association with, or as a consequence of, fishing for target species.

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- Management objectives are clearly defined for all of the target stocks and are consistent with the MSC criteria for a well-managed fishery.
- Harvest rates and escapement goals are precisely set for each target stock unit in the fishery, as qualified by relevant environmental factors.
- Target Reference Points and Limit Reference Points are clearly defined and documented for each target stock unit in the fishery.
- Harvest controls are effective with respect to the attainment of management objectives for each target stock unit in the fishery.
- The management system provides estimates for all catches, landings and bycatch.

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- Management objectives are clearly defined for most of the target stocks and are consistent with the MSC criteria for a well-managed fishery.
- Harvest rates and escapement goals are set for target stocks or target species in the fishery, as qualified by relevant environmental factors.
- Harvest controls are precise and effective for major target stocks or target species in the fishery.
- The management system provides estimates for all major catches, landings, and bycatch.

60 Scoring Guidepost

- Management objectives are clearly defined and consistent with MSC criteria for a well-managed fishery for the majority of target stocks.
- Harvest controls are effective for the majority of the fisheries on target stocks.
- The management system provides for the estimation of catch, landing, and bycatch for the majority of the fisheries.

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Indicator 3.1.2: The management system provides for periodic assessment of the biological status of the target species and the impact of fishing.

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- There is an annual assessment or update of the status of stocks for each major target stock unit in the fishery.
- When results of the assessments or updates indicate that there has been a substantial change in the status of the stocks, this new information is made available to stakeholders in conjunction with the implementation of changes to management measures.
- Reports on the methodologies used for the assessments are published on a regular basis in peer-reviewed journals and PSARC, and/or the appropriate PSC committee regularly reviews the technical analyses for the assessments.

80 Scoring Guidepost

- Assessments or updates of the status of the stocks for the major target stock units are made on a periodic basis, dependent upon the level of exploitation.
- Results of assessment and updates of the status of the stocks are made available to stakeholders in a timely fashion.
- Reports on the methodologies used for the assessments are published in non-peer reviewed reports, and PSARC or the appropriate PSC committee reviews the technical analyses for the assessments.

60 Scoring Guidepost

- Assessments or updates of the status of the stocks for the majority of the target species are made for major fishing regions within the fishery.
- Results of assessment or updates of the status of the stocks are made available to stakeholders.
- Technical analysis and methodologies used for the assessments are published or distributed to stakeholders. .

Indicator 3.1.3: The management system includes a mechanism to identify and manage the impact of fishing on the ecosystem.

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- Monitoring systems are in place to detect the impact of fishing on the ecosystem.

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- Where potential impacts of fishing on the ecosystem have been identified, the management system has clear and well-defined objectives for evaluating and managing the impact of the fishery on the ecosystem.
- Control mechanisms are used to minimize impacts of fishing on the ecosystem.
- There is sufficient evidence to indicate that when used, control mechanisms are adequate for meeting the management objectives.

80 Scoring Guidepost

- The management system includes mechanisms to identify and evaluate the impact of fishing on the ecosystem.
- Control mechanisms are used to minimize impacts of fishing on the ecosystem.

60 Scoring Guidepost

- The management system takes measures to control the impacts of the fishery on the ecosystem in the majority of cases where impacts have been verified.

Indicator 3.1.4: When dealing with uncertainty, the management system provides for utilizing the best scientific information available to manage the fishery, while employing a precautionary approach.

Uncertainty always exists in estimates of the status of a stock, and technically it is not generally possible to determine the accuracy of the assessments. This uncertainty results from sampling and measurement error, limited understanding of the biology of the fish being modeled, error in model assumptions, and an inability to model all of the important processes that affect the dynamics of the stock. It can also arise as a result of changing fishing technology. However, some idea of the uncertainty can be detected or measured through sampling theory, by lack of fit of the model being used, or by sensitivity analysis.

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- The management system provides for the routine assessment of the level of uncertainty in the information collected for management and establishes management controls to address these uncertainties using the best available scientific information and a precautionary approach. .
- The management system implements research efforts to address data gaps.
- For newly developing fisheries for which there is very limited data and information, the management system implements controls on the development of the fishery that are precautionary in nature.
- The management system always quantitatively evaluates the effect of implementation uncertainty (the tendency for actual harvest rates or escapements to differ from those

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intended by the management regulations) on the effectiveness of the proposed management actions.

80 Scoring Guidepost

- The management system provides for some assessment of the level of uncertainty in the information collected for management and establishes management controls which take into account these uncertainties, using the best available scientific information and a precautionary approach.
- In situations when precautionary measures are necessary to manage the fishery, the management system calls for increasing research efforts in order to fill data and information gaps.
- In most cases where there are newly developing fisheries, the management system implements controls on the development of the fishery that are precautionary in nature.
- The management system considers the effect of implementation uncertainty on the effectiveness of most of the proposed management actions.

60 Scoring Guidepost

- The management system for the majority of newly developing fisheries is consistent with a precautionary approach.
- The management system considers the effect of implementation uncertainty on the effectiveness of the majority of the proposed management actions.

Indicator 3.1.5: **Management response to new information on the fishery and the fish populations is timely and adaptive.**

Intent: The management system should be timely and adaptive i.e., new information used by the management system to initiate new management measures or to update and/or improve current management measures in a timely fashion, because characteristics of the fishery can change and/or the natural system can show reduced or increased productivity over time.

100 Scoring Guidepost

- The management system provides a mechanism for rapid adjustments to be made to its management programs.
- When new information or findings support altering the management and conservation programs (such as stock recovery plans), there is evidence to demonstrate that such adjustments are made within 6 months of obtaining the new information.

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- The management system provides a mechanism for responding to unexpected changes in the fishery.
- When new information or findings support altering the management and conservation programs, adjustments are made within 12 months of obtaining the new information.

60 Scoring Guidepost

- For the majority of cases there are provisions for making timely adjustments to the management program, and when they are made the lag time is not so great as to result in the adjustments being ineffectual.

Indicator 3.1.6: The management system provides a process for considering the social and economic impacts of the fishery.

100 Scoring Guidepost

- There exists a formal and well-defined process to consider, over the short and long term, the views, customs, and interests of indigenous peoples who depend on fishing for their food or livelihood.
- There is a formal and well-defined process to consider, over the short and long term, the impact of the fishery on coastal communities that are closely tied to the fishery.
- There are no direct subsidies to the fishing industry.
- The management system regularly seeks and considers input from stakeholders in an effort to understand and address socioeconomic issues related to the fishery.

80 Scoring Guidepost

- The management system regularly undertakes to consider the views, customs and interests of indigenous peoples whose livelihood or food are dependent on the fishery.
- The management system regularly takes into consideration the impact of the fishery on coastal communities that are closely tied to the fishery.
- There are no subsidies to the fishing industry that would lead to unsustainable fishing or ecosystem degradation.
- The management system regularly undertakes measures to understand the socioeconomic impacts resulting from the management of the fishery.

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- The management system more often than not considers the views, customs, and interests of indigenous peoples who depend on fishing for a livelihood or food.
- More often than not the management system considers the impact of the fishery on coastal communities that are closely tied to the fishery.
- For the majority of the fisheries there are no subsidies that threaten sustainable fishing.
- More often than not, the input of stakeholders is sought by the management system.

Indicator 3.1.7: The management system provides decision makers with useful and relevant information and advice for managing the fishery.

100 Scoring Guidepost

- The management system provides decision makers with a range of alternatives for achieving the objectives of management, including risk assessments for each alternative.
- All management decisions are based on useful and relevant information and advice that is provided through the management system.
- The management system, whenever possible, provides information to decision makers within a time frame that permits management controls to be determined before they need to be taken.

80 Scoring Guidepost

- The management system provides managers with a range of alternatives for management.
- Management decisions consistently rely on useful and relevant information provided within the system and there is not a record of decisions going against the information provided.

60 Scoring Guidepost

- The majority of management decisions rely on data, useful and relevant information, or advice provided through the management system.
- Risk assessments are considered in formulating important management decisions.

Indicator 3.1.8: The management system provides for socioeconomic incentives for sustainable fishing.

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- The management system has formal procedure for providing social and economic incentives to stakeholders in the fishery to develop and utilize sustainable fishing practices, particularly the development of selective fishing gear and practices that lead to improved conservation.
- The management system creates strong incentives for harvesters to not exceed target catches or exploitation rates
- The stakeholders in the fishery regularly avail themselves of the opportunity to utilize these incentives.
- Evidence provided by the management system demonstrates that such incentives have contributed to improved conservation.
- The management system continually attempts to understand the impact of their decisions on social and economic factors affecting the stakeholders in the fishery and regularly takes action to mitigate the impacts on stakeholders.

80 Scoring Guidepost

- The management system regularly considers the use of social and economic incentives to the stakeholders in the fishery, which are designed to facilitate the development of fishing gear and practices that can lead to sustainable fishing.
- The management system includes a program to create incentives for harvesters to not exceed target catches or exploitation rates.
- Evidence demonstrates that the stakeholders in the fishery have used such incentives.
- The management system attempts to understand the impact of their management decisions on social and economic factors affecting the major stakeholders in the fishery and takes action to lessen the major impacts on stakeholders.

60 Scoring Guidepost

- The management system provides for the use of social or economic incentives to ensure sustainable fishing.
- The management system attempts to understand the impact of its decisions on social and economic factors affecting the stakeholders in the fishery and is responsive to requests to reduce these impacts.

MSC Criterion 3.2

The management system provides for a framework for research, the results of which are pertinent to achieving the objectives of management.

Under this criterion we are interested in evaluating whether there is a research component to the management system that is sufficiently broad in scope to include all target species and other components of the ecosystem that may be impacted by fishing, and which provides for the acquisition of information and data to support scientifically- sound management actions, and whether the research is timely, open to review by peers and stakeholders in general, and is adequately funded.

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Indicator 3.2.1: The research plan covers the scope of the fishery, includes all target species, accounts for the non-target species captured in association with, or as a consequence of fishing for target species, and considers the impact of fishing on the ecosystem and socioeconomic factors affected by the management program.

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- The management system incorporates a research component that considers relevant data and information needs for formulating management strategies for all target species, and also information leading to an understanding of the dynamics of the ecosystem including data on the catch, landings and discards of non-target species.
- The framework for research includes investigations dealing with socioeconomic impacts of the fishery.
- The research plan responds in a timely fashion to unexpected changes in the fishery.
- Funding is secure and sufficient to meet long-term research needs.
- There is significant continuing progress in understanding the impact of the fishery on target and non-target species, and the ecosystem in general.
- Research results form the basis for formulating management strategies and decisions.
- Research is regularly published in peer review journals and/or is reviewed by PSARC or the PSC.

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- The management system incorporates a research component that provides for the collection and analysis of information necessary for formulating management strategies and decisions for both target and non-target species.
- The research plan addresses concerns related to the impact of the fishery on the ecosystem.
- The research plan addresses socioeconomic issues that result from the implementation of management.
- The research plan is responsive to changes in the fishery.
- Funding is adequate to support short-term research needs.
- There is progress in understanding the impact of the fishery on target and non-target species.
- Research results are utilized in forming management strategies
- Research is reviewed by PSARC or PSC, or other appropriate and technically qualified entities.

60 Scoring Guidepost

- Research provides for the collection of catch statistical and biological data for the target species.

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- There has been useful research on the impact of fishing on target and non-target species taken in the fishery, and on the ecosystem in general.

Indicator 3.2.2: Research results are available in a timely fashion to interested parties, and there is a mechanism for periodic review of the content, scope and results of the research plan.

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- There is a formal and codified arrangement for annual stakeholder review of the content and scope of research plans and results, including matters related to its funding, which is open and transparent.
- There is a formal and codified arrangement for peer review of ongoing research
- The management system regularly incorporates into the research plan recommendations emanating from these reviews.
- Research results are made available to all interested stakeholders on a regular basis and in a timely manner.

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- The management system provides for periodic reviews by stakeholders in the fishery, of the content and scope of research, including funding requirements.
- There are periodic peer reviews of ongoing research.
- Inputs from these reviews are used by the management system to modify research plans.
- Research results are available to interested parties on a regular basis.

60 Scoring Guidepost

- While there are no formal arrangements for stakeholder research review, such reviews are held on a periodic basis for the majority of the research plans and/or results.
- While there are no formal arrangements for peer review of ongoing research, such reviews are periodically conducted for the majority of ongoing research plans and/or results.
- The majority of research results are available to interested parties.

MSC Criterion 3.3

The management system allows for transparency with respect to its operational details, including a consultative process that provides for the incorporation of information and data from stakeholders in the fishery related to matters of a social, cultural, economic and scientific nature.

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The objective here is to evaluate whether the management system is open and transparent with respect to all interested parties and whether the views of stakeholders are considered in formulating management strategies.

Indicator 3.3.1: Provides for a consultative process that is open to all interested and affected stakeholders, which allows for their input on a regular basis into the management process.

100 Scoring Guidepost

- The management system provides a formal arrangement for the direct participation of all interested and affected stakeholders from both the public and private sectors, on matters of a social, cultural, economic and scientific nature.
- The management system provides timely, advanced notice of meetings at which there can be stakeholder participation.
- The management system does not exclude any interested and affected stakeholder from the consultative process.
- The management system addresses the interests of all interested and affected stakeholders.

80 Scoring Guidepost

- The management system provides for the regular participation of most interested and affected stakeholders on matters of a social, cultural, economic and scientific nature.
- The management system generally provides notice of meetings at which there can be stakeholder participation.
- The management system does not usually exclude involvement of any interested and affected stakeholder.
- The views of most interested and affected stakeholders are regularly considered in the formulation of management strategies.

60 Scoring Guidepost

- The majority of interested and affected stakeholders are provided with a forum for input into the formulation of management plans and measures.

MSC Criterion 3.4

The management system implements measures to control levels of exploitation in the fishery.

Sub-Criterion 3.4.1: The management system has provisions for controlling levels of exploitation to achieve the escapement and/or harvest rate goals for target

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stocks, and for the setting of harvest limits for non-target species, when there is information indicating such limits are necessary.

Under this sub-criterion the issue of whether the management system provides for mechanisms such as closed areas, no take zones, and closed dates and times for placing controls on fisheries to ensure that objectives related to exploitation levels and escapement are achieved is evaluated.

Indicator 3.4.1.1: Utilizes methods to limit or close fisheries in order to achieve harvest and/or escapement goals, including the establishment of closed areas, no-take zones, and closed dates and times when appropriate.

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- The management system provides a formal and codified system to achieve harvest and/or escapement goals for target stock units and, as appropriate, non-target species of fish.
- The management system provides a formal and codified mechanism for establishing closed areas, no-take zones, and closed dates and times for any areas of the fishery.
- Management sets exploitation and escapement levels designed to maintain the target stock units at levels of abundance that can sustain high productivity.
- There is no evidence provided by the management system to indicate that, as a result of fishing, target stock units are in serious decline or degradation of the ecosystem is occurring.
- Measures are currently implemented to achieve these objectives.

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- Harvest rates and/or escapement levels designed to achieve target goals are regularly implemented.
- The management system provides for the establishment of closed areas, no-take zones and closed dates and times.
- Controls are set to maintain or restore target species to high productivity levels, and in a manner that does not contribute significantly to ecosystem degradation.
- Measures that limit harvest rates and set escapement goals are implemented when necessary.

60 Scoring Guidepost

- Harvest rates and/or escapement goals for the majority of the target stocks are effective in halting declines in stock abundance caused by the fishery.
- Established harvest and/or escapement goals for target stocks consider the impact of the fishery on the majority of the non-target species, and on the ecosystem generally.

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Indicator 3.4.1.2: Provides for restoring depleted target species to specified levels within specified time frames.

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- The management system has a formal and codified mechanism, which is adequate for restoring depleted target stocks to the TRP or equivalent high level of abundance, as qualified by relevant environmental factors.
- The mechanism includes strict guidelines for restoring these depleted populations within a certain time frame are formalized by the management system.

80 Scoring Guidepost

- The management system includes measures, which are adequate to restore depleted populations of target stock to the TRP or equivalent high level of abundance as qualified by relevant environmental factors.
- A time schedule for restoration, which considers environmental variability, is determined by the management system.

60 Scoring Guidepost

- The management system includes measures for restoring the majority of depleted populations of target stock to the TRP or equivalent high level of abundance.

Sub-Criterion 3.4.2: The management system incorporates measures to ensure that its objectives regarding the conservation of the stocks under its purview and the impact of the fishery on the ecosystem are carried out.

Two major issues are dealt with under this topic. One examines whether the management system includes provisions to determine whether there is adequate enforcement of the measures established for achieving the objectives of management. In these evaluations, compliance is considered to be the result of adequate enforcement mechanisms by the management system and education with respect to providing clear and timely information to the fishing industry regarding such measures. The other examines whether the management system includes adequate monitoring of the fishery so as to evaluate the performance of the fishery with regard to the policies and objectives of management.

Indicator 3.4.2.1: The management system includes compliance provisions.

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- The management system provides for a formal arrangement, such as a compliance committee or a staff review team on compliance, to review the effectiveness of enforcement.
- Education and enforcement procedures are implemented and applicable rules are consistently applied.
- Enforcement actions are effective in achieving the objectives of management.
- There are no infractions being consistently committed in the fishery.

80 Scoring Guidepost

- The management system includes compliance provisions that are effective for the fisheries.
- Infractions, which result in adverse impacts on the status of the stocks or on the ecosystem, are rare.

60 Scoring Guidepost

- The management system includes compliance provisions that are effective for the majority of the fisheries.

Indicator 3.4.2.2. The management system includes monitoring provisions.

100 Scoring Guidepost

- The management system incorporates a formal, effective program for monitoring the fishery, which fully evaluates the performance in terms of whether the regulations are resulting in the intended harvest rates and/or escapements, and achievement of objectives regarding impacts on the ecosystem caused by the fishery.
- Monitoring is comprehensive, and includes all relevant components of the fishery
- Results are reported widely on a regular and timely basis.

80 Scoring Guidepost

- The management system incorporates an effective monitoring program, which evaluates the performance of the fishery relative to management goals and policies.
- Monitoring is broad in scope, and results are available to the majority of the stakeholders.

60 Scoring Guidepost

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- The management system includes provisions for a monitoring program to evaluate the performance of the majority of the fisheries against its policies and objectives.

MSC Criterion 3.5

The management system provides for regular and timely review and evaluation of its performance, and for appropriate adjustments based on the findings of these reviews and evaluations that are consistent with the objectives of the program.

The objective under this criterion is to evaluate whether the management system has an effective mechanism for reviewing performance vis-à-vis the objectives and policies of the management programs. An effective mechanism would include both internal and external reviews, and, when appropriate, the recommendations from the reviews would be incorporated into the management of the fishery. Also, the issue of whether the management system provides a mechanism for resolving disputes emanating from such reviews, or any other sources, is evaluated.

Indicator 3.5.1: There is an effective and timely system for internal review of the management system.

100 Scoring Guidepost

- The management system provides for continuing internal review that is broad in scope, effective, and timely.
- The review process and results are made available to all stakeholders.

80 Scoring Guidepost

- The management system includes provision for an internal review that is conducted periodically as the need arises.
- The results of the review are made available to interested stakeholders.

60 Scoring Guidepost

- The management system provides for internal review of its performance, and when available, review results are made available to the majority of interested stakeholders.

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Indicator 3.5.2: There is an effective and timely system for external review of the management system.

100 Scoring Guidepost

- The management system provides for one or more independent experts to review at least bi-annually all of the important components of management performance.
- The format and standards of the review are established with input from outside the management system.
- Provision is made for making public the review results.

80 Scoring Guidepost

- The management system provides for a review of management performance by one or more independent experts at least once every five years.
- The format and standards of the review are established within the management system.
- Review results are made available to the public.

60 Scoring Guidepost

- The management system is open to external review at least once every 10 years.

Indicator 3.5.3: There is a mechanism for incorporating into the management system recommendations resulting from the review process.

100 Scoring Guidepost

- The recommendations from internal and external reviews are always acted upon and, where appropriate, incorporated into the management system.
- The management system provides for a report to all interested stakeholders describing how it acted on the recommendations of these reviews.

80 Scoring Guidepost

- The recommendations from internal and external reviews are usually, but not always, used to make changes to the management system.

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60 Scoring Guidepost

- Recommendations from internal and external reviews are considered by the management agency and an explanation is provided for the actions or lack of action associated with the majority of these recommendations.

Indicator 3.5.4: There is an appropriate mechanism for resolving disputes.

100 Scoring Guidepost

- The management system has a formal and codified mechanisms for resolution of disputes arising as a result of the fishery.
- Affected parties routinely use the dispute resolution mechanism.
- The dispute resolution mechanism is unbiased and fair respecting all disputing parties.

80 Scoring Guidepost

- The management system has a dispute-resolution process for resolving significant disputes.
- The dispute resolution mechanism is available for use by affected parties, but is not routinely used.
- The dispute resolution mechanism does not discriminate against any disputing party.

60 Scoring Guidepost

- There is a mechanism for resolving disputes that is provided for by the management system.

MSC Criterion 3.6

The management system provides for the operation of the fishery to be in compliance with all relevant legal and administrative requirements.

In this section we attempt to evaluate the management system with regard to whether it manages the fishery in a manner that is consistent with Canada's commitments under relevant international treaties and agreements, and with domestic laws and regulations that pertain to the fishery. In this context we also evaluate whether the management system is in conformity with the legal and customary rights of First Nations peoples, as established by treaties with those peoples, the Canadian Constitution, and other applicable instruments.

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Indicator 3.6.1: The fishery is not operated in a unilateral manner in contravention to international agreements.

For the purposes of this Indicator, only treaties and conventions which the government of Canada has signed, ratified or otherwise is a High Contracting Party to, shall apply.

100 Scoring Guidepost

- When the stocks of fish under the authority of the management system are also under the authority of an international treaty to which the Government of Canada is a party, treaty obligations are respected, and actions by the management system are coordinated with the recommendations of the treaty organization.
- All measures taken within the management system are in compliance with relevant international treaty obligations.
- The management system does not undertake unilateral exemption from any treaty obligation pertaining to the fishery.

80 Scoring Guidepost

- The management system does not willingly act in contravention to any international treaty obligations pertaining to the fishery.
- The management system does not knowingly undertake unilateral exemption from any treaty obligation pertaining to the fishery.
- Evidence indicates any inadvertent action with regard to the contravention of any international treaty obligations by the management system is rare.

60 Scoring Guidepost

- The management system is in compliance with the majority of international treaty recommendations dealing with the fishery.

Indicator 3.6.2: The fishery is carried out in a manner consistent with all relevant domestic laws and regulations relevant to the fishery.

100 Scoring Guidepost

- The management system conducts annual assessments of the fisheries compliance with relevant domestic laws and regulations, and these assessments have confirmed full compliance with these laws and regulations.

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80 Scoring Guidepost

- The management system conducts at least bi-annual assessments of the fisheries compliance with relevant domestic laws and regulations, and these assessments have confirmed that none of the violations that have occurred would result in failure to achieve the objectives of the management plan.

60 Scoring Guidepost

- The management system conducts periodic assessments of the fisheries compliance with relevant domestic laws and regulations, and these assessments have not identified any violations that would result in failure to achieve the objectives of the management plan.

Indicator 3.6.3: The management system provides for the observation of legal and customary rights of First Nation peoples.

100 Scoring Guidepost

- The management system is in compliance with all major legal and customary rights of First Nation peoples that are impacted by the fishery.
- The management system includes processes for consultation with First Nations peoples on the impact of the commercial fishery on their food, social and ceremonial fisheries.

80 Scoring Guidepost

- The management system is found to be in compliance with all legal and most of the customary rights of First Nation peoples that are impacted by the fishery.
- The management system includes processes for providing information to First Nations peoples on the major impacts of the commercial fishery on their food, social and ceremonial fisheries.

60 Scoring Guidepost

- The management system is in compliance with the legal rights of First Nation peoples that are impacted by the fishery.

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Fishery Operations Criteria

MSC Criterion 3.7

Fishing operations make use of gear and fishing practices that limit ecosystem impacts.

The intention regarding this criterion relating to fishery operations is to evaluate the degree to which the management system is capable of implementing responsible fishing practices. The understanding here regarding responsible fishing practices refers to the criteria defined in the MSC, Principle 3.B., Operational Criteria 12-17, and with those sections of the FAO Code of Conduct for Responsible fishing dealing with the conduct of fishing practices by the fishing industry.

Indicator 3.7.1: Utilization of gear and fishing practices that minimize both the catch of non-target species, and the mortality of this catch.

100 Scoring Guidepost

- There are requirements in the management system to reduce the capture of non-target species, which include:
 - Controlling the use of gear types and fishing practices that result in significant catches of non-target species or undersized individuals of target species, and/or
 - Implementing closed seasons and no-fishing zones during times and in areas where the probability of making significant catches of non-target species or undersized individuals of target species is high, and
 - Holding education programs for the fishing industry and other relevant stakeholders to make them aware of the benefits of using fishing techniques and gear that minimize the catch of non-target species or undersized individuals of target species.
- Taking into consideration natural variability in population abundance and the possibility of declining abundance resulting from heavy exploitation, the management system can demonstrate the effective use of these methods by fishers by the existence of downward trends in the catches of non-target species.
- The management system creates incentives to decrease the catch of non-target species (e.g. by providing more fishing time for vessels achieving certain standards for reducing such catches).

80 Scoring Guidepost

- Through educational programs for members of the fishing industry and other relevant stakeholders, the management system discourages the use of gear types and fishing practices that result in high catches of non-target species or undersized individuals of target species, and encourages them to avoid fishing in areas identified to have high concentrations of non-target species or undersized individuals of target species.

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- Taking into consideration natural variability in population abundance, there is evidence that the capture and discard of non-target species or undersized individuals of target species is trending downward, or is at a level of exploitation that has been determined by management to be acceptable.
- Fishers generally conduct their fishing activity in a manner that is consistent with the goal of reducing the catch of non-target species or undersized individuals of target species.

60 Scoring Guidepost

- The majority of fisheries are conducted in a manner that is consistent with the goal of reducing the catch of non-target species or undersized individuals of target species.

Indicator 3.7.2: Prohibits the use destructive fishing practices, such as poisons and explosives.

100 Scoring Guidepost

- The management system prohibits fishing practices that utilize poisons or explosives, or other such devices that damage or destroy physical, chemical, and/or biological features or characteristics of the areas where such practices are prosecuted.
- Evidence can be provided by the management system that such destructive practices are not currently being employed in the fishery.

80 Scoring Guidepost

- The management system can demonstrate that destructive fishing practices, such as poisons or explosives, are not currently being used in the fishery.

60 Scoring Guidepost

- The management system prohibits or discourages the use of destructive fishing practices.

Indicator 3.7.3: Minimizes operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.

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- The management system has a formal program to reduce operational waste in the fishery, with the long-term goal of eliminating such waste.
- The program is effective, as reflected by reduced incidents of operational waste.
- The management system has a formal program in which they work with the fishing industry and other relevant stakeholders to promote the proper handling of catch.

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- The management system has a program that sets guidelines for reducing operational waste.
- The management system encourages the fishing industry and other relevant stakeholders to promote programs for the proper handling of catch.

60 Scoring Guidepost

- There is a program to reduce operational waste.

Indicator 3.7.4: The management system solicits the cooperation of the fishing industry and other relevant stakeholders in the collection of data on the catch and discard of non-target species and undersized individuals of target species.

100 Scoring Guidepost

- The majority of fish harvesters and processors are in compliance with management requests for the collection of data on catches and discards of non-target species and undersized individuals of target species.
- Continued improvement in the quality and quantity of catch and discard data is evident.

80 Scoring Guidepost

- Sufficient numbers of fish harvesters and processors comply with requests for data on catches and discards of non-target species and undersized individuals of target species to ensure that reliable estimates of total catches and discards for the fishery can be obtained.

60 Scoring Guidepost

- Catch and discard data provided by the fishing industry and other relevant stakeholders are sufficient to manage the harvests from the majority of the non-target species and undersized individuals from the majority of the target species.

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Indicator 3.7.5: Implements fishing methods that minimize adverse impacts on habitat, especially in critical zones.

100 Scoring Guidepost

- The management system has a formal program to identify and document the impact of the fishery on habitat, and implements measures to restrict gear and fishing practices that have been shown to adversely affect habitat.
- The crews of fishing vessels comply with such measures and thereby avoid damaging the habitat.
- There is no evidence of continued impacts of fishing on habitat.

80 Scoring Guidepost

- The management system undertakes measures to identify and document the impact of the fishery on habitat and to set guidelines for reducing habitat impacts.
- Fish harvesters are encouraged to follow the guidelines for reducing habitat impacts.

60 Scoring Guidepost

- The management system has a program for assessing the impact of the fishery on habitat, and for making fishers aware of suitable fishing gear and practices that are known to reduce adverse impacts on habitat.

7.5 Information Reviewed

One of the most significant, and difficult, aspects of the MSC certification process is ensuring that the assessment team gets a complete and thorough grounding in all aspects of the fishery under evaluation. In even the smallest fishery, this is no easy task as the assessment team typically needs information that is fully supported by documentation in all areas of the fishery from the status of stocks, to ecosystem impacts, through management processes and procedures.

Under the MSC program, it is the responsibility of the applying organizations or individuals to provide the information required to prove the fishery or fisheries comply with the MSC standards. It is also the responsibility of the applicants to ensure that the assessment team has access to any and all scientists, managers, and fishers that the assessment team identifies as necessary to interview in its effort to properly understand the functions associated with the management of the fishery. Last, it is the responsibility of the assessment team to make contact with stakeholders that are known to be interested, or actively engaged in issues associated with fisheries in the same geographic location.

In the BC sockeye fisheries the applicant (BCSMC) provided a very thorough set of documents that reviewed all aspects of the management of the fisheries under examination and salmon management in general (Section 7). The information was compiled in a format that was very conducive to assessing the fisheries performance indicator by indicator. To date, it appears to be the most thorough submission compiled by a client on any fishery in the MSC program. The submissions made by the client should be considered the benchmark for all other fishery submissions in the future. The information submitted is not only relevant to each performance indicator, but also includes the client's view as to how each fishery compares to the standard. The client also arranged for the assessment team to meet with the appropriate scientists, managers, and enforcement officials responsible for the management of the fishery.

In contrast to the applicant's role in MSC assessments, the stakeholders in the fishery are under no specific obligation, other than personal preference, to provide the assessment team with information. Therefore, a significant effort was made to contact and solicit comments from stakeholders to ensure the assessment team understood their concerns. As discussed earlier (Section 7), the stakeholders in BC also provided a very thorough set of documents on each fishery, and again in a format very conducive to the assessment. The stakeholders in these assessments have also set a benchmark, along with the stakeholders in the pollock fishery assessment, for providing information to an assessment team.

7.6 Assessment Meeting and Interviews

The sites and people chosen for visits and interviews were based on the assessment team's need to acquire information about the management operations of the fisheries under evaluation. Agencies and their respective personnel responsible for fishery management, fisheries research, fisheries compliance, and habitat protection were identified and contacted with the assistance of the client.

The assessment team met with managers and scientists from DFO for a week. At these meetings, DFO personnel provided SCS evaluation team members with presentations summarizing the written documents already provided. Because of the complexity of the set of fisheries being evaluated under one project, it was not an easy or straightforward task for the client to sort through and properly organize the hundreds of reports and thousands of pages of documents by unit of certification and by fishery and by performance indicator. The fact that the client, in conjunction with DFO, accomplished this made it far more efficient for the assessment team to complete its work and for stakeholders to understand thoroughly what information was used to assess the fisheries. Table 3 provides a general list of the people and organizations either met or talked to (by email or phone) during the assessment process.

During this fishery assessment, direct information and/or opinions from a variety of stakeholders, was also provided through the auspices of the Sierra Club acting as a representative of the conservation sector in BC (see Section 7).

Tables 3a – 3f. People Interviewed as part of the BC Sockeye Fisheries Assessment Process

Table 3a. Full Assessment Meetings with Management Personnel and
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Industry on 24 May 2005		
Date	Name	Affiliation
24-May-05	Sandy Argue	BC Ministry Ag., Forest., Fisheries (MAFF)
	Christina Burridge	BC Salmon Marketing Council (BCSMC)
	Rob Morley	Canadian Fishing Company
	Bert Ionson	DFO
	Brian Riddell	DFO
	Dave Peacock	DFO
	Don Radford	DFO
	James Boland	DFO
	Paul Ryall	DFO
	Dana Schmidt	Golder
	Jim Joseph	Independent
	Karl English	LGL
	Rich Lincoln	MSC
	Murray Chatwin	Ocean Fisheries Ltd.
	Mike Lapointe	Pacific Salmon Commission (PSC)
	Don Kowal	PSC
	Chet Chaffee	SCS

Table 3b. Full Assessment Meetings with Management Personnel and Industry on 25 May 2005		
25-May-05	Christina Burridge	BC Salmon Marketing Council (BCSMC)
	Rob Morley	Canadian Fishing Company
	Alistair Thomson	DFO
	Bert Ionson	DFO
	Chuck Parken	DFO
	Dave Peacock	DFO
	Diana Dobson	DFO
	James Boland	DFO
	Paul Ryall	DFO
	Steve Groves	DFO
	Dana Schmidt	Golder
	Jim Joseph	Independent
	Karl English	LGL
	Sandy Argue	MAFF
	Rich Lincoln	MSC
	Murray Chatwin	Ocean Fisheries Ltd.

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	Mike Lapointe	PSC
	Chet Chaffee	SCS

Table 3c. Full Assessment Meetings with Management Personnel and Industry on 26 May 2005		
26-May-05	Christina Burridge	BC Salmon Marketing Council (BCSMC)
	Rob Morley	Canadian Fishing Company
	Dave Peacock	DFO
	James Boland	DFO
	James Boland	DFO
	Mark Potyrala	DFO
	Mark Saunders	DFO
	Paul Ryall	DFO
	Steve Groves	DFO
	Chief Harry Nice Sr.	Dir. F & W
	Dana Schmidt	Golder
	Jim Joseph	Independent
	Karl English	LGL
	Sandy Argue	MAFF
	Rich Lincoln	MSC
	Greg Taylor	Northern Processors Assoc.
	Murray Chatwin	Ocean Fisheries Ltd.
	Chet Chaffee	SCS

Table 3d. Full Assessment Meetings with Management Personnel and Industry on 27 May 2005		
27-May-05	Christina Burridge	BCSMC
	James Boland	DFO
	Andrew Thomson	DFO - Aquaculture
	Sue Farlinger	DFO-Habitat
	Dana Schmidt	Golder
	Jim Joseph	Independent
	Karl English	LGL
	Al Castledine	MAFF
	Jamie Alley	MAFF
	Sandy Argue	MAFF

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	Rich Lincoln	MSC
	Chet Chaffee	SCS

Table 3e. Full Assessment Meetings with Stakeholders on 24 May 2005		
Date	Name	Affiliation
24-May-05	Bill Warehan	David Suzuki Foundation (DSF)
	Jeffery Young	David Suzuki Foundation (DSF)
	Dana Schmidt	Golder
	Jim Joseph	Independent
	Dave Levy	Levy Research
	Bob Bocking	LGL
	Karl English	LGL
	Rich Lincoln	MSC
	Chet Chaffee	SCS
	Ken Wilson	Sierra Club BC
	R. John Nelson	Sierra Club BC
	Vicky Husband	Sierra Club BC

Table 3f. Full Assessment Meetings with Stakeholders on 27 May 2005

27-May-05	Otto Langer	David Suzuki Foundation (DSF)
	Dana Schmidt	Golder
	Jim Joseph	Independent
	Karl English	LGL
	Rich Lincoln	MSC
	Chet Chaffee	SCS
	Terry Glavin	Sierra Club BC
	Vicky Husband	Sierra Club BC

In addition to the meetings that SCS held with stakeholder in the conservation sector (see Table 3f above), SCS met with a few members of the MCC (Marine Conservation Caucus in BC) on different occasions to provide updates on activities. Also, SCS made a significant effort (through emails, faxes, corried packages, and phone calls) to both contact and speak directly with First Nations organizations associated with the fishing and fisheries management of salmon in British Columbia, Canada. Although these efforts were made, SCS was unable to gain any traction with First Nations. Two alternative approaches were also used to try and improve on the communications with First Nations. First, Ken Wilson was asked by SCS to use his contacts amongst First Nations to try and determine if First Nations would like to provide any comments, of any kind, to SCS regarding the assessment of the Canadiana government's management of salmon fisheries. This too yielded little result, except for increasing the awareness of First Nations groups about the ongoing assessment. Second, Mr. Karl English, a member of the assessment team, offered to assist SCS in getting in touch with First Nations organizations.

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While discussing other aspects of fisheries with various groups, Mr. English also explained the activities and overall aspects of the MSC assessment for sockeye salmon. In June 2005, representatives from the BC Aboriginal Fisheries Commission (BCAFC), Cowichan Tribes and Secwepemc Fisheries Commission requested an opportunity to meet with Mr. English, a member of the SCS evaluation team. In the interest of efficiency SCS agreed and Karl English met with each of these groups on the following dates: June 9, 2005 for the BCAFC, June 30, 2005 for Cowichan Tribes, and July 29, 2005 for the Secwepemc Fisheries Commission. Subsequent to these meetings the Secwepemc Fisheries Commission submitted a letter, dated August 3, 2005, to SCS describing their concerns related to MSC Certification of BC Salmon Fisheries (see Appendix 4).

8 Assessment Results

After completing all the reviews and interviews, the assessment team is tasked with utilizing the information it has received to assess the performance of the fishery. Under the MSC program, the process for assessing the fishery is performed by prioritizing and weighting the indicators relative to one another at each level of the performance hierarchy established when the assessment team developed the set of performance indicators and scoring guideposts for the fishery. The weightings in this assessment are shown in the tables provided for each fishery. Subsequent to this, the assessment team assigns numerical scores between 0 and 100 to each of the performance indicators. All of this is accomplished using decision support software known as Expert Choice, which utilizes a technique known as AHP (Analytical Hierarchy Process). A full description of the AHP process can be found on the MSC web site (www.msc.org). In essence, the process requires that all team members work together to discuss and evaluate the information they have received for a given performance indicator and come to a consensus decision on weights and scores (see Section 7.2 for an explanation).

The scoring for this set of certification units (4), as well as the large number of populations was a lengthy process for the assessment team. The team met on 2 different occasions for several days each to be able to complete the scoring for all of the certification units. In addition, the assessment team needed to rescore some indicators in a couple of the units of certification as new information was acquired. As in any fishery assessment, rescoring is driven by the assessment team's need to continue to get clarification on issues. Additional time requirements were not the result of either the client or the stakeholders failing to provide information.

The approach used by the assessment team is important to understand. The decision to aggregate all sockeye stocks into 4 fisheries requires that a Unit of Certification only get certified if the management of all the stocks meets the standard, not just the majority.

It is also worth noting here that there are a number of "conditions" identified in this report. Given the number of fisheries handled under one project, it should not be surprising that there are a number of conditions, and that this number may appear to be higher than in other fishery assessment projects. When viewed on a per fishery or per population basis, the number of conditions is in keeping with other fishery assessment projects, if not lower..

The tables in the evaluations below provide summaries of the scoring details for each fishery. All of our findings have been colour coded to indicate the degree to which scoring guideposts have

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been achieved for each indicator, which also provides the basis for the actual scores on each indicator. The color coding is:

Green – The requirements of the guidepost have been met.

Red – The requirements of the guidepost have not been met.

Orange – The requirements of the guidepost have partially been met.

Black – The requirements of the guidepost are not applicable to the specific sockeye fishery.

The color coding also allows the reader to determine a score for an indicator, simply by following the table from right to left across each row. If the color for an item/cell is green, it receives 100% of the available points, if it is orange it receives 50% of the available points, and if it is red it receives 0% of the available points and blocks progress to the next level of scoring guidepost. The available points for each item/cell are determined by dividing the number of available points between scoring guideposts (20 points available between 60 and 80 scoring guideposts, and 20 points available between 80 and 100 scoring guideposts) by the number of cells or scoring items achieving scores. To assign a score based on the items/cells leading up to the 60 scoring guidepost, it is simply enough to determine if any one item is orange or red. If so, then the fishery receives a score of less than 60 and the fishery fails certification. Therefore, a place holder value of 55 is assigned.

Example:

Summary for Fraser Sockeye (Draft - 11 Sep. 2006)										Criteria @ 100					Criteria @ 80					Criteria @ 60						
										Score	1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5
Indicator A	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx																									

In a given row (i.e. a specific performance indicator) there are 3 cells scored before the 60 scoring guidepost and they are all green; there are 4 cells scored between 60 and 80 scoring guideposts and they are all green; and there are 4 cells scored between between the 80 and 100 scoring guidepost and 2 are green, one is orange, and one is red. The 4 items/cells that are green before the 60 scoring guidepost shows that the fishery minimally meets the score of 60, which requires looking to the next level (between 60 and 80 scoring guideposts). Since the items/cells between 60 and 80 are all green, the fishery has now achieved at least a score of 80 for the indicator, which now requires a review of the scoring between 80 and 100 scoring guideposts. Since 2 cells/items are green, these 2 cells receive full points of 5 each (since each of 4 items can get 5 points for a total of 20 points between 80 and 100). The orange cell receives 50% of the available points for that item which equals 2.5 points (50% of 5 points). The red cell or item receives 0 points. This means the final score for the specific performance indicator is 92.5 or 93 when rounding.

Fishery specific findings follow the summary are crafted in such a way as not to repeat information that is available in other documents, but provide an overview of where the information submitted did and did not show the fisheries met a minimum score of 80. For example, on the Fraser River sockeye fishery, the first indicator with a written summary is 1.1.1.3. Both 1.1.1.1 and 1.1.1.2 scored over 80. This means the information provided by the client as well as stakeholders was sufficient to show that the fishery meets or exceeds a score of 80, so the reader is simply referred to the submitted documents rather than pasting in the same information already available. For indicator 1.1.1.3 the fishery only scored 77, so an explanation is given as to the deficiency and the required condition. To further minimize the need for the

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reader to review our criteria descriptions (SCS 2003), we have included text describing our interpretation of MSC criteria where appropriate along with our findings for Fraser sockeye (the first fishery in the evaluation sequence). These descriptive details are not repeated for the other fisheries. The last section under each Principle provides a list of certification conditions for each fishery and associated time frame for addressing each condition.

8.1 MSC Principle 1 Results

Principle 1 **A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.**

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favor of short-term interests. Thus, exploited stocks would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Principle 1 Summary

Table 1.1. Summary of scores under MSC Principle 1 by Performance Indicator and fishery⁵ for all BC Sockeye fisheries.

Summary for sockeye fisheries					
	Fraser	Barkley	Skeena	Nass	Weighting
PRINCIPLE 1 - Fishery Management for Target Populations					0.333
Criterion 1.1 - Maintain high productivity of target population & associated ecosystem					0.794
Subcriterion 1.1.1 - Stock units					0.400
Indicator 1.1.1.1 Stock management units defined	95	100	100	100	0.317
Indicator 1.1.1.2 Scientific agreement on units	97	93	97	100	0.194
Indicator 1.1.1.3 Geographic distribution known	77	73	90	90	0.108
Indicator 1.1.1.4 Indicator Stocks	70	na	na	na	0.064
Indicator 1.1.1.5 Enhanced Stocks	94	75	70	na	0.317
Subcriterion 1.1.2 - Monitoring and assessment					0.400
Indicator 1.1.2.1 Reliable estimates of removals	74	90	97	100	0.274
Indicator 1.1.2.2 Reliable estimates of escapement	90	77	80	74	0.369
Indicator 1.1.2.3 Information on fish age and size	100	75	90	90	0.112
Indicator 1.1.2.4 Productivity estimates	74	85	95	100	0.246
Subcriterion 1.1.3 - Management goals					0.200
Indicator 1.1.3.1 Limit reference points	70	75	87	75	0.667
Indicator 1.1.3.2 Target reference points	70	75	70	100	0.333
Criterion 1.2 - Fishery allows for the recovery of depleted stocks (Target Stocks)					0.136
Indicator 1.2.1 Well-defined and effective strategy	70	93	na	na	0.500
Indicator 1.2.2 Stocks not depleted and harvest rates are sustainable	75	95	na	na	0.500
Criterion 1.3 - Fishing does not impair reproductive capacity					0.070
Indicator 1.3.1 Age, sex and genetic structure are monitored	100	97	90	90	1.000

The Principle 1 evaluation results for the four sockeye fisheries reveal some consistencies and several substantial differences between the northern (Skeena and Nass) fisheries and southern (Fraser and Barkley Sound) fisheries (Table 1.1). The purpose of the following summary is to describe the Criteria/Sub-criteria where each fishery met or exceeded the 80 scoring guidepost, in sequential order:

1. the stock units were generally well defined for all fisheries;
2. the monitoring systems for assessing the geographic range for the harvests of each stock management unit is more consistently conducted for northern fisheries;
3. Indicator stocks are not used as a primary source of information for making management decision for Barkley Sound, Skeena and Nass sockeye fisheries;
4. No sockeye enhancement activities have been undertaken in the Nass but enhancement in the form of spawning channels and lake enrichment has played a significant role in the other fisheries;
5. The monitoring and assessment systems are generally very good for the major components of each fisheries but there are specific areas where these systems must be improved;
6. to date the management goals have been more clearly defined for the northern fisheries but further clarification of these goals is necessary and expected through the implementation of the WSP;
7. The indicators associated with the recovery of depleted stocks are not applicable to the northern sockeye fisheries because the target stocks have never been depleted below their LRPs;
8. in contrast, both the Fraser and Barkley Sound fisheries have had periods when target stocks were depleted and varying success regarding recovery; and
9. lastly, the level of understanding regarding the effects of fishing on age, size, sex and genetic structure of the target stocks is generally very good for these sockeye fisheries.

In the fishery specific sections that follow, we provide a summary of the areas where the fishery and management practices have been consistent with MSC principles and criteria and details on each of the indicators where scores were less than the 80 scoring guidepost.

Fraser Sockeye – Criterion Summaries

The level of effort applied to the management and assessment of Fraser sockeye is greater than that for the other three sockeye fisheries combined. A summary of our evaluations for each Principle 1 indicator and criteria is provided in Table 1.2. The criteria where the fishery exceeds the 80 Scoring Guidepost are generally considered the highlights (i.e. good news) for the fishery. The highlights associated with the various Principle 1 criteria for Fraser sockeye are summarized sequentially for each group of indicators below:

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1. stock units are well defined and the level of agreement on the stock units used to manage the fisheries is generally very good (Indicators 1.1.1.1, 1.1.1.2);
2. the procedures in place to assess the catch and escapement of target stocks are very good, however, there are some notable deficiencies regarding assessment procedures for non-target stocks (Indicators 1.1.2.1, 1.1.2.2, 1.1.2.3);
3. the management goals are becoming more clearly defined for the target stocks and should continue to improve with the implementation of the WSP (Indicators 1.1.3.1, 1.1.3.2);
4. a rigorous analysis of alternative management options to rebuild Cultus Lake sockeye has been completed and procedures are underway to select and implement an option that will achieve the recovery goals within a specified time frame (Indicator 1.2.1, 1.2.2); and
5. PSC and DFO programs provide all the necessary age, size, sex and genetic stock composition information required for stock assessment and effect fisheries management (Indicator 1.3.1).

Table 1.2. Summary of the evaluations for each Principle 1 criteria and indicator for the Fraser sockeye fishery.

Summary for Fraser Sockeye (Draft - 11 Sep. 2006)		Criteria @ 100					Criteria @ 80					Criteria @ 60					
	Score	1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5
PRINCIPLE 1 - Fishery Management for Target Populations																	
Criterion 1.1 - Maintain high productivity of target population & associated ecosystem.																	
Subcriterion 1.1.1 - Stock units																	
Indicator 1.1.1.1	Stock management units defined	95	P														
Indicator 1.1.1.2	Scientific agreement on units	97		P													
Indicator 1.1.1.3	Geographic distribution known	77									P						
Indicator 1.1.1.4	Indicator Stocks	70								P	P						
Indicator 1.1.1.5	Enhanced Stocks	94	P			P											
Subcriterion 1.1.2 - Monitoring and assessment																	
Indicator 1.1.2.1	Reliable estimates of removals	74	P							P	P						
Indicator 1.1.2.2	Reliable estimates of escapement	90	P	P													
Indicator 1.1.2.3	Information on fish age and size	100															
Indicator 1.1.2.4	Productivity estimates	74	P							P	P						
Subcriterion 1.1.3 - Management goals																	
Indicator 1.1.3.1	Limit reference points	70															
Indicator 1.1.3.2	Target reference points	70				P				P	P						
Criterion 1.2 - Fishery allows for the recovery of depleted stocks (Target Stocks)																	
Indicator 1.2.1	Well-defined and effective strategy	70								P	P						
Indicator 1.2.2	Stocks not depleted and harvest rates are sustainable	75									P						
Criterion 1.3 - Fishing does not impair reproductive capacity																	
Indicator 1.3.1	Age, sex and genetic structure are monitored	100															

Fraser Sockeye – Specific Indicator Problems

Under Principle 1, there were eight indicators where Fraser sockeye did not achieve the 80 scoring guidepost. The following sections identify indicators and criteria where these deficiencies occur and the actions required to attain full MSC certification.

MSC Criterion 1.1

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The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.

Our interpretation of MSC Criterion 1: The performance indicators listed under Criteria 1 focused on the adequacy of the information used to manage the fisheries and stocks. For our assessment, we have organized the performance indicators into the three sub-criteria: 1) the definition of the stock units for each fishery; 2) the information available on the harvests, escapement, biological characteristic, and productivity; and 3) the management goals for each stock unit. As in the evaluations of other fisheries, the effect of the fishery on the associated ecological community will be primarily dealt with under Principle 2. However, the 100% level for indicators related to management goals under Principle 1 cannot be achieved unless information is collected on the associated ecological community and used in setting management goals.

Indicator 1.1.1.3: The geographic range for harvest of each stock management unit in the fishery is known.

100 Scoring Guidepost

- The geographic range for harvests of each stock management unit in the fishery is estimated and documented each year.
- The information on the geographic range of harvests is monitored during the fishing season and used when making in-season management decisions.

80 Scoring Guidepost

- The geographic range for harvests of target stocks is defined.
- The information on the geographic range of the harvests of target stocks is monitored during the fishing season and is sufficient to prevent the over harvesting of these stocks.
- The information available on the geographic range for harvest of non-target stocks is sufficient to prevent the over harvesting of these stocks.

60 Scoring Guidepost

- The information available on the geographic range for harvests of target or non-target stocks is sufficient to prevent the over harvesting for the majority of the stocks within each stock management unit.

The information on the geographic range of harvests is probably adequate to prevent the over harvesting of Sakinaw sockeye; however, deficiencies in the information and analysis on run

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timing through Johnstone Strait have likely resulted in some over harvesting of Sakinaw sockeye.

Condition 1 - Certification is conditional until a review of the run timing and harvest rates for Sakinaw sockeye has been completed and the fisheries management plan is consistent with the goal of minimizing the harvest rate on Sakinaw sockeye (**Fraser Condition #1.1**).

Indicator 1.1.1.4: Where indicator stocks are used as the primary source of information for making management decisions on a larger group of stocks in a region, the status of the indicator stocks reflects the status of other stocks within the management unit.

100 Scoring Guidepost

- The status of the indicator stocks is well correlated with the stocks that are most at risk from a conservation point of view, not just correlated with the most productive stocks in the region.
- The indicator stocks used have been reviewed and found to be scientifically defensible and appropriate by the Pacific Stock Assessment Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientists outside the management agency that the indicator stocks are appropriate.
- The relationships between indicator stocks and stocks of interest are assessed every three to five years.

80 Scoring Guidepost

- There is general agreement among regional fisheries scientists within the management agency that the status of indicator stocks reflects the status of other stocks within the management unit.
- There is no significant scientific disagreement regarding the indicator stocks used by the management agency to formulate management decisions for the fishery.

60 Scoring Guidepost

- There is no significant scientific disagreement regarding the indicator stocks used by the management agency to formulate management decisions for the fishery.
- There is a scientific basis for the indicator stocks used in the management of the fishery.

While there is not complete agreement among regional fisheries scientists outside the management agency regarding the adequacy of the indicator stocks for formulating management decision, there does not appear to be significant disagreement regarding the stocks used. However, further clarification is required regarding the basis for using these indicator stocks.

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Condition 2 –Certification will be conditional until a rigorous review has been completed to confirm that the indicator stocks reflect the status of the other stocks within each management unit (**Fraser Condition #1.2**).

Indicator 1.1.2.1: Estimates exist of the removals for each stock unit.

100 Scoring Guidepost

- Catch estimates are available for all fisheries in Canadian waters that harvest the target and non-target stocks harvested in the fishery being evaluated.
- Mortality rates are available for the fish released or discarded during the fishery.
- Catch estimates are available for fisheries outside Canadian waters that harvest the stocks that are the target of the fishery being evaluated.

80 Scoring Guidepost

- Catch estimates are available for all target stocks harvested in the fishery.
- Catch estimates are available for non-target stocks where the catch of the non-target stock may represent a significant component of the harvest of that stock.
- Mechanisms exist to ensure accurate catch reporting and these mechanisms are evaluated at least once every 5 years.

60 Scoring Guidepost

- Catch estimates for the majority of target stocks are available.
- Catch estimates are available for non-target stocks where the catch of the non-target stocks may represent a significant component of that stock.
- Mechanisms exist to ensure accurate catch reporting and these mechanisms are evaluated at least once every 10 years.

Current catch estimates and fisheries management guidelines for Sakinaw sockeye are based on preliminary analyses that require further review and refinement.

Condition 3 - Certification is conditional until the harvest rate analysis for Sakinaw sockeye has been updated using the best available data and appropriate fisheries management actions are consistent with the goal of reducing harvest rates for Sakinaw sockeye and rebuilding this depleted stock. (**Fraser Condition #1.3**).

Indicator 1.1.2.4: The information collected from catch monitoring and stock assessment programs is used to compute productivity estimates for

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the target stocks and management guidelines for both target and non-target stocks.

100 Scoring Guidepost

- Scientifically defensible productivity estimates (e.g. stock/recruitment relationships) have been derived for all target stocks and the relative productivity of non-target stocks is known.
- Risk assessment has been conducted to determine the impact of alternative harvest strategies on non-target stocks. The risk assessment should include an assessment of the uncertainties with estimates of stock productivity for both the target and non-target stocks.

80 Scoring Guidepost

- There is adequate information to identify the harvest limitations and production strategies required to maintain the high productivity of the target stocks.
- There is adequate information to estimate the relative productivity of the non-target stocks where the fishery harvests may represent a significant component of those non-target stocks.
- The harvest limitations for target stocks take into consideration the impacts on non-target stocks and the uncertainty of the productivity for these stocks.

60 Scoring Guidepost

- The available information and analyses are adequate to identify the harvest limitations and production strategies required to maintain the productivity of the majority of target stocks.
- The relative productivity of the non-target stocks is considered in the management strategy, where the fishery harvests may represent a significant component of those non-target stocks.

The information on the productivity of the Sakinaw stock relative to co-migrating Fraser sockeye stocks needs to be assessed and harvest rates adjusted accordingly.

Condition 4 -Certification is conditional until a review of the relative productivity of Sakinaw sockeye has been completed and the fisheries management plan is consistent with the estimated productivity and goal of rebuilding the Sakinaw sockeye stock (**Fraser Condition #1.4**).

Indicator 1.1.3.1: Limit Reference Points or operational equivalents have been set and are appropriate to protect the stocks harvested in the fishery.

100 Scoring Guidepost

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- The Limit Reference Point for target species have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientist outside the management agency that the LRP's are appropriate.
- There is general scientific agreement regarding the LRP's for non-target species.

80 Scoring Guidepost

- There is some scientific basis for the LRP's for target stocks and these LRP's are defined to protect the stocks harvested by the fisheries.
- There is no significant scientific disagreement regarding the LRP's used by the management agency to formulate management decision for the fishery.

60 Scoring Guidepost

- There is general agreement among regional fisheries scientist within the management agency that the LRP's or equivalent are appropriate to achieve the management goals for target stocks.

The management agency is in the process of defining LRP's for Fraser sockeye stocks in order to implement the WSP. Bradford and Wood (2004) provide the scientific basis for setting minimum population sizes and recovery objectives for Cultus and Sakinaw sockeye stocks.

Condition 5 - Certification is conditional until the Conservation Units have been defined for Fraser sockeye using the methods described in Holtby and Ciruna (2007) and LRP's for each Fraser sockeye conservation unit are defined and peer reviewed. (**Fraser Condition #1.5**).

Indicator 1.1.3.2: Target Reference Points or operational equivalent have been set.

100 Scoring Guidepost

- The Target Reference Point (TRP) for target species have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientist outside the management agency that the TRP's are appropriate.
- The TRP's for the target stocks take into account variability in the productivity of each component of the target stock and productivity of non-target stocks.

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80 Scoring Guidepost

- There is no significant scientific disagreement regarding the TRP's used by the management agency to formulate management decision for the fishery.
- The TRP's for the target stocks take into account variability in the productivity of each component of the target stock and the productivity of non-target stocks.

60 Scoring Guidepost

- There is general agreement among fisheries scientist within the management agency that the TRP's are appropriate for the target stocks.
- Target reference points have been defined for the majority of target stocks harvested in the fishery and these target reference points are not scientifically disputed.
- The management agency has taken into account the relative productivity of non-target stocks when setting the TRP's for the majority of target stocks.

TRP's have been defined for all the major sockeye stocks but there continues to be considerable scientific debate regarding the TRP's for both target and non-target stocks. It is anticipated that the implementation of the WSP will provide a clear definition of the TRP's for Fraser sockeye.

Condition 6 -Certification is conditional until the Management Units have been defined for Fraser sockeye and the management agency defines the TRP's for each Fraser sockeye management unit taking into account the productivity of target and non-target stocks within each management unit. (**Fraser Condition #1.6**).

MSC Criterion 1.2

Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.

Our interpretation of MSC Criterion 1.2: This criterion refers to “populations” where our indicators and evaluation criteria refer to stocks or stock units. The evaluation under this criterion will assess the degree to which the management strategy is designed to keep targeted stocks from becoming depleted, and to promote recovery if they become depleted. Note that this criterion focuses on the recovery of depleted target stocks and is similar MSC Criterion 2.3 which focus on the recovery of depleted non-target stocks.

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Indicator 1.2.1: There is a well-defined and effective strategy, and a specific recovery plan in place, to promote recovery of the target stock within reasonable time frames.

100 Scoring Guidepost

- There are comprehensive and pre-agreed responses to low stock size that utilize a range of management measures to ensure rapid recovery.
- Stocks are allowed to recover to the TRP before commercial fisheries are permitted that target these stocks.
- The management agency does not use artificial propagation as a substitute for maintaining or recovering wild stocks.

80 Scoring Guidepost

- In the event of severe depletion, recovery plans are developed and implemented to facilitate the recovery of the depleted stocks with 3 reproductive cycles. (*SCS Intent – Although this indicator was set for use in salmon fisheries, the cyclic nature of the runs within the Fraser River system require that this statement is interpreted within the context of the cyclic aspects of the Fraser, and not just as 3 reproductive cycles of the species.*)
- Stocks are allowed to recover to more than 150% of the LRP for abundance before any fisheries are permitted that target these stocks.

60 Scoring Guidepost

- In the event of severe depletion, recovery plans are developed and implemented to facilitate the recovery of the depleted stocks within 5 reproductive cycles
- Stocks are allowed to recover to more than 125% of the LRP for abundance before any fisheries are permitted that target these stocks.

Cultus sockeye are a clear example of a severely depleted target Fraser sockeye stock. We acknowledge that a recovery plan has been developed for Cultus sockeye but there are significant concerns regarding the implementation of this plan.

Condition 7 - Certification is conditional until the management agency provides a clear commitment to implement the recovery plan for Cultus sockeye and evidence that fisheries management actions are consistent with the recovery goals for Cultus sockeye. (**Fraser Condition #1.7**).

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Indicator 1.2.2: Target stocks are not depleted and recent stock sizes are assessed to be above appropriate limit reference points for the target stocks.

In contrast to Indicator 1.2.1, which evaluates the strategy for stock recovery, this indicator evaluates the current status of the target species or stocks, and the basis for being reasonably certain about their status. The Scoring Guideposts are arranged hierarchically, so that evaluation of the current status depends on the assessment, which in turn depends on data and knowledge about the stocks and the fishery.

100 Scoring Guidepost

- There is general agreement among regional fisheries scientist outside the management agency that the methods of estimating escapements and exploitation rates for the target stocks are scientifically defensible.
- Management actions have reduced fishing as the target stocks approach the LRP and fisheries have only resulted in escapements that approach or are below the LRP escapement goal in one year in a period of the most recent 10 consecutive years, for any of the target stocks.

80 Scoring Guidepost

- There is general agreement among regional fisheries scientist inside the management agency that the methods of estimating escapements and exploitation rates for the target stocks are scientifically defensible.
- Management actions have reduced fishing as the target stocks approach the LRP and fisheries have only resulted in escapements that approach or are below the LRP escapement goal in one year in a period of the most recent 5 consecutive years, for any of the target stocks.

60 Scoring Guidepost

- There is general agreement among regional fisheries scientist inside the management agency that the methods of estimating escapements and exploitation rates for the majority of target stocks are scientifically defensible.
- Management actions have reduced fishing as the target stocks approach the LRP and fisheries have only resulted in escapements that approach or are below the LRP escapement goal in no more than two years in a period of the most recent 5 consecutive years, for the majority of the target stocks.

LRP's have not been defined for each of the target stock for the Fraser sockeye fishery. However, the management agency has made considerable progress towards the definition LRP's for some Fraser sockeye stocks through initial efforts to implement the WSP.

Condition 8 - Certification is conditional until the management agency defines the LRP's for the target stocks and the management agency provides documentation that fisheries have not resulted in escapements that approach or are below the LRP in more than one year in a period of the most recent 5 cycle years, for any of the target sockeye stocks. The intent for this condition is to resolve the effects of fisheries, not other factors, on the stock and to recognize that the Fraser River sockeye undergo cycles so that these cycles must also be taken into account when examining whether the stocks are being maintained above LRPs. (**Fraser Condition #1.8**).

Barkley Sound Sockeye – Criterion Summaries (what looks good)

A summary of our evaluations for each Principle 1 indicator and criteria is provided in Table 1.3. The following points describe the highlights for Barkley Sound sockeye:

1. stock units are well defined and the level of agreement on the stock units used to manage the fisheries is very good (Indicators 1.1.1.1, 1.1.1.2);
2. the procedures in place to assess the catch and escapement of target stocks are very good, but similar information for non-target stocks, specifically Henderson Lake sockeye, requires improvement. (Indicators 1.1.2.1, 1.1.2.2, 1.1.2.3);
3. the management goals are clearly defined for the target stocks, however, the goals non-target stocks have not been clearly defined (Indicators 1.1.3.1, 1.1.3.2);
4. Given that Henderson Lake sockeye are no longer considered to be a target stock in the Barkley Sound fishery, there are no depleted target stocks. In these few years when returns to Great Central and Sproat Lakes were less than the LRP for these stocks, appropriate management actions were taken to reduce harvest pressure and escapements have only fallen below the LRP twice since 1980. (Indicator 1.2.1, 1.2.2); and
5. DFO programs provide all the necessary age, size, sex and genetic stock composition information required for stock assessment and effect fisheries management (Indicator 1.3.1).

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Table 1.3. Summary of the evaluations for each Principle 1 criteria and indicator for the Barkley Sound sockeye fishery.

Summary for Barkley Sound Sockeye (Draft - 11 Sep. 2006)			Criteria @ 100					Criteria @ 80					Criteria @ 60					
		Score	1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5
PRINCIPLE 1 - Fishery Management for Target Populations																		
Criterion 1.1 - Maintain high productivity of target population & associated ecological community																		
Subcriterion 1.1.1 - Stock units																		
Indicator 1.1.1.1	Stock management units defined	100																
Indicator 1.1.1.2	Scientific agreement on units	93																
Indicator 1.1.1.3	Geographic distribution known	80																
Indicator 1.1.1.4	Indicator Stocks		na	na	na	na		na	na					na				
Indicator 1.1.1.5	Enhanced Stocks	75							P									
Subcriterion 1.1.2 - Monitoring and assessment																		
Indicator 1.1.2.1	Reliable estimates of removals	90	P															
Indicator 1.1.2.2	Reliable estimates of escapement	77	P	P					P									
Indicator 1.1.2.3	Information on fish age and size	90	P															
Indicator 1.1.2.4	Productivity estimates	85	P															
Subcriterion 1.1.3 - Management goals																		
Indicator 1.1.3.1	Limit reference points	75							P									
Indicator 1.1.3.2	Target reference points	75			P				P									
Criterion 1.2 - Fishery allows for the recovery of depleted stocks (Target Stocks)																		
Indicator 1.2.1	Well-defined and effective strategy	93																
Indicator 1.2.2	Stocks not depleted and harvest rates are sustainable	95		P														
Criterion 1.3 - Fishing does not impair reproductive capacity																		
Indicator 1.3.1	Age, sex and genetic structure are monitored	97	P															

Barkley Sound Sockeye – Specific Indicator Problems

Under Principle 1, there were four indicators where Barkley Sound sockeye did not achieve the 80 scoring guidepost. The following sections identify indicators and criteria where these deficiencies occur and the actions required to attain full MSC certification.

Indicator 1.1.1.5: Where stock units are composed of significant numbers of fish from enhancement activities, the management system provides for identification of the enhanced fish and their harvest without adversely impacting the diversity, ecological function or viability of unenhanced stocks.

100 Scoring Guidepost

- Fisheries targeting enhanced stocks are geographically removed from unenhanced stocks and separate terminal harvest areas are established for these fisheries.
- Times and areas have been identified where the majority of enhanced fish migrate through the general fishery.
- There is real time mark recovery program during the prosecution of the fishery that allows determination of harvest rates of the enhanced component of the run and this data is used in regulation of the fishery.

Draft for Review

80 Scoring Guidepost

- In fisheries where both enhanced and un-enhanced stocks are harvested at the same time, the harvest guidelines are based on the goals and objectives established for the un-enhanced stocks.
- There are adequate data and analyses to determine that the presence of enhanced fish in the management units do not adversely impact the unenhanced fish stocks.

60 Scoring Guidepost

- There is general scientific agreement within the management agency regarding the impacts of enhanced fish on the resultant harvest rates or escapements of un-enhanced fish stocks.
- Managers have some scientific basis for assuring that harvest rates for enhanced stocks are not adversely affecting the majority of un-enhanced stocks within each stock unit.

The Henderson Lake hatchery is the only current enhancement activity (200,000 fry released per year) associated Barkley Sound sockeye. Recently fry have been marked with strontium, but there has not been any assessment of whether this marking approach will be sufficient to separate hatchery from wild fish. Therefore, the available data is not adequate to determine the effect of the enhancement initiative on unenhanced stocks.

Condition 9 - Certification will be conditional until an assessment is completed regarding the adequacy of the strontium marking approach to identify the effect of the Henderson Lake enhancement efforts on non-enhanced stocks (**Barkley Sound Condition #1.1**).

Indicator 1.1.2.2: Estimates exist of the spawning escapement for each stock unit.

100 Scoring Guidepost

- Estimates are available for the annual escapement for each stock unit harvested in the fishery.
- In-season escapement data are collected for all stock units and used to regulate the fishery.

80 Scoring Guidepost

- Estimates are available for the annual escapement of each target stock harvested in the fishery.
- Fishery independent indicators of abundance are available for the non-target species harvested in the fishery.
- In-season escapement data are collected for the target stocks and used to regulate the fishery.

Draft for Review

60 Scoring Guidepost

- Escapement estimates for target stocks are available, where escapement estimates are necessary to protect the target stock from overexploitation.
- Fishery independent indicators of abundance are available for non-target stocks where the fishery harvests may represent a significant component of the harvest of that stock.

The recent escapement estimates for Henderson Lake are too uncertain and unreliable to be a useful independent indicator of abundance for this important non-target sockeye stock.

Condition 10 - Certification will be conditional until a more reliable escapement estimates are available for Henderson Lake sockeye (**Barkley Sound Condition #1.2**).

Indicator 1.1.3.1: Limit Reference Points or operational equivalents have been set and are appropriate to protect the stocks harvested in the fishery.

100 Scoring Guidepost

- The Limit Reference Point for target species have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientist outside the management agency that the LRP's are appropriate.
- There is general scientific agreement regarding the LRP's for non-target species.

80 Scoring Guidepost

- There is some scientific basis for the LRP's for target stocks and these LRP's are defined to protect the stocks harvested by the fisheries.
- There is no significant scientific disagreement regarding the LRP's used by the management agency to formulate management decision for the fishery.

60 Scoring Guidepost

- There is general agreement among regional fisheries scientist within the management agency that the LRP's or equivalent are appropriate to achieve the management goals for target stocks.

Draft for Review

Discussion with scientist outside the Management agency indicate that the interim LRP defined for Somass sockeye is not sufficient to formulate management decisions for fisheries that intercept stocks for which LRP's have not been defined (e.g. Henderson Lake sockeye).

Condition 11 - Certification will be conditional until a LRP has been defined for Henderson Lake and there is no significant scientific disagreement regarding this LRP. (**Barkley Sound Condition #1.3**).

Indicator 1.1.3.2: Target Reference Points or operational equivalent have been set.

100 Scoring Guidepost

- The Target Reference Point (TRP) for target species have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientist outside the management agency that the TRP's are appropriate.
- The TRP's for the target stocks take into account variability in the productivity of each component of the target stock and productivity of non-target stocks.

80 Scoring Guidepost

- There is no significant scientific disagreement regarding the TRP's used by the management agency to formulate management decision for the fishery.
- The TRP's for the target stocks take into account variability in the productivity of each component of the target stock and the productivity of non-target stocks.

60 Scoring Guidepost

- There is general agreement among fisheries scientist within the management agency that the TRP's are appropriate for the target stocks.
- Target reference points have been defined for the majority of target stocks harvested in the fishery and these target reference points are not scientifically disputed.
- The management agency has taken into account the relative productivity of non-target stocks when setting the TRP's for the majority of target stocks.

The management agency has not provided any evidence that the productivity of non-target stocks was considered when the interim TRP was defined for Somass sockeye.

Condition 12 - Certification will be conditional until evidence has been provided that the productivity of non-target stocks was considered when the interim TRP was defined for Somass sockeye. (**Barkley Sound Condition #1.4**).

Skeena Sockeye – Criterion Summaries

A summary of our evaluations for each Principle 1 indicator and criteria is provided in Table 1.4. The following points describe the highlights for Skeena sockeye:

1. stock units are well defined and the level of agreement on the stock units used to manage the fisheries is very good (Indicators 1.1.1.1, 1.1.1.2);
2. the procedures in place to assess the catch and escapement of target stocks are very good. (Indicators 1.1.2.1, 1.1.2.2, 1.1.2.3);
3. the management goals are clearly defined for the target stocks and some non-target (Indicators 1.1.3.1, 1.1.3.2);
4. Given that Babine Lake sockeye is the only target stock, there are no depleted target stocks. In these few years when returns to Babine Lake were small appropriate management actions were taken to reduce harvest pressure and escapements have been consistently above LRP since 1982 despite large variations in annual returns. (Indicator 1.2.1, 1.2.2); and
5. DFO programs provide all the necessary age, size, sex and genetic stock composition information required for stock assessment and effect fisheries management (Indicator 1.3.1).

Table 1.4. Summary of the evaluations for each Principle 1 criteria and indicator for the Skeena sockeye fishery.

Summary for Skeena Sockeye (Draft - 5 August 2005)					Criteria @ 100					Criteria @ 80						Criteria @ 60				
					1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5
PRINCIPLE 1 - Fishery Management for Target Populations																				
Criterion 1.1 - Maintain high productivity of target population & associated ecological community																				
Subcriterion 1.1.1 - Stock units																				
Indicator 1.1.1.1	Stock management units defined	100																		
Indicator 1.1.1.2	Scientific agreement on units	97																		
Indicator 1.1.1.3	Geographic distribution known	90																		
Indicator 1.1.1.4	Indicator Stocks		na	na	na	na				na	na						na			
Indicator 1.1.1.5	Enhanced Stocks	70																		
Subcriterion 1.1.2 - Monitoring and assessment																				
Indicator 1.1.2.1	Reliable estimates of removals	97																		
Indicator 1.1.2.2	Reliable estimates of escapement	80																		
Indicator 1.1.2.3	Information on fish age and size	90																		
Indicator 1.1.2.4	Productivity estimates	95																		
Subcriterion 1.1.3 - Management goals																				
Indicator 1.1.3.1	Limit reference points	87																		
Indicator 1.1.3.2	Target reference points	70																		
Criterion 1.2 - Fishery allows for the recovery of depleted stocks (Target Stocks)																				
Indicator 1.2.1	Well-defined and effective strategy		na	na	na					na	na						na	na		
Indicator 1.2.2	Stocks not depleted and harvest rates are sustainable		na	na	na					na	na						na	na		
Criterion 1.3 - Fishing does not impair reproductive capacity																				
Indicator 1.3.1	Age, sex and genetic structure are monitored	90																		

Skeena Sockeye – Specific Indicator Problems (what needs improvement)

Draft for Review

Under Principle 1, there were two indicators where Skeena sockeye did not achieve the 80 scoring guidepost. The following sections identify indicators and criteria where these deficiencies occur and the actions required to attain full MSC certification.

Indicator 1.1.1.5: Where stock units are composed of significant numbers of fish from enhancement activities, the management system provides for identification of the enhanced fish and their harvest without adversely impacting the diversity, ecological function or viability of unenhanced stocks.

100 Scoring Guidepost

- Fisheries targeting enhanced stocks are geographically removed from unenhanced stocks and separate terminal harvest areas are established for these fisheries.
- Times and areas have been identified where the majority of enhanced fish migrate through the general fishery.
- There is real time mark recovery program during the prosecution of the fishery that allows determination of harvest rates of the enhanced component of the run and this data is used in regulation of the fishery.

80 Scoring Guidepost

- In fisheries where both enhanced and un-enhanced stocks are harvested at the same time, the harvest guidelines are based on the goals and objectives established for the un-enhanced stocks.
- There are adequate data and analyses to determine that the presence of enhanced fish in the management units do not adversely impact the unenhanced fish stocks.

60 Scoring Guidepost

- There is general scientific agreement within the management agency regarding the impacts of enhanced fish on the resultant harvest rates or escapements of un-enhanced fish stocks.
- Managers have some scientific basis for assuring that harvest rates for enhanced stocks are not adversely affecting the majority of un-enhanced stocks within each stock unit.

Provisional LRP's have been recommended for most of the un-enhanced Skeena sockeye stocks (Wood, 1999) but to date these LRP's have not been formally used in the development of harvest plans for Skeena sockeye.

Condition 13 - Certification will be conditional until the LRPs have been clearly defined for the un-enhanced sockeye stocks. (**Skeena Condition #1.1**).

Draft for Review

Indicator 1.1.3.2: Target Reference Points or operational equivalent have been set.

100 Scoring Guidepost

- The Target Reference Point (TRP) for target species have been reviewed and found to be scientifically defensive and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientist outside the management agency that the TRP's are appropriate.
- The TRP's for the target stocks take into account variability in the productivity of each component of the target stock and productivity of non-target stocks.

80 Scoring Guidepost

- There is no significant scientific disagreement regarding the TRP's used by the management agency to formulate management decision for the fishery.
- The TRP's for the target stocks take into account variability in the productivity of each component of the target stock and the productivity of non-target stocks.

60 Scoring Guidepost

- There is general agreement among fisheries scientist within the management agency that the TRP's are appropriate for the target stocks.
- Target reference points have been defined for the majority of target stocks harvested in the fishery and these target reference points are not scientifically disputed.
- The management agency has taken into account the relative productivity of non-target stocks when setting the TRP's for the majority of target stocks.

The management agency has indicated that the TRP for the Babine stock does not take into account the productivity of non-target stocks. The WSP calls for the definition of conservation units for each salmon species and the definition of management guidelines for each conservation unit.

Condition 14 - Certification will be conditional until the management agency provides direct evidence that the productivity of non-target stocks has been taken into account when setting the TRP for the target Babine stock. (**Skeena Condition #1.2**).

Nass Sockeye – Criterion Summaries (what looks good)

Draft for Review

A summary of our evaluations for each Principle 1 indicator and criteria is provided in Table 1.5. The following points describe the highlights for Nass sockeye (i.e. criteria where the fishery exceeds the 80% Scoring Guidepost):

1. stock units are well defined and the level of agreement on the stock units used to manage the fisheries is very good (Indicators 1.1.1.1, 1.1.1.2);
2. the procedures in place to assess the catch and escapement of target stocks are very good. (Indicators 1.1.2.1, 1.1.2.2, 1.1.2.3);
3. the management goals are clearly defined for the target stocks and some non-target stocks (Indicators 1.1.3.1, 1.1.3.2);
4. There are no depleted target stocks. In years when returns of Nass sockeye are small or returns of other salmon species are less than escapement goals, appropriate management actions were taken to reduce harvest pressure. Escapements have been consistently above LRP for Nass sockeye since 1982 despite large variations in annual returns. (Indicator 1.2.1, 1.2.2); and
5. DFO programs provide all the necessary age, size, sex and genetic stock composition information required for stock assessment and effect fisheries management (Indicator 1.3.1).

Table 1.5. Summary of the evaluations for each Principle 1 criteria and indicator for the Nass sockeye fishery.

Summary for Nass Sockeye (Draft - 5 August 2005)		Criteria @ 100					Criteria @ 80						Criteria @ 60				
	Score	1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5
PRINCIPLE 1 - Fishery Management for Target Populations																	
Criterion 1.1 - Maintain high productivity of target population & associated ecological community																	
Subcriterion 1.1.1 - Stock units																	
Indicator 1.1.1.1 Stock management units defined	100																
Indicator 1.1.1.2 Scientific agreement on units	100																
Indicator 1.1.1.3 Geographic distribution known	90																
Indicator 1.1.1.4 Indicator Stocks		na	na	na	na		na	na					na				
Indicator 1.1.1.5 Enhanced Stocks		na	na	na			na	na					na	na			
Subcriterion 1.1.2 - Monitoring and assessment																	
Indicator 1.1.2.1 Reliable estimates of removals	100																
Indicator 1.1.2.2 Reliable estimates of escapement	74																
Indicator 1.1.2.3 Information on fish age and size	90																
Indicator 1.1.2.4 Productivity estimates	100																
Subcriterion 1.1.3 - Management goals																	
Indicator 1.1.3.1 Limit reference points	75																
Indicator 1.1.3.2 Target reference points	100																
Criterion 1.2 - Fishery allows for the recovery of depleted stocks (Target Stocks)																	
Indicator 1.2.1 Well-defined and effective strategy		na	na	na			na	na					na	na			
Indicator 1.2.2 Stocks not depleted and harvest rates are sustainable		na	na	na			na	na					na	na			
Criterion 1.3 - Fishing does not impair reproductive capacity																	
Indicator 1.3.1 Age, sex and genetic structure are monitored	90			na					na						na		

Draft for Review

Nass Sockeye – Specific Indicator Problems (what needs improvement)

Under Principle 1, there were two indicators where Nass sockeye fisheries did not achieve the 80 scoring guidepost. The following sections identify indicators and criteria where these deficiencies occur and the actions required to attain full MSC certification.

Indicator 1.1.2.2: Estimates exist of the spawning escapement for each stock unit.

100 Scoring Guidepost

- Estimates are available for the annual escapement for each stock unit harvested in the fishery.
- In-season escapement data are collected for all stock units and used to regulate the fishery.

80 Scoring Guidepost

- Estimates are available for the annual escapement of each target stock harvested in the fishery.
- Fishery independent indicators of abundance are available for the non-target species harvested in the fishery.
- In-season escapement data are collected for the target stocks and used to regulate the fishery.

60 Scoring Guidepost

- Escapement estimates for target stocks are available, where escapement estimates are necessary to protect the target stock from overexploitation.
- Fishery independent indicators of abundance are available for non-target stocks where the fishery harvests may represent a significant component of the harvest of that stock.

Reliable escapement estimates are computed for the aggregate sockeye return to the Nass River and the Meziadin sockeye stock. However, annual estimates are not available in recent years for most of the smaller sockeye stocks (e.g. Bowser, Damdochax, Kwinageese). The escapement of these stocks could be readily estimated using DNA samples obtained from the Lower Nass fishwheels.

Condition 15 - Certification will be conditional until annual escapement estimates are computed for each of the Nass sockeye stocks targeted in the fisheries for Nass sockeye. (**Nass Condition #1.1**).

Draft for Review

Indicator 1.1.3.1: Limit Reference Points or operational equivalents have been set and are appropriate to protect the stocks harvested in the fishery.

100 Scoring Guidepost

- The Limit Reference Point for target species have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientist outside the management agency that the LRP's are appropriate.
- There is general scientific agreement regarding the LRP's for non-target species.

80 Scoring Guidepost

- There is some scientific basis for the LRP's for target stocks and these LRP's are defined to protect the stocks harvested by the fisheries.
- There is no significant scientific disagreement regarding the LRP's used by the management agency to formulate management decision for the fishery.

60 Scoring Guidepost

- There is general agreement among regional fisheries scientist within the management agency that the LRP's or equivalent are appropriate to achieve the management goals for target stocks.

LRP's have been defined for the aggregate sockeye return to the Nass River and the Meziadin sockeye stock. However, LRP's have not been defined for any of the smaller sockeye stocks (e.g. Bowser, Damdochax, Kwinageese). It is anticipated that implementation of the WSP will include the definition of LRP's or their operational equivalent, in the near future.

Condition 16 -Certification will be conditional until LRP's have been defined for each of the Nass sockeye stocks targeted in the fisheries for Nass sockeye. (**Nass Condition #1.2**).

8.2 MSC Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

Principle 2 Summary

A comparison of the scores for the Principle 2 indicators that address ecosystem and non-target populations is provided in Table 2.1.

Table 2.1. Summary of scores for Principle 2 indicators for each fishery.

		Fraser	Barkley	Skeena	Nass	
PRINCIPLE 2 - Ecosystem and Non-Target Populations						0.333
Criterion 2.1 - Maintain natural functional relationships among species						0.500
Indicator 2.1.1	Impacts on ecosystem processes can be identified	85	97	97	97	0.333
Indicator 2.1.2	Provisions to reduce ecosystem impacts	90	90	90	90	0.333
Indicator 2.1.3	Sufficient research on ecosystem impacts	93	97	93	93	0.111
Indicator 2.1.4	Escapement goals address ecosystem needs	95	100	95	95	0.222
Criterion 2.2 - Fishery minimizes impacts on endangered, threatened or protected species						0.250
Indicator 2.2.1	Information on biological diversity used by managers	77	95	98	95	1.000
Criterion 2.3 - Fishery allows for the recovery of depleted stocks (Non-target Stocks)						0.250
Indicator 2.3.1	Provide for recovery of non-target stocks	55	70	74	73	1.000

The basis for Principle 2 evaluation is not surprisingly very similar for the four sockeye fisheries because the general policies of DFO that address Principle 2 apply to all fisheries. Although the use of ecosystem concepts in salmon management has been discussed for decades, the use of ecosystem approaches in establishing target and limit reference points for taking actions on fisheries is a relatively new. Because of the long standing limnological studies of lakes associated with lake fertilization programs in the province, there is a relatively advanced understanding of within lake top-down and bottom up processes that regulate sockeye salmon abundance. In some cases, escapement goals have been established using limnological data that relates lake habitat parameters to sockeye smolt production. Mechanisms associated with cyclic dominance and the role that fishing mortality versus ecological processes is still debated with a high degree of uncertainty but recently in the Fraser River, harvest policies that are robust to assumptions of the mechanisms are being explored. In general, sockeye salmon harvests in the marine environment have little evidence of significant impacts on birds and mammals as indicated by log book records. Most concerns about impacts of fisheries on terrestrial birds and mammals that feed off of fish populations that are harvested are addressed through assurances of limit reference points as set through escapement goals that are of sufficient magnitude to provide near maximal subsequent returns. Over the long term, if escapements are sustainable, the escaped fish populations will provide sustenance for piscivorous birds, mammals and fish, as well as

providing nutrients that are sufficient to sustain smolt production within the lakes. Although in the future, more use of ecological data will likely occur in setting escapement goals, British Columbia sockeye salmon fisheries are far ahead of most fisheries in the world when considering the use of such types of information in harvest policies. The use of ecological data and ecological principles in managing the sockeye salmon fisheries has been embraced in the recently enacted wild salmon harvest policy.

The differences between these fisheries with regard to Principle 2 criteria, primarily is the result of differences in the status and recovery of depleted non-target sockeye salmon stocks. In the case of the Nass fishery, there is no evidence of any known populations of sockeye salmon being depleted; hence there is no immediate concern about recovery of the depleted stocks. Within the Skeena fishery, there are a significant number of non-target stocks that have been identified as being below the potential carrying capacity of the nursery lakes. Recovery programs have been initiated, although the historical status and productivity of many of these systems is still in doubt because abundance information historically is primarily anecdotal so potential carrying capacity is primarily made based on limnological data and the role of fishing in their depletion is less clearly established. Within Barkley Sound, Henderson Lake is clearly substantially below historical levels and fishing has likely had a significant role in their decline. A recovery plan is not yet fully developed for this system but recent analyses of probable harvest rates through run reconstruction suggests accommodations to the commercial fishery may limit the impact of commercial fishing activity on the recovery of this stocks. The Fraser River fisheries have been the biggest challenge, primarily because of the history of the fishery and the geography. With most of the historic exploitation occurring outside of the Fraser River, the multitude of diverse stocks within the river were often subjected to exploitation rates that were appropriate to sustaining escapements from the most productive and abundant fish stocks. When combined with other factors, severe depletion has occurred for some of the fish stocks with the most extreme well documented examples being Cultus and Sakinaw Lakes. Keeping harvest rates low while these stocks recover remains a challenge to harvest managers.

A comparative overview of the four fisheries as related to Principle 2 Criteria follows:

1. (Criterion 2.1) In general, salmon fisheries are inherently able to maintain natural functional relationships among species. Within the marine environment, there are usually two or more year classes at sea that are not subjected to human harvest on based on stock recruitment theory and supported by spawner-return data, average annual fish abundance likely exceeds unharvested stocks, while providing a high rate of harvest of the returning mature fish. Within freshwater, harvests reduce escapements significantly below what on average would be available for piscivorous birds and mammals but for maximal yield to the fishery to occur, sufficient spawners are needed to provide for these species and should be reflected in escapement goals. All of the fisheries use some form of this approach in determining escapement goals. Only in fisheries that are depleted by fishing will maintaining function relationships among species be a factor. Within the four fisheries, the Nass is the only system that has no identified depleted stocks, while recovery plans are in place for the depleted stocks on the Skeena. In the Babine system, there has been concern for overharvest of sockeye spawning in natural systems while fully harvesting returns to spawning channels. Management plans and recent reductions in maximum harvest rates harvest for all systems should ensure this is not a factor. Within the Barkley Sound fishery, the Henderson Lake stock is somewhat depleted and

may be a factor in reducing local consumption of salmon by predators and scavengers but a recovery plans are being initiated. Within the Fraser, the collapse of the Sakinaw and Cultus Lake stocks is of concern although there are additional systems that have information suggesting weak stocks. However, in none of these systems has there been clear evidence presented of reduced abundance of fish consuming species, such as bears and eagles. The mobility of these species and the natural cycles of sockeye salmon has likely ensured behaviour where alternative food sources can be used during periods of reduced abundance. Understanding of limnological processes within lakes has been broadly applied, particularly in determining recover goals, but also in lake rehabilitation/enhancement activities through the application of fertilizer. The Barkley Sound fishery has had a long history of enhancement through fishway construction and fertilizer application but this may have contributed to the reduction of Henderson Lake fishery while providing much higher than natural salmon returns to Great Central and Sproat Lakes. In comparison with other fisheries of the world, sockeye salmon fisheries have had the most intense research and understanding of ecosystem relationships, primarily because of the large dependency of many species on their abundance and their intrinsic dependency upon food webs within lakes. This research has been concentrated within lakes of the Skeena, Barkley, and Fraser systems but the results are broadly applicable to sockeye salmon fisheries everywhere.

2. (Criterion 2.2) Sockeye salmon fisheries are primarily executed through gill net or seine fisheries with short opening times and within restricted areas. Fishery minimizes impacts on endangered, threatened or protected species. Log books have provided some of the basis for marine bird and mammal interactions. Only fisheries within the Fraser River have had impacts on white sturgeon. This population is the only reasonable healthy population of white sturgeon in British Columbia and has tentatively been excluded from SARA listing. Throughout British Columbia, there has been extensive use of genetic information in understanding the degree of isolation populations from individual lakes, and sometimes from different spawning areas within the drainage of a rearing lake. The ongoing process of identifying Conservation Units in all of the fisheries under the wild salmon policy considerations is using this information. This type of information is probably more advanced in British Columbia sockeye salmon fisheries because DNA information is frequently used in identifying the stock of origin of commercially harvested fish and is used in the US Canada Treaty process in determining the international distribution of harvest. Since sockeye salmon have lesser straying rates than other species and the confinement of the freshwater rearing phase of their life history, in most cases, to lakes, both population dynamics and biodiversity center around individual or closely associated lakes in determining spatial definitions of individual populations that are to be conserved to maintain biodiversity as well as productivity of the associated fishery. This type of information has been used in all four of the sockeye salmon fisheries being investigated with degree of use dependent upon complexity of management problems faced and the importance of addressing depleted populations.
3. (Criterion 2.3). The recovery of non-target stocks is the one component of Principal 2 that had significant contrast between stocks. In the Nass system, there were no identified depleted stocks and available evidence suggests that small populations that are not monitored regularly, have similar levels of productivity as do the targeted stocks. In the

Skeena, several lakes have been at levels much below their apparent carrying capacity based on limnological data and their size. The historic productivity of these lakes is poorly documented, other than anecdotal evidence, so it is not clear as to what impact fishing has had on their low abundance. However recovery plans have been developed with defined limit reference points, so harvest managers have clear objectives to follow when attempting to restore these populations. In Barkley sound, Henderson Lake is depressed substantially below historic abundance levels and historically, it was a target stock prior to enhancement of sockeye salmon fisheries further inland. A recovery plan has not yet developed but there have been analyses suggesting current management of the fisheries should be able to prevent further depletion. The Fraser River fishery has primarily been conducted somewhat distant from the final spawning areas on timing aggregations of multiple stocks of fisheries populations. Several stocks (specifically Cultus and Sakinaw) have been depleted to such a degree they are threatened with extirpation as returns have been less than 100 fish. Because of the nature of the fishery, until these stocks were depleted, they would have been part of the targeted aggregations, based on their run timing. There are now recovery plans that are being developed and implemented for these stocks and attempts to manage the commercial fishery to reduce the commercial fisheries. There are other stocks within the Fraser River system that are part of the timing aggregates, where the conservation status has not been as thoroughly reviewed as the previous two example.

In the fishery specific sections that follow, we provide a summary of the areas where the fishery and management practices have been consistent with MSC Principal 2 criteria and details on the each of the indicators is provided where scores were less than the 80 scoring guidepost.

Fraser Sockeye – Criterion Summaries (what looks good)

Table 2.2 Summary of the evaluations for each Principle 2 criteria and indicator for the Fraser sockeye fishery.

PRINCIPLE 2 - Ecosystem and Non-Target Populations													
Criterion 2.1 - Maintain natural functional relationships among species													
Indicator 2.1.1	Impacts on ecosystem processes can be identified	87		P	P								
Indicator 2.1.2	Provisions to reduce ecosystem impacts	90				P							
Indicator 2.1.3	Sufficient research on ecosystem impacts	93			P								
Indicator 2.1.4	Escapement goals address ecosystem needs	95	P										
Criterion 2.2 - Fishery minimizes impacts on endangered, threatened or protected species													
Indicator 2.2.1	managers	78					P						
Criterion 2.3 - Fishery allows for the recovery of depleted stocks (Non-target Stocks)													
Indicator 2.3.1	Provide for recovery of non-target stocks	73			P		?	?	?	P			

Fraser has historically been the largest producer and is by far the most complex and difficult to manage fishery. A summary of our evaluations for each Principle 2 indicator and criteria is provided in Table 2.2. The criteria where the fishery exceeds the 80 Scoring Guidepost are generally considered the highlights (i.e. good news) for the fishery. The highlights associated

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with the various Principle 2 criteria for Fraser sockeye are summarize sequentially for each group of indicators below:

1. Natural Functional relationships are well maintained in the management of Fraser stocks. Ecosystem impacts are reasonably understood, based on limnological research on nutrient contribution of salmon carcasses and responses of lake trophic levels to high escapements as well as fertilizer additions. Mechanisms of cyclicity of some of the stocks are still uncertain and controversial as to how to best manage weak and strong year classes. Ecosystem impacts are as well understood, or most likely better with sockeye salmon fisheries in the Fraser than in most fisheries of the world. The DFO and the major universities in British Columbia have decades of research and myriads of publications on ecosystem effects of salmon escapements. However, broad use of ecosystem data to establish carrying capacity of lakes in determining escapement goals has had limited implementation, most often because there is little definitive analysis as to the benefits of using information on carcass nutrients, top-down trophic cascades, piscivore consumption rates, and other habitat based information in setting escapement goals. This information is much more relied upon when stocks are depleted or there is limited stock recruitment data to use in estimating escapement goals or harvest rates. (Indicators 2.1.1 to 2.1.4.).
2. The acquisition and use of information on biodiversity is quite developed with British Columbia sockeye salmon fisheries. There is relatively little bycatch of other species and much genetic information has been developed to determine biodiversity within sockeye salmon that use the system. These findings generally support the risk of stock depletion as restoration through artificial propagation or introduction of sockeye salmon into new systems has been very difficult. However much is still not known about small stocks and their ability to reestablish after depletion from either anthropogenic or natural causes (Indicator 2.2.1).
3. The recovery of depleted non-target stocks is by far the biggest challenge and the most controversial element of the Fraser River sockeye salmon fishery. Part of the dilemma facing fisheries managers is that the marine commercial fishery, depending upon its timing, results in the harvest of many stocks, some of which are seriously depleted. The reduction of maximum exploitation rates to 60% of the aggregate timing group has been a major step to reduce the overall harvest pressure on weak stocks with reduced or no harvests during other periods when severely depleted stocks are present, will likely result in significantly reduced harvest pressure on none target stocks. The rejection of the SARA listings of Cultus and Sakinaw sockeye salmon because of potential economic hardships to the fishing industry has created much apprehension within the conservation community. However, the Fisheries Minister has indicated that outside of SARA listing, the government will do what is necessary to restore these stocks, both which have had commercial fishing as a significant component in their reduction. The wild salmon policy recently enacted contains provisions for recovery of depleted stocks and sets general guidelines but does not contain specific mandates for actions in the commercial fishery if a stock is depleted. This has required the reviewers to examine individual recovery plans, harvest management plans, and associated reports and analysis to determine if the explicit

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mandates for stock recovery probabilities of the MSC program are likely to be met and to provide confidence that economic realities will not result in the long term commitment (past the next election) of the Canadian government to waiver in the recovery of depleted salmon stocks. This issue is addressed in detail in understanding the ratings of the Fraser Salmon fishery to individual MSC Criteria, associated indicators and scoring guideposts.

Fraser Sockeye – Specific Indicator Problems

Indicator 2.2.1 **The management of the fishery includes provisions for integrating and synthesizing new scientific information on biological diversity at the genetic, species or population level of all species harvested in the fishery and impacts on endangered, threatened, protected or icon species.**

The intent of this measure is to ensure that the management system incorporates available knowledge and considers the impacts of the fishery on biodiversity issues. This indicator includes the impacts of enhanced fishery harvests on these issues.

100 Scoring Guidepost

- A risk assessment has been conducted, based on current knowledge of direct and incidental mortalities from the fishery, to ensure the fishery does not pose a significant threat to the biodiversity of the target or non-target species.
- Stock composition including enhanced component, is known within Fishery Management Units with the likelihood of harvest of endangered, threatened, protected, or icon species has been estimated.
- Time and area of migrations of weak year classes, sub-stock or population components are known.
- The management system contains provisions to reduce harvests based on biodiversity concerns of affected endangered, threatened, protected or icon species, or weak year classes, of stocks, including the enhanced components, of the targeted species.

80 Scoring Guidepost

- The fishery has been monitored and the stock composition is assessed with a special effort to determine presence of rare, endangered, protected, or icon species.
- The management agency has a history of incorporating new research into management as new research data on impacts of fisheries on biodiversity become available.
- The fisheries management system includes provisions for harvest reduction when biodiversity concerns are identified for target or non-target species.

60 Scoring Guidepost

- Efforts are being made to assess the impacts of the fishery on the biodiversity of the endangered, threatened, and protected or icon species.

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- The impact of the fishery on endangered, threatened, and protected or icon species is identified and is considered in the management of fisheries.
- There are provisions in the management system to reduce the impacts of the fishery on the biodiversity of the endangered, threatened, and protected or icon species.

The first scoring guidepost was considered partially met because stock composition analysis is generally assessed and efforts have been made to identify the presence of depleted stocks in the fishery, including Cultus Lake sockeye. There has apparently no special effort to identify Sakinaw sockeye salmon in the fishery or to monitor white sturgeon bycatch, a species currently undergoing SARA review. Steelhead catches are also not apparently well documented and many of the steelhead stocks in the region have been highly depleted.

Condition 17 - Continued certification of the Fraser sockeye salmon fishery is contingent upon providing reliable and defensible estimates of the harvest of white sturgeon and steelhead within a reasonable time frame. See also Condition 1, 3, and 4 regarding Sakinaw sockeye, and the need to be able to identify and understand the impact of fish released from a supplementation program to assist in the recovery plan of Sakinaw sockeye and to be able to detect impacts on natural spawning produced returning adults. (**Fraser Condition 2.1**)

Indicator 2.3.1 Management strategies include provision for restrictions to the fishery to enable recovery of non-target stocks to levels above established LRPs (Limit Reference Points)

100 Scoring Guidepost

- The management plans and escapement goals have been shown to have a high (>80%) probability of achieving a long-term recovery of depleted non-target stocks using risk analysis.
- Historic data have been thoroughly examined to ensure fisheries restoration objectives are based on the likely habitat capacity, rather than on trends that cover only the most recent decades, thus avoiding the “moving baseline” syndrome.
- (P) Monitoring and assessment programs are established to determine with a high degree of confidence and in a timely manner that recovery is occurring.
- Proposed management strategies have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- The management system supports the collection of data on non-fishing related human activity in the development of recovery plans for non-target stocks.

80 Scoring Guidepost

- The management system includes assessment of plans for the recovery of non-target stocks to levels above established LRPs.
- Objectives for recovery have at least some consideration of historic documents on stock abundance.

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- The management system has a reasonable (>60%) probability of achieving long-term recovery of depleted non-target stocks.
- (P) Monitoring and assessment programs are established to determine with a high degree of confidence and in a timely manner that recovery is occurring.
- Escapement goals will be revised periodically to accommodate new data indicating success or failure of existing recovery plans.
- The management system considers the impact of non-fishing related human activity in the development of recovery plans for non-target stocks

60 Scoring Guidepost

- The management system attempts to prevent extirpation of non-target stocks and does have rebuilding strategies for the majority of the stocks.
- The management system has at least a 50% probability of achieving long-term recovery of depleted non-target stocks.
- The management system has a strategy for periodic revisiting escapement goals to respond to new data on recovery success or failure for the majority of the stocks.

The current management system has adequately addressed the likelihood of recovery of Cultus Lake Sockeye by conducting a risk analysis but has fallen short in addressing the same issue with Sakinaw Sockeye Salmon. The recovery plan for Sakinaw identifies harvest as a contributing factor and sets goals to achieve reduced harvests, there does not appear to be any area closures that would protect the fishery during the latter half of the run based on historical run timing (After late July/early August). The exploitation rate of 10-12% that is currently used as a harvest goal to ensure the fishery does not impair recovery of the this stock should eliminate the fishery as a major factor in eliminating returns. A run reconstruction effort was provided in providing evidence that over the past two years this level was being achieved. This document however provided additional uncertainty concerning the assumptions made and the appropriateness of the estimations of harvest rate over 2004 and 2005. Because escapement into Sakinaw lake during the latter half of the run based on historical run timing are so low, exploitation rates for the entire stock would likely be low regardless of the harvest rates that occurred during the latter portion of the run. An extreme example would be if zero fish returned during the period when the fish are vulnerable to harvest. The current method of calculation would result in an estimate of 0% harvest for the latter half of the run when there is a reasonable probability that this portion of the run was harvested at 100%. Estimates of the harvest rate should avoid using these very small fish counts in the calculations and rely on unbiased historical run reconstruction data and the assumed harvest rate parallels that of other abundant stocks that occur in the same fishery. In the absence of a risk analysis, low harvest rates should be imposed over a high proportion of the historical run timing to eliminate the possibility of the fishery inadvertently reducing returns or preventing the recovery of the later timed component of the run. It appears from the escapement timing information that the latter portion of the run has been reduced the most and consequently should receive at least equal conservation efforts. This is also of concern that because of the low numbers of fish returning, it is nearly impossible to directly measure exploitation rates specific to this stock and as a consequence there remains a high uncertainty as to what harvest rates actually are on the Sakinaw stock. The MSC scoring guidelines established for this Criteria requires that to meet the 80 scoring guidepost, we are required to have at least a 60% probability that depleted stocks

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will recover. Based on the information provided to date for the Sakinaw sockeye stock, we believe that the fishery may still be a factor in the recovery of at least the latter half of the run. Although the recovery plan goes a long way in providing goals and procedures to ensure freshwater productivity is increased, in the absence of further risk analysis of the recovery strategy, we remain unconvinced that the current harvest policies and commercial closures have been adequately examined for their impact on the recovery of Sakinaw sockeye.

Beyond Cultus and Sakinaw sockeye, there are other small salmon stocks in the area of targeted Fraser River sockeye stocks that have recently had reduced returns. Although we had limited information as to what role harvests have had on these reductions, their recent reductions parallel those of the Sakinaw and may have a common cause. The management entities as part of meeting the Wild Salmon Policy guidelines are expected to develop the functional equivalent of Limit Reference Points for these stocks and if necessary, develop similar analysis and recovery strategies as those developed for Cultus and Sakinaw. Although sockeye salmon stocks are of primary concern, depleted stocks of other species that are a significant bycatch in the sockeye salmon directed fishery also must be addressed.

Although all of the 60 scoring guideposts have been determined to have been met, the problems identified in meeting the guidepost 3 under the 80 scoring level could potentially apply to guidepost 2 under the 60 scoring level. Since we are unable to distinguish the difference between a 50% probability at the 60 scoring level and a 60% at the 80 scoring level, we are interpreting the difference between these two criteria as qualitative in that meeting the provisions of the 80 scoring level of 60% is likely to occur given conditional certification. This is a judgment of the reviewers given the track record at implementing the current management system by the DFO. Whereas failure of the same criteria at the 60 scoring level with a 50% probability would indicate we believe it would be highly unlikely that a modified recovery plan and changes to the current harvest system will occur and it is more likely than not this would lead to the commercial extirpation of the depleted non-target stock. In our judgment, the responses to low run abundance by DFO during recent years and the development of recovery plans and their implementation in other systems suggest DFO will complete the necessary changes under the conditions outlined under scoring level 80. Failure to meet such provisions would result in the certification of this fishery being terminated.

Condition 18 - Fraser Sockeye Salmon Condition #2. Certification of the Fraser sockeye salmon fishery is contingent upon developing and implementing a risk assessment of the Sakinaw Lake recovery strategy that will include the following items: 1) Examination of the risk of differing temporal harvest rates on returning run and its implication on the probability of the recovery of the stock; and 2) refinement and peer review of run reconstruction analysis for Sakinaw sockeye. (**Fraser Condition 2.2**)

Condition 19 - Fraser Sockeye Salmon Condition #3. Certification will be conditional until Limit Reference Points or their equivalent have been defined for Fraser sockeye salmon stocks, and recovery plans have been developed and implemented for stocks harvested in Fraser sockeye fisheries that are below their LRP. The proposed recovery plans must provide information regarding the probability of recovery and the timing for recovery. (**Fraser Condition 2.3**)

Barkley Sound Sockeye – Criterion Summaries (what looks good)

Table 2.3 Summary of the evaluations for each Principle 2 criteria and indicator for the Barkley Sound sockeye fishery.

PRINCIPLE 2 - Ecosystem and Non-Target Populations											
Criterion 2.1 - Maintain natural functional relationships among species											
Indicator 2.1.1	Impacts on ecosystem processes can be identified	97		P							
Indicator 2.1.2	Provisions to reduce ecosystem impacts	90			P						
Indicator 2.1.3	Sufficient research on ecosystem impacts	97			P						
Indicator 2.1.4	Escapement goals address ecosystem needs	100									
Criterion 2.2 - Fishery minimizes impacts on endangered, threatened or protected species											
Indicator 2.2.1	Information on biological diversity acquired and used	95									
Criterion 2.3 - Fishery allows for the recovery of depleted stocks (Non-target Stocks)											
Indicator 2.3.1	Provide for recovery of non-target stocks	70			P		P	P	P		

Barkley Sound is located on the west side of Vancouver Island and has several large sockeye salmon fisheries that have been developed by improved fish passage and a very long term lake fertilization program. A summary of our evaluations for each Principle 2 indicator and criteria is provided in Table 2.3. The criteria where the fishery exceeds the 80% Scoring Guidepost are generally considered the highlights (i.e. good news) for the fishery. The highlights associated with the various Principle 2 criteria for Barkley Sound sockeye are summarize sequentially for each group of indicators below:

1. Natural Functional relationships are well maintained in the management of Barkley Sound stocks. Ecosystem impacts are reasonably understood, based on limnological research on nutrient contribution of salmon carcasses and responses of lake trophic levels to high escapements as well as fertilizer additions as the Great Central Lake has been the subject of much limnological research on factors limiting sockeye salmon production with a continuous data set approaching 30 years. Ecosystem impacts are as well understood, or most likely better with sockeye salmon fisheries in the major lakes in Barkley Sound than in most fisheries of the world. The DFO and the major universities in British Columbia have decades of research and myriads of publications on trophic level effects and other ecological processes in the major lakes within this system. Most of the classic limnological work on sockeye salmon nutrient dependence has been established through research on these lakes and top down responses to escapement levels coupled with bottom up responses from nutrient additions are very well researched in this system. These data have been heavy used in the establishment of escapement goals. (Indicators 2.1.1 to 2.1.4.).
2. The acquisition and use of information on biodiversity is quite developed with British Columbia sockeye salmon fisheries including the Barkley Sound fishery.. There is relatively little bycatch of other species and much genetic information has been developed to determine biodiversity within sockeye salmon that use the system. These findings generally support the risk of stock depletion as restoration through artificial propagation or introduction of sockeye salmon into new systems has been very difficult. However much is still not known about small stocks and their ability to reestablish after depletion from either anthropogenic or natural causes. Although depleted, the Henderson

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stock is not endangered of extirpation and there are no known stocks that are threatened with extirpation. (Indicator 2.2.1).

3. The recovery and management of the depleted former target stock (but now a non-target stock) at Henderson Lake is the biggest challenge and the most controversial element of the Barkley Sound sockeye salmon fishery. Enhancement activities at Sproat and Great Central Lake, in addition to enhancement activities at Henderson Lake, have had great success resulting in much larger sustainable sockeye salmon runs than were there historically. Harvesting these highly productive stocks while increasing escapements to Henderson Lake present the most difficulty. Time and area management data that were summarized suggest reasonable success in lowering harvest rates on Henderson but these policies have not resulted in the recovery of the stock to historic levels. The reduction of maximum exploitation rates to a 60% of the aggregate timing group has been a major step to reduce the overall harvest pressure on weak stocks with reduced or no harvests during other periods. A forthcoming recovery plan for the Henderson Lake stock should provide a comprehensive view of recovery strategies that go beyond just the reduction in harvest rates. This issue is addressed in detail in understanding the ratings of the Barkley Sound sockeye salmon fishery to individual MSC Criteria, associated indicators and scoring guideposts. (Indicator 2.3.1).

Barkley Sound Sockeye – Specific Indicator Problems

Indicator 2.3.1 **Management strategies include provision for restrictions to the fishery to enable recovery of non-target stocks to levels above established LRPs (Limit Reference Points)**

100 Scoring Guidepost

- The management plans and escapement goals have been shown to have a high (>80%) probability of achieving a long-term recovery of depleted non-target stocks using risk analysis.
- Historic data have been thoroughly examined to ensure fisheries restoration objectives are based on the likely habitat capacity, rather than on trends that cover only the most recent decades, thus avoiding the “moving baseline” syndrome.
- (P) Monitoring and assessment programs are established to determine with a high degree of confidence and in a timely manner that recovery is occurring.
- Proposed management strategies have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- The management system supports the collection of data on non-fishing related human activity in the development of recovery plans for non-target stocks.

80 Scoring Guidepost

- (P) The management system includes assessment of plans for the recovery of non-target stocks to levels above established LRPs.

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- Objectives for recovery have at least some consideration of historic documents on stock abundance.
- (P) The management system has a reasonable (>60%) probability of achieving long-term recovery of depleted non-target stocks.
- (P) Monitoring and assessment programs are established to determine with a high degree of confidence and in a timely manner that recovery is occurring.
- Escapement goals will be revised periodically to accommodate new data indicating success or failure of existing recovery plans.
- (P) The management system considers the impact of non-fishing related human activity in the development of recovery plans for non-target stocks

60 Scoring Guidepost

- The management system attempts to prevent extirpation of non-target stocks and does have rebuilding strategies for the majority of the stocks.
- The management system has at least a 50% probability of achieving long-term recovery of depleted non-target stocks.
- The management system has a strategy for periodic revisiting escapement goals to respond to new data on recovery success or failure for the majority of the stocks.

The Barkley Sound fishery issues center around the recovery of Henderson Lake and the likely impact that current fisheries have on this non-targeted stock. The first, third, fourth and sixth guideposts were considered partially met, primarily because of the lack of a completed recovery plan for this stock. In the absence of a recovery plan, the reassessment of escapement goals is not assured (guidepost five). Although there have been a significant number of management actions that have taken place to reduce harvest rates, confidence in the stock reconstruction is lacking and there is no reliable estimate of harvest rates of returning Henderson Lake sockeye. Without a completed recovery plan and reliable interception data of Henderson sockeye salmon, the effectiveness of the current management regime in the recovery of the Henderson stocks is uncertain. Although a formal risk analysis would also be desirable as part of the recovery plan, obtaining information and providing analysis as to the current harvest rates by time and area of Henderson Lake sockeye is of highest priority.

Although all of the 60 scoring guideposts have been determined to have been met, the problems identified in partially meeting the guidepost 3 under the 80 scoring level could potentially apply to guidepost 2 under the 60 scoring level. Since we are unable to distinguish the difference between a 50% probability at the 60 scoring level and a 60% at the 80 scoring level, we are interpreting the difference between these two criteria as qualitative in that meeting the provisions of the 80 scoring level of 60% is likely to occur given conditional certification. This is a judgment of the reviewers given the track record at implementing the current management system by the DFO. Whereas failure of the same criteria at the 60 scoring level with a 50% probability would indicate we believe it would be highly unlikely that a recovery plan will be developed that would ensure needed changes to the current harvest system would occur and it is more likely than not that the current management practices would lead to the commercial extirpation of the depleted non-target stock. In our judgment, the responses to low run abundance by DFO during recent years and the development of recovery plans and their implementation in

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other systems suggest DFO will complete the recovery plan and implement any necessary changes under the conditions outlined under scoring level 80. Failure to meet such provisions in a timely manner would result in the certification of this fishery being terminated.

Condition 20 - Barkley Sound Sockeye Salmon Condition #1. Certification will be conditional until Limit Reference Points or their equivalent have been defined for Barkley Sound sockeye salmon stocks, with particular reference to Henderson Lake sockeye, and recovery plans have been developed and implemented for stocks harvested in Barkley Sound sockeye fisheries that are below their LRP. The proposed recovery plans must provide information regarding the probability of recovery and the timing for recovery. (**Barkley Sound Condition 2.1**)

Skeena Sockeye – Criterion Summaries (what looks good)

Table 2.4 Summary of the evaluations for each Principle 2 criteria and indicator for the Skeena sockeye fishery.

PRINCIPLE 2 - Ecosystem and Non-Target Populations													
Criterion 2.1 - Maintain natural functional relationships among species													
Indicator 2.1.1	Impacts on ecosystem processes can be identified	97		P									
Indicator 2.1.2	Provisions to reduce ecosystem impacts	90				P							
Indicator 2.1.3	Sufficient research on ecosystem impacts	93			P								
Indicator 2.1.4	Escapement goals address ecosystem needs	95	P										
Criterion 2.2 - Fishery minimizes impacts on endangered, threatened or protected species													
Indicator 2.2.1	Information on biological diversity acquired and used by managers	98	P										
Criterion 2.3 - Fishery allows for the recovery of depleted stocks (Non-target Stocks)													
Indicator 2.3.1	Provide for recovery of non-target stocks	74			P			P	P	P	P		

Skeena sockeye salmon fishery is located on the north central portion of the British Columbia Pacific coast and has several large sockeye salmon production lakes that include some that have had large enhancement spawning channels formed. A summary of our evaluations for each Principle 2 indicator and criteria is provided in Table 2.4. The criteria where the fishery exceeds the 80% Scoring Guidepost are generally considered the highlights (i.e. good news) for the fishery. The highlights associated with the various Principle 2 criteria for Skeena sockeye are summarize sequentially for each group of indicators below:

1. Natural Functional relationships are well maintained in the management of Skeena stocks. The DFO and the major universities in British Columbia have decades of research and myriads of publications on trophic level effects and other ecological processes in the major lakes within this system. These data have been heavy used in the establishment of escapement goals. (Indicators 2.1.1 to 2.1.4.).
2. The acquisition and use of information on biodiversity is quite developed with British Columbia sockeye salmon fisheries including the Skeena fishery.. There is relatively little bycatch of other species and much genetic information has been developed to determine biodiversity within sockeye salmon that use this system. This system is ahead of other systems with regard to the use of this information. (Indicator 2.2.1).
3. There are several lakes that have numbers substantially below calculated carrying capacity but have remained low for a relatively long period of time. Anecdotal evidence suggests historically stocks were significantly stronger in these lakes but recent year trends to not suggest these stocks are in any immediate peril. The reduction of maximum exploitation rates to a 60% of the aggregate timing group has been a major step to reduce the overall harvest pressure on weak stocks with reduced or no harvests during other periods. However, in the absence of a risk analysis, there is little evidence of recovery plans. In addition, chum salmon are a major concern and the effect of the sockeye salmon fishery on chum salmon recovery is a concern. This issue is addressed in detail in understanding the ratings of the Skeena sockeye salmon fishery to individual MSC Criteria, associated indicators and scoring guideposts. (Indicator 2.3.1).

Skeena Sockeye – Specific Indicator Problems

Indicator 2.3.1 Management strategies include provision for restrictions to the fishery to enable recovery of non-target stocks to levels above established LRPs (Limit Reference Points)

100 Scoring Guidepost

- The management plans and escapement goals have been shown to have a high (>80%) probability of achieving a long-term recovery of depleted non-target stocks using risk analysis.
- Historic data have been thoroughly examined to ensure fisheries restoration objectives are based on the likely habitat capacity, rather than on trends that cover only the most recent decades, thus avoiding the “moving baseline” syndrome.
- (P) Monitoring and assessment programs are established to determine with a high degree of confidence and in a timely manner that recovery is occurring.
- Proposed management strategies have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- The management system supports the collection of data on non-fishing related human activity in the development of recovery plans for non-target stocks.

80 Scoring Guidepost

- (P) The management system includes assessment of plans for the recovery of non-target stocks to levels above established LRPs.
- Objectives for recovery have at least some consideration of historic documents on stock abundance.
- (P) The management system has a reasonable (>60%) probability of achieving long-term recovery of depleted non-target stocks.
- (P) Monitoring and assessment programs are established to determine with a high degree of confidence and in a timely manner that recovery is occurring.
- (P) Escapement goals will be revised periodically to accommodate new data indicating success or failure of existing recovery plans.
- The management system considers the impact of non-fishing related human activity in the development of recovery plans for non-target stocks

60 Scoring Guidepost

- The management system attempts to prevent extirpation of non-target stocks and does have rebuilding strategies for the majority of the stocks.
- The management system has at least a 50% probability of achieving long-term recovery of depleted non-target stocks.
- The management system has a strategy for periodic revisiting escapement goals to respond to new data on recovery success or failure for the majority of the stocks.

The Skeena sockeye salmon fishery falls short in the area of development of recovery plans for the Damshiquit, Kitwanga, Sicintine, and Spawning systems. Given the relatively long term period of low returns to the depressed systems, there is reasonable doubt that these stocks will have at least a 60% probability of recovery. Indicators 1, 3, 4 and 5 are all deficient for some of the identified depleted stocks. Although these stocks do not appear to be immediately threatened with extirpation, a recovery strategy associated with a risk analysis is needed. In addition, we received information suggesting chum salmon stocks are depleted in this area and are a significant bycatch of the sockeye salmon fishery. A recovery plan for these target stocks and associated risk analysis of any modified harvest strategy should be completed.

Although all of the 60 scoring guideposts have been determined to have been met, the problems identified in partially meeting the guidepost 3 under the 80 scoring level could potentially apply to guidepost 2 under the 60 scoring level. Since we are unable to distinguish the difference between a 50% probability at the 60 scoring level and a 60% at the 80 scoring level, we are interpreting the difference between these two criteria as qualitative in that meeting the provisions of the 80 scoring level of 60% is likely to occur given conditional certification. This is a judgment of the reviewers given the track record at implementing the current management system by the DFO. Whereas failure of the same criteria at the 60 scoring level with a 50% probability would indicate we believe it would be highly unlikely that a recovery plan will be developed that would ensure needed changes to the current harvest system would occur and it is more likely than not that the current management practices would lead to the commercial extirpation of the depleted non-target stock. In our judgment, the responses to low run abundance by DFO during recent years and the development of recovery plans and their implementation in other systems suggest DFO will complete the recovery plan and implement any necessary changes under the conditions outlined under scoring level 80. Failure to meet such provisions in a timely manner would result in the certification of this fishery being terminated.

Condition 21 - Skeena Sockeye Salmon Condition #1. Certification will be conditional until Limit Reference Points or their equivalent have been defined for Skeena sockeye salmon stocks, and recovery plans have been developed and implemented for stocks harvested in Skeena sockeye fisheries that are below their LRP. The proposed recovery plans must provide information regarding the probability of recovery and the timing for recovery. (**Skeena Condition 2.1**)

Condition 22 - Skeena Sockeye Salmon Condition #2. Continued certification of the Skeena sockeye salmon fishery is contingent upon developing and implementing a recovery plan for chum stocks harvested in Skeena sockeye fisheries that are below their LRP. The proposed recovery plan must include procedures for determining the impact of the existing fishery management system on these stocks and provide for decreasing incidental harvest rates on chum salmon. (**Skeena Condition 2.2**)

Nass Sockeye – Criterion Summaries

Table 2.5 Summary of the evaluations for each Principle 2 criteria and indicator for the Nass sockeye fishery.

PRINCIPLE 2 - Ecosystem and Non-Target Populations														
Criterion 2.1 - Maintain natural functional relationships among species														
Indicator 2.1.1	Impacts on ecosystem processes can be identified	97		P										
Indicator 2.1.2	Provisions to reduce ecosystem impacts	92		P		P								
Indicator 2.1.3	Sufficient research on ecosystem impacts	93			P									
Indicator 2.1.4	Escapement goals address ecosystem needs	95	P											
Criterion 2.2 - Fishery minimizes impacts on endangered, threatened or protected species														
Indicator 2.2.1	Information on biological diversity acquired and used	95												
Criterion 2.3 - Fishery allows for the recovery of depleted stocks (Non-target Stocks)														
Indicator 2.3.1	Provide for recovery of non-target stocks	73			na			P			P			

The Nass sockeye salmon fishery is the most northern sockeye salmon fishery in British Columbia and is located near the Nass River. A significant portion of the ownership of this fishery and the management has been transferred to the Nishka First Nation as the first (and currently only) Native Claims Treaty Settlement in British Columbia. A summary of our evaluations for each Principle 2 indicator and criteria is provided in Table 2.5. The criteria where the fishery exceeds the 80% Scoring Guidepost are generally considered the highlights (i.e. good news) for the fishery. The highlights associated with the various Principle 2 criteria for Nass sockeye are summarize sequentially for each group of indicators below:

1. Natural Functional relationships are well maintained in the management of Nass stocks. During the 1990's a relatively large number of studies were conducted on the limnology and productivity of the major sockeye salmon lakes. Compared to most fisheries in the world, including salmon fisheries, the freshwater life history is well understood. The Nisga'a have invested significantly in management of the fisheries and there has been extensive use of local knowledge in development of fisheries plans. A relatively large personal fishery occurs on this stock in addition to both native and non-native commercial fisheries. (Indicators 2.1.1 to 2.1.4.).
2. The acquisition and use of information on biodiversity is quite developed with British Columbia sockeye salmon fisheries including the Nass fishery. There is relatively little bycatch of other species and much genetic information has been developed to determine biodiversity within sockeye salmon that use this system. The genetic information has been used to determine stock of origin in the intensive boundary fisheries with the State of Alaska. Salmon enhancement programs are not operating on the Nass system, other than the fishway into Meziadin Lake which was installed in 1966. This has apparently had substantial benefit to salmon production in addition to being used in management to recover tags and enumerate escapement, with an increases of the Meziadin component of the sockeye population from 40 to 80%. These increases have occurred without apparently providing differential increases in return per spawner rates that could lead to overharvest of systems that were not enhanced. (Indicator 2.2.1).
3. The Nass system is relatively unique in BC sockeye salmon fisheries as there are no data to suggest significant depletion of any of the sockeye salmon stocks. The biggest concern

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is the depletion of the chum salmon stocks that are harvested coincidental with the sockeye salmon fishery. Provisions are needed to ensure non-target stocks are not over harvested. (Indicator 2.3.1).

Nass Sockeye – Specific Indicator Problems

Indicator 2.3.1 Management strategies include provision for restrictions to the fishery to enable recovery of non-target stocks to levels above established LRPs (Limit Reference Points)

100 Scoring Guidepost

- The management plans and escapement goals have been shown to have a high (>80%) probability of achieving a long-term recovery of depleted non-target stocks using risk analysis.
- Historic data have been thoroughly examined to ensure fisheries restoration objectives are based on the likely habitat capacity, rather than on trends that cover only the most recent decades, thus avoiding the “moving baseline” syndrome.
- Monitoring and assessment programs are established to determine with a high degree of confidence and in a timely manner that recovery is occurring.
- Proposed management strategies have been reviewed and found to be scientifically defensible and appropriate by the Pacific Scientific Advice Review Committee or the appropriate Pacific Salmon Commission technical committee.
- The management system supports the collection of data on non-fishing related human activity in the development of recovery plans for non-target stocks.

80 Scoring Guidepost

- The management system includes assessment of plans for the recovery of non-target stocks to levels above established LRPs.
- Objectives for recovery have at least some consideration of historic documents on stock abundance.
- The management system has a reasonable (>60%) probability of achieving long-term recovery of depleted non-target stocks.
- Monitoring and assessment programs are established to determine with a high degree of confidence and in a timely manner that recovery is occurring.
- Escapement goals will be revised periodically to accommodate new data indicating success or failure of existing recovery plans.
- The management system considers the impact of non-fishing related human activity in the development of recovery plans for non-target stocks

60 Scoring Guidepost

- The management system attempts to prevent extirpation of non-target stocks and does have rebuilding strategies for the majority of the stocks.

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- The management system has at least a 50% probability of achieving long-term recovery of depleted non-target stocks.
- The management system has a strategy for periodic revisiting escapement goals to respond to new data on recovery success or failure for the majority of the stocks.

As there are no identified depleted sockeye salmon stocks on the Nass, the first two guideposts are not factors and we have no reason to believe that if stocks become depleted in the future, such factors will be considered in concert with the Wild Salmon Policy document. The third criteria was considered partially met in that the Wild Salmon Policy provides guidance and considerations for depleted sockeye stocks. We have been provided with ample evidence of major depletion of chum salmon stocks that are intercepted in the marine fisheries for sockeye salmon and may be harvested in the inshore fisheries. There is no obvious process or a recovery plan for this stock that limits the impact of fisheries on their harvest by periodically addressing escapement goals with the intent of limiting impacts on non-target fisheries. There needs to be a process in place where any depleted non-target species will require a recovery plan with a reasonable chance of success. Without a risk analysis or other process that identifies the relative risk to the chum salmon (or other non-target stocks) of the existing fishery, the sustainability of these non-target stocks cannot be assured. The last guidepost was considered partially met in that the escapement monitoring and intensive scrutiny of habitat and development that impact the Nass fisheries is likely to occur with the broad based ownership of the fishery by the Nisga'a people.

Although all of the 60 scoring guideposts have been determined to have been met, the lack of a management plan for chum salmon recovery could question the achievability of the second guidepost. As reviewers, we are unable to distinguish the difference between a 50% probability at the 60 scoring level and a 60% at the 80 scoring level, we are interpreting the difference between these two criteria as qualitative in that meeting the provision of the 80 scoring level of 60% is likely to occur given conditional certification. This is a judgment of the reviewers given the track record at implementing the current management system by the Nisga'a and DFO. Whereas failure of the same criteria at the 60 scoring level with a 50% probability would indicate we believe it would be highly unlikely that a recovery plan and changes to the current harvest system will occur and its more likely than not this would lead to the commercial extirpation of the depleted non-target stock.

Condition 23 - Nass Sockeye Salmon Condition #1. Certification of the Nass sockeye salmon fishery is contingent upon developing and implementing a recovery plan for chum salmon stocks that are below the LRP and that spawn in the Nass or its tributaries. Such a plan must have clear procedures to determine the impact of the existing fishery management system on these stocks and provide for decreasing incidental harvest rates on chum salmon, if harvest pressure is found to have significant risks to chum recovery. (**Nass Condition 2.1**)

8.3 MSC PRINCIPLE 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

MSC Intent: The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

For the purposes of this section, the management system is defined to mean all public sector entities with responsibility for managing salmon in British Columbia, including Fisheries and Oceans Canada (FOC), the Pacific Salmon Treaty (PST), and Pacific Salmon Commission (PSC), in addition to scientific assessment groups such as Pacific Scientific Advice Review Committee (PSARC) and other governmental entities that provide advice to managers.

Some indicators under Principle 3 appear to overlap with indicators under Principles 1 and 2, however, Principles 1 and 2 are concerned with the outcomes of a management system respecting the fact that the resources are maintained at the desired levels of abundance, while Principle 3 is concerned with evaluating whether all of the processes for reaching management objectives are in place.

Principle 3 Summary

Evaluation scores for the four sockeye fisheries were above the 80 scoring guidepost for most of the Principle 3 indicators. The following points provide a summary of our findings:

1. the management systems in place for Skeena and Nass sockeye are consistent with MSC principles and criteria while those for Fraser and Barkley Sound sockeye require some enhancements for certification.
2. all fisheries are deficient in their framework for research since no research plans were provided for target or non-target species;
3. the consultation process is similar for each fishery and this process was found to be completely consistent with our evaluation criteria;
4. the management system includes effective measures to control levels of harvest for each fisheries but for Fraser sockeye has fallen short of MSC requirements regarding the restoration schedule for depleted populations;
5. the processes in place to review the management system were similar for the Fraser, Barkley Sound and Skeena sockeye fisheries and only deficient with regard to external reviews. The Nass fisheries include a rigorous internal and external review process as part of the implementation of the Nisga'a Final Agreement;
6. All sockeye fisheries were found to be compliant with international agreements, and domestic laws. Only the Nass sockeye fisheries were found to be in compliance with all legal and most customary rights of First Nation peoples that are impacted by the fishery; and
7. fishing gear and practices were generally found to be consistent with MSC criteria, however, there is general agreement that the data on catches and discards of sturgeon in Fraser River sockeye fisheries is not adequate for the management of this threatened species.

Table 3.1. Summary of scores for Principle 3 indicators for each fishery.

PRINCIPLE 3 - Management and Operational Framework		Fraser	Barkley	Skeena	Nass	0.333
Management Framework						
Criterion 3.1 - Management system consistent with MSC principles and criteria						0.327
Indicator 3.1.1	Clear and defensible set of objectives	75	100	100	96	0.199
Indicator 3.1.2	Periodic assessment of biological status	100	100	100	100	0.102
Indicator 3.1.3	Identify the impact of fishing on the ecosystem	85	95	95	95	0.064
Indicator 3.1.4	Uses best information and precautionary approach	77	77	94	100	0.104
Indicator 3.1.5	Responses to new information are timely and adaptive	100	100	100	100	0.098
Indicator 3.1.6	Responsive to social and economic impact of fishery	90	90	90	95	0.095
Indicator 3.1.7	Useful and relevant information to decision makers	94	90	97	94	0.192
Indicator 3.1.8	Socioeconomic incentives for sustainable fishing	78	77	96	100	0.147
Criterion 3.2 - Framework for research pertinent to management						0.100
Indicator 3.2.1	Research plan for target and non-target species	70	73	74	77	0.667
Indicator 3.2.2	Research is timely, available and reviewed	90	90	90	95	0.333
Criterion 3.3 - Transparency in operations and consultation process						0.041
Indicator 3.3.1	Open consultations process	100	100	100	100	1.000
Criterion 3.4 - Measure to control levels of harvest						0.179
Subcriterion 3.4.1 - Catch and exploitation levels						0.500
Indicator 3.4.1.1	Firshery control systems including no-take zones	94	100	100	100	0.500
Indicator 3.4.1.2	Measures to restore depleted fish populations	70	85	85	95	0.500
Subcriterion 3.4.2 - Ensure that conservation objectives are met.						0.500
Indicator 3.4.2.1	Compliance provisions (effective enforcement)	90	98	98	100	0.500
Indicator 3.4.2.2	Monitoring provisions	97	100	100	100	0.500
Criterion 3.5 - Regular and timely review of management system						0.152
Indicator 3.5.1	Internal review	100	100	100	100	0.316
Indicator 3.5.2	External review	70	70	70	100	0.258
Indicator 3.5.3	Recommendations from reviews incorporated	95	95	95	100	0.284
Indicator 3.5.4	Mechanism for resolving disputes	80	80	80	90	0.142
Criterion 3.6 - Compliance with legal and administrative requirements						0.124
Indicator 3.6.1	Compliance with international agreements	100	100	100	100	0.250
Indicator 3.6.2	Compliance with domestic laws and regulations	90	90	90	90	0.375
Indicator 3.6.3	Observes legal and customary (First Nation) rights	75	75	75	100	0.375
Fisheries Operational Framework						
Criterion 3.7 - Ecosystem sensitive gear and fishing practices						0.077
Indicator 3.7.1	Avoid catch and minimize mortality of non-target species	97	100	97	100	0.277
Indicator 3.7.2	No distructive fishing practices	100	100	100	100	0.139
Indicator 3.7.3	Minimize operational waste	100	100	100	100	0.128
Indicator 3.7.4	Cooperation of fishers	70	95	95	95	0.328
Indicator 3.7.5	Fishing methods minimize impacts on habitat	100	100	100	100	0.128

Fraser Sockeye – Criterion Summaries (what looks good)

A summary of our evaluations for each Principle 3 indicator and criteria is provided in Table 3.2. The following points describe the Principle 3 highlights for Fraser sockeye:

1. most components of the management systems in place for Fraser sockeye are consistent with MSC principles and criteria;
2. the consultation process was found to be completely consistent with our evaluation criteria;
3. the management system includes effective measures to control levels of harvest for each fisheries;
4. the management system includes an extensive internal review process for assessing management actions, fisheries recommendations and resolving disputes;
5. Fraser sockeye fisheries were found to be compliant with international agreements, and domestic laws. and
6. fishing gear and practices were generally found to be consistent with MSC criteria.

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Table 3.2. Summary of the evaluations for each Principle 3 criteria and indicator for the Fraser sockeye fishery.

[illegible]

Draft for Review

Fraser Sockeye – Specific Indicator Problems

MSC Criterion 3.1

The management system has a strategy for management that clearly defines long-term objectives for managing the impact of fishing on target species, non-target species and the ecosystem; the objectives are consistent with a well- managed fishery and MSC principles and criteria; and the management strategy includes provision for the effective implementation of measures to attain these objectives.

The objective regarding this criterion dealing with Management Systems is to compare the Fisheries and Oceans Canada management system for British Columbia salmon, as detailed in the Integrated Fisheries Management Plan for British Columbia Salmon, and elsewhere, with the standards for a well-managed fishery as defined in the MSC Principles and Criteria for Sustainable Fishing. Particularly important is whether the management system has clearly defined objectives and goals that incorporate currently evolving standards for responsible fisheries management with respect to conservation of the species, regard for the ecosystem to which they belong, transparency of the management process and recognition of the impact of the fishery on social, cultural and economic issues.

Throughout this section the term “impact on the ecosystem” is taken to mean the degree to which fishing alters the ecosystem relative to its non-fished state.

Indicator 3.1.1: The management system has a clear and defensible set of objectives for the harvest and escapement for target species and accounts for the non-target species captured in association with, or as a consequence of, fishing for target species.

100 Scoring Guidepost

- Management objectives are clearly defined for all of the target stocks and are consistent with the MSC criteria for a well-managed fishery.
- Harvest rates and escapement goals are precisely set for each target stock unit in the fishery, as qualified by relevant environmental factors.
- Target Reference Points and Limit Reference Points are clearly defined and documented for each target stock unit in the fishery.
- Harvest controls are effective with respect to the attainment of management objectives for each target stock unit in the fishery.
- The management system provides estimates for all catches, landings and bycatch.

Draft for Review

80 Scoring Guidepost

- Management objectives are clearly defined for most of the target stocks and are consistent with the MSC criteria for a well-managed fishery.
- Harvest rates and escapement goals are set for target stocks or target species in the fishery, as qualified by relevant environmental factors.
- Harvest controls are precise and effective for major target stocks or target species in the fishery.
- The management system provides estimates for all major catches, landings, and bycatch.

60 Scoring Guidepost

- Management objectives are clearly defined and consistent with MSC criteria for a well-managed fishery for the majority of target stocks.
- Harvest controls are effective for the majority of the fisheries on target stocks.
- The management system provides for the estimation of catch, landing, and bycatch for the majority of the fisheries.

The management agency has recently initiated processes to define the conservation units and management objectives for Fraser sockeye stocks under the Fraser River Sockeye Spawning Initiative and the WSP. These processes need to be completed before we can assess whether these objectives are consistent with MSC criteria. On a separate issue, there are significant concerns regarding the data on the bycatch and mortality of sturgeon in Fraser River sockeye fisheries.

Condition 24 - Certification will be conditional until a clear set of management objectives has been defined and found to be consistent with MSC criteria and measures are taken to reduce the bycatch of sturgeon and improve the monitoring systems used to estimate sturgeon bycatch. (Fraser Condition #3.1).

Indicator 3.1.4: When dealing with uncertainty, the management system provides for utilizing the best scientific information available to manage the fishery, while employing a precautionary approach.

100 Scoring Guidepost

Draft for Review

- The management system provides for the routine assessment of the level of uncertainty in the information collected for management and establishes management controls to address these uncertainties using the best available scientific information and a precautionary approach. .
- The management system implements research efforts to address data gaps.
- For newly developing fisheries for which there is very limited data and information, the management system implements controls on the development of the fishery that are precautionary in nature.
- The management system always quantitatively evaluates the effect of implementation uncertainty (the tendency for actual harvest rates or escapements to differ from those intended by the management regulations) on the effectiveness of the proposed management actions.

80 Scoring Guidepost

- The management system provides for some assessment of the level of uncertainty in the information collected for management and establishes management controls which take into account these uncertainties, using the best available scientific information and a precautionary approach.
- In situations when precautionary measures are necessary to manage the fishery, the management system calls for increasing research efforts in order to fill data and information gaps.
- In most cases where there are newly developing fisheries, the management system implements controls on the development of the fishery that are precautionary in nature.
- The management system considers the effect of implementation uncertainty on the effectiveness of most of the proposed management actions.

60 Scoring Guidepost

- The management system for the majority of newly developing fisheries is consistent with a precautionary approach.
- The management system considers the effect of implementation uncertainty on the effectiveness of the majority of the proposed management actions.

Draft for Review

The management agency has not shown a clear commitment to define and implement action plans for two sockeye stocks (Cultus and Sakinaw) where precautionary measures are necessary to manage Fraser sockeye fisheries.

Condition 25 - Certification will be conditional until the management agency provides a clear commitment to implement recovery action plans for Cultus and Sakinaw sockeye (**Fraser Condition #3.2**).

Indicator 3.1.8: The management system provides for socioeconomic incentives for sustainable fishing.

100 Scoring Guidepost

- The management system has formal procedure for providing social and economic incentives to stakeholders in the fishery to develop and utilize sustainable fishing practices, particularly the development of selective fishing gear and practices that lead to improved conservation.
- The management system creates strong incentives for harvesters to not exceed target catches or exploitation rates
- The stakeholders in the fishery regularly avail themselves of the opportunity to utilize these incentives.
- Evidence provided by the management system demonstrates that such incentives have contributed to improved conservation.
- The management system continually attempts to understand the impact of their decisions on social and economic factors affecting the stakeholders in the fishery and regularly takes action to mitigate the impacts on stakeholders.

80 Scoring Guidepost

- The management system regularly considers the use of social and economic incentives to the stakeholders in the fishery, which are designed to facilitate the development of fishing gear and practices that can lead to sustainable fishing.
- The management system includes a program to create incentives for harvesters to not exceed target catches or exploitation rates.
- Evidence demonstrates that the stakeholders in the fishery have used such incentives.

Draft for Review

- The management system attempts to understand the impact of their management decisions on social and economic factors affecting the major stakeholders in the fishery and takes action to lessen the major impacts on stakeholders.

60 Scoring Guidepost

- The management system provides for the use of social or economic incentives to ensure sustainable fishing.
- The management system attempts to understand the impact of its decisions on social and economic factors affecting the stakeholders in the fishery and is responsive to requests to reduce these impacts.

The lack of any defined allocations for Fraser sockeye makes it virtually impossible to discourage harvesters from exceeding catch targets or exploitation rate limits. First Nation treaties provide an avenue for defining salmon allocations and penalizing those that exceed these limits by reducing their harvest opportunities in future years.

Condition 26 - Certification will be conditional until the management agency provides a clear evidence that measures are being implemented to encourage harvesters not to exceed catch targets or exploitation rate limits (**Fraser Condition #3.3**).

MSC Criterion 3.2

The management system provides for a framework for research, the results of which are pertinent to achieving the objectives of management.

Under this criterion we are interested in evaluating whether there is a research component to the management system that is sufficiently broad in scope to include all target species and other components of the ecosystem that may be impacted by fishing, and which provides for the acquisition of information and data to support scientifically- sound management actions, and whether the research is timely, open to review by peers and stakeholders in general, and is adequately funded.

Indicator 3.2.1: The research plan covers the scope of the fishery, includes all target species, accounts for the non-target species captured in association with, or as a consequence of fishing for target species, and considers the impact of fishing on the ecosystem and socioeconomic factors affected by the management program.

100 Scoring Guidepost

Draft for Review

- The management system incorporates a research component that considers relevant data and information needs for formulating management strategies for all target species, and also information leading to an understanding of the dynamics of the ecosystem including data on the catch, landings and discards of non-target species.
- The framework for research includes investigations dealing with socioeconomic impacts of the fishery.
- The research plan responds in a timely fashion to unexpected changes in the fishery.
- Funding is secure and sufficient to meet long-term research needs.
- There is significant continuing progress in understanding the impact of the fishery on target and non-target species, and the ecosystem in general.
- Research results form the basis for formulating management strategies and decisions.
- Research is regularly published in peer review journals and/or is reviewed by PSARC or the PSC.

80 Scoring Guidepost

- The management system incorporates a research component that provides for the collection and analysis of information necessary for formulating management strategies and decisions for both target and non-target species.
- The research plan addresses concerns related to the impact of the fishery on the ecosystem.
- The research plan addresses socioeconomic issues that result from the implementation of management.
- The research plan is responsive to changes in the fishery.
- Funding is adequate to support short-term research needs.
- There is progress in understanding the impact of the fishery on target and non-target species.
- Research results are utilized in forming management strategies.

Draft for Review

- Research is reviewed by PSARC or PSC, or other appropriate and technically qualified entities.

60 Scoring Guidepost

- Research provides for the collection of catch statistical and biological data for the target species.
- There has been useful research on the impact of fishing on target and non-target species taken in the fishery, and on the ecosystem in general.

The lack of any research plan for Fraser sockeye makes it difficult to assess whether the plan addresses concerns related to the impact of the fishery on the ecosystem, socioeconomic issues that result from the implementation of management plans, or if the research plan is responsive to changes in the fishery.

Condition 27 - Certification will be conditional until the management agency provides a research plan that addresses identified concerns related to the impact of the fishery on the ecosystem, with emphasis on non-target stocks, and takes into consideration socioeconomic factors and anticipated changes to fisheries. (Fraser Condition #3.4).

MSC Criterion 3.4

The management system implements measures to control levels of exploitation in the fishery.

Sub-Criterion 3.4.1: The management system has provisions for controlling levels of exploitation to achieve the escapement and/or harvest rate goals for target stocks, and for the setting of harvest limits for non-target species, when there is information indicating such limits are necessary.

Under this sub-criterion the issue of whether the management system provides for mechanisms such as closed areas, no take zones, and closed dates and times for placing controls on fisheries to ensure that objectives related to exploitation levels and escapement are achieved is evaluated.

Indicator 3.4.1.2: Provides for restoring depleted target species to specified levels within specified time frames.

100 Scoring Guidepost

Draft for Review

- The management system has a formal and codified mechanism, which is adequate for restoring depleted target stocks to the TRP or equivalent high level of abundance, as qualified by relevant environmental factors.
- The mechanism includes strict guidelines for restoring these depleted populations within a certain time frame are formalized by the management system.

80 Scoring Guidepost

- The management system includes measures, which are adequate to restore depleted populations of target stock to the TRP or equivalent high level of abundance as qualified by relevant environmental factors.
- A time schedule for restoration, which considers environmental variability, is determined by the management system.

60 Scoring Guidepost

- The management system includes measures for restoring the majority of depleted populations of target stock to the TRP or equivalent high level of abundance.

The lack of TRP or equivalent for the depleted Fraser Sakinaw sockeye stock and the lack of a time schedule for recovery suggests that this indicator has not yet been met. The recovery plan needs credibility by providing clear restoration guidelines, time frames, and a strategy for incremental changes to management and incremental increases in funding when the time schedule for achieving the TRP is not met.

Condition 28 - Certification will be conditional until the management agency provides TRP's for the Cultus sockeye salmon stock and an assessment of the probability of recovery and the timing for recovery for Cultus sockeye. (**Fraser Condition #3.5**).

MSC Criterion 3.6

The management system provides for the operation of the fishery to be in compliance with all relevant legal and administrative requirements.

In this section we attempt to evaluate the management system with regard to whether it manages the fishery in a manner that is consistent with Canada's commitments under relevant international treaties and agreements, and with domestic laws and regulations that pertain to the fishery. In this context we also evaluate whether the management system is in conformity with the legal and customary rights of First Nations peoples, as established by treaties with those peoples, the Canadian Constitution, and other applicable instruments.

Draft for Review

Indicator 3.6.3: The management system provides for the observation of legal and customary rights of First Nation peoples.

100 Scoring Guidepost

- The management system is in compliance with all major legal and customary rights of First Nation peoples that are impacted by the fishery.
- The management system includes processes for consultation with First Nations peoples on the impact of the commercial fishery on their food, social and ceremonial fisheries.

80 Scoring Guidepost

- The management system is found to be in compliance with all legal and most of the customary rights of First Nation peoples that are impacted by the fishery.
- The management system includes processes for providing information to First Nations peoples on the major impacts of the commercial fishery on their food, social and ceremonial fisheries.

60 Scoring Guidepost

- The management system is in compliance with the legal rights of First Nation peoples that are impacted by the fishery.

The submissions by the client indicate that DFO believes it has met its First Nations obligations to protect and manage for food, social, and ceremonial harvest by First Nations. However, in consultation with First Nations and conservations groups, the assessment team was provided with information indicating that several of the First Nations that harvest Fraser sockeye expressed clear concerns that the management system for Fraser sockeye has not adequately addressed their legal priority rights for FSC fisheries and “is not a transparent process, thus it does not comply with Principle 3 criteria” (Appendix 4 - Letter from Secwepemc Fisheries Commission dated August 3, 2005). Similar views were expressed by representatives of the BCAFC and Cowichan Tribes. A letter from Chief Kelly of the Soowahlie Band of the Sto:lo First Nation to Minsiter Thibault of Fisheries and Oceans clearly stated disagreements with the management approach for protection for Cultus and Sakinaw sockeye.

Condition 29 – Certification will be conditional until the management agency provides evidence that First Nation issues regarding aboriginal and treaty rights have been identified
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and these issues are being addressed through an effective consultation or negotiation process. (Fraser Condition #3.6).

MSC Criterion 3.7

Fishing operations make use of gear and fishing practices that limit ecosystem impacts.

The intention regarding this criterion relating to fishery operations is to evaluate the degree to which the management system is capable of implementing responsible fishing practices. The understanding here regarding responsible fishing practices refers to the criteria defined in the MSC, Principle 3.B., Operational Criteria 12-17, and with those sections of the FAO Code of Conduct for Responsible fishing dealing with the conduct of fishing practices by the fishing industry.

Indicator 3.7.4: The management system solicits the cooperation of the fishing industry and other relevant stakeholders in the collection of data on the catch and discard of non-target species and undersized individuals of target species.

100 Scoring Guidepost

- The majority of fish harvesters and processors are in compliance with management requests for the collection of data on catches and discards of non-target species and undersized individuals of target species.
- Continued improvement in the quality and quantity of catch and discard data is evident.

80 Scoring Guidepost

- Sufficient numbers of fish harvesters and processors comply with requests for data on catches and discards of non-target species and undersized individuals of target species to ensure that reliable estimates of total catches and discards for the fishery can be obtained.

60 Scoring Guidepost

- Catch and discard data provided by the fishing industry and other relevant stakeholders are sufficient to manage the harvests from the majority of the non-target species and undersized individuals from the majority of the target species.

Draft for Review

Reliable estimates for sturgeon and steelhead bycatch are not available for sockeye fisheries in the lower Fraser River.

Condition 30 – Same as Condition 17. Certification will be conditional until the management agency provides reasonable estimates of the harvest of white sturgeon and steelhead within a reasonable time frame. (**Fraser Condition #3.7**).

Barkley Sound Sockeye – Criterion Summaries
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A summary of our evaluations for each Principle 3 indicator and criteria is provided in Table 3.3. The following points describe the Principle 3 highlights for Barkley Sound sockeye:

1. most components of the management systems in place for Barkley Sound sockeye are consistent with MSC principles and criteria;
2. the consultation process was found to be completely consistent with our evaluation criteria;
3. the management system includes effective measures to control levels of harvest for each fisheries;
4. the management system includes an extensive internal review process for assessing management actions, fisheries recommendations and resolving disputes;
5. Barkley Sound sockeye fisheries were found to be compliant with international agreements, and domestic laws; and
6. fishing gear and practices were generally found to be consistent with MSC criteria.

Table 3.3. Summary of the evaluations for each Principle 3 criteria and indicator for the Barkley Sound sockeye fishery.

Summary for Barkley Sound Sockeye (Draft - 26 June 2007)			Criteria @ 100					Criteria @ 80						Criteria @ 60				
		Score	1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5
PRINCIPLE 3 - Management and Operational Framework																		
Management Framework																		
Criterion 3.1 - Management system consistent with MSC principles and criteria																		
Indicator 3.1.1	Clear and defensible set of objectives	100																
Indicator 3.1.2	Periodic assessment of biological status	100																
Indicator 3.1.3	Identify the impact of fishing on the ecosystem	95	P			P												
Indicator 3.1.4	Uses best information and precautionary approach	77		P	na	P			P	na				na				
Indicator 3.1.5	Responses to new information are timely and adaptive	100																
Indicator 3.1.6	Responsive to social and economic impact of fishery	90																
Indicator 3.1.7	Useful and relevant information to decision makers	90		P														
Indicator 3.1.8	Socioeconomic incentives for sustainable fishing	77	P	P					P									
Criterion 3.2 - Framework for research pertinent to management																		
Indicator 3.2.1	Research plan for target and non-target species	73																
Indicator 3.2.2	Research is timely, available and reviewed	90																
Criterion 3.3 - Transparency in operations and consultation process																		
Indicator 3.3.1	Open consultations process	100																
Criterion 3.4 - Measure to control levels of harvest																		
Subcriterion 3.4.1 - Catch and exploitation levels																		
Indicator 3.4.1.1	Firshery control systems including no-take zones	100																
Indicator 3.4.1.2	Measures to restore depleted fish populations	85		P														
Subcriterion 3.4.2 - Ensure that conservation objectives are met.																		
Indicator 3.4.2.1	Compliance provisions (effective enforcement)	98			P													
Indicator 3.4.2.2	Monitoring provisions	100																
Criterion 3.5 - Regular and timely review of management system																		
Indicator 3.5.1	Internal review	100																
Indicator 3.5.2	External review	87																
Indicator 3.5.3	Recommendations from reviews incorporated	95	P															
Indicator 3.5.4	Mechanism for resolving disputes	80																
Criterion 3.6 - Compliance with legal and administrative requirements																		
Indicator 3.6.1	Compliance with international agreements	100																
Indicator 3.6.2	Compliance with domestic laws and regulations	90	P															
Indicator 3.6.3	Observes legal and customary (First Nation) rights	75							P									
Fisheries Operational Framework																		
Criterion 3.7 - Ecosystem sensitive gear and fishing practices																		
Indicator 3.7.1	Avoid catch and minimize mortality of non-target species	100																
Indicator 3.7.2	No destructive fishing practices	100																
Indicator 3.7.3	Minimize operational waste	100																
Indicator 3.7.4	Cooperation of fishers	95		P														
Indicator 3.7.5	Fishing methods minimize impacts on habitat	100																

Barkley Sound Sockeye – Specific Indicator Problems

Indicator 3.1.4: When dealing with uncertainty, the management system provides for utilizing the best scientific information available to manage the fishery, while employing a precautionary approach.

Draft for Review

100 Scoring Guidepost

- The management system provides for the routine assessment of the level of uncertainty in the information collected for management and establishes management controls to address these uncertainties using the best available scientific information and a precautionary approach. .
- The management system implements research efforts to address data gaps.
- For newly developing fisheries for which there is very limited data and information, the management system implements controls on the development of the fishery that are precautionary in nature.
- The management system always quantitatively evaluates the effect of implementation uncertainty (the tendency for actual harvest rates or escapements to differ from those intended by the management regulations) on the effectiveness of the proposed management actions.

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- The management system provides for some assessment of the level of uncertainty in the information collected for management and establishes management controls which take into account these uncertainties, using the best available scientific information and a precautionary approach.
- In situations when precautionary measures are necessary to manage the fishery, the management system calls for increasing research efforts in order to fill data and information gaps.
- In most cases where there are newly developing fisheries, the management system implements controls on the development of the fishery that are precautionary in nature.
- The management system considers the effect of implementation uncertainty on the effectiveness of most of the proposed management actions.

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- The management system for the majority of newly developing fisheries is consistent with a precautionary approach.
- The management system considers the effect of implementation uncertainty on the effectiveness of the majority of the proposed management actions.

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The management agency has not shown a clear commitment to define and implement action plans for the depleted Henderson Lake sockeye stock.

Condition 31 – Same as Condition 20. (Barkley Sound Condition #3.1).

Indicator 3.1.8: The management system provides for socioeconomic incentives for sustainable fishing.

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- The management system has formal procedure for providing social and economic incentives to stakeholders in the fishery to develop and utilize sustainable fishing practices, particularly the development of selective fishing gear and practices that lead to improved conservation.
- The management system creates strong incentives for harvesters to not exceed target catches or exploitation rates
- The stakeholders in the fishery regularly avail themselves of the opportunity to utilize these incentives.
- Evidence provided by the management system demonstrates that such incentives have contributed to improved conservation.
- The management system continually attempts to understand the impact of their decisions on social and economic factors affecting the stakeholders in the fishery and regularly takes action to mitigate the impacts on stakeholders.

80 Scoring Guidepost

- The management system regularly considers the use of social and economic incentives to the stakeholders in the fishery, which are designed to facilitate the development of fishing gear and practices that can lead to sustainable fishing.
- The management system includes a program to create incentives for harvesters to not exceed target catches or exploitation rates.
- Evidence demonstrates that the stakeholders in the fishery have used such incentives.

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- The management system attempts to understand the impact of their management decisions on social and economic factors affecting the major stakeholders in the fishery and takes action to lessen the major impacts on stakeholders.

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- The management system provides for the use of social or economic incentives to ensure sustainable fishing.
- The management system attempts to understand the impact of its decisions on social and economic factors affecting the stakeholders in the fishery and is responsive to requests to reduce these impacts.

The lack of any defined allocations for Barkley Sound sockeye makes it virtually impossible to discourage harvesters from exceeding catch targets or exploitation rate limits. As indicated for Fraser sockeye, First Nation treaties provide an avenue for defining salmon allocations and penalizing those that exceed these limits by reducing their harvest opportunities in future years.

Condition 32 - Certification will be conditional until the management agency provides clear evidence that measures are being implemented to encourage harvesters not to exceed catch targets or exploitation rate limits. (**Barkley Sound Condition #3.2**).

Indicator 3.2.1: The research plan covers the scope of the fishery, includes all target species, accounts for the non-target species captured in association with, or as a consequence of fishing for target species, and considers the impact of fishing on the ecosystem and socioeconomic factors affected by the management program.

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- The management system incorporates a research component that considers relevant data and information needs for formulating management strategies for all target species, and also information leading to an understanding of the dynamics of the ecosystem including data on the catch, landings and discards of non-target species.
- The framework for research includes investigations dealing with socioeconomic impacts of the fishery.
- The research plan responds in a timely fashion to unexpected changes in the fishery.
- Funding is secure and sufficient to meet long-term research needs.

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- There is significant continuing progress in understanding the impact of the fishery on target and non-target species, and the ecosystem in general.
- Research results form the basis for formulating management strategies and decisions.
- Research is regularly published in peer review journals and/or is reviewed by PSARC or the PSC.

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- The management system incorporates a research component that provides for the collection and analysis of information necessary for formulating management strategies and decisions for both target and non-target species.
- The research plan addresses concerns related to the impact of the fishery on the ecosystem.
- The research plan addresses socioeconomic issues that result from the implementation of management.
- The research plan is responsive to changes in the fishery.
- Funding is adequate to support short-term research needs.
- There is progress in understanding the impact of the fishery on target and non-target species.
- Research results are utilized in forming management strategies.
- Research is reviewed by PSARC or PSC, or other appropriate and technically qualified entities.

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- Research provides for the collection of catch statistical and biological data for the target species.
- There has been useful research on the impact of fishing on target and non-target species taken in the fishery, and on the ecosystem in general.

The lack of any research plan for Barkley Sound sockeye makes it difficult to assess whether the plan addresses concerns related to the impact of the fishery on the ecosystem, socioeconomic

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issues that result from the implementation of management plans, or if the research plan is responsive to changes in the fishery.

Condition 33 - Certification will be conditional until the management agency provides a research plan that addresses identified concerns related to the impact of the fishery on the ecosystem, with emphasis on non-target stocks, and takes into consideration socioeconomic factors and anticipated changes to fisheries. **(Barkley Sound Sockeye Condition #3.3).**

Indicator 3.6.3: The management system provides for the observation of legal and customary rights of First Nation peoples.

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- The management system is in compliance with all major legal and customary rights of First Nation peoples that are impacted by the fishery.
- The management system includes processes for consultation with First Nations peoples on the impact of the commercial fishery on their food, social and ceremonial fisheries.

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- The management system is found to be in compliance with all legal and most of the customary rights of First Nation peoples that are impacted by the fishery.
- The management system includes processes for providing information to First Nations peoples on the major impacts of the commercial fishery on their food, social and ceremonial fisheries.

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- The management system is in compliance with the legal rights of First Nation peoples that are impacted by the fishery.

The submissions by the client indicate that DFO believes it has met its First Nations obligations to protect and manage for food, social, and ceremonial harvest by First Nations. However, in consultation with First Nations and conservations groups, the assessment team was provided with information suggesting that several of the First Nations that harvest Barkley Sound sockeye would not agree the management system is in compliance with all the legal and most of the customary rights of First Nation peoples that are impacted by the Barkley Sound sockeye fishery.

Condition 34 – Same as Condition 29. (Barkely Sound Condition #3.4).
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Skeena Sockeye – Criterion Summaries

A summary of our evaluations for each Principle 3 indicator and criteria is provided in Table 3.4. The following points describe the Principle 3 highlights for Skeena sockeye:

1. the management systems in place for Skeena sockeye are consistent with MSC principles and criteria;
2. the consultation process was found to be completely consistent with our evaluation criteria;
3. the management system includes effective measures to control levels of harvest for each fisheries;
4. the management system includes an internal review process for assessing management actions, fisheries recommendations and resolving disputes;
5. Skeena sockeye fisheries were found to be compliant with international agreements, and domestic laws. and
6. fishing gear and practices were found to be consistent with MSC criteria.

Table 3.4. Summary of the evaluations for each Principle 3 criteria and indicator for the Skeena sockeye fishery.

Summary for Skeena Sockeye (Draft - 26 June 2007)			Criteria @ 100					Criteria @ 80						Criteria @ 60				
			1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5
PRINCIPLE 3 - Management and Operational Framework																		
Management Framework																		
Criterion 3.1 - Management system consistent with MSC principles and criteria																		
Indicator 3.1.1	Clear and defensible set of objectives	100																
Indicator 3.1.2	Periodic assessment of biological status	100																
Indicator 3.1.3	Identify the impact of fishing on the ecosystem	95	P			P												
Indicator 3.1.4	Uses best information and precautionary approach	94		P	na	P			na					na				
Indicator 3.1.5	Responses to new information are timely and adaptive	100																
Indicator 3.1.6	Responsive to social and economic impact of fishery	90																
Indicator 3.1.7	Useful and relevant information to decision makers	97	P															
Indicator 3.1.8	Socioeconomic incentives for sustainable fishing	96	P	P														
Criterion 3.2 - Framework for research pertinent to management																		
Indicator 3.2.1	Research plan for target and non-target species	74																
Indicator 3.2.2	Research is timely, available and reviewed	90																
Criterion 3.3 - Transparency in operations and consultation process																		
Indicator 3.3.1	Open consultations process	100																
Criterion 3.4 - Measure to control levels of harvest																		
Subcriterion 3.4.1 - Catch and exploitation levels																		
Indicator 3.4.1.1	Firshery control systems including no-take zones	100																
Indicator 3.4.1.2	Measures to restore depleted fish populations	85		P														
Subcriterion 3.4.2 - Ensure that conservation objectives are met.																		
Indicator 3.4.2.1	Compliance provisions (effective enforcement)	98				P												
Indicator 3.4.2.2	Monitoring provisions	100																
Criterion 3.5 - Regular and timely review of management system																		
Indicator 3.5.1	Internal review	100																
Indicator 3.5.2	External review	87																
Indicator 3.5.3	Recommendations from reviews incorporated	95	P															
Indicator 3.5.4	Mechanism for resolving disputes	80																
Criterion 3.6 - Compliance with legal and administrative requirements																		
Indicator 3.6.1	Compliance with international agreements	100																
Indicator 3.6.2	Compliance with domestic laws and regulations	90	P															
Indicator 3.6.3	Observes legal and customary (First Nation) rights	75						P										
Fisheries Operational Framework																		
Criterion 3.7 - Ecosystem sensitive gear and fishing practices																		
Indicator 3.7.1	Avoid catch and minimize mortality of non-target species	97		P														
Indicator 3.7.2	No destructive fishing practices	100																
Indicator 3.7.3	Minimize operational waste	100																
Indicator 3.7.4	Cooperation of fishers	95		P														
Indicator 3.7.5	Fishing methods minimize impacts on habitat	100																

Skeena Sockeye – Specific Indicator Problems

Indicator 3.2.1: The research plan covers the scope of the fishery, includes all target species, accounts for the non-target species captured in association with, or as a consequence of fishing for target species, and considers the impact of fishing on the ecosystem and socioeconomic factors affected by the management program.

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- The management system incorporates a research component that considers relevant data and information needs for formulating management strategies for all target species, and also information leading to an understanding of the dynamics of the ecosystem including data on the catch, landings and discards of non-target species.
- The framework for research includes investigations dealing with socioeconomic impacts of the fishery.
- The research plan responds in a timely fashion to unexpected changes in the fishery.
- Funding is secure and sufficient to meet long-term research needs.
- There is significant continuing progress in understanding the impact of the fishery on target and non-target species, and the ecosystem in general.
- Research results form the basis for formulating management strategies and decisions.
- Research is regularly published in peer review journals and/or is reviewed by PSARC or the PSC.

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- The management system incorporates a research component that provides for the collection and analysis of information necessary for formulating management strategies and decisions for both target and non-target species.
- The research plan addresses concerns related to the impact of the fishery on the ecosystem.
- The research plan addresses socioeconomic issues that result from the implementation of management.
- The research plan is responsive to changes in the fishery.
- Funding is adequate to support short-term research needs.
- There is progress in understanding the impact of the fishery on target and non-target species.
- Research results are utilized in forming management strategies.

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- Research is reviewed by PSARC or PSC, or other appropriate and technically qualified entities.

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- Research provides for the collection of catch statistical and biological data for the target species.
- There has been useful research on the impact of fishing on target and non-target species taken in the fishery, and on the ecosystem in general.

The lack of any research plan for Skeena sockeye makes it difficult to assess whether the plan addresses concerns related to the impact of the fishery on the ecosystem, socioeconomic issues that result from the implementation of management plans, or if the research plan is responsive to changes in the fishery.

Conditon 35 - Certification will be conditional until the management agency provides a research plan that addresses identified concerns related to the impact of the fishery on the ecosystem, with emplasis on non-target stocks, and takes into consideration socioeconomic factors and anticipated changes to fisheries. (**Skeena Condition #3.1**).

Indicator 3.6.3: The management system provides for the observation of legal and customary rights of First Nation peoples.

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- The management system is in compliance with all major legal and customary rights of First Nation peoples that are impacted by the fishery.
- The management system includes processes for consultation with First Nations peoples on the impact of the commercial fishery on their food, social and ceremonial fisheries.

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- The management system is found to be in compliance with all legal and most of the customary rights of First Nation peoples that are impacted by the fishery.

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- The management system includes processes for providing information to First Nations peoples on the major impacts of the commercial fishery on their food, social and ceremonial fisheries.

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- The management system is in compliance with the legal rights of First Nation peoples that are impacted by the fishery.

The submissions by the client indicate that DFO believes it has met its First Nations obligations to protect and manage for food, social, and ceremonial harvest by First Nations. However, in consultation with First Nations and conservations groups, the assessment team was provided with information suggesting that several of the First Nations that harvest Skeena River sockeye would not agree the management system is in compliance with all the legal and most of the customary rights of First Nation peoples that are impacted by the Skeena River sockeye fishery.

Condition 36 – Same as Condition 29. (**Skeena Condition #3.2**).

Nass Sockeye – Criterion Summaries

A summary of our evaluations for each Principle 3 indicator and criteria is provided in Table 3.5. The following points describe the Principle 3 highlights for Nass sockeye:

1. the management systems in place for Nass sockeye are consistent with MSC principles and criteria;
2. the consultation process was found to be completely consistent with our evaluation criteria;
3. the management system includes effective measures to control levels of harvest for each fisheries;
4. the management system includes an internal and external review process for assessing management actions, fisheries recommendations and resolving disputes;
5. Nass sockeye fisheries were found to be compliant with international agreements, domestic laws and observe the legal and customary rights of First Nations; and
6. fishing gear and practices were found to be consistent with MSC criteria.

Table 3.5. Summary of the evaluations for each Principle 3 criteria and indicator for the Nass sockeye fishery.

Summary for Nass Sockeye (Draft - 26 June 2007)			Criteria @ 100					Criteria @ 80						Criteria @ 60				
		Score	1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5
PRINCIPLE 3 - Management and Operational Framework																		
Management Framework																		
Criterion 3.1 - Management system consistent with MSC principles and criteria																		
Indicator 3.1.1	Clear and defensible set of objectives	96		P	P													
Indicator 3.1.2	Periodic assessment of biological status	100																
Indicator 3.1.3	Identify the impact of fishing on the ecosystem	95	P			P												
Indicator 3.1.4	Uses best information and precautionary approach	100			na				na					na				
Indicator 3.1.5	Responses to new information are timely and adaptive	100																
Indicator 3.1.6	Responsive to social and economic impact of fishery	95																
Indicator 3.1.7	Useful and relevant information to decision makers	93																
Indicator 3.1.8	Socioeconomic incentives for sustainable fishing	100																
Criterion 3.2 - Framework for research pertinent to management																		
Indicator 3.2.1	Research plan for target and non-target species	96		P		P												
Indicator 3.2.2	Research is timely, available and reviewed	95																
Criterion 3.3 - Transparency in operations and consultation process																		
Indicator 3.3.1	Open consultations process	100																
Criterion 3.4 - Measure to control levels of harvest																		
Subcriterion 3.4.1 - Catch and exploitation levels																		
Indicator 3.4.1.1	Fishery control systems including no-take zones	100																
Indicator 3.4.1.2	Measures to restore depleted fish populations	95		P														
Subcriterion 3.4.2 - Ensure that conservation objectives are met.																		
Indicator 3.4.2.1	Compliance provisions (effective enforcement)	100																
Indicator 3.4.2.2	Monitoring provisions	100																
Criterion 3.5 - Regular and timely review of management system																		
Indicator 3.5.1	Internal review	100																
Indicator 3.5.2	External review	100																
Indicator 3.5.3	Recommendations from reviews incorporated	100																
Indicator 3.5.4	Mechanism for resolving disputes	90	P	P	P													
Criterion 3.6 - Compliance with legal and administrative requirements																		
Indicator 3.6.1	Compliance with international agreements	100																
Indicator 3.6.2	Compliance with domestic laws and regulations	90	P															
Indicator 3.6.3	Observes legal and customary (First Nation) rights	100																
Fisheries Operational Framework																		
Criterion 3.7 - Ecosystem sensitive gear and fishing practices																		
Indicator 3.7.1	Avoid catch and minimize mortality of non-target species	100																
Indicator 3.7.2	No destructive fishing practices	100																
Indicator 3.7.3	Minimize operational waste	100																
Indicator 3.7.4	Cooperation of fishers	95		P														
Indicator 3.7.5	Fishing methods minimize impacts on habitat	100																

9 Tracking, Tracing Fish and Fish Products

MSC Chain of Custody requirements were only checked as far as the landing of fish on board legally licensed fishing vessels and found to be compliant with MSC requirements. Further chain of custody assessments were not conducted for any of the fish moving from boat deck into the processing segment of the fishery either onboard or at shoreside processors. It is highly recommended that any Chain of Custody certificates issued for product originating from this fishery also examine fish ticket data as part of ensuring that the fish products carrying the MSC logo are properly verified.

10 Peer Review, Public Comment, and Objections

Two peer reviews will be chosen based on MSC requirements. A list of potential peer reviews will be negotiated with the client, the government, and stakeholders, and the list of agreed peer reviewers posted for comment as required by the MSC.

A public comment period will also be conducted as required by the MSC. The public comment period will follow the peer review and last for a minimum of 30 days.

11 Certification Recommendations

It is the assessment team's consensus judgment that the management of the BC sockeye fisheries complies with the MSC's requirements for achieving certification for all 4 units of certification. Therefore, SCS as the certification body of record recommends that each unit of certification be issued a joint fishery/chain of custody certificate pending (1) the submission and approval of an Action Plan to show how the applicant intends (content and timelines) to meet the proposed conditions, and (2) proof of a contractual agreement between the applicant and an accredited certification body that assures the applicant will continue to comply with all specified conditions, all required surveillance audits, and all other responsibilities under the MSC program.

12 Requirements for Continued Certification

To be awarded an MSC certificate for a fishery, the applicants or client (BCSMC) must agree in written contract to develop an 'Action Plan' for meeting the required 'Conditions'; a plan that must provide specific information on what actions will be taken, who will take the actions, and when the actions will be completed. The Action Plan must be approved by SCS as the certification body of record. The applicant must also agree in a written contract to be financially and technically responsible for surveillance visits (once a year at a minimum) by an MSC accredited certification body, which would occur at a minimum of once a year, or more often at the discretion of the certification body (based on the applicant's action plan or by previous findings by the certification body from annual surveillance audits or other sources of information). The contract must be in place prior to certification being awarded. Surveillance audits will be comprised in general of (1) checking on compliance with the agreed action plan for meeting pre-specified 'Conditions', and (2) sets of selected questions that allow the certifier to determine whether the fishery is being maintained at a level of performance similar to or better than the performance recognized during the initial assessment.

12.1.1 General Requirements for Continued Certification

The general 'Conditions' set for the BC sockeye fisheries are:

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- BCSMC must recognize that MSC standards require regular monitoring inspections at least once a year, focusing on compliance with the 'Conditions' set forth in this report (as outlined below) and continued conformity with the standards of certification.
- BCSMC must agree by contract to be responsible financially and technically for compliance with required surveillance audits by an accredited MSC certification body, and a contract must be signed and verified by SCS prior to certification being awarded.
- BCSMC must recognize that MSC standards require a full re-evaluation for certification (as opposed to yearly monitoring for update purposes) every five years.
- Prior to receiving final certification, BCSMC shall develop an 'Action Plan for Meeting the Condition for Continued Certification' and have it approved by SCS.

12.1.2 Specific Requirements (Conditions) for Continued Certification

In addition to the general requirements outlined above, BCSMC must also agree in a written contract with an accredited MSC certification body to meet the specific conditions as described in Section 8 of this report (within the agreed timelines that will be agreed in the 'Action Plan for Meeting the Condition for Continued Certification' to be approved by SCS).

13 MSC Logo Licensing Responsibilities

As the “applicant” (BCSMC) for certification of the BC sockeye fisheries, BCSMC is the only entity that has the right to apply for a license to use the MSC logo. It is also the case that BCSMC has the right to approve the use of the logo for others associated with the fishery at its discretion.

14 Conclusion

The SCS Assessment team concludes after all aspects of the MSC procedures were followed, that the BC sockeye fisheries meet the standards of the MSC.

15 References

All the references for the information base that was used in this assessment can be found in the submission provided to SCS from both DFO and the MCC.

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Appendix 1 – Letters Exchanged with Conservation Sector Representatives Concerning Stakeholder Consultative Processes.

August 27, 2007

Terry Glavin
Sierra Club of BC
578 Johnson St.
Victoria BC V8W 1M3

Terry:

Here is the information I promised when we last met in Vancouver. While a little later than I had originally anticipated, it should give you the general sense of what we are proposing as a procedural plan should an evaluation ever take place. I have copied Karl so that he can add additional material if I have inadvertently missed something. I did not have a chance to pass this by him before sending it to you.

What Karl and I are recommending goes beyond the minimum requirements of the MSC in many cases. We are making these recommendations after getting many comments back from you and others about addressing concerns of thoroughness and transparency. If you have additional suggestions, please let me know.

As I stated at lunch, I need your comments to feel comfortable that my budget proposal will include the necessary time and personnel to do the required job. I do not want to quote inappropriately and then find out after the fact that a number of additional steps are needed to ensure stakeholders of a proper process. Therefore, I would prefer to include any input you or your colleagues might have up front so I can tailor a budget to properly address any concerns. This is the only way I know to ensure that we can accomplish all the steps necessary to maintain a thorough and transparent process.

Below is a general framework for the steps Karl and I have recommended for completing an evaluation of the BC salmon fisheries. What I have included is a brief explanation of how the proposed steps may (in my view) be different from the MSC requirements at present. I have no doubt that the MSC requirements will be changing to keep pace with the concerns and comments from the individuals and groups that have expressed both support and concern regarding MSC certifications.

Recommended Steps for the Evaluation Process

1. *Hire fisheries experts to form an evaluation team*

--The MSC requirement is that the certifier of record picks a competent team with the credentials necessary to evaluate the fishery. At a minimum the team must be comprised of three people, and their backgrounds cover the range of expertise needed in fisheries management, ecosystem impacts of fishing, and stock assessments.

--For this project, we are recommending that both industry and stakeholders be asked for recommendations as to experts that can serve on the evaluation team. All recommendations will be gathered and sent out for comment prior to picking experts. Experts will be chosen by the certifier with the goal of meeting recommendations from as many stakeholder groups as possible. At the very least, experts will be chosen to keep the group neutrally balanced regarding any perceived bias. The goal is a neutrally balanced team that can come to as objective an outcome as possible.

--We will choose 3 expert scientists to provide the content review of the fisheries. All will be under subcontract to the certifier. The certifier will have one person work with the team to make sure that the proper processes are followed and completed. All team members cast equal votes as to the level of compliance with MSC Principles and Criteria so no one person can sway the results. The person from the certification company will not be a voting member of the team.

2. *Draft a set of performance indicators and guidelines for using them to evaluate the fishery*

--The minimum MSC requirement is that the guidelines be drafted by the certifier and posted on the MSC website.

--For this project, we are recommending that the expert panel draft the performance indicators and then make them available to independent scientists and stakeholders for review and comment. The expert panel will then take the comments and revise the performance indicators as needed. After stakeholder comments/suggestions are incorporated, the

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redrafted performance indicators will be submitted to the MSC for final approval by the MSC Standards Council.

3. *The final performance indicators will be given to the applicant fishery or fisheries to put together the necessary documents for the expert panel to review.*

--It will be up to the applicant fishery or fisheries to put a set of documents/data together to prove to the review panel that the fishery or fisheries under consideration meet the MSC Principles and Criteria.

4. *Stakeholder Consultation*

--The MSC minimum is that stakeholder groups need to be notified of the process and then the certification team is to solicit the views of any stakeholders showing interest.

--As you can see from the points above, we are already proposing to extend the stakeholder consultation to include input into the experts chosen on the review panel and in reviewing the performance criteria. In addition, we are proposing to ask the stakeholders to provide written comments where they can on the actual management of the fisheries. We propose then to arrange face-to face meetings to be able to exchange information and ensure that the expert panelists fully understand the issues raised by the stakeholders. While the MSC requirements are to allow several weeks for this consultation, we would be looking for direct feedback from stakeholder groups as to how much time is needed to properly respond. We will adjust as necessary and within reason to ensure a successful process.

5. *Draft Report*

--The review is completed and the fishery scored against the performance criteria. A report(s) is then written and submitted for internal review by the applicant fishery or fisheries to catch any possible errors or omissions.

6. *Peer Review*

--Peer reviewers are hired to independently review the report(s). We will use a similar process in picking peer reviewers by talking to stakeholder groups. This again is

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well beyond the minimum requirement, which is for the certifiers to choose reviewers without consultation.

7. Public summary document

--The minimum requirement by the MSC at present is to release a public summary document if the fishery or fisheries are certified. For fisheries that do not pass, there is no requirement for a public document.

--In this project, we are again going beyond the MSC requirement and recommending to the client fishery or fisheries that the full report(s) be put into the public domain, not a shortened version as a public summary. This would allow stakeholders to properly comment.

In general, this is the basic process that we are proposing for any evaluation that may take place in BC. Moreover, others and I have been advocating this as the general process for all fisheries. I believe the MSC is taking these process issues under consideration at the next Standards Council meeting, but you would have to ask the MSC that question directly to get an accurate answer.

I trust this helps explain further the intent for the BC process, which is to get as much cooperative participation as possible from stakeholders and make the process and the outcome as transparent as possible.

As I mentioned at the start, any constructive comments or suggestions for improving upon this are welcome. I hope as Karl reads this he will add his comments as well.

Sincerely,

Chet Chaffee
Manager, Marine Fisheries Certification Program
Scientific Certification Systems, Inc.

cc: Sharon Chow, Sierra Club of BC
Karl English, LGL
Christina Burridge, BC Salmon Marketing Council
Trevor Axford, MSC Accreditation Officer
Duncan Leadbitter, MSC Fisheries Officer

British Columbia Salmon Fisheries
Draft for Review by Client and Stakeholders
Scientific Certification Systems, Inc.

Draft for Review

June 27, 2001

Chet Chaffee,
Scientific Certification Systems Inc.
1939 Harrison St., Suite 400,
Oakland, California,
United States of America
94040

Dear Chet:

Thank you for your letter of June 12 regarding a “procedural plan” for a possible MSC certification application from the B.C. Salmon Marketing Council.

As you will see by the attached letter, the Sierra Club of B.C. is in the midst of an internal review, with the Sierra Club of Canada and the Sierra Club of the U.S., with respect to our position on the Marine Stewardship Council generally. This review was prompted by the MSC’s recent conduct, especially its certification of Alaska’s salmon fisheries, and by the possibility of MSC certification being extended to B.C.’s salmon fisheries.

As to the specific matter of the process you envision for an MSC certification process for B.C. salmon, your letter has been considered at length by the marine committee of the Sierra Club of B.C. What follows is a summary of our response, addressing points in the order in which you raise them in your letter.

We take no comfort in your suggestion that an application for certification from the B.C. salmon-fishing industry would prompt you to canvass “industry and stakeholders” for recommendations regarding the names of experts to serve on the “evaluation team.” This was something you told us to expect of a B.C. application when we first discussed this matter several weeks ago.

In the event that your company chose appropriately in the selection of an evaluation team, you propose that the three-member expert panel will draft performance indicators for their evaluation that will then be available for review by “independent scientists and stakeholders.” We have no confidence that the performance indicators would be appropriately revised as a result of these reviews. There is nothing in what you propose to ensure that “stakeholder comments/suggestions” will be incorporated. Further, should draft performance indicators be developed in this way, it is solely the MSC Standards Council that approves them.

Further, while you propose that stakeholders should be given an opportunity “to provide written comments where they can on the actual management of the fisheries,” it is unclear whether stakeholders, or indeed anyone outside of government and industry, will be given any opportunity to review or comment upon the case the applicant makes that the salmon fisheries meet the MSC’s criteria. Neither does your correspondence indicate where an opportunity might exist for independent review, or stakeholder comment, on the data the applicant would present in an attempt to prove its case.

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Importantly, beyond a review by peers chosen only by the certifier, the expert panel's draft report - in which the fisheries-management regime is scored against the panel's performance criteria - would be made available only for internal review by the applicant. There is no assurance that independent scientists and stakeholder groups will be given any opportunity to fully review the report. "Talking to stakeholder groups" about who reviewers might be is insufficient.

Similarly, we take no comfort in knowing that the full, final report will be made public only if certification is granted, and only if the applicant agrees to an SCS recommendation that it be made fully public.

In response to your request that we provide suggestions about how to improve upon the procedures you've proposed, we must preface our comments by reminding you that among reputable environmental organizations, confidence in the MSC process has been shaken worldwide, and the Sierra Club of B.C., specifically, remains adamant that the MSC's blanket certification of Alaska's salmon fisheries was irresponsible.

We are convinced that a fundamental flaw with the MSC process is that certification may be extended to fisheries that are not sustainable – but merely managed and prosecuted by agencies and industry groups that make certain specific promises which, theoretically, would place their fisheries on a sustainable footing. Moreover, the MSC process itself is designed to produce only the best evaluation an applicant's money can buy. The more rigorous the evaluation, the more the process costs the applicant. This not only compromises the integrity of the MSC process, but it is unfair to potential applicants whose fisheries may be subjected to more rigorous evaluation than others.

Under these circumstances, in order for an MSC certification of any portion of the B.C. salmon fisheries to have any credibility with conservation organizations, the following conditions would necessarily be present:

- The individuals chosen to serve on the expert panel must be scientists with credibility among conservationists – individuals who recognize the importance of restoring and conserving the diversity of naturally-spawning salmon populations over the greatest possible range, in an abundance that takes the role of salmon in the functioning of terrestrial ecosystems into account.
- The conservation sector would have to be confident that the performance indicators established by the panel are appropriate to the circumstances of the salmon-fisheries management regime on Canada's west coast, and to the specific circumstances with respect to the protection of salmon habitat in British Columbia, and to the protection of the constitutionally-protected fishing rights of B.C.'s aboriginal peoples. It would be necessary to consult directly with mainline conservation groups and aboriginal organizations to ensure that such performance indicators are acceptable. The MSC itself would have to take measures to ensure that B.C.'s conservation sector, and B.C.'s aboriginal leadership, are satisfied that the performance indicators are sufficient.
- All information provided to the review panel by the applicant and by fisheries-management agencies should be publicly available. Aboriginal groups and the conservation sector should be provided with an opportunity to present their own case with respect to whether B.C.'s salmon fisheries meet the MSC's criteria.

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- The draft report of the review panel should be made immediately available to conservation organizations and the aboriginal leadership for their comment and response. The MSC should make every effort to ensure that the final report enjoys the widest possible approval.

We realize that what we are proposing may, in effect, hold B.C.'s salmon fisheries to a higher standard than was required of the Alaskan fisheries-management regime. This is regrettable, because it would be patently unfair. However, we must insist that conservation standards should not be lowered simply because the MSC conducted itself in a less-than-rigorous way with respect to the Alaskan salmon fisheries.

We also realize that what we have outlined here may add somewhat to the costs of the certification application, which are expected to be borne by the applicant, in this case the B.C. Salmon Marketing Council. This, too, is unfair. Ideally, should SCS and the MSC commit to a certification process that is satisfactory to the conservation sector, B.C.'s conservationists might find the resources, with the MSC's help, to specifically recover these costs.

We have advised the B.C. Salmon Marketing Council that the best-case scenario is that we proceed together in this matter. We have made it clear that we would prefer to think of the problems created by the MSC's certification of Alaska's salmon fisheries as problems that both the B.C. industry and B.C.'s conservationists will most effectively solve cooperatively and jointly.

It is in that spirit that we offer the observations and suggestions contained in this letter.

Sincerely,

Terry Glavin,

on behalf of the Sierra Club of B.C.

Draft for Review

3 October 2001

Terry Glavin and Sharon Chow
Sierra Club of BC
578 Johnson St.
Victoria BC V8W 1M3

Terry and Sharon:

I am writing to you once again in hope of clarifying what appears to be a misunderstanding regarding our commitment to conduct the evaluation of the BC commercial salmon fisheries under the Marine Stewardship Council initiative in a manner that will have credibility with all stakeholder groups, including the conservation and aboriginal groups.

In my letter of 3 September 2001, I did not properly acknowledge the fact that in general the four conditions you raised in your letter dated 27 June 2001 were acceptable to us. I apologize for not clarifying this in writing.

So to be clear, we agree that each of the four conditions you raised must be addressed early in the evaluation process of the BC salmon fisheries. To accomplish that:

- SCS will consult with many groups to ensure that the individuals chosen for the expert panel are respected fisheries scientists and include scientists with credibility among conservationists and BC's aboriginal leadership.
- SCS and the MSC will take measures to ensure that the performance indicators address the concerns of the BC conservation sector and BC aboriginal leadership with respect to the evaluation of the BC fisheries.
- Aboriginal groups and the conservation sector will have access to all public information provided to the review panel, and representatives for each group will be encouraged to present their own case regarding the certification of the BC fisheries directly to the review panel.
- Lastly, the report of the review panel will be circulated to conservation organizations, aboriginal leadership and others for comments and response.

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I hope that this helps clarify our response to the points you raised. Once again, if there is anything that needs to be included that I have missed or not properly understood, please contact me directly so that I can work to solve the problem as quickly as possible. As always, I am committed to working with all sectors to make this project a success as well as an example for all future evaluations.

Sincerely,

Chet Chaffee

Manager, Marine Fisheries Certification Program
Scientific Certification Systems, Inc.

cc: LGL, Karl English

BC Salmon Marketing Council, Christina Burrridge

MSC, Trevor Axford, Duncan Leadbitter, Brendan May, Jim Humphreys

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Appendix 2 – Peer Review of Performance Indicators and Scoring Guideposts

Comments on MSC Evaluation of the British Columbia Commercial Salmon Fisheries Performance Indicators

From: B. Riddell,

Pacific Fisheries Resource Conservation Council and
Science Branch, Dept. Fisheries and Oceans

Tuesday, August 06, 2002

In order to get you comments back as soon as possible, I am writing about some general concerns and you can determine if you want more specific comments. After several readings of the document I have to admit that I was disappointed. But, I was not certain why because many of the indicators seemed reasonable. So I started from each MSC principle and criterion (p&c) that I understand you are not allowed to change. Unfortunately, I think these are a serious problem. I believe that the p&c were originally written for marine fisheries (non-salmon) and I can see how they could be more applicable to those fisheries. But even then the principles are not clear and their meaning must be interpreted (i.e., the Intent sections), use of terms is confusing (e.g. productivity), and the criteria repeated between principles. I extracted just the p&c so that I could more easily review the text (attached to this memo) and note: that criteria 1b and 2c are exactly the same, that criteria 1c and 2b address the same issues, and that wordings in 1a and 2a are very confusing (these seem more concerned for using important “terms” than be clearly understood). I am assuming that Principle 1 concerns fishing conduct and that Principle 2 concerns the biological bases of the resource, but even this is not transparent. I have less concern for Principle 3 but it maybe a more easily described issue. So the challenge becomes how to take such poorly written “principles” and apply them to Pacific salmon fisheries, and understand what the evaluation will be based on.

The approach then seems to be to write sub-criteria and indicators that compensate for the p&c that you cannot address. I considered what is required for sustainable management of commercial fisheries, and summarized my list in the second attachment. My list of points may not be comprehensive but it does identify that there are issues of resource inventory and assessment, a management plan, conduct of fisheries and data collection, post-season evaluation, and enforcement and compliance (with numerous Treaties, etc.). This does expose another problem though since this evaluation only addresses the commercial fisheries. The issues of stock sustainability are clearly now involved with 3 major fishing sectors (Native, recreational, and commercial), International obligations, and habitat management (most of which are not addressed in this evaluation). Not to mention the responsibility of the Dept. of Fisheries and Oceans for the core assessment data that the commercial sector has no control over at all. So what is that you can really evaluate about commercial fishing? We could review stock

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sustainability for some stocks (e.g.. sockeye, pink and chum salmon), but only a minor component for other stocks. Is the evaluation intended to be species/stock specific by areas, or an overall assessment? We could evaluate the conduct of the fisheries but for what time periods (this is never even mentioned).

If this evaluation is important to the commercial industry and the people involved, then the evaluation criteria (the indicators in this case) should be clear and understandable, appropriate to the commercial sector, and measurable. An example of the latter is the frequent reference to ecosystems ... other than the theory, how would you evaluate consideration of ecological issues in salmon management?

I think that many of your sub-criteria and indicator statements are workable but I encourage you to limit the text to very clear and explicit meanings. For example:

Sub-criteria 1.2 include "... and associated ecological community." None of the indicators refer to anything ecological?

Sub-criteria 1.3 refer to "... to unsustainable levels." Most levels of stock production can be sustained at some rate of fishing, but I presume you actually mean lower levels of production being undesirable even if they are sustainable.

Principle 2, indicator 2.1 and 2.2, how would you provide any credible evaluation of these statements?

Indicator 3.1 requires knowledge of "age, size, sex and genetic structure of the target stocks.." What is being assessed here, certainly the genetic bases of these traits are not. Is it the genetic structure of the sub-populations in the target stocks? The traits identified involve phenotypic variation and vary annual with the survival rate of brood years. Are these the only traits that influence reproductive capacity?

Further, there are certain important terms that are not defined. The most confusing of which is "productivity". At times I think you mean production, other times yield, etc. This will lead to poor evaluations. Also, "target stock" ... I presume for salmon you mean a key indicator stock with detailed information gathered, or are you referring to the stock that a fishery is literally targeted at? And then there are LRP and TRP, there is no agreement on the application of these to salmon so how will they be assessed?

Suggestions:

- 1) Decide under Principles 1 and 2 what will actually be involved in the evaluation. I might suggest that Principle 1 address the conduct of fishing (objectives, accounting, total mortality issues, sampling including non-target, non-salmon species, and compliance and enforcement monitoring). Principle 2 would then address the stock inventory and assessment/evaluation issues (identification of stock management units, accountability of indicator stocks and application to other stocks, basis of biological objectives, total mortality accounting over all fisheries, and appropriateness of Departmental monitoring

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programs, etc.). If Principle 3 addresses management processes and governance, then it is likely fine, including Criterion 7.

- 2) I think you need to reconsider and agree on what exactly is being evaluated. At present, this outline is more an evaluation of the stock and management process that allows for commercial fishing. But as I noted, the impacts on stocks and their conservation are not only due to commercial fishing. Also, commercial fishing today is very different from the past. I think you need to define the geographic scale and time period included in this evaluation. The commercial sector has made great improvements in recent years, but it took major setbacks during the 1990s to stimulate these changes.
- 3) In this evaluation, the adequacy of government monitoring and assessment programs and their accounting for uncertainty will be as important as any comments on fishing activities. It would be very useful to separate these issues where possible and make clear statements about these factors. This could be addressed by including appropriate indicator questions.
- 4) Similar to point 3, the issue of appropriate research is mentioned in several locations. This would be another important issue to comment on but likely needs some specific indicators. For example, if stock management units are undefined or ecological process unknown, are there research programs addressing these. Or, if incidental mortalities of non-target species are monitored in a fishery, can the impact of those mortalities be put in any context ... is it a problem?
- 5) A number of criteria and indicators involve identifying frameworks or processes. Frequently these are in place but the real issue for review is whether they are effective. Have these processes in the past lead to appropriate change in the fisheries or establishment of new research programs, etc.? The indicators and evaluation standards should note past effective processes and not vague statements about the existence of process.

I suspect that I am creating more work than being very useful, so I should move on to my own work. I was rather surprised by the difficulty of applying the MSC p&c to salmon fisheries and hope they consider re-writing them for such evaluations. But that won't assist your current task. If you clarify the evaluation intent of the principles, and then provide explicit and measurable indicators under each, then I think the evaluation could be supported. With the present text though I am not confident that an objective and fair evaluation of the commercial fisheries would result. It would certainly be highly dependent upon the members of the review team and their interpretations.

Thanks for providing a copy to review ... I will be reviewing with interest how Alaskan ever met these criteria in all fisheries!

MSC Principles and Criteria

MSC Principle 1: A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Intent: The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favor of short-term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Criterion 1a: The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.

Criterion 1b: Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.

Criterion 1c: Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

MSC PRINCIPLE 2: Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

Intent: The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Criterion 2a: The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.

Criterion 2b: The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimizes mortality of, or injuries to endangered, threatened or protected species.

Criterion 2c: Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames,

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consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

MSC PRINCIPLE 3: The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent: The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

A. Management System Criteria

Criterion 3a: The management system has a strategy for management that clearly defines long-term objectives for managing the impact of fishing on target species, non-target species and the ecosystem; the objectives are consistent with a well-managed fishery and MSC principles and criteria; and the management strategy includes provision for the effective implementation of measures to attain these objectives.

Criterion 3b: The management system provides for a framework for research, the results of which are pertinent to achieving the objectives of management.

Criterion 3c: The management system allows for transparency with respect to its operational details, including a consultative process that provides for the incorporation of information and data from stakeholders in the fishery related to matters of a social, cultural, economic and scientific nature.

Criterion 3d: The management system implements measures to control levels of exploitation in the fishery.

Criterion 3e: The management system provides for regular and timely review and evaluation of its performance, and for appropriate adjustments based on the findings of these reviews and evaluations that are consistent with the objectives of the program.

Criterion 3f: The management system provides for the operation of the fishery to be in compliance with all relevant legal and administrative requirements.

B. Fishery Operations Criteria

Criterion 3g: Fishing operations make use of gear and fishing practices that limit ecosystem impacts.

Steps in Stock Assessment and Management of Pacific Salmon (excluding research)

Determine the resource inventory:

- a) based on species, geographic area or habitats, and biological traits ... determine the populations units in the resource
- b) develop an assessment framework of spawning escapements by population, determination of productivity and sustainable exploitation rates (based total fishing mortality) for some indicator populations, conduct annual assessment surveys for basic biological and demographic data
- c) develop biological objectives for management (escapement goals, LRP or TRP, etc.) and annual forecasts of abundance
- d) establish annual monitor programs (eg. tagging) including environmental variables that affect production
- e) habitat monitoring and protection (enforcement)

Fishery management planning:

- a) develop management objectives for fishery, identify stocks exploited (frequently multiple stocks/species) and identify limiting factors, such as depressed individual populations, etc.
- b) balance conflicting issues of production and yields vs. conserving biodiversity and ecosystem aspects
- c) identify levels of uncertainty and incorporate allowances for uncertainty in decision processes (Precautionary principle)
- d) conduct consultations in determining final management plans
- e) establish regulations/procedures, and assess compliance against other agreements (Pacific Salmon Treaty, domestic policies, and Native agreements)
- f) develop an evaluation framework and check points

Conduct of Fisheries:

- a) fisheries are defined by area, time period, and gear ...and for each there will be retained catch and incidental mortalities (estimate encounter rates of non-retained fish, and appropriate mortality rates)
- b) monitor catch and fishing effort, accounting must be timely and accurate (or if estimated then designed for a specified level of precision and accuracy)
- c) conduct sampling of fishing mortalities (encounter rates, stock compositions, age for some species, recovery of tags, average weights, etc.)
- d) conduct in-season test assessments (monitor check points and pre-season forecasts)

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- e) monitor fishery for compliance

Post-season Evaluations:

- a) develop an annual post-season assessment process to review conduct of fishery, regulations, compliance, and adequacy of data collected
- b) examine timeliness of data needed for annual assessments and appropriateness of sampling strata, data, etc., identify limiting factors
- c) at higher level ... assess consistency with regulator processes and Treaties.

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26 July 2002

Chet Chaffee

Scientific Certification Systems, Inc.

2004 Sunnyview Lane

Mountain View, CA 94040

Dear Chet,

Please find attached my comments on your "MSC Evaluation of the British Columbia Commercial Salmon Fisheries Performance Indicators" draft dated 3 July 2002. I commend the certification team for their efforts. All of you had a difficult task.

Although I have many comments, I hope that they are useful to you and the other members of the certification team. My intention was to help improve the certification procedures. Thanks for the opportunity to have input to your process. Please let me know if you want me to attend a meeting. Good luck!

Sincerely,

Randall M. Peterman

Professor and Canada Research Chair in

Fisheries Risk Assessment and Management

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26 July 2002

Comments on the "MSC Evaluation of the British Columbia Commercial Salmon Fisheries Performance Indicators" draft dated 3 July 2002

Background

As I understand it, you were given the Marine Stewardship Council (MSC) Principles 1 through 3, and each principle was associated with one or more of the MSC's criteria. You have developed the "Subcriteria" and their affiliated "Indicators" to apply to the B.C. commercial salmon fisheries. Each indicator will be used to give a "score" to these fisheries. I think that the "certification team" (henceforth called "the team") has done an excellent job of drafting text to achieve these ends. It is much better than the Alaskan certification guideposts. This initial draft is the hardest step, in some sense, and I could not have done any better. However, I have many questions, comments, and suggestions below, but keep in mind that the bulk of your framework is very good.

A few of my comments arise from a lack of information provided about exactly how the team will apply the written material to come up with the scores. I will assume that the procedures will be what I heard from Karl English informally over the phone and from what I learned a couple of years ago about how the Alaskan salmon certification process worked. Specifically, I heard from Karl that these principles, criteria, subcriteria, and indicators will be applied separately to each species and region (unspecified) in B.C. Furthermore, apparently the onus will be on the management agencies (DFO and PSC in particular) to provide detailed information for the team to use in their scoring. This is both appropriate and necessary for most components of your scoring. However, it bothers me on one particular point. In some indicators, you give a certain score for "...a strong record of taking action on ..." or "...most often adjustments are made in a timely fashion." Clearly the score will depend on what proportion of the cases that the certification team knows about take the appropriate action. Lack of some independent "score card" can lead to misrepresentation of reality in either direction (i.e. either in favor of the claim that the agency is doing a good job if the team is presented with mostly those cases or not in their favor if the team hears about the high profile, mostly negative cases that appear in the press and that are the focus of many harvesters). I don't have a practical suggestion to get around this other than for the certification team to be aware of the issue.

As well, if your B.C. process is to be like the Alaskan one, there will be some procedure (Analytic Hierarchy Process?) to help the team develop their scores. Without knowing how that

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process is being applied, I cannot know exactly how the overall scores will be developed. In addition, is it the case the a score of 60 is a failure but 80 is a pass, and 100 is pass "with flying colors?" This has to be clarified in the publicly written documents about the procedures. One person's 60 is a pass, whereas another's 60 is a dismal failure.

General comments

Before I get into specific detailed suggestions, I'll state some general ideas that were in the back of my mind as I was reading your draft. You might consider whether these ideas are worth articulating somewhere or acting upon.

The broad objective of the MSC certification process is to help maintain biologically and economically productive fish populations over the long term. To that end, the indicators and guideposts for a passing score should be quite rigorous (i.e. high standard of proof that the required conditions are being met). Generally they are sufficient in your document, with the exceptions that I note later. However, the success of a certification scheme also hinges on at least two things: (1) retailers and consumers being educated about what MSC certification actually means in terms of the environment, and (2) management agencies and harvesters being provided with strong incentives to "perform" to high standards over the long term. For these reasons, it is critical that there be very clear meanings for the indicators and guideposts that result in a passing score. This is one major place where the current draft could be improved considerably. As I detail below, ambiguities are very common.

In recent years, considerable work has been done on developing measurable "indicators of sustainability," particularly by Serge Garcia and John Caddy at FAO in Rome. You should consider reviewing documents such as the symposium volume edited by Garcia and Staples (2000a) and their detailed paper therein (Garcia and Staples 2000b). These papers contain ideas on which measures are practical and useful and how to articulate more specifically some of the conditions that you want met to obtain passing scores. Unfortunately, I read those papers when they first came out and don't remember details, and I don't have time to dig them out right now. However, I remember that they had some innovative and useful ideas (e.g. traffic light and other graphical representations), which seemed to be relatively easy to implement and communicate to others.

Another general suggestion comes from a paraphrase of a point in Yost (1999). "Does the [management system] set performance standards for industry, enlisting companies' creativity in solving environmental problems rather than micromanaging through traditional command and control?" I make one suggestion later to create such an incentive, but you might consider inserting others elsewhere.

Another important point is that the indicators and scoring guideposts should provide incentives for management agencies and harvesters to continually improve their performance over time. You mentioned this idea in only a few places in the document; you might consider inserting it elsewhere too. A related point is that the indicators and guideposts should help the management agencies and harvesters move toward having similar objectives, rather than different ones and collaborating to achieve them. For example, ultimately, both groups should have as their primary objective the maintenance of fish populations that are highly productive, biologically and economically. You could do this by building in more recognition in your 80% and 100% guideposts that harvesters comply with conservative regulations when required by the poor status of a stock, management agencies use the latest innovative methods for anything, etc.

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You already have a few instances of this idea, but more could be inserted. At the same time, I would like to see some statement that you can't have an economically productive system without it also being biologically productive. While that seems obvious to us, it is worth stating -- harvesters seem to forget this sometimes in the presence of their short-term goals.

After finishing your draft, it occurred to me that there was very little evaluation of the fishing industry; most of the indicators focused on the management system. You should come up with more evaluations of fishing practices because they contribute heavily to conservation problems.

Detailed questions, comments, and suggestions

1. It should be made very explicit and unambiguous which components of the MSC evaluation structure have a "veto" over the certification of a given species/region. I believe that the general MSC material says that a failure of any one of the "Principles" to "pass" means that the fishery will not be certified. However, it is not clear whether an overall pass would be given to Principle 1 (for instance) if its MSC criterion #1 passes but its criterion #2 fails. This question applies to each level in the hierarchy below the level of "criteria." For instance, it is not clear whether an overall pass would be given to MSC criterion #1 if subcriterion #1.1 passes but subcriterion #1.2 fails. Likewise, what happens if the fishery fails on indicator 1.1.3 but passes on indicators 1.1.1 and 1.1.2? Also, what if one of the bullets under a 60% scoring guidepost is true (i.e. the situation is bad), but the rest are not true? Does that lead to a 60% score for the indicator or does the score depend on the relative weight given to each bullet? Can you give different grades (A, B, or F), rather than just pass or fail?

I realize that in the past, the MSC certification used some process of averaging (perhaps even weighted averaging using the team's judgment). However, what should be done first is to identify in writing which indicators, subcriteria, or criteria are "fatal" to the certification of the species/area fishery if they do not pass. This suggestion arises because obviously, some indicators are more critical than others for achieving the goals of the MSC principles and therefore should get more weight. To ensure a credible process, the team needs to write down this ranking/weighting of indicators, subcriteria, and criteria before the "data" are gathered to develop the scores, and keep this ranking/weighting confidential to prevent biasing of information by the groups providing the data. Also, if you are averaging scores, watch out for a built-in bias of having two categories with a passing score and one with a failing (e.g. what if you gave a zero to the failing bullets?).

2. It is also essential that the team insert into subcriteria and indicators its own elaborations or clarifications of the MSC Principles and MSC Criteria in cases where those are too vague or unclear. For instance, I would suggest clarifying MSC Principle #1 by explicitly addressing several issues. First, clearly define what you take the MSC to mean by "overfishing." This is non-trivial; the U.S. National Marine Fisheries Service has an entire technical report on the topic. However, you could make it as simple as avoiding "recruitment overfishing" (suitably defined, e.g. having a probability less than X of the spawning population abundance of a given stock management unit dropping below abundance Y in the next Z years). These three elements (X, Y, and Z) are also critical to mention regarding "recovery" (last word in MSC Principle #1). Otherwise, you could get into a controversy because one person's "recovery" level is not another's.

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Second, I would carefully define various terms in the publicly available text. For instance, in MSC Criterion #1, "productivity" could lead to confusion. I am continually amazed at how many biologists, let alone managers, don't use such terms correctly. DFO traditionally uses the word "production" to mean amount of fish caught. As the members of the team know, traditionally, ecologists use the term to mean an increase in biomass of a population. "Productivity" (different from "production") usually refers to the amount of increase in some population per unit time (e.g. per year), per unit spawning population, and/or per unit area. Obviously, there is a big difference between the total abundance of some population and its rate of increase (or decrease). Furthermore, as you know, in the case of Pacific salmon, abundance of the population is usually measured in terms of numbers of adult recruits, rather than using units of biomass or reproductive potential. In any case, regardless of how you choose to define it, to avoid confounding interpretations, I would suggest making your interpretation of "productivity" in MSC Criterion #1 really clear.

3. In general, please invoke the "clarity test" of Morgan and Henrion (1990, page 50). This is where one asks, "Is the condition stated in a bullet under a given scoring guidepost sufficiently well specified that a group of knowledgeable people, given a description of the issue, could agree whether the condition had been met (e.g. recovery or maintaining genetic and ecological diversity)? Without such precision, vagueness about what the stated condition represents is liable to get confounded with uncertainty about whether it was met. This suggestion of asking yourselves whether the clarity test has been met applies throughout the document, which currently contains quite a few ambiguous terms. While I respect the certification team and trust their judgment, the less ambiguous terms are, the easier the scoring process will be, and the greater will be the credibility of results.

4. a. Your italicized interpretation directly under MSC Criterion #1 needs some editing for grammar and style. More importantly, though, clarify whether the last phrase "will influence the evaluation scores" refers to Principle #1 or #2.

b. The rest of the document also needs considerable detailed copy editing, e.g. "rationale" instead of "rational", "defensible" rather than "defensive," etc. I recognize that the team had very little time to write this draft and I think it has done an excellent job of producing a framework for comments. However, it really needs to be polished to make it more readable.

In my comments below, rather than referring to pages on my printout, I use headings denoting the criteria and indicators. This is because I have sometimes found that my printer gives different pagination than other printers.

5. Indicator 1.1.1:

a. The wording of the 100 and 80 Scoring Guideposts are too similar. I cannot tell the conditions under which one of them will be met and the other not.

b. You should define "stock management unit." I began to question what you meant by this when you mentioned "stock management units for non-target species" under Indicator 1.1.2. Don't you really mean limits on by-catch of particular stocks or species, regardless of which population they come from?

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6. Indicator 1.1.3:

Knowing the "geographic range for harvest" is not good enough. What you need to get a 100 or even an 80 should be "reliable" and "timely in-season" information on this topic. While this might sound picky, I recall numerous places in the MSC scoring guideposts for Alaskan salmon where such vagueness and lack of rigor apparently allowed so much "weasel room" that a pass was given by the certification team when most biologists/managers would have given a failing score. You could even go further and indicate quantitatively what you mean by "reliable."

7. Subcriterion 1.2:

a. It is really important that somewhere, perhaps not here, you clearly state what you mean by "maintain the productivity." I don't mean just defining the word as I mentioned above. Instead, I mean to state, for example, that you want to maintain productivity of the target populations at a moderate to reasonably high level. The reason to state this is that I can maintain a population at a low level of productivity (e.g. recruits per spawner per year), but that is clearly not desirable. Again, while this might seem obvious, it doesn't hurt to be explicit.

b. Modify your italicized paragraph as shown in bold text: *Extended [meaning what?] monitoring of specific stocks is generally required to compute **reliable** estimates of productivity.* Furthermore, what is meant by "**reliable**" (\pm X% of variable Y, and what units does Y have?). This last question applies to every use of the word "reliable" in the text.

c. Also, in every place that you refer to some data or information being "available", indicate how frequently the data must be available (e.g. annually applies to most cases in this subcriterion).

8. Indicator 1.2.1:

Expand on the fisheries for which you need reliable catch estimates, i.e. all commercial, sport, native fisheries, both Canadian and non-Canadian, that harvest a particular target or non-target stock.

9. Indicator 1.2.2:

a. Is it possible to insert something in the second bullet under "100" or perhaps elsewhere in the document the idea that the team's scoring process is critically affected by how data "are used." It is one thing for a scientist or manager to take in-season estimates into account in some quantitative model and another to just qualitatively consider the categorical state (e.g. low, medium, high estimate).

b. Insert "spawning" before "abundance" in the second bullet under "80".

10. Indicator 1.2.3:

a. The statement "...have been considered..." for this indicator is too vague. Don't you need to know what has been done with the information by the management agency? See point

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9a above. I suggest tightening up the wording on several points like this in order to create the incentive over the long term to improve on the way in which information is used. The management agencies have come a long way in the past two decades but compared with NMFS's management of groundfish populations, for instance, we have some room for improvement in the development of scientific advice for management of Pacific salmon.

b. 80%, 2nd bullet: Define "biosampling."

c. In the first bullet under "60" define what "is not adequate." Except for the most obvious failings of not having things like aging data, I would suggest that "not adequate" can only be determined after broader risk assessments have simulated the effects on performance of management procedures that are missing various bits of information (or that have such data but with high variance on the estimates). A given state of the "information available" would be "not adequate" if it led to an unacceptably high probability of a population dropping below its limit reference point (defined as I do below) in some specified period. This is not intended to be an idealistic academic suggestion. It is a practical matter. Someone decides what is "adequate" based on several criteria. I would like to see the bar raised over time by creating the incentive for more applications of rigorous quantitative risk assessments, like they have done in NMFS.

11. Indicator 1.2.4:

a. I think you meant in the definition of this indicator that "...management guidelines..." should apply to both target and non-target stocks; it only says the latter.

b. 100%, 2nd bullet: Expand on what you think should go into "risk assessment." For instance, at the very least, it should include an explicit consideration of the major uncertainties and an examination (preferably through quantitative modelling) of the implications of these uncertainties for estimates of stock productivity and the potential effects of the range of management options on both the target and non-target stocks.

12. Subcriterion 1.3:

a. Reword this subcriterion to be: "Management goals and procedures for achieving them have been set and are appropriate to create an acceptably low probability (X) that stocks will decline to unacceptable levels (Y_i , one for each stock i) within Z years."

b. The most important change to make here is to the team's italicized interpretation of "limit reference point (LRP)" under indicator 1.3.1. It is not correct, according to my understanding, which is based on the FAO's use of the term (e.g. Caddy and Mahon 1995). As far as I am aware, the standard definition of an LRP in most fisheries is that it is a condition to be avoided. It may be an unacceptably low abundance or an unacceptably high % harvest rate but regardless, it is expected that sufficient regulatory action will be taken by the agency that there will be a small chance that the stock will ever reach that LRP. Therefore, action such as closing fisheries, which you mention, should be taken well before the LRP is reached. We cannot wait until "the exploitation rate is greater than an LRP exploitation rate", as you put it. How can a scientist evaluate the effectiveness of some proposed management regulation if there is ambiguity about what it is trying to avoid (or achieve)? If my interpretation is correct, you must change the LRP wording in several places in this document. Unfortunately, I have heard highly respected DFO scientists using this term LRP incorrectly (the way you use it) and my attempting to explain their misuse of the term and sending them copies of the appropriate FAO papers, etc.

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seems to not have changed their thinking. Perhaps you can set them straight. By the way, if I am wrong here, please let me know.

13. Under the first Indicator 1.3.1 (there are mistakenly two indicators with this number):

a. The 4th bullet and others under this indicator state "...protect all stocks..." Isn't that an impossible task? Perhaps it should read "an acceptably high proportion of stocks." This generally applies throughout the document. There should be explicit recognition in the relevant bullets that the stated conditions should be achieved in a certain proportion of the time or by a given proportion of the stocks. This builds in a general recognition of the uncertainty in achieving some stated goal or condition.

b. Insert in some bullet that "the LRPs, TRPs, etc. are widely available for inspection and evaluation."

c. The "60" score should also include at the end of the sentence "... appropriate for target stocks or protect only an unacceptably small proportion of target stocks."

14. Under the second Indicator 1.3.1:

a. The definition of Target Reference Point (TRP) is too restrictive. You define it as the point at which the maximum productivity of the stock occurs. Many scientists (and perhaps managers) argue that this MSY state (if that is what you mean) is too risky. Given the large uncertainties arising from natural variation, measurement error, and implementation uncertainty, many agencies no longer consider that the target should be MSY. In fact, some of them in Europe and the U.S. consider the MSY state to be one of the LRPs (something to be avoided)! [I noticed that you said essentially this later under Indicator 2.2, so change 1.3.1 to be consistent.] Many scientists and managers now suggest that the TRP should be some state that "presses" the population less hard. To fix this, I would simply change your wording to leave open the definition of TRP because you quite properly create an expectation in your scoring guideposts below that the TRP will have been reviewed and found appropriate.

b. Do you mean sub-stocks in the phrase "the components of the target stock" in the 3rd bullet?

I reached the end of MSC Criterion #1 and was struck by the very limited mention of the concepts of uncertainties, risk, and probability. Surely these are among THE key issues that the certification process is trying to deal with, so you should consider incorporating here and elsewhere some of my suggestions above about phrasing that will bring measures of probability into the team's scoring procedures. As you well know, nothing is "black and white", so these three issues of uncertainties, risk, and probability must be dealt with explicitly in as many places as possible.

15. MSC Criterion 2, Indicator 2.1:

a. 100%, first bullet: "...pre-agreed responses to low stock size or high exploitation rate ..." Some species like chinook and coho are managed on the basis of target exploitation rates, rather than target spawner abundances. Your text properly recognizes this point later but all of it

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should be checked for consistency. Also, the "...comprehensive and pre-agreed responses..." should preferably be developed through quantitative analyses.

b. 100%: delete the second bullet because of my previous point about LRPs.

c. 100%: insert a bullet such as, "Stocks are allowed to recover substantially before fishing on them is increased."

d. 100% and 80%: After reading the entire document, I did not find a single reference to "enhancement" or "artificial propagation." That is an oversight. This section might be the most appropriate place to put something about this. For example, in keeping with the FAO's (1995) suggestion, give high scores for a bullet such as: "The management agency does not use artificial propagation or other forms of enhancement as a substitute for maintaining or recovering wild populations." You might also consider having a new principle that is very similar to MSC's Principle 2 (which says "Fishing operations should allow for the maintenance of structure..."), only the new one would start with "The management system should ...maintain biodiversity, etc." Is this point covered somewhere? It is really important.

e. Similarly, create a 100% scored bullet somewhere that says: "The management system takes extra precautions in the presence of the limited knowledge about biodiversity [or whatever topic you wish to insert] and how to effectively measure it."

f. For the "60" guidepost under indicator 2.1 -- add on after the end: "...depletion, or the plans are inadequate to achieve the recovery goal, or their adequacy has not been determined through analysis."

16. Indicator 2.2:

a. In the indicator's definition, expand on the concepts to get away from the lack of a "black or white" situation in the salmon fisheries, e.g. "The abundance of a target stock is not sufficiently reduced to create an unacceptably high probability of stock depletion." [You could define depletion near the start of the document as I did above -- stock abundance being less than Y by year Z]. Also, "sustainable" is not a yes/no variable; there are various levels of sustainable harvest or probabilities of having a highly productivity population. Perhaps say instead "harvest rates are at moderate to high levels". Again, the point about limit reference point applies at the end of your phrasing about this indicator.

b. Replace B_{MSY} with S_{MSY} because, as you know, Pacific salmon normally use S (abundance of spawners), not biomass.

c. As noted above, the definition of a LRP should be changed to represent the condition to be avoided, i.e. the state that causes various responses to be initiated before the stock gets there. I will not try to re-write all sections where the incorrect use of LRP appears. I assume that you will want to do so in a way that will make everything consistent and integrated. Short of focusing entirely on the probabilistic definitions that I have described above, you might use Caddy and Mahon's (1995) term, "threshold reference point" (ThRP). This is the state of the stock or fishery at which new management actions will be taken so as to avoid the LRP. In many of the places where you use LRP now, you could use ThRP instead of LRP. For instance, the second bullet under the "80" guidepost could read "Exploitation rate is reduced or other measures are taken as stocks decline below their ThRPs."

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However, in my opinion, using ThRP is a poor compromise. It is not a widely used term now because it is unnecessary to the extent that management actions are designed to achieve the probabilistic objective that I have mentioned several times above (the actions lead to a probability of less than X that the population (or other indicator like exploitation rate) will be at level Y within the next Z years. The ThRP is unnecessary because at every state of the stock or fishery, actions should aim to keep that probability less than X. If they don't, they should get a failing score.

d. Even after you re-write the scoring guideposts for this indicator to deal with the problem of the use of "LRP", it is appropriate to include under the "60" guidepost some criterion such as "below the LRP" in 2 of the last 5 years (or whatever numbers you choose).

17. In your italicized interpretation of MSC Criterion 3, the last sentence says that "impacts on "local stocks or spawning units" are used as a proxy at the 80% scoring level." However, your text of that 80% guidepost does not mention "local stocks or spawning units".

Furthermore, I expected you to distinguish between having information comprehensively across all major stocks for a 100% score compared with just having good data for some specific local indicator stocks for the 80% score. Your wording does not do this. Wouldn't that distinction be useful to make here or elsewhere in the guideposts? I have not yet read anything about indicator stocks and it may appear later in the document. However, if you do bring in this idea, a key issue is, "How well do the indicator stocks (for which there tends to be lot of information) reflect the status and productivity of other stocks in the region, particularly those that are most at risk?" I would think something like the following would be appropriate, perhaps somewhere under MSC Criterion 1 near indicator 1.1.2 (or perhaps under MSC criterion 2):

Indicator X.X: Where indicator stocks are used (define them) as the primary source of information for making management decisions on a larger group of stocks in a region, the status of the indicator stocks is well correlated with the status of other stocks, particularly those that are most at risk.

100% scoring guidepost

- The status of the indicator stocks is well correlated with the stocks that are most at risk from a conservation point of view, not just correlated with the most productive stocks in the region.
- The indicator stocks used have been reviewed and found to be scientifically defensible and appropriate by the Pacific Stock Assessment Review Committee or the appropriate Pacific Salmon Commission technical committee.
- There is general agreement among regional fisheries scientists outside the management agency that the indicator stocks are appropriate.

80% scoring guidepost

- There is general agreement among regional fisheries scientists within the management agency that the indicator stocks are appropriate for target species.

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- There is no significant scientific disagreement regarding the indicator stocks used by the management agency to formulate management decisions for the fishery.

60% scoring guidepost

- There is significant scientific disagreement regarding the indicator stocks used by the management agency to formulate management decisions for the fishery.
or
- There are few or no analyses regarding the appropriateness of the indicator stocks used.

18. Indicator 3.1:

First bullet: insert the boldface words: "...and the impact **of changes in these factors** on the reproductive capacity..."

19. MSC Principle 2:

a. Generally, this section contains more specific measures that are used to come up with scores than the sections under MSC Principle 1. That is good. However, the wording in this entire section is way too convoluted and complex. Simplify it in several ways: (1) a good thorough editing would help a lot; (2) break some of the complex indicators like 2.1 down into several separate indicators, (3) reduce the occurrence of double negatives (e.g. see the "intent" paragraph under indicator 2.1; it has so many negative words in it that I had to read it three times to figure out the intent). An "intent" paragraph is meant to clarify what the indicator is attempting to achieve, not confuse readers.

b. Again, I caution you against using wording implying that something is black and white, e.g. "ensure sustainability", "do not have measurable impacts", "will not adversely impact".

c. A related issue is that the wording in various places under MSC Principle 2, Criterion 1 should recognize that managers legitimately frequently make tradeoffs, for example, between the need for more catch and the need for more spawners and nutrients from carcasses. I suggest that what you should be asking for in some 100% guidepost is that sufficient research has been done and sufficient documentation of the reasoning of managers is available to justify whatever tradeoff decisions they have made. 80% might result from having a well-documented procedure for assessing those tradeoffs, but the documentation of the reasoning of managers might be missing.

d. In numerous places under this Principle 2, the topic of nutrients from carcasses comes up. The implication with the current wording is too limited because it generally implies that more nutrients are better, without exception. For instance, under indicator 1.2's 100% guidepost, you state, "Escapement goals for each species and stock aggregates are based on maintenance of nutrient requirements..." Surely you mean "based IN PART on ..." because legitimate considerations about density-dependent processes, for instance, also come into play when setting escapement goals. Not all systems are nutrient limited and not all salmon populations' abundances are equally affected by nutrients in the freshwater lifestage. Furthermore, you are undoubtedly aware that many salmon scientists are not convinced of the broad general benefits of nutrients from carcasses. Such benefits seem to be clearest in cases of extremely nutrient-poor

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systems, combined with current stocks at extremely low abundances, and for salmon species where in-stream or lake residence time is substantial. However, there are many cases in which one or more of those conditions is not met, and where it is unreasonable to expect that maximizing nutrients is important. Among other edits, I would tone down the wording about nutrients in this section by putting in caveats (e.g. "for species, locations, and abundances where appropriate, etc.") and emphasize other aspects of the ecological system.

20. MSC Principle 2, Criterion 1, Indicator 1.1:

- a. Don't you need a continuous numbering system to make each criterion and indicator number unique throughout the entire document? As I flipped back and forth among sections, it was not immediately obvious which principle or criterion I was reading.
- b. There is way too much complexity included in this single indicator. Split it up into two or three indicators.
- c. You need to define what you mean by "...the management approach is precautionary." I am continually amazed at how few people really know what this means. I would stick with the definitions from FAO (1995). You might need more space than you have here, so it could be put in an appendix.
- d. Again, risk assessment is a key approach to developing and evaluating management plans these days. You might add this as another bullet under the 100% scoring guidepost: "A risk assessment has been conducted as part of developing the management plan." You justifiably did this under the 2nd bullet of the 100% guidepost for indicator 2.2 later.

21. MSC Principle 2, Criterion 1, Indicator 1.2:

- a. Under the 100% guidepost, in the third bullet, what do you mean by "when referenced against decadal variation in natural abundance"? Cut out "natural" and replace "referenced against" by "compared to past ranges of..."
- b. In the 4th bullet, explain what you mean by "remote".
- c. Under the 60% guidepost, insert "Managers assume that" at the start of each bullet and edit the rest for clarity.

22. MSC Principle 2, Criterion 2, Indicator 2.1:

- a. The 3rd bullets for both 100% and 80% guideposts should also refer to the mature fish that are harvested. Size selective fishing gear on mature adults may also detrimentally affect populations.

23. MSC Principle 2, Criterion 3:

- a. In your interpretation of Criterion 3, be more explicit about your intentions because your wording is a bit convoluted. In your indicators, you actually consider three causes of declines in abundance of salmon: directed harvesting by fisheries, non-fishery human activities (e.g. habitat destruction, global warming), and natural processes (e.g. changes in climatic regimes not related to global warming, often occurring on decadal scales).

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b. Do you mean anthropomorphic or anthropogenic? You use both.

24. MSC Principle 2, Criterion 3, Indicator 3.1:

a. Under 100% and 80%, I would insert a bullet like the 4th one that you currently have under 100% for indicator 3.2, i.e. "The fishery management actions have a strong track record of closing fisheries..." This is essential for any level of a pass, 80% or 100%, because it is not sufficient to have the flexibility and management plans in place for dealing with depletions if they are not implemented.

b. 1st bullet: "to ensure" is again a bit unrealistic. All we can do is develop management plans that have an acceptably high probability of producing long-term recovery of depleted stocks. Nothing is 100% certain. I know that I have said this many times, but I'll put it another way now. Perhaps one difference between 100%, 80%, and 60% scoring guidelines could be the probability of achieving the goal (recovery in this case). That probability would be highest for the 100% score (perhaps >0.8), moderate for 80% (perhaps >50%), and low or not even estimated for 60% score (failure). That structure could be used in many places in the document, although the numbers would vary among variables being assessed.

c. 3rd bullet: Why do you put "independent" in front of risk analysis here but not elsewhere in the text? While this is a great idea under ideal circumstances, at present risk analysis is rarely done. I would keep something there about doing a risk analysis in the ideal situation, but I would also add as separate bullets the ideas that you used earlier in the text, which stated "[Proposed management strategies] have been reviewed and found to be scientifically defensible and appropriate by the Pacific Stock Assessment Review Committee or the appropriate Pacific Salmon Commission technical committee. Also, you said, "There is general agreement among regional fisheries scientist outside the management agency that the [management strategies] are appropriate." In fact, setting up an expectation of external peer review is a very good goal for many of the components of this entire document's indicators and scoring guidelines. Please consider inserting such bullets elsewhere.

d. Insert a bullet under 100% and 80% to say that "monitoring and assessment programs are sufficient to determine with a high degree of confidence and in a timely manner whether recovery is occurring."

25. MSC Principle 3, 3A (Management system criteria), Criterion 1:

You should define the management system, which I think you intend to mean not only the managers but also the scientific assessment group and other units that provide advice to managers.

26. MSC Principle 3, 3A (Management system criteria), Criterion 1, Indicator 1.1:

a. In the definition of the indicator, it is good that you state "as qualified by environmental factors." Be sure to keep that. Also, to take into account discarding, don't you mean just "captured" rather than "captured and landed"?

b. For consistency, you might consider stating the various bullets about objectives and goals in terms of having clearly defined and agreed-upon TRPs.

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c. Although the bullets under this indicator are generally excellent, the 100% and 80% scoring guideposts are almost indistinguishable. To differentiate them more, you could use an explicit gradient of % of target species/stocks/areas from high to low.

27. MSC Principle 3, 3A (Management system criteria), Criterion 1, Indicator 1.2:

a. Third bullet under both the 100% and 80% guideposts. Of course, it is unrealistic to expect that annual stock assessments will be published in peer-reviewed journals -- delete "technical analysis" because I interpreted that to mean stock assessment results. Why not adopt the wording that you used elsewhere regarding review by PSARC and the Pacific Salmon Commission? Of all the topics so far in this MSC text, reviewing stock assessments and methods of assessment is closest to what those groups already do on a regular basis.

28. MSC Principle 3, 3A (Management system criteria), Criterion 1, Indicator 1.3:

a. For the 100% case, include the same "control mechanisms are used" as stated in the 80% case, but add "on a regular basis as required," or use your wording from before "a strong track record of using control mechanisms when required." Also, for 100% you should expect that "There is sufficient evidence that the control mechanisms are adequate for meeting the objective." This additional concept of adequacy of actions is really important and applies to most of this document. If you do not adopt my suggestions mentioned earlier about using objectives that state having a given probability of such-and-such occurring, then you should at least add some text about requiring evidence that the control mechanisms used are adequate to the task. I am sensitive to this point because of the appallingly small "adjustments" to harvest strategies that we discovered in the 1999 Canada-US Pacific Salmon Treaty. Even if those adjustments are triggered frequently to respond to low abundance, they are probably inadequate for generating recovery or preventing further decline in abundance.

b. For the 60% case, at the end of the line, add something like: "or only uses controls infrequently compared to when they were appropriate."

29. MSC Principle 3, 3A (Management system criteria), Criterion 1, Indicator 1.4:

a. You should insert one of your italicized paragraphs interpreting the text of this indicator, and reword some of the bullets below it to reflect the following point. Uncertainty always exists in assessments and technically we usually don't know how accurate they are (i.e. no "true" state to compare them to). We can say something about precision of estimates, though, and can compare estimates derived from different methods or from simulated cases similar to real ones.

b. Under the 100% guidepost, you might reword the first bullet to reflect the idea that what you want is a management system that is based on "the best scientific information and advice available and the best available methods of analyses to take the inevitable uncertainties into account."

c. Add the following boldface words: "...such controls being **biologically** precautionary in nature **to the degree required**." The reason is that I have heard some business people using the term "precautionary" from their perspective, as in, for example, "If we are so uncertain about the effects of A on B, then a precautionary approach is in order, which would not change harvest

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rates until we are more certain about the effects." BLAH! Perhaps a clear definition of precautionary as I suggested earlier would suffice.

d. 80% guidepost, 1st bullet: I don't like "allows for" because it is not the same as implementing the required controls. Make this statement stronger, but less so than in the 100% case. Merely "allowing for some action" without a track record of taking it should be grounds for failure (60%).

e. Somewhere, perhaps here under indicator 1.4, you should explicitly deal with newly developing fisheries. Although this might be unlikely for B.C. salmon, it is still appropriate to put it down writing that when developing new fisheries, management agencies should follow the recommendations of the FAO (1995) precautionary approach, among others. I have been amazed at how often this has not been done in B.C. (particularly for invertebrate fisheries).

f. To deal with implementation uncertainty (e.g. the tendency for actual harvest rates or escapements to differ from those intended by the management regulations), insert bullets under the scoring guideposts such as the following:

100%: Under all circumstances, the management system quantitatively evaluates the effect of implementation uncertainty (defined as...) on the effectiveness of the proposed conservation and management controls.

80%: The management system occasionally, or only qualitatively, considers the effect of implementation uncertainty on the effectiveness of the proposed conservation and management controls.

60%: The management system either does not consider the effect of implementation uncertainty on the effectiveness of the proposed conservation and management controls or the effect is so large as to severely reduce the conservation benefits of those controls.

30. MSC Principle 3, 3A (Management system criteria), Criterion 1, Indicator 1.5:

- a. Clarify what you mean by "quasi-real-time."
- b. Add to the end of the definition of this indicator 1.5 "... and the fish populations" because the natural system can show reduced or increased productivity over time.
- c. The 100% and 80% guideposts are not very different. How about the following text to make them more distinguishable? You may want to use different numbers for the years than in these examples.

100% : second bullet, replace "such adjustments are made on a quasi real-time basis" with "such adjustments are made on a time scale approaching the rate of change in the factors of concern." Example: if the Ricker 'a' parameter drops by 50% over a 10-year period, the management response should be tracking that as closely as possible, given the lags created by the maximum age-at-maturity of the salmon. The response should not appear 10 or 15 years later.

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80%: second bullet, replace "most often adjustments are made in a timely fashion" with "most often adjustments are made but with a lag of up to 5 years beyond what they would ideally be"

60% add to the present text: "or when adjustments are made, they are not timely."

31. MSC Principle 3, 3A (Management system criteria), Criterion 1, Indicator 1.7:

- a. 100%, First bullet - excellent.
- b. 100%, Second bullet - is this reasonable to expect? Won't other information affect the tough tradeoff decisions that fisheries managers have to make? Perhaps you are assuming that all such information comes in through the formal stakeholder meetings, reports, etc.
- c. 80%, first bullet - Don't say "whenever possible"; surely managers should always be provided with a range of alternatives for management. Some of them may be ruled out immediately for various reasons, but it should not be up to analysts to decide ahead of time which options to give to managers. Discussions between analysts and managers should occur and may identify constraints, but only then should options be ruled out.

32. MSC Principle 3, 3A (Management system criteria), Criterion 1, Indicator 1.8:

- a. Clarify what you mean by "social incentives" that can be used by the management system. I thought that such incentives would arise within the fishing industry.
- b. Add a bullet under each guidepost with variations on the theme: "The management system creates strong incentives for harvesters to not exceed target catches or exploitation rates." This is a critical component that is missing.

33. MSC Principle 3, 3A (Management system criteria), Criterion 2, Indicator 2.1:

- a. 100%, 3rd bullet: omit "that are of a natural or operational nature."
- b. 100%, Here is where you could refer again to research being "published in peer review journals and/or reviewed by PSARC or the PSC."

34. The 100% and 80% scoring guideposts for most indicators under MSC Principle 3, Criteria 2, 3, and 4 are way too similar. The 60% is good; it is almost always qualitatively different from the others. To make your scoring task easier, you should go back through all guideposts and reword the 100% and 80% bullets to make them more distinctive.

35. MSC Principle 3, 3A (Management system criteria), Criterion 3, Indicator 3.1:

- b. Omit the last bullet of the 60% case. You will never know whether some view has been ignored. However, it is legitimate for a scientist or manager to consider a view and then dismiss it due to lack of supporting evidence.

36. MSC Principle 3, 3A (Management system criteria), Criterion 4:

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- a. Reword the last 7 words of sub-criterion 4.1 ("and as ... species"); they are garbled.
- b. In the italicized part under this sub-criterion, broaden the definition of "closed areas and no-take zones" to include closed dates/times as well. Make this change elsewhere too.

37. MSC Principle 3, 3A (Management system criteria), Criterion 4, Indicator 4.1.1:

a. Add to some bullet in the 100% section that "the mechanisms for establishing no-take zones or other regulatory measures are based on pre-agreed upon guidelines, where feasible and appropriate." Comment -- This is obviously ideal because it reduces the amount of in-season consultation and friction between management agencies and harvesters when changes are made to an initial management plan. However, such pre-agreed upon guidelines are not feasible or appropriate in every case.

b. 100%, 4th bullet: Omit "as a result of fishing." Surely, for a 100% score you want fishing pressure to decrease if there is evidence of a serious decline in stocks due to any cause.

38. MSC Principle 3, 3A (Management system criteria), Criterion 4, Indicator 4.1.2:

This indicator "Provides for restoring depleted target species to specified levels within specified time frames." Wasn't this already dealt with earlier under MSC Principle 1? The subtle difference that I can see is that here you are asking whether the management system has some procedures in place for restoring depleted stocks. In contrast, under MSC Principle 1 you were determining whether the fishery was actually being conducted in a way that is likely to achieve recovery. Please clarify the differences between these two occurrences of topics related to recovery.

39. MSC Principle 3, 3A (Management system criteria), Criterion 4, Indicator 4.2.1:

- a. Add a bullet under 100%: "Enforcement actions are effective."
- b. Under 60%, reword as: "...are implemented only irregularly or inadequately, or there is a record of consistent infractions."

40. MSC Principle 3, 3A (Management system criteria), Criterion 4, Indicator 4.2.2:

a. Under 100%, explain what you mean by "relative to the policies and objectives of the management plan." In case you do not mean the following, I would suggest putting in something like: "fully evaluates the performance in terms of whether the regulations are resulting in the intended harvest rates and escapements." This deals with one very important aspect of implementation uncertainty, which is often ignored when evaluating management options. That is whether there are physical or biological processes in the environment and/or activities of the harvesters that result in the intended harvest rate being exceeded, for instance. Your idea to have that effectiveness monitored is great, but I would be more explicit about what you want monitored.

- b. Again, define "quasi real-time basis."

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41. MSC Principle 3, 3A (Management system criteria), Criterion 5, Indicator 5.1:

I'm confused by the first and second bullets under 100%. The first says "The management system... internal review" and the second says "input from stakeholders." Do you consider stakeholders as an internal part of the management system? If so, that is a surprise and you should go back to earlier sections where you discuss the management system and clearly state that assumption. I had been operating under the assumption that stakeholders were outside the management system but were having input to it through multi-stakeholders meetings.

42. MSC Principle 3, 3A (Management system criteria), Criterion 5, Indicator 5.2:

a. I like this indicator! I have been arguing for years that to create the incentive for improved decision making processes we have to focus more on the adequacy of those procedures and less on the outcomes. The latter are often affected by favorable or unfavorable natural variation in survival rates, growth rates, etc. and it is difficult to attribute a particular cause to some observed change in status of a stock. Management regulations are usually confounded with such natural changes.

b. 100%, first bullet. "Regular and continuing" is a bit unrealistic. How about "every X years?" For the reason noted in the paragraph above, clarify that by "performance" at the end of this bullet you do NOT mean outcomes in terms of the status of the stocks. Instead, focus on whether comprehensive, rigorous decision making procedures are being used.

c. 60%, add to the end of the bullet: "or there is no internal or external review of management performance."

43. MSC Principle 3, 3A (Management system criteria), Criterion 5, Indicator 5.3:

a. 100%: Add a bullet: "The management agency should provide a publicly available report describing how it has acted on the recommendations of these reviews."

b. 80%: insert "only occasionally" between "are" and "used".

44. MSC Principle 3, 3A (Management system criteria), Criterion 6:

a. Insert "also" after "In this context we" in your italicized paragraph.

45. MSC Principle 3, 3A (Management system criteria), Criterion 6, Indicator 6.1:

I don't know how far you want to take the idea of obligation to international agreements but it occurred to me that there are some that Canada has signed, but that may not yet be in force because the required number of nations still has not ratified the treaty. For example, as of the year 2000, the 1995 United Nations Agreement on Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks was not yet in force but Canada had ratified it. We should therefore expect that the management system in Canada would be consistent with that agreement. I don't know whether this would also apply to the 1992 Biodiversity Convention.

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46. MSC Principle 3, 3A (Management system criteria), Criterion 6, Indicator 6.2:

The phrase under the 80% guidepost "when violation of these would adversely impact the fishery" should also apply to the 100% case. To me, it was implied in the 100% wording.

47. MSC Principle 3, 3A (Management system criteria), Criterion 6, Indicator 6.3:

Clarify what you mean by "First Nations communities have been included in the management system." I didn't know that they were part of the management system. They are part of consultations but does that mean that they are part of the management system? This relates to a similar question that I raised above in my point #41 about whether stakeholders were part of the management system.

48. MSC Principle 3, 3B (Fishery operations criteria), Criterion 7

a. In the italicized paragraph on Criterion 7, why include the phrase "under its own volition?" Don't you want to ensure that the fishing industry is pursuing responsible fishing practices regardless of whether they are being forced to or whether they are doing it on their own?

b. How about using the word "harvesters" instead of "fishers?" It's politically correct and as most biologists know, fishers are a taxonomic group of animals in the weasel family that eats fish and small invertebrates in streams. That message is out and at least some people in the industry don't like fisher. Mike Sissenwine from NMFS once mentioned that the commercial fishing groups that he deals with on the east coast hate being called "fishers" because they know about this. I know the media use it around here, but you can do better than the media!

c. A general comment on Criterion 7: I strongly encourage you to re-think the structure and wording of all indicators and guideposts under Criterion 7 because at present, it is a jumble of items. Some evaluate *the management system's attempts to influence fishing practices* and others evaluate *the fishing industry's activities*. For instance, the italicized text under Criterion 7 gave me the impression that this section will be used to evaluate the fishing industry's activities, yet in numerous places below it, you mention "the management system does such-and-such." Instead, you should have separate criteria for evaluating the management system and the fishing activities. First, you want to know what actions the management system takes to encourage or force the industry to fish responsibly. Second, and quite separately, you want to know whether the industry is actually acting consistently with those incentives and complying with regulations. Another reason for separating these two categories of evaluation criteria is that if in some stock/area the management system passes but the industry does not (or vice versa), you want to be able to say unambiguously which group needs to improve.

In addition, it seems like some of these ideas may overlap with earlier sections. You may want to have another look at those to see whether they are indeed distinct enough.

49. MSC Principle 3, 3B (Fishery operations criteria), Criterion 7, Indicator 7.1

a. If you do retain the intention that this indicator 7.1 aims to evaluate the management system's actions, here are some minor edits.

b. 100% guidepost, first bullet: insert "management" before "system."

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c. 100% guidepost, 3rd open-circle bullet: "to make them aware of the benefits of using fishing techniques..."

d. 100% guidepost, 3rd solid bullet: This is an example of a guidepost that, as written now, applies only to evaluating the management system. In a separate new section evaluating fishing activities, it could be worded as: "Harvesters do not discard non-target species or undersized individuals of target species that are dead." This rewriting from a different perspective would be relatively easy to do for most of the relevant guideposts under Criterion 7, using the same points and having a parallel structure for the bullets.

e. How about adding more proactive ideas to 100% guideposts such as "The management system creates incentives to decrease by-catch (e.g. more fishing time for particular vessels)." This was once considered in the Alaskan groundfish fishery, but I am not sure whether it was implemented.

f. 80% guidepost, 2nd bullet: replace "sustainable" with "acceptable to the management agency." The reason is what I mentioned previously -- there are lots of different levels of sustainable harvest. I could harvest 1 fish per year from a heavily depleted population and do it in perpetuity, but of course that is not acceptable.

50. MSC Principle 3, 3B (Fishery operations criteria), Criterion 7, Indicator 7.2

a. Clarify "destructive" so that it is not misconstrued as only meaning destructive to the target population. It should also refer to other species, other stocks, and the habitat.

b. You should add a bullet to the 80% and 100% guideposts that says "The industry and/or management agencies are taking effective actions to restore habitats that have been degraded."

51. MSC Principle 3, 3B (Fishery operations criteria), Criterion 7, Indicator 7.3

a. This indicator should read "Harvesters minimize operational waste..."

b. The 2nd bullet under 100% is good and it should also be inserted elsewhere above where you are evaluating the management system, which should be monitoring and quantifying other things as well. That reminds me though, you did have some of this idea much earlier in the document (e.g. regarding monitoring by-catch). If so, you should avoid overlap.

c. The 100% and 80% guideposts are too similar.

52. MSC Principle 3, 3B (Fishery operations criteria), Criterion 7, Indicator 7.4

Add to the end of the bullet under 60%: "for evaluating catch and discard rates of target and non-target species/stocks."

52. MSC Principle 3, 3B (Fishery operations criteria), Criterion 7, Indicator 7.5

Reword the bullet under 60%: "is silent with respect to the recommendation of **suitable fishing gear and practices** or proscription of fishing gear and practices that are known to have adverse impacts on habitat.

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- Garcia, S. M. and D.J. Staples. 2000a. Sustainability indicators in marine capture fisheries: Introduction to the special issue. *Marine and Freshwater Research* 51:381-384.
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(CommentsMSCCertifBCsalmon)

Appendix 3 – Stakeholder Comments Concerning Performance Indicators and Scoring Guideposts

From: fred hawkshaw [linfred@citytel.net]

Sent: Tuesday, October 30, 2001 12:32 PM

To: Jim Humphreys

Cc: Min@DFO-MPO.GC.CA; Jon VanDongan; Lorne Clayton; Countrywide CBC

Subject: Certification for whom? I would appreciate a reply, please.

Marine Stewardship Council – "Work for sustainable marine fisheries by promoting responsible, environmentally appropriate, socially beneficial and economically viable fisheries practices."

Dear Mr. Humphreys,

Good day to you sir. I am a Commercial fisher (producer/harvestor) from the North Coast of BC, Canada. I understand that apparently the Salmon Fishing Industry in BC (BCSMC) has applied to you people for Certification of it's Salmon Fishery.

On the surface it sounds like a great idea, and certainly very doable. I for one, am very supportive of the FOC's (Fisheries and Oceans, Canada) Management practices here in BC. Any program that will lend it's support to protecting the Publics interests and concerns around the management and sustainability of one of our priceless renewable resources, certainly gets my support. **But therein lies the rub:** I've used the term "priceless" to describe the potential value of a renewable natural resource, if it is managed in a manner that will not only sustain it in perpetuity, but also **harvested** in a manner that will enable us to attain not only public support, but also, the maximum potential benefits overall, from the resource.

Responsible harvesting practices, responsible fish handling practices, responsible processing techniques, and responsible marketing strategies must all become part of the mandate as our contribution to the process. Issues from Forest resource harvesting practices, to subdivision builders, water way users, water quality management, cities effluent management, from Ocean marine life management and water quality to issues around our ability to maintain the fresh water environment, not just for the salmon, but for all the very complex issues that go along with maintaining that environment, are just a few of the others. Maintenance of all those values is key and integral to successfully managing, sustaining and maximizing all the potential that can come as a result. There are a huge spectrum of values and issues, right?

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But even after we've looked at all those concerns, what about the fishery itself, the issue that the industry is concerned about? The very complexity and incredibly large amount of issues that must be dealt with, brings into question the credibility and possibility of such an undertaking, if it does not address **all** the issues.

By now, you may be wondering just where I am coming from or where I'm going with this? Let me see if I can explain.

This industry was once a very valuable component of and contributor to, Canada's GDP or economic values. It was also a very large and valuable contributor to our Rural and Native Coastal Communities economic well-being. I won't go back in time to where there may have been issues that needed addressing, because we've certainly moved ahead since. The fishers (producers) have been hit with tremendous management controls, that for some, has resulted in devastation of their livelihoods, disruption of their families and communities. Certainly, we were not alone in bearing the pain nor the responsibility. But, if the abrupt tightening of fishing opportunities and fishing practices was not enough, the prices paid to the fishers by the buyers, has dropped to possibly their lowest levels in history.

This is where my concern over the intentions of having this industry "certified" as "sustainably managed and harvested", rises to the surface. I am writing to you, not to call into question your intentions or ability to convince the consuming public about our managers ability to manage or to carry out their responsibilities. No, not at all. What is concerning me the most is that there seems to be a false belief, false sense of security, being conveyed to the fishers and the public, that as a result of applying for this certification, (if we should receive it), that this is it! This is all we need to return to prosperity once again. That this is some magical kind of panacea, that will once again make us all rich. This will ensure "fish and fortune forever".

There is no doubt in my mind about our managers ability to manage these public resources, in fact, I'm very optimistic. I'm also not concerned about the intent or the need to reassure the public that as much as is humanely possible is being done to protect their resources, especially in the present day reality of over 6 billion people in the world, the most of whom, for the most part, all live on, near, around, alongside of or have an inevitable impact on all the world's water and natural resources. **What I am so very skeptical about is, not so much what it is we will gain, but very much more so, who will gain?**

For certain, this industry as a whole, suffers greatly from a credibility/public perception/image problem. The potential for certification to help ameliorate some of those concerns could be there, should be there, however, some (UBC) have called into question your ability to maintain an arms length distance from the corporate processors, and I very much, share that same concern. For whom are we seeking certification? It is for this reason, that I write you.

If I have trouble believing that something largely supported by the corporate sector is going to help the fishers and our communities, when these are the very people who paid such a paltry

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price for this priceless resource this year, what will be the public's perception, after the doing? How valid will the public consider this process? I would like to believe that these kind of concerns are merely perception and not valid in reality, so how will you convince those of us who are taking the full brunt of the all but non-existent values in our natural resources, that this is not just simply another prescription, written only for the benefit and protection of the processors, and will leave us, the producers, our communities and the public coffers, out in the cold?

Using management practices as the sole means to certify a healthy resource maintenance program, could, with the proper delivery, leave the public with the impression that all's well. Please understand that I may be missing the whole point here, but, if the sole intent of certifying proper management was just to protect the resource forever, with no intention to harvest, perfect, but if the intent of certification is to convince consumers and the public, that all's well, and that they can once again feel comfortable buying and eating our resources, should not also that certification include a responsibility that falls directly on the shoulders of the users/benefactors of the resource in the form of **newer and better fish harvesting/ handling techniques** and **processing/marketing strategies** that will result in a higher quality product, higher recoveries, better use of our share, much more responsible use and delivery of our resources and the benefits that will in turn, result directly in higher returns to our fishers, our communities and the public?

Let me try and zero in on what I'm trying to say. In everything that falls prey to the corporate commodity marketing stream, only the stockholders win. The "shareholders/stakeholders" become the "collateral damage." WHO'S BENEFITTING?

This MSC thing, only appears to me to be another form of corporate subsidy, if there is not also support for and equal responsibility attached to the producers harvesting gear technology development, live fish handling techniques development, and more flexible and responsive marketing strategies, resulting in the highest value returns to all. The whole issue of sustainable management practices, around harvesting, is directly related to the successful development of better harvesting gear technology and responsible fish handling techniques! If there were such a thing as the perfect gear type that can precisely avoid any encounters with non-target species or stocks of concern, no problem, but until such technology comes along, we need better gear development and fish physiology understanding for the fishers and fish handling techniques, to enable us to fulfill our side of the bargain of truly selective and sustainable harvesting, resulting directly in socially beneficial, economic viability and vitality to all.

Alaska has your MSC certification. These issues were not addressed in their hasty pursuit of "Utopia" and they are now asking themselves why their "priceless" MSC Certified Wild Alaskan Salmon, is now all but "worthless".

Right from the moment we anticipate encountering/harvesting this resource, out to the consumer/public, there must also be a certification of what we do with the resource and how we will get there. The responsibility must fall on everyone's shoulders, all inclusive, and not just the

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managers of the resource! As they say in the forest industry "STUMP TO DUMP" Are these the values you uphold?

Sincerely,

Fred Hawkshaw

421 - 6th Ave E,

Pr. Rupert, BC, Can.

V8J - 1W6

e-mail; linfred@citytel.net RSVP

From: fred hawkshaw [linfred@citytel.net]

Sent: Monday, September 30, 2002 2:25 AM

To: fisheries@msc.org

Cc: Dir.Pac.Reg. John Davis; Hon. Robert Thibault; chaffe3@attglobal.net

Subject: Comments to the MSC

Dear folks at the MSC,

I have taken the time to read through your "Principles and Criteria for Sustainable fishing." I must say, at first glance I sincerely commend your principles and goals. However, (of course there has to be one of those, right?) in the first four principles, I wonder if I've missed something or could it be possible that I'm just not interpreting it all correctly? Your first one mentions and speaks about "target species (or stocks)", but it doesn't come out loud and clear speaking about "non-target" stocks or species. Further down in the document you do bring up the subject of "non-target" concerns and for that I commend you again.

It's just that in our wild salmon fishery, especially here on the North Coast of BC, we are constantly dealing with non-target or stocks/species of concern. Each passing season seems to bring about new ones to care about. Perhaps your way of referring to these other stocks/species is dealt with in the second principle? I am not trying to find fault, I think your doing a great job, but I just would like to feel comfortable in my mind that we are not overlooking the greatest current concerns regarding access to our local fishery, ensuring that fishers are in full compliance of and in full understanding of the need to respect and maintain not only the integrity of our target species, but so too, our non-target species.

I have no shame in mentioning that I really tried to take you folks to task in the beginning of this process, but please understand that at that time, it did not seem possible that the BC salmon fishing industry would ever be willing or able to come to terms with the need to protect all our resources for the future, in spite of the Federal Dept of Fisheries best efforts to persuade fishers to change their behavior and attitudes. I hope I tried to make it clear that my concerns were not so much with you people, but more with the general attitude here to our resource as a whole. At that particular time, I firmly believed that if a fishery with such belligerent attitudes towards respect and responsibility and in such chaos as ours, at the time, could receive your certification, something was wrong with the process and the public was not going to trust us irregardless.

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I don't want to make this too long, but I really want to congratulate you people on your efforts. There was no doubt in my mind then and there is no doubt now, that **if** we fishers follow yours and the Federal Dept's directions for our collective future, none of us will regret moving forward. The past has come and gone and today I agree wholeheartedly, we all need to make a firm commitment to the future and **independent of industry** guiding principles such as these, will ensure a future and benefits for all stakeholders. I think you could have patted yourselves a little more in your bulleted benefits of getting involved with the MSC program at the top of your website, by including:

- Wild Salmon for our collective future

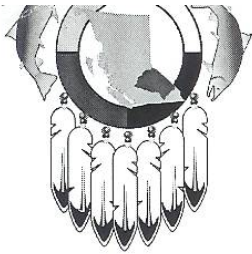
because that's how important I see the potential of your independent of industry role, working together with the Dept of Fisheries and us.

Clearly you have put a huge amount of time and effort into drawing up the guiding principles for the benefit of our resources, the Public and the wild salmon fishery and the best part of it all is, you have gone out of your way to maintain not only yours but also our integrity by remaining independent of industry. It is that independent integrity that is a must if we are to have any credibility and a future in the world's marketplace.

Sincerely, Fred and Linda Hawkshaw

421 6th Ave East,
Pr. Rupert, BC

Appendix 4 – Stakeholder comment during assessment process



Secwepemc Fisheries Commission

274-A Halston Connector Road, Kamloops, BC V2H 1J9

PH: (250) 828-2178 FAX: (250) 828-2756

Date: August 3, 2005

Chet Chaffee
Manager, Marine Fisheries Certification Program
Scientific Certification Systems Inc.
2000 Powell Street, Suite 1350,
Emeryville, California 94608
USA

**Re: Secwepemc Fisheries Commission comments on the BC Salmon Marketing Council
Application for MSC Certification for BC Salmon Fisheries**

Dear Mr. Chaffee,

This letter is in response to the invitation for consultation provided to the Secwepemc Fisheries Commission on April 20, 2005 entitled "MSC Stakeholder Consultation Process - Independent Evaluation of British Columbia Commercial Salmon Fisheries".

The SFC is a non-profit, support service agency operating as a division of the Shuswap Nation Tribal Council Society. We are based in Kamloops in south-central British Columbia within the territory of the Secwepemc or Shuswap people. SFC is a unique organization originally formed in 1992 as a technical and policy support organization for the tribal leadership on fisheries issues. On behalf of our affiliated bands SFC's mission is to promote the protection, maintenance and sustainable use of fisheries resources in Secwepemc territory. We are responsible for guiding the recovery of traditional fisheries and developing First Nations governance capacity for fisheries management.

Our response to the MSC application for certification for BC salmon fisheries by the BC Salmon Advisory Board is from Secwepemc communities in Thompson / Shuswap drainage only. Other Secwepemc communities in the mid-Fraser need to be contacted and involved directly. We can provide contacts if required.

We will not be participating in the performance indicator evaluation process (Criteria 100,80,60 etc.), however, we will make general and specific references to the MSC Principles and Criteria for Sustainable Fishing relative to Department of Fisheries and Oceans (DFO) management of salmon stocks of concern to the Secwepemc communities.

Principle 1

A fishery must be conducted in manner that does not lead to over fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

DFO's management of salmon in a mixed-stock harvest regime, particularly in the marine area, has led to the over fishing of salmon populations destined for streams within the Thompson drainage. Examples of DFO's non compliance with Principle 1 are as follows:

- There is a decreasing trend in escapement of several key sockeye populations within the Thompson basin that are of extreme cultural and ecological importance to the Secwepemc people.

Early summer sockeye:

- Exploitation rates (ER) on sockeye stocks destined for Scotch, Seymour, Fennell and Raft have averaged over 60% for all cycle years since the early 1950s. Recent decreases in ER have not led to demonstrable increases in escapement. The repression of these populations through overfishing has directly impacted the Secwepemc people's opportunity to harvest fish.
- Several of these sockeye populations are declining at alarming rates
 - Seymour River (2001 cycle) is declining at a rate of -43%, which is considered threatened under Canada's COSEWIC (Committee on the Status of Endangered Wildlife in Canada) status rating for population health
 - Fennell Creek (2001 cycle) is declining at a rate of -46%
 - Both the 2001 and 1997 escapements (2,449 and 3,085 respectively) for Scotch Creek are less than ½ of the previous two brood cycle escapements for 1993 and 1989 (8,359 and 7,236)
- In 2004 early summer sockeye escapements to the Thompson drainage were only 10% of the 2000 brood year – DFO could not fully account for the loss of several hundred thousand sockeye from the marine area to the spawning grounds

Late summer sockeye:

- In 2004 DFO failed to meet their pre-season conservation objectives for Cultus (COSEWIC endangered sockeye population in lower Fraser) and late run Shuswap stocks. The pre-season exploitation ceiling targets for Cultus and Late Run Shuswap were 10 -12% and 15% respectively. The actual exploitation rates were 24% on Cultus and 31% on late Shuswap (41% on the Adams River population)
- the DFO objective to maintain the 2005 late summer escapement at the brood year level of 25,000 was too low; this provided no opportunity for rebuilding and recovery
 - this objective is below the previous five year cycle average of 75,000 and the interim escapement goal of 364,000

While these examples are of immediate concern to the Secwepemc people, DFO's approach using large management units based on aggregate timing groups for sockeye is the source of its inability to meet any of the MSC principles. DFO cannot protect or rebuild smaller or repressed sockeye populations by managing at large aggregate levels. While large aggregates of sockeye may be stable or increasing in size smaller non target populations are declining, thus this regime of fishery management is not sustainable.

Our cause for concern is that on cycles, like the 2005 cycle, several sockeye populations within the early summer aggregate are declining at alarming rates. While DFO mentions these as concerns they have not described any management measure that will demonstrably lead to their recovery. We fear that DFO will allow these populations to decline to levels that are deemed too costly to recover based on management or socio-economic costs. While DFO has put in place the Wild Salmon Policy to protect population diversity this process is not implemented as yet and is unproven. Even within that process there is still an opportunity for DFO to write off endangered or threatened populations based on socio economic costs.

Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

DFO cannot adhere to this principle as they have minimal, if any, understanding of the effects their management of salmon have on biological diversity or the ecosystem within the marine or freshwater environment. One certainty is that they may never understand nor be able to measure how their management of salmon harvests have impacted the ecosystem. A review of DFO escapement records for sockeye populations in our area indicates they have continuously repressed sockeye escapements by managing harvests at exploitation rates in excess of 60%. We believe the only way to determine the structure, productivity, function and diversity of the ecosystem in freshwater is to allow escapements to be fully productive. It is well known that a variety of resident freshwater fish species, wildlife, and other aquatic species depend on the health of salmon populations. It is logical that by repressing salmon populations like sockeye the entire ecosystem is impacted in a negative manner. Again, DFO have not shown in a demonstrable way how fisheries will be executed such that recovery and rebuilding will occur to a specified level or within a specified time frame consistent with the precautionary approach and considering the ability of the populations to produce long term potential yields.

Principle 3:

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable

DFO has not developed long-term objectives consistent with MSC principles. There are several sockeye populations that are declining at threatened or endangered rates within our area. Escapement goals for aggregates or single populations have not been identified using any biological or habitat based methods. While DFO has incorporated new harvest management approaches for sockeye, these are based on large aggregates or management units and afford little or no protection for non target weak or declining populations.

There has been little or no effort in developing lower limit reference points for harvests on smaller or weak populations. Target stocks like the large summer sockeye run in 2005 are managed to maximize harvests and ensure escapement, however, exploitation rates on smaller co-migrating populations are extremely high, particularly those destined for the Thompson/Shuswap system. While the fishery may be sustainable on the target stocks it is not sustainable for those smaller non-target populations caught as bycatch. Examples of the declines in non-target stocks are expressed under Principle 1.

DFO should be lauded for the direction it has taken to develop consultative processes with First Nations and other sectors by initiating the Integrated Fisheries Management Plan Salmon. While this process is still evolving it is still far from achieving the objectives of the Secwepemc people in terms of recovering salmon populations, particularly sockeye populations that our communities depend on for food, social, or ceremonial purposes.

As you are aware, International and Canadian law have described First Nations as having priority in the allocation of salmon resources and also in having a substantive say in how salmon should be managed to protect their interests. The issue of allocation and DFO management practices are inseparable; the way DFO deals with their harvest and conservation objectives has a direct impact on Secwepemc communities and our ability to re establish our fisheries to historic levels.

The SFC has repeatedly described to DFO how the repression and decline of sockeye escapements and other salmon populations directly impacts our harvest opportunities. They have not described to us nor demonstrated how sockeye populations that we depend on will be recovered in the short or long term. Our concerns and objectives are considered along with those put forward by other fishery sectors; however, the law states First Nations interests take priority above others. DFO has not described in detail how our interests are weighed against others; they simply balance their management on some sort of reasoning without explanation. This is not a transparent process, thus it does not comply with Principle 3 criteria.

Summary

The SFC cannot support the BC Salmon Advisory Board Application at this time. We fully believe that DFO's management of BC fisheries does not adhere to MSC principles for the reasons listed above. While DFO may have improved their management structure, their performance in managing and recovering stocks and ensuring the harvest interests of the Secwepemc people are met does not meet our standards or those set out by MSC.

DFO has initiated the Wild Salmon Policy and various planning structures to ensure a wide range of input into fisheries management; however, this process is not fully implemented and as yet is unproven. It may provide the framework to enable a MSC certification in the long term, but until DFO's management performance improves we cannot support the BC fishery MSC certification application.

We would consider supporting conditional approval of MSC certification if DFO can agree with SFC on demonstrable recovery plans for salmon populations that are of concern to us. As well meaningful discussions would need to take place describing how the abundance of sockeye and other salmon species can be increased to meet our harvest requirements. We will await provision of the draft MSC technical team assessment prior to considering any conditional approval of MSC certification.

Draft for Review

Thank you for this opportunity to express our concerns at this time and please incorporate our views into the MSC assessment. Please provide us with a draft of your assessment when it is complete and we will review it further. If you have any questions or require clarification please contact Pat Matthew or myself at (250) 828 2178.

Sincerely,

Fred Fortier
Chair/Director
Secwepemc Fisheries Commission

Cc: Christina Burridge BC Salmon Marketing Council
Bert Ionson DFO
Arnie Narcisse BCAFC
Marcel Shepert FRAFS
Bob Moody Shuswap Nation Tribal
B Rosenberger DFO BCI
G Sterritt Caribou Tribal Council
Karen Tarica Marine Stewardship Council